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COAL AGE

With Which is Consolidated The Colliery Engineer

DEVOTED TO COAL MINING AND COKE MANUFACTURE

ISSUED WEEKLY

VOLUME XVII

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January 1 to June 24, 1920

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COAL AGE

With Which is Consolidated
The Colliery Engineer

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January—June, 1920

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COAL AGE

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A Happy and Prosperous New Year

By R. Dawson Hall

AUSPICIOUSLY indeed does the New Year open with everyone working. For the immediate present at least (how long it will continue no one knows) we are enjoying a period that is free from strikes that are the normal ills of prosperous times. If we can only work steadily without domestic strife, the year 1920 will fulfill the most cheerful of our anticipations. This is said with full knowledge that the worst strike period this country has ever witnessed is barely over and that a similar or worse period portends.

Perhaps none too often do we wish one another Happy and Prosperous New Years but certainly too little do we strive to make those good wishes come true. The war ended, everybody had visions of peculiarly prosperous times. They would not have been dangerous dreams or unfilled prophecies had we all set ourselves strenuously to seek their accomplishment by steady unremitting toil.

But first of all we waited till everybody was convinced that the high wages and high prices had come to stay, and then we waited again till certain others had become certain that the high war wages were not to be followed by even higher peace wages.

Both parties the wage reductionists and the wage incretionists—pardon the word— are now alike satisfied, let us hope, that the war wages had come to stay but not to grow and that upward adjustments, if any, must be few. The lesson is learned, let us return to our work, happy that the strife did not succeed in killing off the prosperity that is ours.

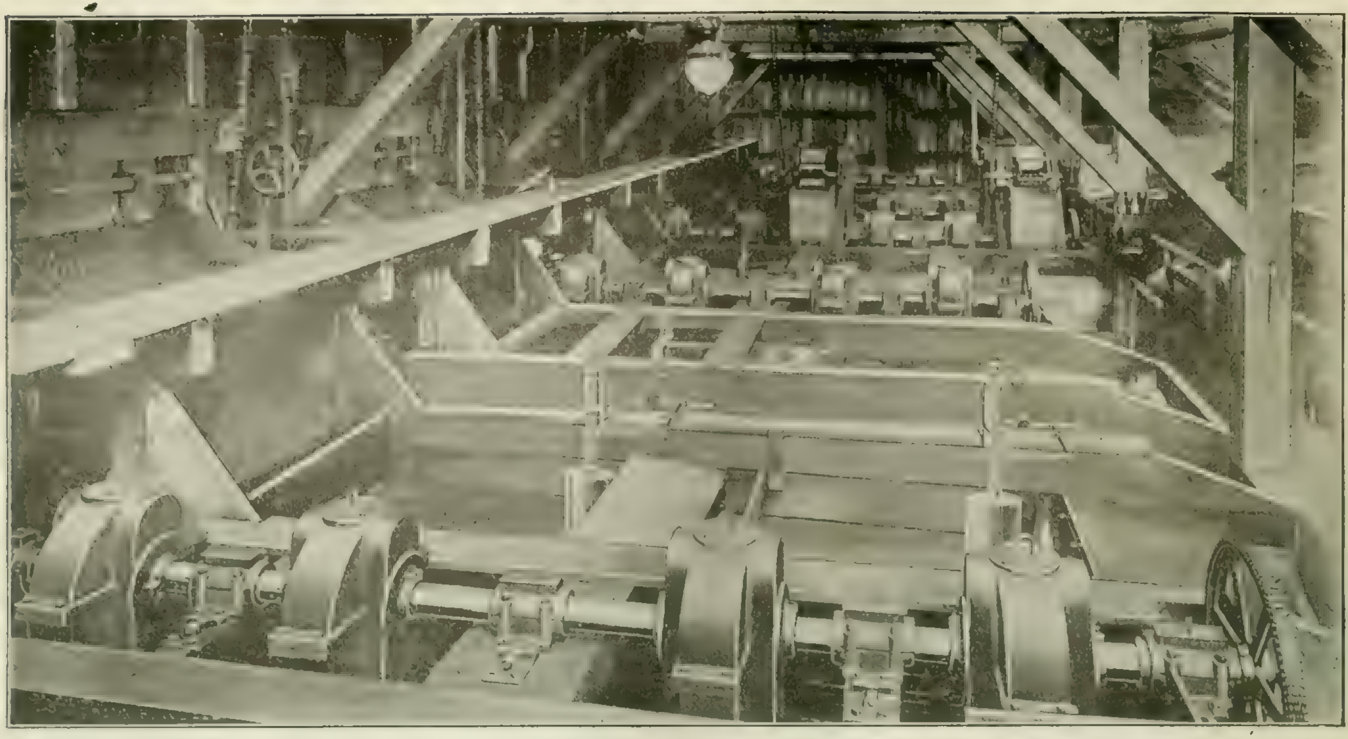
Unfortunately luxury is getting to be almost our biggest industry. We occupy the place that France used to hold, but while France traded in luxuries with the whole world, we largely serve with such frivolous things only ourselves. If our prosperity is to travel along on an even keel we must place it boldly on the progress of the staple, basal and essential industries, not on the parasitic trades which do not feed the bird but merely feather the nest.

It must be our great task to put the railroad industry and the street-car service on their feet, for without these even the luxury trades must suffer. In fact the success of the luxury trades will be their own undoing. Only in real material development can a people grow and prosper in such a degree as to make luxuries possible.

When the work and genius of a whole people goes into making ''joy wagons'', moving pictures, cigars and elegant wearing apparel, then that people soon falls into decay. The ploughman, the miner, the common laborer, the railroad man, the seaman and the worker in metals typify the forms of industry which make for national prosperity.

The workers in these trades, whether capitalists or laboring men must not by combination hold up their fellow countrymen, but neither must they be subjected to restraints from which other capitalists and other laboring men are relieved. They must not by general strikes and general lockouts hold up the public, nor must the public by special repressive legislation hold up them.

In 1920 may we have maximum production and may real productive industry come once more into its own. Conditions will never become sound until the public serves best those who by catering to its real needs serve the public most.



INSTALLATION OF FIVE ELMORE JIGGING MACHINES IN PLANT OF CARBON HILL COAL CO., CARBONADO, WASH. EACH JIG HAS TWO COMPARTMENTS FOR HANDLING FINE COKING COAL

Modern Practice in Coal Washing*

By Horatio C. Ray†
Pittsburgh, Penn.

Coal washing is undertaken in order to reduce the amount of impurities contained in the coal. Larger sizes of coal can best be treated in jigs while the smaller sizes can be handled more efficiently on concentrating tables. Sludge sedimentation and water clarification may also be effected by means of suitable apparatus

It is not the intent of this paper to give a treatise upon the subject of coal washing, since this has been well covered in a recent series of articles by Ernest Prochaska in Coal Age. Rather this paper shall deal with some of the recent changes in the art and some of the problems introduced or intensified by these changes.

Since coal washing is for the purpose of removing deleterious substances, let us consider first, what are the impurities with which we have to deal. Impurities in coal may be grouped into two general classes:—Chemical and mechanical. Chemical impurities are those that are so intimately mixed with the coal that they form a part of its composition; they include the ash coming from the organic matter from which the coal was formed, all or nearly all the phosphorus, and that part of the sulphur coming from the same source as the ash. It is obviously impossible to separate this class of impurities by mechanical means.

Mechanical impurities are those that form a more or less intimate mechanical mixture with the coal, but do not enter into its composition. These are slate, bone, pyrite, and occasionally calcite and gypsum. Intimacy of the admixture is the most important factor in considering the possibility of commercial washing.

Slate is usually interbedded with the coal, and ordinarily is freed from it by a minimum of crushing, hence it offers, as a rule, little interference to separation.

Bone, or "bony coal", consists of a mixture of coal and slate so interstratified that the two cannot be separated. This material varies widely in its carbon content, so that at times small amounts may be left in the coal without a serious increase to the ash content. Since its specific gravity usually differs but little from that of coal, its separation ordinarily offers great difficulties.

Pyrite, which is the chief source of the sulphur in coal, and often, the source of much ash as well, may occur in several forms:—(1) In rounded, or lenticular masses, in which condition it is easily separated from the coal by crushing and washing, its specific gravity being relatively high (about 5). (2) Thinly interleaved with the coal. In this occurance, separation is difficult and requires finer crushing and more careful preparation before the final washing. When gypsum, or calcite, are present, they usually occur in this same manner. (3) As little discs, like fish scales. These scales are usually so buoyant that they accompany the coal in washing, and may complicate considerably the problem of water recovery.

There is still another source of impurity, which is not often given the attention that it deserves. It is from pieces of either the underlying or overlying strata, or both. This can be controlled to some extent by mining but in many cases forms a considerable part of the impurities, especially in those cases where the bottom is rough, or where there is an overlying layer of brittle material. Fortunately this material is often of a character to make its removal by washing comparatively simple.

Until recently, it might be said that there were two chief reasons for washing coal: (1) In years past much coal was sent to the waste dumps as being too fine for the market. Ways were found in which this coal could be utilized, and as it was mixed with a large percentage of impurities, washing was resorted to. (2) Coal used for coking must be washed in order that the sulphur may be lowered in percentage below that which would cause trouble in metallurgical operations. Some coking coals are naturally sufficiently free from sulphur to meet this requirement but many are not.

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*Paper delivered before the Coal Mining Institute of America, Pittsburgh, Penn., Dec. 4, 1919.

†Professor of Ore Dressing, School of Mines, University of Pittsburgh.

VIEW OF DEISTER OVERSTROM COAL WASHING TABLE

The first of these reasons applies specifically to the anthracite coal industry, where washing for years has been the rule rather than the exception. The demand for small sizes of anthracite, fostered largely by the coal producers, has become so great that the unsightly "culm banks" of former years are almost gone, and the current production of this material is washed instead of being piled as before. The bituminous industry does not have this material, for its waste piles in many cases have been and are burning. Furthermore the rejected coal is mixed with so much rock and slate, as to make commercial washing improbable, if not impossible, for many years to come.

The second reason has become more vital every year. Altough American coals, such as those of the Connellsville region, that can be made into good metallurgical coke without washing, are not near exhaustion, they have reached or about reached, the peak of their production. On the other hand, the demand for coke low enough in sulphur and ash to be used in metallurgical operations has grown enormously, so that it can no longer be supplied by those fields. This has led to the use of inferior coals, which demanded washing before coking. The demand is likely to become still more urgent as the production of these fields decline, and it may become a problem before this decline becomes great, because metallurgy is seeking betterment in this matter of fuel, rather than the maintenance of present standards. I would predict therefore that the rapidly increasing use of by-product coke ovens will render this subject of washing increasingly vital in the near future.

In recent years, several other factors have tended to bring this subject to the attention of the coal producers. One of these is the education of the industrial, and even the domestic user, of coal and coke. Where formerly any kind of coal was accepted, which passed the casual inspection of the eye, and in many cases not even that, it must now pass the test of the chemical analysis, as well as the boiler trial. Even some of the better coals have difficulty in passing these tests, and their producers are compelled to accept lower prices on account of inability of their product to meet certain specifications, or such a product has at least been restricted to or from some particular market. This has necessitated in many cases installations of washing plants.

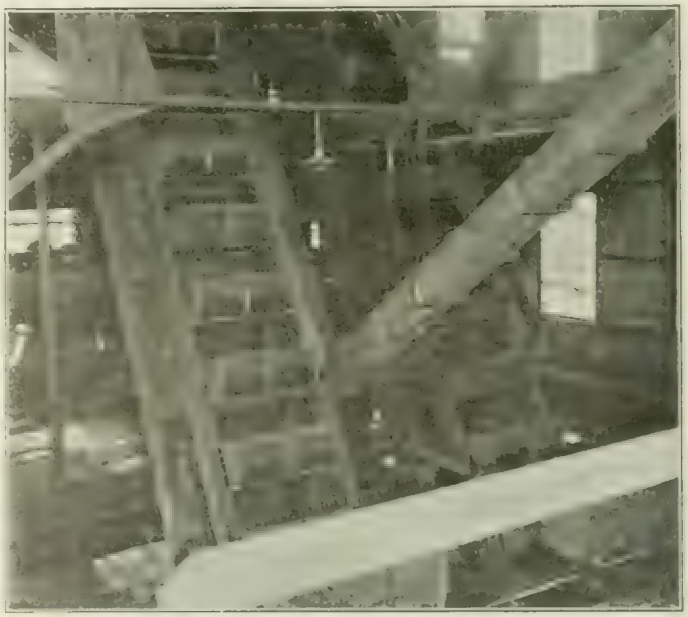
Another of these factors is the possibility of producing a superior product for which the market will pay an increase in price, not only sufficient to defray the extra expense of washing, but enough to yield a profit on the washing itself. Under those market conditions where the supply appears to exceed the demand, as it frequently does in the bituminous coal industry, the possibilities of a superior coal ought to be worth consideration.

Another factor, which at present is of some importance, especially in the western fields, but which promises to become more and more important, even in the eastern regions, as time goes on, and the production from beds already opened declines, is the marketing of inferior high-ash and high-sulphur content coals. As already pointed out, since the consumer is not likely to accept a reduction in standards, improved washing must result.

Still another factor, which was brought about by the exigencies of the war, is the production of pyrite suitable for burning in the manufacture of sulphuric acid. Under the proper combination of circumstances this might be equally successful in peace times, even in competition with cheap sulphur and pyrite. If I am not incorrectly informed, there are still operating successfully several plants producing this material. The pyrite produced from coal is usually of a chemical character especially desirable (because of the absence of certain deleterious impurities, such as arsenic) in the production of acid.

Summing up, some of the principal advantages following the washing of coal are:—

1. The removal of objectionable sulphur, which is important from even a physical standpoint, since fires from spontaneous combustion in coal bins and piles are conceded to be largely due to the heat generated in coal containing a considerable amount of sulphur; 2. The increase in heating value of coal; 3. An increase in boiler efficiency; 4. A reduction in the amount of combustible matter lost in the ash; 5. A decrease in transportation difficulties; 6. Washing renders marketable the product from low grade coal, or screenings, heretofore wasted; 7. It renders possible an increase in the use of pulverized coal, thereby increasing markets; 8. Washing makes probable increased prices and profits.



DEWATERING ELEVATORS AT MIDDLEFORK WASHERY BENTON, ILL.

Until within the last few years, coal washing has been carried on by means of trough washers, ascending current washers (such as the Robinson), jigs, and in a few cases the Campbell table. Trough washers and ascending-current washers will not be considered here. The ascending-current washers, however, should be given credit for first awakening interest on a large scale in the subject of coal washing. The Campbell table, which is the forerunner of modern methods, is given no further mention here, because of certain inherent mechanical defects and low capacity.

It is well at this point to consider the principle underlying coal washing. The action of every coal washing apparatus, or machine, depends upon the difference in the velocities with which identically shaped particles of various specific gravities settle in water. That is, if pieces of coal, slate and pyrites of approximately the same shape are dropped into water, the pyrites, having the greatest specific gravity, fall most rapidly; then the slate Sp. G.; and finally the coal follows.

It will be readily seen that size and shape are bound to exert an influence upon this settling power. There can easily be conceived those conditions (which actually occur in practice) where pieces of pyrite, slate and coal of equal settling powers, although of different specific gravity, size and shape, will be found together. The obvious solution of this is to so limit the difference in sizes, that settling power comes to depend mostly upon specific gravity. The effect of difference in size must be kept in mind in the consideration of this problem of coal washing.

IMPURITIES MUST BE SEPARATED

In order to separate the coal and the impurities it is necessary that they be detached from one another. This is done by crushing, and the proper selection of a crusher is important. In general, toothed or corrugated rolls for coarse crushing, and hammer crushers for fine crushing are used. It will be readily appreciated that finer crushing will be necessary to free the coal in some conditions, than is necessary in others.

Jigs have been and still are the machines most used in the washing of coal. In the jigging of coal there are two practices: (1) The raw coal is washed; and (2) the coal is sized then washed. In the former practice, the coal is sent directly from the bins, usually after crushing, to the jig, and the feed will vary in size from that of the largest treated to the finest of dust. It is obvious, keeping in mind the principle underlying coal washing, that an efficient treatment of these different sizes is impossible. What actually occurs is that the finer material is washed away with the coal regardless of its character. If this is high in impurities it must be separated from the coal later by screening. In the latter practice, the coal is divided into two or more sizes by means of screens, the larger sizes being treated on coarse-coal jigs and the smaller sizes on fine-coal jigs.

Fine-coal jigs have been in use for a long time for treating the small sizes, but they are not particularly well suited to this work, both on account of the character of work done and certain inherent defects. One of these is that an artificial bed must be maintained upon the screen, made up of material larger than that treated, since the screen openings must be of sufficient size to allow the free passage of the water currents. Of recent years there has been a growing realization among operators, especially those producing coal for the making of metallurgical coke, of the necessity for a machine that would be more economical and efficient in the washing of the smaller, or finer sizes of coal, say, that which passes through a ½ in. perforation down to the finest dust. To ascertain the best method of doing this much experimentation has been carried on with various types of concentrating tables.

The table concentration of ores has been carried on successfully for a number of years. When tables were first introduced (about 14 years ago) they revolutionized the concentration of ores, replacing many of the fine jigs then in use. They seem destined to do the same in coal washing. The difference between the washing of coal by the table method and the table concentration, of ores, is, that in the former, the pure coal, being of lower specific gravity than the refuse, is removed along what is ordinarily known in the treatment of ores as the "tailing discharge edge", while the refuse is taken off over the end of the table where the valuable constituents of the ore are ordinarily removed. In other words, coal washing is the exact reverse of ore concentration.

Many types of tables have been used in the concentration of ores, but so far only two have been successfully adapted to coal washing, the Deister and the Wilfley. These various types of tables differ but slightly, in main, and not at all in principle. The chief difference is the arrangement of the riffles and the mechanism for giving the table its motion. The tables as adapted to coal washing are but little different from the ore type, the usual change being a slight enlargement, both as to length and width, and a consequent strengthening of the construction. The two types mentioned differ only slightly so that a description of one will be sufficient.

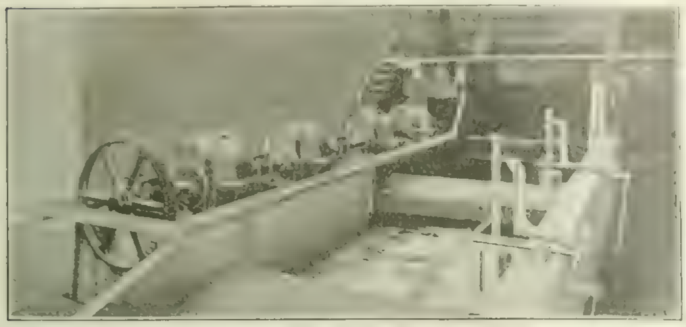
DETAILS OF THE DEISTER TABLE

The Deister table as used in coal washing consists essentially of a linoleum-covered plane surface, or deck, approximately the shape of a parallelogram, about 8 ft. wide by 17 ft. long (the Wilfley being about a foot narrower and shorter), transversely inclined, and reciprocated endwise by a head-motion mechanism. The deck is supported by means of toggles, or slides, on a tilting frame, which allows the transverse inclination to be readily changed. The tilting frame is held firmly by a base built up of channels and steel plates. On the top are tacked wooden cleats, or riffles, which taper vertically from the head-motion end, where they have a thickness of about ½ in., to a feather edge at the "refuse discharge end". The riffles terminate in a diagonal line. They are about ¼ in. wide set about 1¼ in. apart, although this varies somewhat according to the size of the material treated. The elements which influence the particles upon the table are: the length of the stroke imparted by the head-motion; the side inclination of the deck; the quantity of feed and wash water; and occasionally the longitudinal slope. In many cases however no longitudinal inclination is given.

In the table washing of coal, the operation is as follows: —The raw coal, previously mixed with about twice its weight of water, is delivered to the feed box in the upper corner at the head-motion end of the deck, and thence through a series of small holes onto the deck. Water distributing boards are provided and attached to the same side of the deck as the feed box in order to obtain a nice adjustment in the distribution of water over the deck surface. The table is erected in a horizontal position and is practically level longitudinally, that is, along the line of its reciprocation. A slight side inclination at right angles to the line of reciprocation, and which is adjustable in order to meet changing conditions, permits the clean coal to be washed down over the long edge of the table into a trough, or launder, through which it flows to its ultimate destination, while the action of the head-motion in reciprocating the deck at approximately 275 strokes per minute, with a length of stroke of ¾ in., drives the sulphur and refuse, which stratify next to the surface of the table deck in accordance with their greater specific gravity, out and over the short edge, or refuse end, of the table, where it is caught in launders and conveyed to the refuse dump. The wooden riffles on the surface of the deck aid in collecting and guiding the refuse to its proper point of discharge from the table, and also prevent the finer particles from washing over with the clean coal.

The capacity of a coal washing table is variable, depending on the ease of separation of the refuse from the clean coal, and also on the purpose for which the clean coal is to be used. For example, if the coal is intended for use under boilers, or in pulverized-coal plants, the requirements, with reference to the reduction of ash will not ordinarily be stringent, necessitating less careful [illegible] correspondingly greater capacity per table. [illegible] hand, in the washing of coal for the making of metallurgical coke, the prime requisite is the reduction of sulphur to the lowest possible limit, making necessary great care in operation of the tables with a corresponding reduction in capacity. The capacity of the Deister table ranges from 7 to 10 tons per hour on bituminous coal.

The maximum power requirements per table are about 1½ h.p. The amount of water needed is approximately 470 gal. per ton of raw coal treated.


INSTALLATION OF AN ELMORE COAL JIG

Coal washing tables are usually fed from storage bins by means of some positive arrangement, such as a screw conveyor, which will insure a steady continuous flow of material, which is absolutely essential to good working as is the case with all washing machinery. With such an arrangement, the table can be adjusted to a certain position and requires little attention, except to see that there are no chokeups of launders, water pipes, etc. In fact, one good tableman, who thoroughly understands the work should be able to operate 50 of these tables as readily as one.

As will be readily understood there is bound to be in the product coming to the table certain particles, which will be composed of coal and slate, coal and bone, or coal pyrites. The reason for this is that the crushing has not detached the different materials one from another. The fineness of crushing is, of course, a matter to be decided entirely from the viewpoint of the profit balance sheet. The amount and character of the final material will depend upon the degree of admixture of coal and impurities in the raw feed. This material, which is neither coal nor refuse, obviously, however, will have to be finally placed with one or the other, or be divided between them, depending upon its character, amount, and the result desired from the washing. So it will be seen that there can be no sharp line of division between the products. This has given rise to the practice of removing this mixed material as a separate product, called middle product, or middlings. In ore dressing, this material is either stored awaiting more improved methods of treatment, or in most modern cases, is recrushed and reconcentrated. In coal washing, the same practice, has been followed, even when using jigs. In this case the middlings from the coarse jigs are recrushed and treated on the fine jigs, the middlings from the fine jigs usually being rewashed without crushing and eventually getting into one or the other of the products. By the use of tables it has become possible to recrush and treat this material from fine jigs or from other tables working on coarser sizes. This, of course, results in a saving of coal and a reduction in the ash. Both of which are important factors.

On account of varying conditions, it is extremely difficult to get an idea of the cost of plant installations, but estimates have been made which run all the way from $3600 for single table installations for the treatment of screenings and refuse from the tables of the washery, to $[illegible] for a 60-table plant of concrete and steel construction. The per ton cost of operation, which includes interest on the investment and plant depreciation, has been estimated at from 10 to 12 cents per ton on a single table installation to as low as 3 to 5 cents per ton in a plant of 1000 tons daily capacity.

From a large number of tests made on Illinois coal containing sulphur extremely difficult of reduction, the following have been selected as representative:

TEST No. 3

	Total Lb. Dry Wt	Per Cent. Total Wt	Per Cent. Ash	Per Cent. Sulphur
[illegible]	[illegible]	100.00	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	6.09	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	31.06
Refuse	190.00	11.93	[illegible]	6.87

TEST No. 10

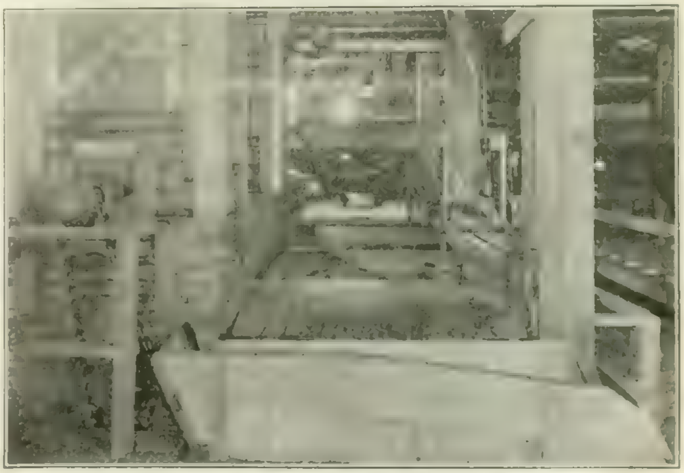
	Total Lb. Dry Wt	Per Cent Total Wt	Per Cent Ash	Per Cent Sulphur
Raw coal	[illegible]	[illegible]	[illegible]	[illegible]
Washed coal	[illegible]	[illegible]	[illegible]	[illegible]
Refuse	174.50	17.15	53.15	9.09

From the foregoing figures, it will be noted that the ash content of the washed coal is approximately the same in each case; in other words, it represents closely the small amount of fixed, or non-removable refuse. A critical analysis of the work in these tests indicated that washing by the table method eliminated 90 per cent or more of the free or removable ash and sulphur content. In each of these tests, the coal was washed at the rate of approximately 8½ tons per hour.

From tests run on Pennsylvania bituminous coals, the following have been selected:

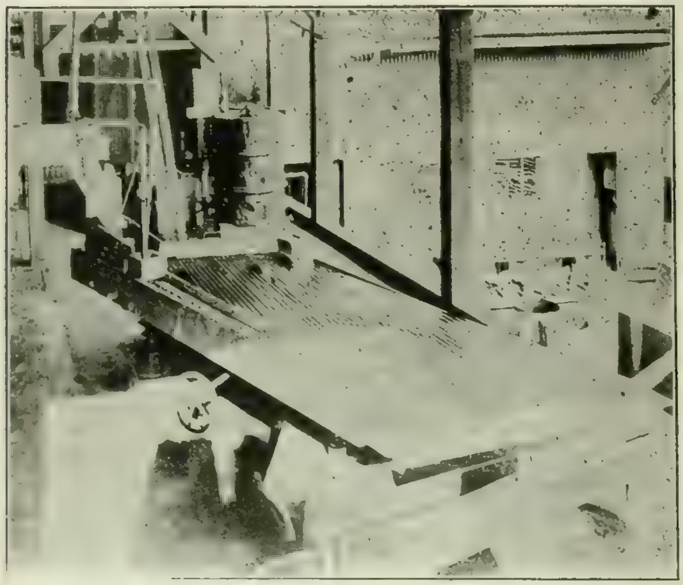
RAW COAL		WASHED COAL				REFUSE	
		ASH		SULPHUR			
Per Cent Ash	Per Cent Sulphur	Per Cent Ash	Per Cent Reduction	Per Cent Sulphur	Per Cent Reduction	Per Cent Ash	Per Cent Sulphur
12.13	2.54	6.34	46.20	1.17	53.94	51.26	11.73
16.01	2.59	[illegible]	63.99	.90	65.25	55.86	8.48
10.52	1.85	5.46	48.17	.84	54.60	48.53	10.34
18.20	2.49	7.90	56.59	1.00	59.82	66.80	9.11
11.00	3.22	5.87	55.73	1.32	59.01	52.22	18.91

Dewatering of the washed coal has always been one of the important problems in the consideration of coal washing. Obviously, the consumer does not wish to pay for water in the coal, yet unless it is removed someone must


JIG IN PLANT OF DURHAM COAL CO., WASH.

pay the freight on it and this charge must be added to the cost of the delivered fuel. Water, of course, is not combustible and, therefore, some heat will be consumed in heating it in whatever operation the coal is used, with a consequent lowering in efficiency. Further, in the temperature zone, where there are winters like we have in the various coal-producing sections of the United States, the problems, arising through the freezing of the wet coal in bins and later in railroad cars, when transported, must be given due consideration. In a general way, it might be said that the lower the water content, the less trouble there will be from this source.

Another reason for close dewatering, is the cost of the water used in washing. A washer, using any process in treating fine coal, be it tables or fine-coal jigs, is bound to use large quantities of water. In many cases an abundance of water is available with an expense arising only from damming and piping, but in those cases where water has to be purchased or pumped, it becomes a real problem and dewatering must be practiced in order to recover this water, since recovery of at least a large part of it will be much cheaper than the purchase of the same amount of make up.



GENERAL VIEW OF DEISTER-OVERSTROM WASHING TABLE

This problem has become increasingly important with the adoption of concentrating tables,not because they use more water, than jigs, as they usually use less, but because the smaller the particles the more water will be held, since the percentage of voids will be greater, and the more difficult the separation becomes because of the decreased porosity of the mass. Moreover, the actual minimum percentage to which the coal can be dewatered, without the use of heat, becomes higher as the size of the particle becomes smaller. In any moist mass of insoluble particles from which has been drained all possible moisture, the retained moisture will be made up of water films held on the surface of the particles by adhesion, and the water absorbed by the particles. In the case of coal the latter will usually be of no importance, but the former is proportional to the area of the surfaces of the particles. This increases rapidly as the particles decrease in size.

The percentage of moisture allowable in washed coal (aside from the factors mentioned) depends upon the use to which the fuel is to be put. The two main uses are: (1) Coking coal and (2) fuel coal. The moisture of washed coal charged into beehive ovens varies widely. Replies from a number of operators in the various coal fields place the limits from "so wet that the water would run out the door" to 8 per cent. And the modern tendency is towards drier coal, as giving better coking results.

It is interesting to note that a certain large Colorado coke producer has fixed upon 5 per cent as the lowest moisture desirable, for with moisture below this equally good results are not obtained. Unfortunately he has neglected to state whether this effect is in the coke itself or in the operation of the ovens. In by-product ovens, it seems that 12 per cent is the maximum allowable, with between 8 and 10 per cent as the average, while 6 to 8 per cent are the proportions sought as giving the best results. Dry-screened dust is often added to lower the moisture content. This can only be done in those cases where the dust would be sufficiently low in ash and sulphur to permit this admixture. The degree of dewatering of fine fuel coal depends upon the demands of the consumer, but the moisture should not exceed 10 per cent. A mixture with dry coal can also often be added to advantage in this case.

In the dewatering of coal simplicity of installation should be the keynote, together with economy of space, low power consumption and small installation and operating costs. Also a dewatering plant should so function that a continuous stream of coal is kept moving between the mine and the cars, or ovens, so that, no interruption or even slowing down is permitted.

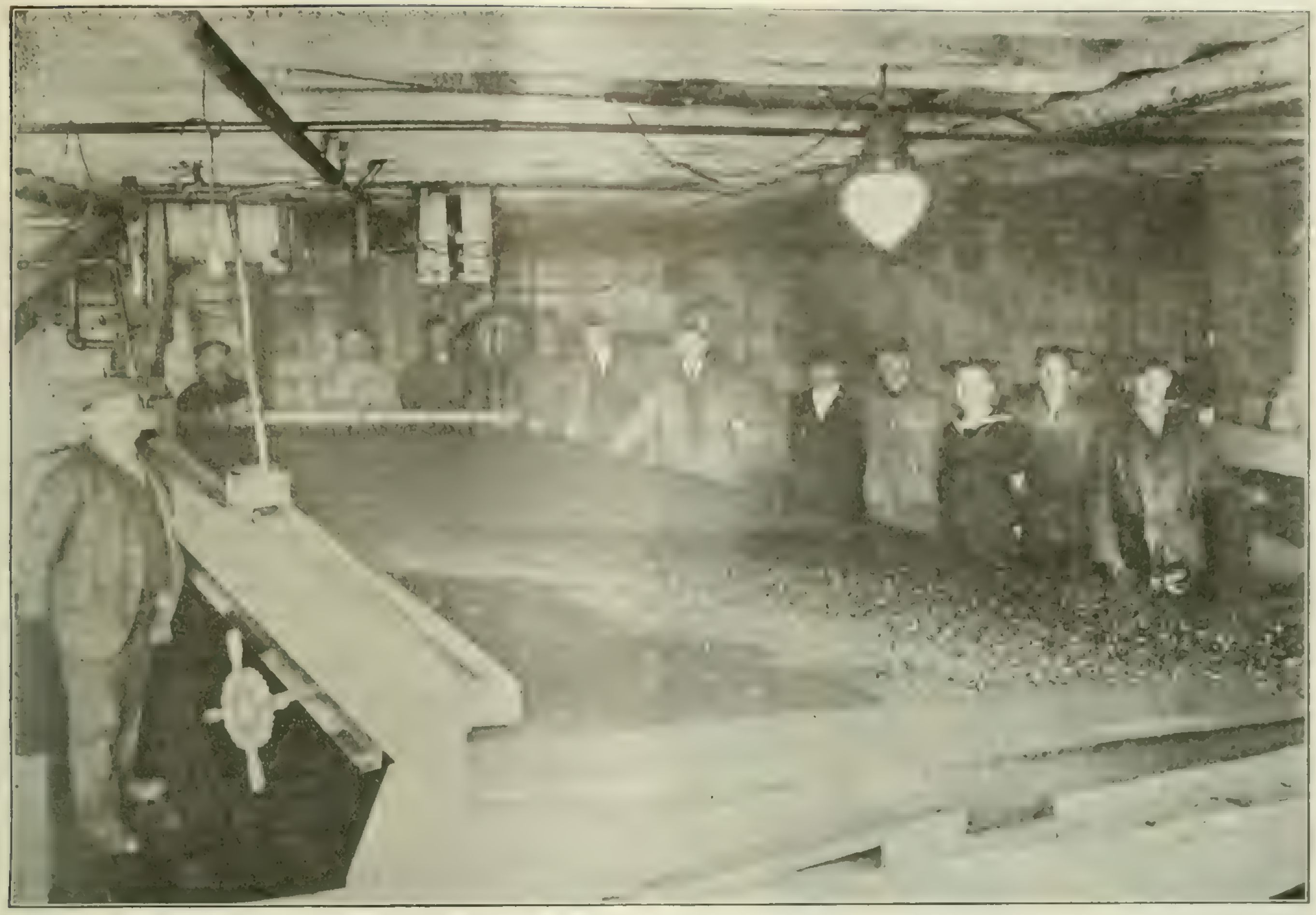
CHARACTER OF MATERIAL INFLUENCES DRYING

The methods to be employed for drying coal must be adapted to the character of the material. This requirement demands especial attention. The coarser coal is ordinarily rather easily treated by draining methods, but the fine material offers serious difficulties and should be treated separately. The character of the fine coal from different mines shows many variations. With a hard, not easily shattered slate, the fine coal, and especially the sludge, are innocuous. The dewatering is comparatively easy and can be, at least partly, combined with water clarification. But if the slate, or what is even worse, the slate and the coal are disposed to produce a microscopically fine pulp held in suspension in the water, the process of dewatering must be carried on in an entirely different manner. This condition is especially noticeable when fireclay is present. In these conditions the separation of the fine material from the pulp must be accomplished in the early stages of the process if it is to be carried out successfully. This is done preferably while the coal is dry by screens or dust-removing devices.

The following devices for dewatering are in use at the present time:—(1) Dewatering bins and pits; (2) dewatering elevators and conveyors; (3) centrifugal dryers; (4) Dorr classifiers and thickeners; and (5) filters (for sludge only). Sludge may be defined as the mixture of solids, formed in the washing of coal passing through a screen with perforations $\frac{1}{16}$ in. in diameter together with water.

At the Franklin washery of the Cambria Steel Co. are employed dewatering pits built of concrete 30 by 30 ft. and 16 ft. deep. These pits have false bottoms made of wooden grates with $\frac{3}{16}$ in. openings between the slats. The coal, as it comes from the washery, is sluiced into these pits where the water is allowed to drain off through the false bottom, or overflow around the edge of the tank. After the pit is full of coal, it is allowed to stand for a number of hours in order to drain off the surplus water. This is a slow process and wasteful of the fine coal.

Dewatering is in many instances simply accomplished in the ordinary washery storage bins, the water and certain of the fine solids passing off through the bottoms, no effort being made to make them tight. Coal going into a bin with 16 per cent moisture having been partially dewatered



VIEW OF No. 7 DEISTER OVERSTROM WASHING TABLE IN OPERATION ON COARSE COAL FEED

by elevators, will drain within 24 hr. down to 12 per cent, but in 72 hr. it can often be reduced to ten per cent and occasionally to as low as 9 per cent.

In Europe, draining bins are commonly employed and the draining off of the water is accelerated by the use of filter bodies made of expanded metal covered with canvas, which open up the densely packed mass of fine coal. Moistures as low as 8 per cent are often obtained in 48 hours by this means.

The disadvantages of draining bins are as follows: On account of the large surfaces the sludge settles out of the water, considerably delaying thereby the process of dewatering. On account of the lack of other drying apparatus, all sludge produced must be sluiced into the draining bins, there to be dewatered. This delays also the rapid draining off of the water. In the emptying of the bins, the coarse coal flows out more rapidly than the fine material and sludge, which later clings to the walls. When the bins are emptied this sludge hangs upon the walls for some time and drops off suddenly in large masses. This destroys that uniformity of the coal which is desirable for the coking process. The bins also require considerable space and head room.

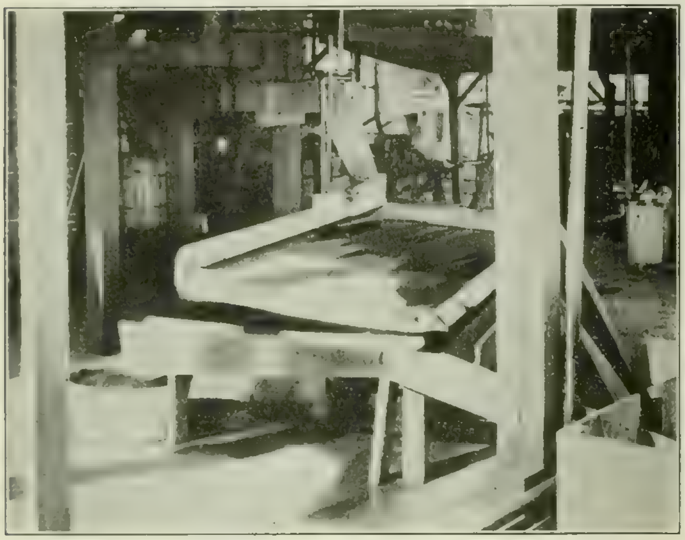
The perforated bucket elevator and the dewatering drag conveyor are quite commonly employed, being used in many instances when other types of apparatus follow. The perforations vary, but when used alone or with bins, they are usually $\frac{1}{16}$ in. in diameter. The excess water, amounting to about 75 per cent of that used in washing the coal and carrying the fine solids in suspension, is sluiced to separate settling tanks. Dewatering elevators and conveyors must be built heavy, depending on the character of the coal, the required capacity, and the distance over which the material must be conveyed. This is the more important since the speed must be slow in order to give the water time to drain off. In elevators the inclination and the distance apart of the buckets must be such that the buckets do not drip their water into the ones lower down. The following table gives some data on elevators and conveyors:

Type	Dimensions Width	Length	Slope Degrees	Speed Ft. per Minute	Per Hour Capacity Tons	Power H. P.	Dewatered Moisture Per Cent.
Conveyor	32 in 13 ft.	50-130	0-40	1⅔-12	5-60	4-18	10-18
Elevator...	20 in.- 6 ft.	50-130	40-65	3 -32	10-60	12-32	10-18

Centrifugal dryers are the most efficient pieces of apparatus now in use for the purpose of reducing the moisture in the washed coal below 10 per cent. To really do efficient work these machines require the moisture of the incoming coal to be reduced to about 15 per cent, which can be quickly done by the dewatering elevator. Centrifugal dryers on account of their high speeds, are restricted to the dimensions of the revolving parts, hence are limited in capacity, so that only those that are continuous give a satisfactory output. Their greatest disadvantage, which ought not to be serious, lies in the wear of the screen plates. The use of a protecting grate, or inner coarse screen, or the keeping of a thin layer of coal on the screen which would act as a filter and protect the screen from abrasion, ought to solve this difficulty. The screen, in order to have the requisite strength, must be so coarse that it allows the escape of the finer material. There is also a tendency towards the production fines because of the grinding action of the centrifugal force on the coal.

The best of these dryers is the Elmore. The screen which is a truncated cone, is supported and made to revolve by the vertical main shaft driven at the top by gears. Revolving on the main shaft is a hollow, or quill shaft, which moves at a somewhat lower rate of speed, carrying a series of flights, or scrapers. Coal is fed through the stationary feed spout in the top and falls into a conical distributor, which throws it against the screen. The water and the fine material pass through and the coal is retained. It is scraped off by the flights and falls to the bottom and thence passes out.

As was said before, these machines work better when the coal is fed to them with some of the water removed, but they do fair work even when the moisture is high. Working on a material crushed through a ¾ in. hole with 50 per cent of it passing through a ⅛ in. round hole, and with initial 50 per cent moisture, the dried coal carried 9 to 11 per cent. When the coal fed was reduced to 20 to 25 per cent moisture, the dried coal contained 8 per cent moisture. When put into the dryer with 12 to 15 per cent of water, the coal can be dried to 6 per cent. This is on a machine with a capacity of 75 tons per hour, with a speed of 400 to 450 r.p.m., and taking a maximum of 35 h.p.



INSTALLATION OF LABORATORY, SIZE D AND O TABLE

The results of two tests run on a commercial machine in actual practice at Benton, Illinois give an idea of the sizes and show the improved catchment of the fines, especially those below 10 mesh. These results in the second column are brought about by better understanding of the machine and its work, no change having been made in the screen in the time.

ELMORE DRYER TESTS

	7-26-19	9-30-19
Held on ⅛ in.	72.02	70.19
Through ⅛ in., held on 10 mesh	11.92	11.27
Through 10 mesh, held on 20 mesh	8.52	8.79
Through 20 mesh, held on 40 mesh	1.06	5.95
Through 40 mesh, held on 60 mesh	1.02	1.87
Through 60 mesh	1.62	1.93

Dorr classifiers and thickeners as well as filters are usually only used in the dewatering of sludge and in water clarification. They will therefore be discussed under that heading.

The necessity for water recovery has already been referred to. The importance of this detail in coal washing will be emphasized when it is known that a washery treating 2000 tons of coal in eight hours circulates in that time 1½ million gallons of water. In the separation of the water from the sludge, it is necessary to clarify it, otherwise the density of the water would be changed and the washing affected. In washing, fresh water must be added in sufficient quantity to make up the loss by evaporation, that carried away by the slate, coal and other materials discarded, and the loss by leakage. Since these losses will aggregate large, it should be confined to as small an amount as possible, by employing proper methods of clarification.

The sludge, which is obtained from all the preceding types of dewatering apparatus, consists in most cases of fairly pure coal mixed with water. When this is the case, all that is necessary is the separation of the two, which is comparatively simple. However, if there are finely divided impurities present, such as come from the disintegration of fireclays, there must be first a separation of the coarser materials, usually coal, followed by the clarification.

Heretofore, both of these problems have been handled, more or less satisfactorily by means of settling basins, settling tanks of cylindrical or oblong shape, and pointed boxes, or spitzkasten. This has always been a weak point of the washery, especially when the first two types of clarifiers were used. Recently however the Dorr classifier and thickener, and various filters, that have worked satisfactorily in other fields, have been installed with satisfactory results.

The Dorr classifier consists of a settling tank in the form of a shallow inclined trough open at the upper end. The tank may be set at any desired slope, usually about 2½ in. to the foot. The feed enters near the center and the liquids and the slow settling solids overflow at the closed end, while the quick settling solids are conveyed along the bottom by mechanically operated reciprocating rakes and, after emerging above the liquid, are discharged at the open end. Broadly speaking, the slope of the bottom, the amount of water in the feed, and the speed of the rakes determine the character of the two products.

DETAILS OF THE DORR THICKENER

The Dorr thickener consists of a slow moving mechanism set in a tank or basin. The mechanism is made up of a central vertical shaft driven by a worm gear and worm, the shaft having radial arms attached at its lower end. These arms carry plow blades set at an angle which, through the rotation of the mechanism, move the settled material to a discharge opening at or near the center of the tank. The feed enters continuously near the center of the tank, and a peripheral overflow trough collects the clear liquid. The underflow, consisting of thickened solids, is discharged through a hole in the bottom. In many cases a pump is connected to this opening and the outflow regulated thereby. The underflow varies greatly in moisture content, depending upon what is desired. With moistures of less than 50 per cent it is not possible to handle the product with pumps. The gentle stirring action of rakes in the pulp gives a thicker product than entirely quiet sedimentation. This stirring has no disturbing effect upon the settling. The rakes move about 1 revolution in two minutes, and require in the smaller sizes about ¼ h.p. for their propulsion.

The Dorr classifier is used to remove the coarser materials in the sludge from the finer solids and the liquids. In those cases where the sludge consists only of comparatively coarse solids in water, water clarification may be carried on in the classifier. In those cases however, where there are extremely fine solids also, the separation of the coarser is carried on in the classifier and the water clarification is secured in the Dorr thickener.

The disposal of the settled material from both the classifier and the thickener depends upon its character. Usually that from the classifier will be of such composition that it can be sent to the coal bins direct, without materially increasing the ash or sulphur content of the bin contents. Filtering may be advantageous, as the moisture contained in this material will be usually at least 20 [illegible] per cent, and if added to the bin coal might increase the moisture of the whole by 1 or even 2 per cent. In case this material is of a nature too high in impurities to be sent to the bins, it can usually be concentrated on tables. If this is not advantageous it must be wasted.

The underflow from the thickener is rarely of a character that can be added to the bins direct, both on account of its impurities and moisture content, which will usually be in the vicinity of 50 per cent. If it contains excessive impurities there is no help for the matter for this material would usually be of a character that could not be commercially treated on tables or other concentrating devices. The high moisture content can be lowered appreciably by filtering.

The only filter which has been successfully used so far is the Oliver. This is because of the fact that it is continuous in operation and hence the costs are within the range of possibility. The ordinary material to be handled by filters in coal washing ought to give rather high capacities. The Oliver continuous filter consists of a drum or cylinder rotating on a horizontal axis with the lower portion submerged in a tank containing the material to be filtered. The surface of the drum is divided into compartments or sections, the dividing partitions being parallel to the main shaft. These sections are covered with screen for supporting the filter medium which is held in place and protected from wear by a wire winding. Each of the sections of the drum is connected by means of pipes passing through a hollow trunnion to an automatic valve, which controls not only the vacuum for forming the cake, but also the admission of air for discharging the cake.

A scraper is fitted across the face of the drum to insure that the cake is entirely removed after being released by air or steam pressure. An agitator suitable for the pulp being filtered is placed in the tank beneath to keep the heavier particles in suspension so as to insure a uniform cake. The filter is entirely automatic and constant attendance is not necessary so labor costs are low. The total expense will be about 3 or 4 cents per ton depending upon the costs of materials, and, of course, upon the substance to be handled. The filtering rate varies from 1000 to 2000 lb. dry weight of coal sludge per square foot of filtering area per day of 24 hr. The discharged cake will contain from 10 to 20 per cent of moisture depending upon the fineness of the product, specific gravity, and temperature of filtering. Coal sludge, however, presents in most cases an easy problem.

SUMMARY

Coal, which contains mechanically mixed impurities, can be successfully washed after crushing sufficiently fine to free these impurities from the coal. Jigs are economically and satisfactorily used for the treatment of coal ½ in. in diameter, or larger. For sizes below ½ in., reciprocating tables are more efficient and economical.

Coarse coal can be satisfactorily dewatered by a combination of bins, elevators, and conveyors, or by mechanical dryers. Fine coal and sludge dewatering, combined with recovery of the water is best accomplished by settling devices, such as the Dorr classifier and thickener, and by filters.

In conclusion, I wish to express my thanks to those manufacturers who so kindly loaned illustrations and furnished information. Also to those operators and others who gave practical information from operating plants. Without the help of these people this article could not have been written.

The Mine Foreman

By C. L. Green

[illegible], W. Va.

THE real key to the labor problem in a mine is the foreman. The importance of this position is in many cases at least almost equally divided with the shot-fire in mines where such men are employed. For the sake of brevity therefore we will in the discussion which follows include shot-firers, who in reality act as sub-foremen as well as foremen proper.

Operators may plan as they will, they may be willing and anxious to extend to their men every human consideration, they may put forth every effort to make working conditions right, and after all this has been done they may meet with failure in solving their labor problems if the foreman is not what he should be.

General officials, managers and superintendents are one and all helpless if the foreman through ignorance or malice, does not, in his personal contact with his men, carry out the policies of the operator, or company.

The management plans, the local managers and superintendents may earnestly and honestly try to put those plans over to the men, but in order that they may reach and stick, in order that they may be rightly put, and in a way that they will stay put, the plans must be delivered by the foreman, for he it is who is in contact constantly with the men. He and he only of the management is in constant personal touch with the workmen themselves. He virtually holds within his personal power the fate of the worker, in that he it is who decides whether the worker shall continue at his work or not. This is true, even though the power of discharge does not lie with him, for if he decides that a man is not desirable, that man will go, whether discharged or not, since the foreman can and often does, make his life so miserable that the man cannot or will not remain on the job.

EXACTING SELECTION OF FOREMEN ADVISED

This being the case it naturally follows that the greatest care should be exercised in selecting foremen. Too often a foreman is chosen because he knows his work, without due consideration being given to his knowledge or lack of knowledge of human engineering. Of what possible value can a man be to an organization, no matter how well he knows the work which he is engaged to supervise, if men will not work under him? The manager, even the superintendent may be a man of a personality not congenial or one that does not draw men to him, and yet if he has full knowledge of his work he may "get by" successfully, if he has a good foremen, for the foreman acts as a buffer between management and men, and thus forms the contact that completes the circuit and makes the man power of the plant effective.

The human problems of a plant are after all the hardest ones to solve. Techinal problems have long since been left to experts, but the human side, the one most important of all, has been until of late considered of too little importance to receive particular attention.

If machinery breaks down or does not operate smoothly, a highly skilled mechanic is called in to locate and remedy the trouble. In matters of engineering we get the best to be found for the work and their word is law. If the mules are sick or do not work well we call in a specialist, the veterinarian, whose advice is followed to the letter, but if labor problems arise it seems to be the belief that anyone can solve them. We will not trust the manager, the superintendent or foreman to repair a complicated or expensive piece of machinery, nor is he called upon to doctor the sick mule, but we expect him to remedy labor troubles, while in fact he has probably given more thought and real mental effort to both machinery and mules than he has to the intelligent study of human beings and to human engineering.

The foreman who does not make good is not so much to blame for his short-comings as is the man who selected him for the job of foremen. We cannot expect a good foreman if we have selected a man simply because he knows the technique of his work, or is a good driver of men, or has a reputation for getting big tonnage. He must in order to succeed know, first of all, men, and how to win from them their best efforts. And he must secure these in such a way that they give freely and willingly the best that is in them.

We will fire a man who will overload a motor or abuse a mule, even though he does either to increase the tonnage or the mine; yet we often promote the man who overloads or abuses men with the same object in view.

JUSTICE MUST EVER BE PRESENT

The real foreman is he who through reason of his being in constant personal touch with the worker, and, while securing all that is to be reasonably had from him, must at the same time, advise, protect and conserve the worker's energy. He it is who must through his understanding of men, see that they work safely, and contentedly, that fair play is afforded to each man alike, that each is given the same opportunity to "make good", that each man shall be heard fairly in case he has complaint to make or information to ask; that each man gets a fully square deal in his work.

In order to do this, the foreman must be a man who not only knows his work, but must be a real human being himself, a normal man, not one whose mind is distorted through past abuses or reverses, but a man who recognizes the justice of the claim of every other man to a square deal, and has that fairmindedness which will cause him to act justly.

He must have the full confidence of his men; he must have leadership; he must be systematic; he must be sincere. The confidence of his men will depend upon his ability in his work, his sense of fairness, and the extent to which he treats his men as human beings.

Leadership can exist only when confidence has been established and is augmented by personal example. Men follow only such men as they regard as superior, in some way, to themselves. The true leader always appreciates honest effort and knows when and how to reward it.

System is essential. The man who never knows what to do or when or how it is required to be done cannot be efficient. The good foreman will be systematic and through his brief, clear orders his men will know what he wishes done and when and how he desires it accomplished.

The sincere foreman, the one thoroughly interested in his work, the one who has the best interests of his industry at heart, is the man who will inspire like sentiments in his men. There must be entire absence of bluff, for no man can "get by" on bluff for any extended period, and once his bluff is called or is in any way exposed, he has finished his work and must step aside and make room for a real man.

Team work between foremen is highly essential. Foremen of different mines, and of different parts of the same mine should get together often and discuss their daily problems. No man has any monopoly of good ideas. By the interchange of ideas, all may become possessed of the individual ideas of each, and in this way not only will good plans and practices be absorbed but the bad may be eliminated. Thus the comparison of ideas should be made.

We often hear old operators complain that men are not what they used to be; that men do not have that personal interest in their work that the men of the old days had. The old fellow who thus complains has not stopped to ascertain why this is true.

In the early days of coal mining the operation was small. The operator was often his own manager, superintendent and foreman. He employed only a few men, but most important of all, he knew all of his men. He knew them by their first names, he knew their wives and the names of their children. He knew what was going on in their homes, and if "Billy" was sick or "Mary" had the measles, he knew it and when he met "Tom" the father of these children, he asked how "Billy" or "Mary" was getting along.

This personal touch, this interest on the part of the operator in the personal affairs of the miner formed one of the bonds between employer and employee. And in the work, if "Tom" thought a certain job would be done in a better way, he did not hesitate to discuss the matter with the operator. They were friends and Tom has as much interest in the success of the mine as the owner did.

THE FOREMAN AS THE BUFFER

What has taken place? The coal industry as well as others has developed to such a degree that it is no longer possible for the operator of the executives of a company to continue that personal touch with the men. They can and do have the same friendly intercourse with the managers who in turn have the same relations with the superintendents and so on until it is the foreman who has the personal contact with the men who dig and handle the coal. And the successful foreman is to his men just what the old operator was in former days. To the men he is the company, for he is that part of the company with which they come in contact. Their opinion of the firm employing them is exactly their opinion of him. They are just as loyal to the company as the foreman makes them.

This is why it is said that the foremen is the key to the labor problems of an industry. The men know him, and regard him as being symbolic of the company they work for. This is natural for they rightly argue, this man must be what the company is, his acts must be what the company desires, his treatment of the men is in line with the company's policies, for the company puts him in his position knowing that it is through him that the men will form their opinions of their employer since the impressions they receive are derived from the foremen.

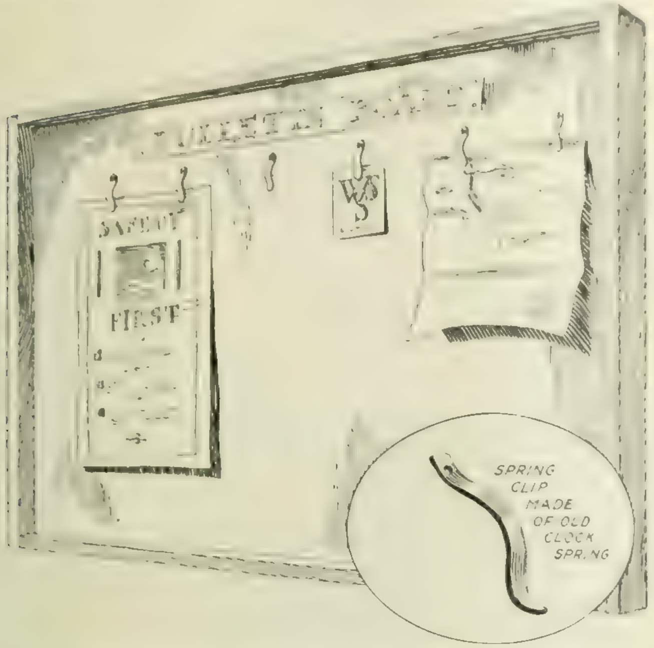
If foremen will keep in mind that their every order and act is interpreted by the men working under them as being what the company desires, if they will keep in mind the fact that in all their work they are to the men no individuals but the company; if in their dealings with the men they will conduct themselves just as they expect the managers and others over them to conduct themselves when dealing with them, many of the misunderstandings and mistakes now prevalent will be eliminated, and they will find that they will command the same respect and confidence of their men as they themselves have for their managers and other officials, with resulting greater efficiency in the part of their men, under their charge, to say nothing of that greatest of all ends to be desired, the true regard and friendship of their charges.

That foreman who drives his men to big output may enjoy the temporary confidence of his manager but he cannot last. That foreman who leads his men to greatest efficiency and output will not long remain a foreman for he will be moved on to better things.

Bulletin Board Clips

By Chas. H. Willey
Concord, N. H.

Thumb tacks for holding notices on a bulletin board are always getting lost. Their use also is detrimental to the board because of the many holes made in it. Pasting the notices up makes an unsightly, messy board, because of the old pieces that are left stuck on. To overcome these difficulties "one of the boys" improvised some very handy spring clips out of an old clock spring, as shown in the accompanying illustration. The holes were punched in the spring by a sharp punch, setting the spring on soft brass when punching.. The uses of these clips are clearly shown and need no description.


SAFETY
FIRST
W.S.
SPRING CLIP MADE OF OLD CLOCK SPRING

NOVEL BUT EFFECTIVE CLIPS CAN BE USED

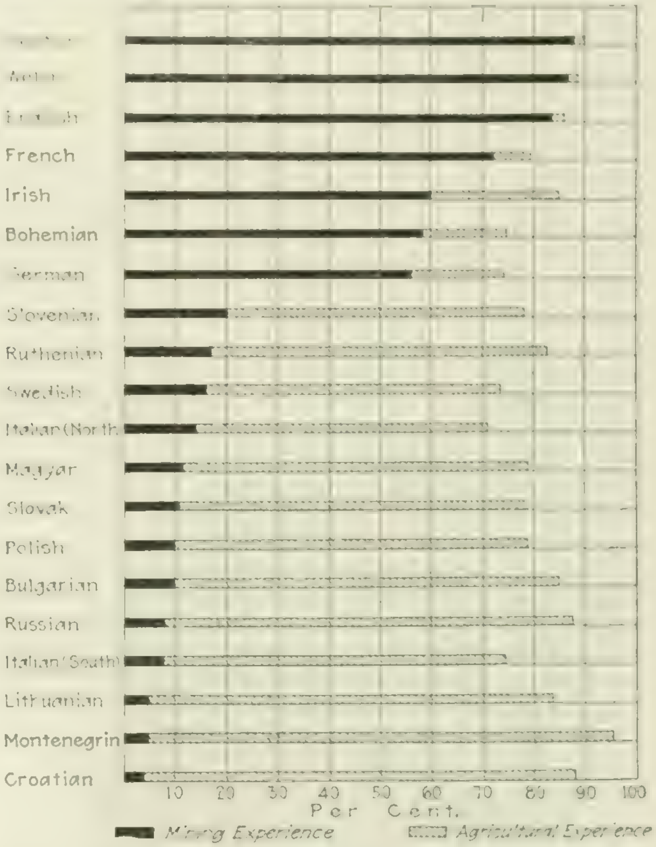
New Laboratories for Spanish Mining Interests

In the extraordinary estimates of the Ministry of Commerce there is an item of 59,490,000 pes. to be destributed over 10 years, out of which much experimental mining equipment is to be acquired, and laboratories established and maintained. Those will include apparatus for deep drilling to facilitate the investigation of all the mineral regions of Spain, and a building for a geological institute. Financial aid will be given to mining concerns, to unwatering syndicates, and to investigation by private enterprise with participation of the State in eventual profits. A chemico-industrial laboratory will be erected for the analysis of combustible mine gases, waters, explosives, and for coal distillation. This will be supplementary to the chemical laboratories of the Mining School and others which in their sphere are recognized as excellent. Testing workshops will be erected for the chemical preparation of minerals provided with apparatus for trituration, classification and concentration, with special equipment for flotation and electromagnetic systems, and also a laboratory for metallurgical tests with reverberatory and electrical furnaces, etc.

Senor Calderon, replying to an observation of the Revista Minera, suggesting that the proposed laboratories appear to be unnecessary as excellent ones are already available, explains that intensive competition is not intended, but that the new institution will provide for the analysis of minerals that have to be submitted afterwards to various tests on behalf of metallurgy, whereas the laboratories now existing are already overcharged with work, particularly that of Gomer Pardo, with the analysis of coal for a number of private firms. Private laboratory owners will be invited to assist in the organization of the new one, which will aim rather at practical scale experiments. The main idea of the new move is to promote the rapid industrialization of Spain, analogous to what other countries are doing.

Our Farmer Mine Workers

Albert H. Fay, statistician of the United States Bureau of Mines, in reading a paper before the National Safety Council published in our combined issue of Nov. 13 and 20 of this year passed from hand to hand a chart that is presented herewith. It shows that the Scotch, Welsh and English mine workers in America were miners before they came here with but few exceptions while all but the French, Irish, Bohemians and Germans were in large percentage farmers before reaching our shores. With such men there is no background of training, and, as there is hardly any possibility of instruction, so little do they learn of English, it is no wonder that the death rate of these men exceeds the death rate of others.



Correction

On page 620 of Coal Age of Oct. 9, 1919 John L. Boardman is quoted as saying that out of 300 would-be mine-rescue men at the plant of the Anaconda Copper Mining Co. only about 60 were found physically fit. What Mr. Boardman actually said in reply to a question as to what percentage of the men came up fully to the qualifications he had enumerated was that "out of 300 men trained about 60 really came up to all the qualifications."

Effect of Sulphur in Coal Used in Ceramic Industries*

By C. W. Parmelee†

SYNOPSIS—*For the burning of clay products, regardless of kind or variety, a low sulphur content in the fuel employed is desirable. Of course, low sulphur is not as important in the burning of ordinary brick and tile as when making porcelain or sanitary ware. The sulphur of the coal in the form of an oxide attacks various constituents of the clay or of the decorating pigments, causing a variety of troubles that are here enumerated.*

THE ideal fuel for burning ceramic wares is the one that, among other characteristics, has little or no sulphur. For that reason wood was long considered the most desirable fuel, but its high cost has practically eliminated its use except in regions where it is abundant or other circumstances warrant its choice. The fuels commonly employed are natural and producer gas, oil and coal. The last named is undoubtedly the most important, not only in this country but abroad. Occasionally anthracite is used, but the larger part is bituminous.

The quality of the coal used depends on the kind and the value of the products being manufactured. For some materials, such as common brick, hollow block, etc., the quality of the coal is of less importance than in the manufacture of polychrome terra cotta, pottery, porcelain, etc. It is obvious that in burning clays that contain appreciable amounts of pyrite, marcasite or gypsum, as is the case with many common clays, the sulphur content of the fuel is of little importance.

The permissible amount of sulphur in the coal used will depend on the kind of product being manufactured. "A good sample[1] of coal commonly used in pottery ovens has something like this quantity of sulphur":

	Per Cent.
Total sulphur	1 20
Sulphur in the ash	0 11
Volatile sulphur	1 09

This is based on English pottery practice. Correspondence with a number of leading manufacturers in this country has brought to me the following figures:

Sanitary Ware.—(*a*) 1 per cent. maximum, (*b*) 0.5 per cent.

Sewer Pipe.—(*a*) 1.2 per cent., (*b*) 1.1 per cent. present run, 3 per cent. has been used.

Terra Cotta.—(*a*) 0.5 per cent. basis of contract, 1 per cent approximate.

Pottery.—1 per cent. contract, 1.5 per cent. probable content.

Enameled Brick.—1.3 per cent. maximum.

(*a*) and (*b*) designate different firms giving figures.

Since a pottery kiln for sanitary ware will require about 14 tons of coal for a burn, the quantity of SO that will be generated from a 1-per cent content of sulphur will be considerable. Other kinds of wares will require much greater fuel consumption, depending on the size and the type of the kiln and the weight of the clay products being burned.

The objections to the presence of sulphur in the fuel for clay products may be grouped as follows: The clinkering of fuel in the firebox; the action of the oxides of sulphur in waste-heat driers; the effect of the oxides of sulphur on the clays during burning; the effect of the oxides of sulphur on glazes on the clays during burning; the effect of the oxides of sulphur on glazes and colors during burning; the effect of the oxides of sulphur on burned clay products.

Clinkering is so commonly associated with a high sulphur content that it is included here. Owing to the high temperatures developed in the fireboxes of kilns, a badly clinkering coal greatly increases the labor of firing and seriously damages the walls of the firebox because of the slagging action. A mass of plastic slag settling down on the grates chokes off the air supply, preventing the maintenance of a proper excess of air in the hot gases, thus seriously interfering with the development of acceptably colored ware.

ACTION OF SULPHUR IN WASTE-HEAT DRIERS

The waste heat of burning kilns may be used for drying the cruder products. The chief objection to the application of this process to a larger range of wares is the accumulation of the oxides of sulphur in the moisture on the partly dried wares and the attack of the acid water upon compounds of lime, magnesia and alkalies present in the clay forming sulphates, which subsequently appear as a white wash. Moreover, the gases taken up by the moisture condensing in the cooler parts of the drier upon the steel cars result in a serious corrosion of the framework.

A difficulty commonly experienced with high-sulphur coal is the development of "kiln white," or a coating of sulphates upon the surface of the ware. These sulphates are formed by the condensation of moisture containing sulphuric acid upon the cold ware during the early stages of the firing. This kiln white is highly disfiguring. Its formation may be prevented by a proper method of firing—namely, the passage of a large volume of air through the kiln during the period of the burn when this trouble may be expected to develop.

The color of burned clay products is undoubtedly affected by the character of the gases with which they come in contact during the burning. The mode of attack at low temperatures has been mentioned. Investigations carried on under higher temperature conditions show that clays ignited at red heat in a stream of sulphur trioxide are attacked and that iron present will, in some degree, form a sulphate which, at a higher temperature, decomposes, leaving red ferric oxide behind.[2] Hopwood and Jackson state that "experience of firebrick makers has shown that if one side of their kilns be exposed to a fresh breeze the combustion of coal on that side being thereby rendered more complete, the bricks obtained from this part of the kiln are always of a deeper color than the remainder, because in this part of the kiln the sulphur is not completely oxidized and not available as a decomposing agent for the clay substance."

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*Paper presented before the [illegible] meeting of the American Institute of Mining Engineers, September, 1919.

†University of [illegible]

[1] Mellor, Trans. Eng. Cer. Soc., [illegible]

[2] Hopwood and Jackson, *Trans.* Eng. Cer. Soc., 2, 95.

[3] *Loc. cit.*

The same authors[4] explain the red specking of white earthenware as due to the contact of the ware with ferruginous sand that, during the early stages of the firing, is attacked by the acid vapors giving rise to the formation of ferric sulphate. This ferric sulphate is subsequently decomposed with formation of a speck of red ferric oxide on the surface of the ware.

Other phenomena of a similar sort are discussed by the authors, all of which are attributable to the action of sulphur trioxide formed from the sulphur of the fuel.

Seger[5] calls attention to the action of sulphur trioxide in the development of a red color in the burning of limey clays which normally give a cream or dirty white color. He showed, by analysis, that the yellow centers of the brick contained 0.61 per cent. SO_3, while the red outside coat contained 8.49 per cent. of the same.

Blistering is the most common manifestation of the action of sulphur gases. The trouble probably has its origin in the absorption of acid fumes by moisture and the condensation upon the glaze during the early stage of the burn. The sulphuric acid thus deposited attacks the glaze constituents, forming sulphates that later, at a higher temperature, are decomposed and cause the development of the blisters and pimples. The trouble will manifest itself in the parts of the kiln where the circulation of the gases is somewhat retarded. The method of prevention is to maintain a proper circulation of air through the kiln during this period of the burn.

Blebs Left by Escaping Gas

A piece of ware may have a perfect surface when it is removed from the glaze kiln, but subsequent heating to a much lower temperature causes gas to escape from the glaze, leaving small blebs. The kind of escaping gases and the causes operating to produce this phenomenon are not well understood but it is quite probable that sulphur dioxide and sulphur trioxide are the offenders.

These gases may have been absorbed and held in solution or they may be liberated by the dissociation of sulphates in solution. Pelouse[6] has shown that mirror glass may dissolve up to 3 per cent. sodium sulphate and hold it in solution without losing any of its transparency, although there will be a frost-like opalescence upon its surface. A similar phenomenon may be observed with glazes of certain types. If glasses or glazes so saturated are supplied with more silica, the formation of blisters will follow. Glazes, glasses and slags can absorb considerable quantities of gases which may be liberated again. Moore and Mellor[7] found that a frit (a glass) absorbed from 4.7 to 5.7 c.c. of coal gas, which could again be set free, collected and burned.

Slags may contain a large quantity of gas. Johnson[8] states that it may be seen passing off in large volumes when a ladle of slag is quickly dumped and that it ceases as soon as the slag ceases to flow.

The influence of the oxides of sulphur upon the development of colors is particularly great. Because of the [illegible] sulphur content of wood, it has long been considered the most desirable fuel for porcelains. [illegible], one of the most accomplished of modern ceramic artists, has said "until the coming of a chemist who will obtain with coal the fresh and brilliant palette which wood affords, I will confine myself to the fuel of [illegible]."

Edwards[10] has shown, experimentally, that sulphur gases may cause the darkening of green colors obtained with chromium. A correspondent writes that trouble is experienced particularly in the production of green and brown shades on enameled brick if sulphur gases are present in abnormal quantities.

All burners of clay products using the Seger cones as temperature indicators are familiar with the fact that when these cones are subjected to exposure to sulphur gases under favorable conditions they will show either a dulling of the surface or blistering. The blistering is due to the causes already described. The dulling of the surface with the appearance of a feathery crystalline coating is caused, according to Mellor,[11] by the formation of a layer of sulphates. The conditions most favorable for this are an oxidizing atmosphere at a temperature near the congealing point of the glaze and, of course, a sufficient concentration of the oxides of sulphur in the kiln atmosphere. He recommends, therefore, that coal as free as possible from iron pyrites be used at this stage of the burn.

The accumulation of an extremely dilute solution of sulphuric acid upon the ware during the early stage of the firing may lead to the attack and the solution of color oxides used in the decoration of the ware. In that case it sometimes happens that the soluble sulphates thus formed will penetrate the body, reaching the surface of the other side of the piece where the evaporation of the water will cause a deposition of the color and its subsequent fixation by firing. This sometimes results in a complete reproduction of the pattern on the surface opposite to its original location. Sometimes the color solution merely drains to a lower portion of the same surface where it lodges, forming an unsightly blemish.[12]

How Salt Glaze Is Developed

Salt glaze is developed by the action of the vapors of common salt volatilized in the kiln during the firing of the ware attacking and combining with constituents of the clay to form an insoluble glassy coating. It is developed on such wares as face brick, sewer pipe, conduits, chemical stoneware and drain tile. These wares are made from such suitable clays as are available and frequently contain appreciable quantities of pyrite or marcasite. The fuel used for such a purpose generally cannot be selected with the same care as is necessary in the production of the finer grades of wares. However, some care is used to obtain a coal as low in sulphur as circumstances will warrant.

The trouble most frequently experienced in the development of the salt glaze as influenced by the sulphur is similar to that already mentioned, a dulling of the glaze. Another trouble due to the sulphur gases is the formation of a surface coating on the ware of calcium sulphate, which is generally credited with preventing a proper development of the glaze.

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[4] *Loc. cit.*, 98. *Abriss der Thonwaarenindustrie*, [illegible]

[5] "Collected Writings," 1, 361. Easton, Penn., 1902. Chemical Pub. Co.

[6] Seger's "Collected Writings," 646.

[7] *Trans.* Eng. Cer. Soc. (1909) 7, 7.

[8] Johnson: Principles, Operation and Products of the Blast Furnace, 217. New York, 1918. McGraw-Hill

[9] [illegible] *Ceramics*," 132

[10] *Trans*, Eng. Cer. Soc., (1912) 11, 175.

[11] Mellor: *Trans*. Eng. Cer. Soc. (1907), 6, 71.

[12] Idem

Information regarding the effect of sulphur upon burned-clay products is meager. Seger[13] has pointed out the possibility of the destruction of the surfaces of glazed brick by suphates that had their origin in the action of sulphur gases of coal used in burning the ware. This destructive action may be deferred for a long period after the manufacture of the brick. However, this may be possible only under rather exceptional conditions of manufacture as described by him.

An important phase of this problem that, as yet, has been inadequately studied, is the action of the sulphur dioxide and trioxide upon refractories such as firebrick and blocks, retorts, etc.

Electric Shot Firing in Mines

The advantages of electric firing are obvious and generally admitted. For one thing, it is safer. If a misfire occurs, it is safe to go to the face to investigate and rectify the trouble, because it is certain that the charge is not going off at all if it does not go the instant the blasting machine is operated. This saves time. In case of a misfire with cap and fuse, it is necessary to wait a considerable time before investigating because the miss may arise from a break in the powder train of the fuse or some other slight defect and there is always a possibility that the charge may go some time after it is normally due.

As to comparative cost of electric blasting and cap and fuse blasting, there is but slight difference. An ordinary No. 6 blasting cap and 6 ft. of fuse will cost within a fraction of a cent the same as a No. 6 electric blasting cap with 6 ft. wires. The objection on the part of miners to generally adopting electrical firing is based almost wholly upon the cost of the blasting machine and the leading wire. However, these items should be looked upon as first cost equipment which when properly taken care of will last a long time. That most miners prefer electric firing is proven by the fact that they often use ordinary dry cells to fire their shots. Of course, they fire but one shot at a time, and this results in great waste of time. After one of these single shots, they must return to the face, prepare another single shot and continuously repeat this operation until they have blown down the amount of coal desired.

ADVANTAGES OF THE BLASTING MACHINE

By using a blasting machine, a number of holes could be loaded and fired simultaneously and holes could be so located as to obtain a cumulative effect at the time of firing the blast. This is impossible when cap and fuse is used or, at any rate, involves considerable risk. Miners try to time dependent shots by cutting the fuse to different lengths, but all practical blasters know that fuse cannot be depended upon to burn exactly uniformly. As a result, it frequently happens that a shot or hole intended to follow some other shot actually goes off ahead of it. This may cause complete failure to obtain desired results, may add more or less heavy expense in the loss of explosives or may even result in a shortage of coal for the following day's work.

Such chance of failure can be avoided only in one of two ways: (1) The use of a blasting machine; (2) by using delay electric igniters. However, the latter increases the cost of production and unlike the blasting machine, the cost of delay igniters is not a first cost; it is a continuing cost from day to day.

Payment for one death or serious injury under an employers liability law would involve an amount that would provide blasting machines for even a large mining operation for years. If considered from that standpoint alone, it would undoubtedly pay mine owners to supply their miners with blasting machines.

However, there are many other reasons applicable to the subject, among them increased output because of the saving in time involved.

Miners and operators should get together on this subject of electric blasting. Their interests are common and unquestionably some way could be agreed upon whereby electric blasting could be universally adopted in the coal mines of the United States.

Coal Situation in Canada

United States Consul Felix S. S. Johnson, reporting from Kingston, Ontario, under date of Nov. 7, 1919, states that Canada's main sources of coal supply are, roughly, four in number. The Pacific coast is supplied from Nanaimo, Wash., and to some extent Alberta; the prairie provinces receive their logical supply from the Alberta and British Columbia mines; sections of eastern Canada are taken care of by the Nova Scotia fields; the chief supply and almost the entire amount of anthracite coal comes from the United States. As the density of population and industrial development is highest in Ontario and Quebec, a coal shortage in the United States seriously affects this section.

The coal situation on the Pacific coast and in the maritime Provinces may be dismissed as being reasonably satisfactory On the prairies a serious shortage exists. The fuel year in the Alberta coal fields commences on April 1. Last year, (1918) which was by no means a record year for coal production in western Canada, there had been shipped between April 1 and the second week in September, 1,313,421 tons of "commercial" coal as distinguished from coal for railway service. In the same period of the present year (1919) only 529,522 tons of "commercial" coal had been shipped. The volume of railway coal was equally low by comparison.

Legal Department

Alabama Mine Prop Law Interpreted—The Alabama coal mining act fixes a duty against persons operating coal mines in the state to supply sufficient props and other timbers useful for propping in a mine for the benefit of those working therein. Interpreting this statute, the Supreme Court of the state holds that it is not limited to the benefit of direct employees of an operator. The duty extends in favor of every person rightfully working in a mine, regardless of whether he is an employee of the operator or some one else. But, notwithstanding failure to furnish props as required by the law, it is open to an operator, on being sued for damages for injuries to a miner, to show that the accident was due to the injured man's own carelessness. (Spann vs. Corona Coal and Iron Co., 82 Southern Reporter, 444.)

Violation of Mine Safety Laws—Where an Oklahoma coal miner is injured through insufficiency of props furnished for his use on request, as required by the Oklahoma statutes, the employing operator will not be permitted to escape liability in damages on a theory that the injured man expressly or impliedly agreed to assume the risk of injury. "To permit owners or managers of mines to avail themselves of such an assumption of risk by its employees would be, in effect, to enable them to nullify the statute, and that is against public policy"; $8,423.33 was not excessive recovery for injuries sustained by a miner, through negligence attributable to his employer, where it was shown that the plaintiff was 46 years old, and had earned $5 daily, and that his hips were crushed, his right leg crushed and partly paralyzed, and, suffering continued pain and being required to use crutches, he had been unable to work for two and one-half years. (Oklahoma Supreme Court, Schneider vs. Whitehead Coal Mining Co., 183 Pacific Reporter, 49.)

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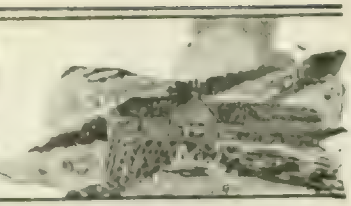
[13] "Collected Writings," 376

SNAPSHOTS IN COAL MINING



Kansas City Miners Return to Work

After an absence of five weeks beginning Nov. 1, 1919, the union coal miners returned to work. The bituminous coal supply of the country was completely tied up as a result of their action. Kansas and the surrounding region suffered considerably, though its difficulties were somewhat lightened by the use of coal commandeered by the Railroad Administration. The return of the men gave the entire country much relief

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Mr. Robinson, former assistant to chairman F. N. Hurley, of the United States Shipping Board, and special shipping representative at the Paris Peace Conference and later a member of the United States Shipping Board, has been named by President Wilson to represent the public on the commission newly appointed to settle the coal strike.

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Mr. Keenan, a member of the United States Employees' Compensation Committee and former vice president of the International Machinists' Union, acted in the capacity of a "liaison" officer between the many leaders of the mine workers during the conference at Indianapolis and Washington.

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Kansas Volunteers in Coal Stripping

In the left foreground may be seen Adjutant General Charles I. Martin of the Kansas National Guard, and Labor Commissioner John Crawford watching students of the Kansas Agricultural School digging coal in the Reliance Mine No. 1., near Pittsburg, Kan., during the recent coal strike and famine, which was severely felt

Conditions in the French and Belgian Coal Fields

By George S. Rice
Chief Mining Engineer
U. S. Bureau of Mines, Washington, D. C.

SYNOPSIS:—German coal fields are the most important on the Continent. Seven per cent of France was invaded by the German troops. In accordance with the terms of the Peace Treaty, Germany must supply France with coal to replace the loss in production due to the destruction of the mines in France. Problems confronting the French engineers are large.

THE Germans in planning a campaign for world supremacy had as one of their first objectives the seizing of the important Briey iron ore deposits of France and the coal fields of Belgium and northern France.

Large resources of coal and iron have led to the commercial greatness of the countries possessing them as exemplified by the great development first in England then in the United States, and in Germany when the minette high phosphorus iron ores became useful through the invention of the Thomas and Gilchrist dephosphorizing process in 1878. However, this development was anticipated by the German scientific advisors in 1871, and led to the then known deposit of minette ore in Lorraine being taken from France to Germany.

Mr. Rice was a member of a Commission sent by the Secretary of the Interior to France to investigate developments in mining and metallurgy under stress of war conditions, and also to observe the extent and character of the destruction of the collieries and the steel and iron plants, and methods which were being taken to reestablish them. This commission consisted of Dr. F. G. Cottrell, Chief Metallurgist of the Bureau of Mines, Mr. Frank H. Probert, Dean of the University of California Mining School, and Mr. George S. Rice, Chief Mining Engineer of the Bureau. While conducting this investigation a trip was made to the Saar Basin to observe the conditions there. Following this Mr. Rice acted as advisor on mining matters to the Representative of the Economic Council in an Interallied conference held at Cologne in April 1919, and subsequently visited the mining districts in central and southern France, Belgium, and Great Britain.

When these ores became available, Germany made such tremendous strides their own minette ore developments were insufficient and they had to import ore. Meantime France, by drilling, had established the extension of the minette ore field into French Lorraine. Then it was discovered that France had greater resources while the German resources were being rapidly depleted.

Although Germany in its Westphalian basin possessed the most important coal field on the Continent, which contained the largest resources in coking coal outside of Great Britain, its coal was distant from the sea coast, so it could not be an important factor in the export business. No doubt this fact caused the German Imperialists to look forward to securing the coal basin of Belgium and northern France for future ocean trade.

It was a striking feature in the German conduct of the war that although the steel and iron plants of Belgium and France, and other industrial establishments in the invaded regions of Belgium and France were utterly destroyed, that the iron mines in French Lorraine were not destroyed nor materially damaged by the Germans in their retreat, while the destruction in France continued until the day of the Armistice. The other striking fact is that the coal mines of Belgium were not destroyed. It can only be conjectured whether this was due to President Wilson's threat of retribution, which did not stay their hand in France, or was due to the fact that they did not consider Belgium as a real competitor. Whereas it was evident they wished to cripple France industrially when they could not hold these northern provinces.

The provinces invaded by the Germans, while representing only 7 per cent of the area of France were most important industrially to that country as 30 per cent of the industrial output came from the invaded provinces prior to the war.

The coal in the Pas de Calais-Nord field, latterly known as the Lens basin, is the best coal in France and the basin contains its largest resources. The production of this field was 28,000,000 tons out of a total French production of 41,000,000 tons. The consumption in that year, 1913, was 62,000,000 tons, so that France had to import 22,000,00 tons, chiefly from England, but some from Belgium and Germany. The coke made in the Pas de Calais-Nord field was important to the welfare of the iron and steel industry of France. In 1913, 2,873,000 tons were produced in that field and largely used in Lorraine. The largest steel plants of France were located in the Briey Iron District and adjacent districts of Lorraine and these are the plants destroyed by the Germans.

The invasion of the French coal basin began Aug. 24, 1914, immediately following the Battle of Mons, which is a short distance across the line in the Belgian coal field, and from which the British retreated south towards Paris. After the Battle of the Marne trench warfare was resorted to. The line passed north and south across the coal basin through mining towns whose names are made famous by the fighting, although the towns have utterly perished. The line extended from Arras, the headquarters of the coal field although some miles south to the basin, through Souchez, where was the famous sugar refinery around which fierce fighting occurred, through Lievin, Loos and La Bassee, at the north edge of the field.

Later the British gradually driving back the Germans secured Vimy Ridge. This line, south of the coal basin, then partly surrounded Lens, commands a view over the low lying coal field. But northward the German line held. When the Germans made their last advance in the Spring of 1918, the British line gave way further north, but held firmly at Lens, although crowded back at the north edge of the basin to the outskirts of Bethune.

In the Summer and Fall of 1918, came the final drive of the allies which forced back the Germans first slowly then rapidly into Belgium where they were saved by the Armistice. While the retreat of the Germans was going on, they found more time to systematically destroy the French mines and this destruction continued to the very day of the Armistice.

Three-fourths of the coal field has been occupied by the Germans, and mines destroyed which produced in 1913, 20,000,000 tons (metric). Probably not over 1/5 of this destruction could be attributed to battle or military necessities.

Splendid surface structures generally built of steel, iron and concrete were blasted down and many of the shaft linings were ruptured by explosives, allowing the mines to

MULOT MINE AT HENIN LIETARD BEFORE THE GERMANS CAME

fill with water. Most of the shafts in the French field had to be sunk through quicksand or water bearing chalks and marls which necessitated the use of the freezing process or of the cementation method. Hence, when the iron linings were broken, water would run in freely, but this was not enough to suit the Germans and in some instances, they ditched in surface swamps and ponds.

It was estimated by the Courrieres Colliery management that in their mines twenty million cubic meters of water had run in. Pumping this would roughly be equivalent to hoisting 20,000,000 tons of coal.

The Central Committee of France has set forth striking figures of destruction. Two hundred and twenty pits or shafts had been rendered unusable for several years. All surface installation had been destroyed in detail. An annual production of more than 20,000,000 tons or 50 per cent production has been temporarily at least lost to the country, and a working population of 100,000 people has been reduced to unemployed and they and their homeless families to extreme poverty . Material damages equal to at least 2,000,000,000 francs (on pre War Exchange basis $400,000,000). This is without counting the loss to France of 100,000,000 tons of production including by-products in the five years of occupancy of the field by the Germans So France today pays heavily for coal it must use. It is commonly thought that the giving over of the German fiscal mines in the Saar Basin would help the situation.

The Saar Basin in 1913 produced 17,000,000 tons of coal including that produced in Lorraine annex and Bavaria, the fiscal mines producing 12,000,000 tons, a large part of which is used locally. The French Commission at Atlantic City estimated that only 7½ million tons would be available for use outside of the Saar.

The Treaty of Peace states that in the next five years, Germany should deliver to France coal the equivalent of the annual production of the mines she destroyed, not gratis however, but to be paid for by France at pit head price paid by the Germans but not exceeding the exporting price of English coal, and for the succeeding five years a maximum of 8,000,000 tons. Also the treaty of Peace says that Germany is to continue to furnish France the normal quantity received before the War, 7,000,000 tons. In theory France should receive from Germany and the Saar Basin 34½ million tons, but as yet, Germany has not furnished this quantity of coal, and the Commission stated that France could not count on more than 15,000,000 tons of German coal in 1920. As regards to the reconstruction, the technical procedure as to methods of recovery of mines had not been announced in April 1919. The decision of an official Commission was being awaited. There were difficulties to be overcome in starting work and poor means of communication. There were meager railroad facilities and it was necessary to lay branch lines and bridge the numerous canals. These damaged canals are now serious obstacles to transportation. Another factor is that while a great army of workers are needed there are no suitable

MULOT SURFACE PLANT AFTER THE GERMANS HAD RETREATED

CENTRAL ELECTRIC STATION NEAR BRUAY

quarters for them. Former refugees are drifting back in little pathetic parties trundling their goods on baby carriages and carts seeking places in the ruins, cellars and military dugouts. Prisoners have been employed to some extent but chiefly in gathering shells and barbed wire.

On account of the difficulty in getting supplies, the Government has found it necessary to purchase all supplies and distribute them pro rata There has been reluctance on the part of the Government to buy mining machinery outside of France, on account of further depreciating their currency.

The shafts are deep and workings are extensive and connected with those of other mines. Therefore, it is necessary that the shafts shall be recovered to prevent the water from continuing to drain into the mines, but it will require some very rich engineering work to accomplish this.

The French engineers are very capable and they need little help from an engineering standpoint. They know their problems better than we do. While they appreciate the offers of engineering assistance, this must rather be from a standpoint of general help, especially financial help.

I desire to express my great appreciation of the wonderful fortitude of the French and their present cheerful acceptance of most appalling conditions. In conclusion let me express my gratitude to the French engineers with whom I came in contact for their unfailing courtesy and evident desire to render me every assistance.

Hydraulic Flushing of Mine Workings

(British Correspondence)

AT the Wigan Mining College in England, on Feb. 15, 1919, an address on the subject of "Hydraulic Stowing in Collieries" was delivered by J. Drummond Paton, before the Students' Association Mr. Paton said almost any material could be used in hydraulic stowing (or flushing), except that which dissolved on coming in contact with the water used in flushing it into the mines. But even material which would become a mud could be used provided the time of disintegration was not inside the time necessary to get it down into the mine. At some collieries on the continent of Europe, special preference was given to any rubbish which would disfigure the surface. In the event of sufficient flushing material not being available at the collieries, empty coal cars might bring the flushing material back to the mines. Where flushing was done properly there was no need for timber to be left in.

Mr. Paton claimed that flushing was the means of beautifying the land, there being no need to disfigure it any more than was necessary. He described how he had seen miners working away at the face while the flushing process was in actual operation. He had seen statues and models carved out of the flushed material, had been brought to the surface a few weeks after the material had been stowed below ground; also, he had seen figures over the doors of engineers' offices carved out of this flushed material from the mine.

In one mine Mr. Paton visited on the continent of Europe, although there was a bad floor, "creep" was unknown because the advance of the coal face was so quick and the time consumed so low, the flushing material being passed from the crusher to the pipes, into the mine and the water off it again, in two or three hours. He had seen pumps of 2000 hp. pumping the water back to the surface.

A great deal of money was spent in the early stages of hydraulic flushing, but after spending the money it was found that the system was economical. The timber employed where hydraulic flushing was in operation was only used temporarily, the props being withdrawn wherever possible. Where the inclination of the seam would allow drainage, all objection to the flushing system was practically removed. Mr. Paton caused some laughter by saying he proposed to develop mining on the flushing principle, whereby coal could be brought out of the mine by the same water which had carried the flushing material to its destination in the mine.

As regards the cost of this system of flushing, Mr. Paton said that if a system was developed on a sufficiently large scale the cost of coal could be brought down quite low, especially where there was an adequate supply of material that could be easily crushed and flushed. He instanced a case where the cost of flushing was 9c. a ton of production, the material used in flushing coming from glass works and the waste from chemical works. In some instances the cost had been as high as from 49 to 61c. per ton, but it was not altogether a question of the actual cost of flushing. In a mine where flushing was in operation the air was as fresh below ground as on the surface; in fact, if anything, it was sweeter. In the Lancashire coal field (given a reasonable supply of material) there was no reason why the cost of stowing should not be brought down to 12c. a ton.

The consumption of coal in the lump meant terrible national waste, and in his opinion the future of coal mining did not lie in the recovery of the maximum lump but in the recovery of the maximum quantity. In the future the value of coal would depend on its volatile qualities and on results attained by its use. He was not one of those who questioned the practicability of obtaining oils and fats from coal. It had been done. In America extensive research was going on in this direction. One day we should have to use our coal with the intention of getting out of it all that there was in it; when we did that we should mine small coal and mine by machine, and machine mining, he hoped, would improve the work of the miners and make the part underground easier than it is at present. Mr. Paton's proposal was that collieries should be run entirely mechanically.

Mr. Paton, who is perhaps the highest authority on hydraulic flushing in Great Britain, invited questions from the audience. In reply to a member who wanted to know if it would not require a great amount of pressure to stow hydraulically in a mine 200 yd. deep and with the seams pitching 1 in 9, he said the limit of flushing was a 50-yd. rise. In such a case a borehole was often put down and a tunnel driven up to it, or a cross drift higher up. There were hundreds of these little tunnels in the German coal fields.

Asked whether the excessive friction of the flushing material on the pipes was not a big expense, Mr. Paton said it was surprising the amount of wear there is in a ⅛-in. pipe. It had, however, been found in practice that a round pipe wore out so as to form an egg-shaped bottom; so an egg-shaped pipe was used and a liner put in the bottom with the result that the wear was on the liner. The life of the ordinary pipe was fairly long and the cost was not an excessive item. In an installation carrying 50 tons a day, say, the pipes would have about ten years' wear, and the pipe system in such an installation would rarely exceed $7000 or $7500, or say $1500 a year; if 50 per cent. more coal was obtained, this would soon pay for the wear of the pipe.

In regard to the question of stoppage in the pipes, the lecturer said in single-line systems there was very rarely a stoppage at all. They might go on for years and never have a stoppage. The first likely trouble would be from leakage through the wearing of the pipes, but even leakages were quite rare. There were junction systems, but no two were worked at one time unless arrangements had been made for a bigger main pipe in the shaft.

FLUSHING AND ITS RELATION TO OUTPUT

Mr. Paton informed a member that he did not defend hydraulic flushing for every case, but what he did claim was that hydraulic flushing was being extensively practiced and that it lent itself to the developing of mining on a simple and sound system. A big output could be obtained by its use, and a mine in 20 or 30 years would be as good as when it was started; whereas in some cases a mine might have to be closed in ten years where this system was not in use and the coal had to be won quickly and cheaply. A mixture of chalk or lime in the stowing material had a cementing effect, and he instanced one case where blasting had to be resorted to to make a road through a flushed area four or five months after the material had been sent down the mine.

Mr. Paton interested his audience by saying he believed that hydraulic flushing had its origin in an incident at a small mine on the Howarden estate in Flintshire, the seat of the Gladstone family. An outcrop was mined and a little brook carried sand and mud and other material into the mine, flushing it clean up so that it had to be abandoned. When pumping was resorted to later, it was found that the flushed material was dry. He honestly believed that this was where hydraulic flushing came from. The man who tried to push the system was a Welshman who went mad in his efforts to get the mining people interested so that they would adopt hydraulic flushing. This man made the journey to the United States, but here there was so much coal that they could afford to waste it, so he made the return journey across the Atlantic, took the idea to Germany, and Germany perfected the system of hydraulic flushing.

American Machinery in Demand at French Mines

The Lens coal-mining district in France is the center of interest in mining machinery circles. Other mines have been wrecked by the war, others have been overworked to the point where extensive repairs will be necessary but the problem at Lens overshadows them all. At this, the greatest French coal-producing point, all the machinery may be said to have been wrecked by artillery fire or demolition charges placed. The mines have been flooded, not from the surface but by wrecking the casing of the shafts. At least two years will be consumed in pumping out and repairing the shafts. In the meantime French machinery manufacturers are making a special effort to be ready with whatever new machinery may be required.

French mining engineers are familiar with American practice. Undoubtedly inquiries will come to America for machinery that can not be supplied in France and it would be well for Americans to keep in touch with the Comptoir Central d'Achats pour les Regions Envahies on this subject. Among the inquiries that have been received pneumatic locomotives have been prominent. Some Americans may not realize that French practice does not permit extensive blasting, the use of undercutting tools, and other American methods designed primarily to increase tonnage. The French problem is to avoid unnecessary waste either above or below ground.

Under the terms of the treaty, the Saar Valley mines will serve France for the next few years. Although the supply of coal and iron ore will be short, this arrangement will tide over the crisis and will make it possible to proceed methodically with the rehabilitation of the mines that otherwise would be essential to the life of industry.

American engineers have been to France recently making a careful study of the probable French requirements. French engineers have been to America looking after their needs and some of the larger French concerns even maintain permanent offices in America. Opportunities, therefore, should be well known to those in position to take advantage of them.

A consular report states that work in connection with the mine and track scales has been continued in different sections of the country, and six men are now employed in this field of work. The mine scale trucks have operated in the states of Tennessee, West Virginia, and Kentucky, while track scale-testing equipments have covered the states of Kentucky, Michigan, Minnesota, North Dakota, Montana, and Washington. Recently a member of the bureau's staff attended a meeting in New York with representatives of the American Railroad Association and the scale department of the Pennsylvania Railroad, in order to discuss the subject of track-scale specifications. As a result of this conference it has been proposed to add to the committee of the American Railroad Association, a representative of the Bureau of Standards. It is hoped that when this committee is organized it will form a means whereby progress in the securing of accurate weights on railroads will be very much expedited, and all railroads will be induced to adopt types of scales and weighing rules which will result in first-class weights.

Coal soon will be available to the mines in the Fairbanks district of Alaska. The railroad connecting Fairbanks with the Nenana coal field is practically complete. Mining operations in the Fairbanks district have been greatly curtailed in recent years because of the depletion of timber supply which could be used for fuel.

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Is this Our Forefather's Land of Equal Laws and Opportunity?

EMPLOYEES ARE ALLOWED, and in fact have been invited by Government officials, to join in combinations which, in turn, seek by creating public distress and discomfort to raise unreasonably the price of their product—labor. Yet employers are forbidden to combine, even where the price of their product is not raised thereby or is so maintained that only a fair price is secured.

Employees are allowed to deny the right to work to any employees who are not members of their combination. Employees in other instances are denied by other employees the right to join a combination and to work at an industry of their choice, and employers are, in some instances, bidden by their employees to refuse work to those who are not members of the combination yet it is well known that employers are not allowed to thus monopolize any industry.

Employees when combined are seeking to secure as a right the privilege of breaking contracts and are seeking that their combinations be not held accountable for the misdoing of members or of the combination as a whole, while combinations of employers are held responsible for their acts as a body, and for the acts of individuals where the combination is chargeable with having instigated their illegal acts.

Employees believe that they have unbounded rights to strike, but demand that employers shall not have a right to lock out their men.

Employees demand that they be allowed to refuse their services but they require that no one shall deny those thus striking the right to continue in the houses they have rented, the right to buy of whom they will and the right to have trust extended to them.

Employees are in general, allowed to seek high wages by means of combination, while employers in the coal or food-stuff industries may not accept a higher price even when freely offered and when obtained without combination.

Is this America? If it is the America of today it is a country of privilege. The outcome of privilege is almost sure to be abused, and the people suffer. The danger menaces, not the rich so much as the poor, for one of two things happens.

Either those employees who secure the privileges cause prices to rise and make employees in other industries suffer, or they reduce profits and create such losses that industries lose more than they gain, and the industries become poor and cannot grow. In fact they may cease to continue in operation.

Unprofitable industries eat up the product of the past faster than they create product and soon nothing is left. Suppose in a good year a farmer plants and is allowed to gain a crop only a fifteenth (6⅔ per cent.) more than is planted. Next year he plants as much as the year before and the crop fails and he loses all he plants. Where will he be? Will he be able to plant again? So it is with industry, it must gather in good years and in good ground much more than it sows or it will have no seed to sow after bad years and little if any left to sow if some falls on poor ground. Every man must balance large profits against big losses or he will have little left, and little left means a poor country.

This house is Tom's and that is Jack's; the other is John's and one belongs to Arthur. But if Tom and Jack and John and Arthur let their houses burn or rot away and do not rebuild, paint, repair and enlarge them, soon there is no village. If 100,000,000 Toms, Jacks and Johns and Arthurs all spend more than they can save, a nation is soon without the accumulation of its toil and where is that nation? Where, if this is the case, will be America?

If the sun of our political life prevents more than a 6 per cent. profit where will we get seed for future planting after a summer of drought? Is it right to restrain the frugal farmer from taking the full product of that part of his field which being "good ground" yields "some sixty and some a hundred fold", and let him bear the whole loss on the wheat that falls upon stony ground and takes no root. Usury is taking big return with no risk; where the risk is large the return must be large, or the capital invested will dwindle as ice in mingled cold nights and sunny days.

Why Government Salaries Should Not Be Raised

NO DEGREE OF INTELLIGENCE, only a formula from the book of public sentiment, is needed to prove that the employees of the Government should not receive any increase in pay, despite the increased cost of living. All that is necessary to prove the proposition is to take as a postulate something which is so often stated and so generally believed that it must surely be true. It runs thus:

When a service is necessary to the public and when the costs of that service increase, the parties rendering that service should find some way of meeting the increased cost without raising the cost of the service to the "dear" people.

It would be a folly to show how essential is the work of the Government official. It is clear that, if we had no Government, the right to pursue happiness would be denied us. The Government guarantees to us that we will get food and fuel at near cost or at cost or less than cost so that we may pursue not only digestion and warmth with success but may have money left to obtain many other things which bring accidents, and headaches and short sleeping hours in their train.

The Government certainly is most necessary to the public and therefore its cost should not be increased. Government officials should unflinchingly meet the increased cost of operation by strenuous economy and skillful contriving.

It has been observed that officials in the service look prosperous. The officials themselves, it is true, allege that this is due to their frugality, good taste and to their skill in the art of economy, but their appearance is so like to their reprehensible profiteering brethren that a little question must always arise in the minds of the public. Not being possessed of the qualities listed, outsiders must wonder that so much can be done with such a modest income.

So long as Government officials serve the public so well and essentially we must narrowly watch their efforts to improve their status. Even now it is said that they are trying "to pass the buck" of higher living cost to the ultimate consumer, and it is rumored that they have selected and sent out an agent—a "sinister agent" is the expression universally approved in such [illegible] trying to find out whether the ultimate consumer is not faring much more generously than they.

The public must object to any such inquiry (1) because it will show that Government officials are not paid nearly as well as men of equal or lower achievement and (2) because many of the officials in civil life are not nearly as useful as the Government men and therefore not being public utilities should be allowed to get anything they can set their minds or their hands on.

All of which is quite clear. Is it not?

We usually pay for value received. Generally speaking the one who tries to collect more for his services than those services are worth in the open markets of the world is doomed to failure from the very start.

A Generation Without Achievement

WE, THE PEOPLE of this generation, can not pride ourselves on the railroads we have built for our fathers who constructed the trunk lines of which we are so proud have given place to us who do not continue their work. Some superanuated railroad builders may remain, relics of a dead past. They stand like the solitary peaks that mark the mighty strivings of a prior era.

The United States introduced the electric street car system, which extended itself in a network on and around every city and even invaded the country. Its progress is now backward. Lines are being abandoned and the service of such as are still operating is being restricted. No longer have we any glory in our street-car system. No luxury industry is so mean that it cannot point with disdain at the elevated, street-car and subway service of the country.

Other utilities are not quite so severely curtailed, but none of them are progressing as triumphantly as in the past. In a short while, if we do not prove more generous, we shall find that not a single public utility is growing as fast as the need for its service. The cold hand of poverty will palsy the progress of all of them. No investor will take any bonds and the refunding of those bonds that reach maturity will be impossible.

There will result a land of many theaters, of roads made impassible by joy riders and highways cut up and cluttered by auto busses and motor trucks which latter can give better service than electric roads because allowed special privileges, the choice of runs and the stimulus of large profits. The old public utilities will be in an indigent class while luxuries and new types of public utilities will be in another and a prosperous class, till the new utilities suffer in their turn from a similarly drastic control.

For this reason the public utilities should stand together—the railroads, the street traction interests, the coal mines, the flouring mills, the packers, the electric power stations, the gas companies and like industries. They should fight as one, not for their privileges but for their rights. They are the cast-off spouses of the American people. When they were first seen they were courted and feted. Cities prided themselves on their utilities. Now the public has gone after the courtesans of traffic, and is willing to allow adequate reward only to those trades which cater to its folly.

Note the bill 11,339 introduced by Representative Charles H. Brand of Georgia on Dec. 19 last in which a dealer or any person regularly engaged in the business of selling foodstuffs and fuel is required under pain of a term of servitude, not less than one nor more than 20 years in the penitentiary, to sell these goods when he is offered reasonable and market prices. What this means is of course questionable. The market price may not be reasonable, and the reasonable price may not be that of the market.

If the coal man is to be held liable to imprisonment if he does not sell at the market price then he cannot mine and store coal, for if the price temporarily goes below cost he must accept the price which nets him a loss and lose his storage costs, labor, power, machinery depreciation, coal degradation, rent, stealage, fireloss and all other charges. He must sell his coal no matter how great the loss. Perhaps this is not meant by the author of the bill, but if the emphasis is to be put on the word "reasonable" and not on "market" why add the latter word which makes the matter ambiguous.

But why make it apply only to fuel and foodstuffs, unless the intention is to relieve the luxury trades from legislation? Class legislation was rampant before the war. It grew during the conflict. It is the supreme menace of the future.

The socialists openly assert that they will trap and starve the public utilities first and then when these utilities are without further power of resistance they will drag them into their own camp. They are trapping and starving some now and others are progressively getting into such an anemic condition that the socialists are ready to drag them home.

The railroads and the traction companies are already almost docile, and the mines and the power companies will follow soon. It is time that public utilities cease to quarrel with one another and band together to obtain a small measure of justice. If control is just for one man, it is just for another. The yard stick should be 36-in. long whether it measures cloth for James, the dry-goods man, or for John, the dealer in a public utility.

Strike May Raise Clothing Cost

When the coal strike occurred it made several plants run short hours and so prevented the garment workers and the woolen and cotton mills from working at high pressure. That will mean less clothing. When there is a shortage of dry goods, every retailer is bidding for the wholesaler's output, and prices go up. The retailer can charge what he will and be sure of selling. A strike of coal miners, therefore, decreases the production of clothing and makes it scarce and expensive, giving trouble to everybody, for we all need clothes.

DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

The Vicious Circle

Letter No. 1—The trend of the times is clearly indicated in the issue of "Coal Age" for Oct. 2, 1919, which recently came to hand. First, there is the poem by Rufus T. Strohm, which is the Foreword in that issue and deals with the now popular phrase, The Vicious Circle. This is followed, in the Discussion Department, by the several letters dealing with Prices and Wages, Wages versus Work Hours, and Bolshevism in America.

Though each and all of these contributions tell the same story, one fact seems to have escaped the several writers; namely, the manufacturers and producers of the necessities of life are themselves responsible for the perpetuation of the so-called Vicious Circle. Granting the demand for increased pay, shorter hours and other radical requests made by labor everywhere, the producer and manufacturers alike pass on the buck, so to speak, through increased prices and profiteering.

In the coal industry, for instance, one observes either a feast or a famine. When the demand for coal is at its highest, as it was during the war, the miners have steady work and earn good wages, while the operators take advantage of the opportunity to retrieve the losses of slack periods. The price of fuel soars, the increase being attributed to the law of supply and demand. This may not be justly called profiteering, but rather, good business; but let us look further.

LABOR AS A COMMODITY

How is it with labor, which is properly a commodity? In the slack period the earnings of the miner grow less and less. He works one or two days a week when the operator can get cars to load and has the orders for shipments; but the good Lord is supposed to look after the miner the rest of the time. When business picks up his services are again in demand. Now, if he lays off a day or so, a trick he has learned from his enforced idleness at other times, he is called a slacker, his loyalty to the industry is questioned and every expedient is used to make him put in as many hours as possible at the face of the coal.

The question arises, if labor is a commodity, which is generally acknowledged, why may not the miner take advantage of the same law of supply and demand, which avails the manufacturer and producer? Can he be blamed for asking an increased price for the commodity he is selling, the productive effort of his hands' labor? Does the demand for an increased wage by labor, justify the worker being called a Bolshevist, a radical, dyed deep in the wool? In the meantime, the price of coal goes higher and a like rise takes place in the price of all commodities whose manufacture requires fuel.

Notwithstanding the attempts made from time to time to becloud the true situation, reason compels the admission that every man is entitled to three things, in return for his labor; namely, food, clothing, and shelter, to which should be added a suitable amount of recreation and amusement. If his labor does not bring these things to the honest toiler and a small profit besides for the so-called rainy day and the frost of old age, what right has capital to ask for more and greater returns on its investments.

What has become of the Brotherhood of Man, the Golden Rule and other teachings of the Great Disciple, as embodied in the words, Do unto others as you would have others do unto you? Shall the greed of rapacious individuals, who are by far in the minority, be allowed to make life harder and harder for the workers who constitute the vast majority of mankind? When the futile, ineffectual attempts of workers to rise above the conditions that threaten to engulf them fail of their object it is not surprising that men resort to strikes.

I cannot agree with the statement of Jospeh R. Thomas, page 588 of the issue of "Coal Age" to which I have referred. In speaking of the decline in money value, he states, The principal cause for this condition can be traced to so large a class of workers who have fallen victims to Bolshevik activities. Mr. Thomas evidently knows nothing about the inflation that money has undergone and which is, more than anything else, responsible for the decreased purchasing value of the dollar, at the present time.

COST OF LIVING CAN BE LOWERED

But, returning to our subject, why ignore the truth, especially when it is backed by justice? The Vicious Circle, the trouble and turmoil, the present industrial strife and unrest, are not only the natural reaction of war conditions but a natural protest against the profiteering indulged in by those who control the means of production.

The cost of living can be lowered and the worker satisfied, though it may take more to accomplish this, at the present stage of affairs, than would be required had a more humane policy been followed in the beginning. Production can be increased and the price of living lowered if employers will make an earnest effort to bring this about. Here is the suggestion, and I pass it along for what it is worth.

During the war, the government fixed the price of coal, and operators still made money. The same can be done in respect to other commodities at no great loss to producers but the curtailing of extortionate profits. Strikes penalize both employers and employees and the entire nation suffers. The strike of coal miners in Great Britain cost that country over $50,000,000. Employers in an industry that does not function for any length of time lose far more than what they would sacrifice by cutting down their margin of profit and sharing it with their employees.

At the present time, any increase granted workers is added to the cost of production, and the price of the product is increased. The increased price of raw material to the manufacturer is passed on to the merchant, as is also any increase due to higher wages paid in the shop or factory. Again, the merchant selling the product of the factory adds to the price his share of profit. The result is that the increase is passed on to the ultimate consumer, who must eventually bear the burden.

It is well to remember, however, that the ultimate consumer is not only the worker whose labor has produced the goods but the original producer, the manufacturer and the merchant. All are paying the high prices they themselves have created by the large profits claimed in the business of producing the raw material and making and selling the goods. In other words, as is so well illustrated in Mr. Strohm's poem to which I have referred, like the pup, each man is chasing his tail and the result is the vicious circle. Let each of us study carefully the situation and decide for himself wherein lies the remedy.

Pittsburgh, Penn. MACK WILLIAMS.

Promotion of Ambitious Workers

Letter No. 6—I read with growing interest the letters Fairplay, "Coal Age," Aug. 28, p. 375, and that of Richard Bowen, Oct. 9, p. 628, on the subject of the promotion of ambitious workers. The letters brought to my mind a Foreword that appeared some time ago in "Coal Age," Vol. 11, p. 461.

The foreword, which was entitled, What Was Wrong, dwelt at considerable length on the circumstance of a man who served one coal-mining company continuously for 61 years. After 27 years of service, in different capacities, he secured a position as engineer, which he continued to hold the remaining 34 years of his service, and was then retired on a pension.

The writer seemed to convey the idea that, because this man had made a good engineer, hoisting the same loads, guarding against the same dangers and carrying the same responsibilities, he had been held by the company in that position all these years without being offered promotion. Perhaps, it would even have been refused, if asked. Evidently, the man was an efficient engineer and gave excellent and satisfactory service, and I believe we are justified in concluding that he was well satisfied with his job and would, in all probability, have refused a higher position had it been offered him.

ATTITUDE OF MANY WORKERS

In my opinion, sooner or later, most men find the station or position in industrial life for which they are particularly fitted and best adapted, and when that is the case, they seldom have any desire to go higher. Many good men shrink from the added responsibilities of higher positions than those they hold and are quite content with their lot.

With comparatively few exceptions, the general run of workmen are seeking positions and occupations where the work and its responsibilities are light. It is true that some workers have the ability and qualifications to fill high positions in the industrial world, but the vast majority are not so qualified. When they advance so far, they reach their limit.

In my opinion, the fact that a man is proficient in any one line is a good and sufficient reason for retaining him in that work. It is not a reason why he should be promoted; nor is it evident that he would prove equally proficient in a higher position. Long and faithful service in one position does not always fit or qualify one for a higher place. As in the Foreword mentioned, a man may make an efficient and faithful hoisting engineer who would prove a failure in the position of mine foreman.

I would be a great mistake, to my mind, to promote a man for no other reason than his long service in the employ of the company. Such promotion would often elevate a man to a position for which he was not qualified, while the same man would have filled an under position with success.

What has been claimed as a discouragement to ambitious workers in coal mining, is equally true in respect to all other industrial pursuits. Locomotive engineers pull and push the same levers, look ahead along the same rails, see the same scenery, and count the same miles of run year after year, with no expectation of ever being made superintendent of the road, though it is possible some of them would be capable of filling the place. A railroad company needs the services of their good engineers at the throttle. They have other men who are not engineers, but whose training is fitting them for the position of superintendent or manager. It is only reasonable to assume that, under like circumstances, we would follow the same course in the promotion of men to those positions for which their training fits them.

All young men entering the coal-mining business cannot expect to become superintendents and managers of mines any more than all school boys can hope to become governors and presidents, and the same is true in respect to all industries. I believe it is safe to say that as many miners have been called from the pick and shovel to higher positions, as is true of men who served behind the counter and later gained the manager's desk.

DIGNITY OF HONEST WORK

A miner, with black face and hands can do just as honest and faithful work, as the man who wields the pen or handles goods of delicate texture with white hands. The work of the former is just as honorable as that of the latter. Someone has said, It is not the employment or station that brings honor to the man; but the man brings honor to the position he holds, by the way he performs his work.

Circumstances over which men have little if any control often affect their advancement. At times, a man will leap by a single bound from obscurity at the bottom of the industrial ladder to a place of prominence at the top. Such instances are particularly in evidence in political affairs.

In coal mining, the ambitious miner studies to fit himself for the position of fireboss or mine foreman. It may happen that, in a large mine, there are three or four of such miners who are applicants for the same position of foreman, which has been recently vacated. It is quite clear to anyone that all of them cannot secure the position. The appointment can only go to one and the rest are disappointed. At such times, we are apt to hear the cry of favoritism, which may or may not be the case. Such cries generally come from the men who are least worthy and competent to fill the place.

Many workers are ambitious for promotion to positions they are not qualified to fill, but which they desire for the honor that goes with the appointment. Many miners imagine that mine foremen have an easy time and do not realize the responsibilities that rest on their shoulders. If they did, some of them would not be as anxious to secure the place.

Dayton, Tenn. JOHN ROSE.

Finding a Mine Door Set Open

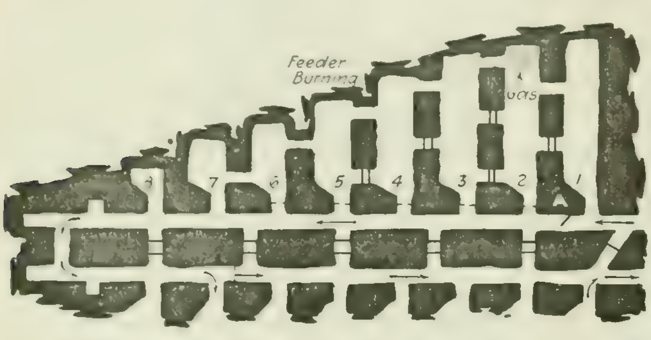
Letter No. 14—The question raised by Richard Bowen, as to whether it is the best and safest method for the fireboss to start his regular morning inspection of a mine on the intake air, or to begin at the return end and proceed against the current, submitted to the readers of "Coal Age," in the issue of Sept. 11, p. 462, is bringing out some interesting replies.

As the geological formations, in different mines, vary widely in both extent and general conditions, it seems to me that, in most instances, this matter can be solved best by the judgment and experience of the fireboss, who must be thoroughly acquainted with the natural conditions in his mine. If a fireboss feels that it is just as safe to go one way as the other, let him go the most convenient way.

As a general rule, however, I think the examination should begin with the intake current. My reason for thinking so is that all gases swept from the faces of the chambers are carried ahead with the air, and the place is left clear. On the other hand, if the examination is started at the return end of the mine, the gases swept from the chambers ahead of the fireboss might have a tendency to accumulate in the chambers behind, which he has just examined, in case the air current was weak.

Finding this particular door set open would indicate clearly to the experienced fireboss that he had no circulation in the entire intake side of the mine, and any gases found accumulated in the faces of the chambers could not be removed until the circulation was restored. The fireboss would also assume that the open door would not affect the circulation in the return section of the mine.

Now, as has been suggested, had this door been left open by some careless driver, at about the time the shots were being fired and remained open up to the time the inspection was made, if the fireboss started his examination on the intake side of the mine he would discover quickly on entering Chamber 1 that something was wrong with the circulation; but if he started the inspection on the return side he would not detect anything wrong, until he had reached Chamber 7, on the intake side. Neither would he be apt to smell the smoke from the burning feeder, until he passed through the crosscut between Chambers 6 and 5, where he would find the burning feeder and try to extinguish it.



ASSUMED GASSY SECTION TO BE EXAMINED

In case the smoke from the burning coal was so dense and hot, because of the little air passing, that the fire cannot be extinguished, the crosscut between Chambers 3 and 4 must be closed and a stopping built on the entry between Chambers 4 and 5 so as to deflect the air current up Chamber 4 and through the crosscut to the face of Chamber 5, which would clear out the smoke and cool the chamber so that the feeder could be approached and extinguished. The stopping in the crosscut may then be removed and the inspection continued to the end of the section, after which the door may be closed and the circulation restored.

In his letter, "Coal Age," Oct. 9, p. 627, Andrew O. Bain, tells how he would remove the gas from Chambers 2 and 3 which is very good, except that he fails to close the crosscut at the face between Chambers 3 and 4. If this crosscut is left open when the door on the entry is closed and the circulation restored in these three chambers, in my opinion, there would be danger of enough gas-laden air passing through Chamber 4 and coming in contact with the burning feeder in Chamber 5 to be disastrous.

Again, it may not be definitely known in what chamber the burning feeder is to be found. Suppose, instead of its being in Chamber 5 on the intake side, it is in Chamber 8, near the face of the heading, on the return side. In that event, I think Mr. Bain would run a great risk in sweeping out any considerable amount of gas and sending it on along the gangway to this burning feeder. Judging from the figure or plan given, the mine is evidently a small one and the distance from the mouth of Chamber 3 to that of Chamber 8, is not so far but that there might be more or less danger in sending gas in that direction.

While acting as fireboss, in a very gassy mine that was being worked altogether with safety lamps and in which a part of the circulation came through another mine that was also gassy, I recall an instance when a pump got out of repair, in the other mine, and the water rose until the air passing into our mine from that quarter was cut off, which allowed gas to accumulate in the other mine. When the pump was started again and the water lowered sufficiently to permit the air to pass through to our mine again, our safety lamps were knocked out, for a distance of more than two thousand feet from where the gas had accumulated.

To say the least, it is a very uncomfortable situation to find a burning feeder and an accumulation of gas in the mine at the same time, more especially when the air is passing from the gas toward the feeder. To leave the door open, as Mr. Bowen says has been his custom in gaseous operations, and proceed with the examination, until it is ascertained that there are no burning feeders in the mine, I think is the proper course to follow. But if the inspection is made with the door set open, beginning on either the intake or the return side, and any accumulation of gas is found in the unventilated section of the mine, a second inspection will always be required after closing the door.

Now, in conclusion, permit me to say that to lay down a fixed method of inspection that will apply alike to every mine, would be a difficult undertaking. Conditions vary and the nature and formation of mines differ widely, and a method that might be practiced with a reasonable degree of safety, in making the examination in one section of a large mine, possibly could not be followed in another mine. As I said before these things should be left to the judgment of the experienced fireboss.

A long experience as fireboss, has led me to be guided largely, in making the inspection, by the condition of the mine. Sometimes I would prefer following the intake and in other cases would start in the return. However, in all gassy mines where accumulations of gas are expected to be found and must be removed, the intake should invariably be followed; and a door set found open, short-circuiting the main current, should not be closed, until it has been ascertained that there are no burning feeders in the mine.

Dayton, Tenn. JOHN ROSE.

Acetylene Safety Lamps

Letter No. 1—During recent months "Coal Age" has developed most interesting discussions regarding firebossing, rescue work, and rescue appliances for use in mines. It would seem, howver, that the question of illumination, which is of so great importance to coal mining, has not received the consideration it deserves. The same remark will apply also to the excellent work of the Bureau of Mines, which has been instrumental in creating a growing interest and has received the hearty coöperation of mining companies, in the organizing and equipping of well-trained rescue crews in mining districts.

In the matter of illumination, the electric lamp has been generally considered as an essential equipment of all rescue stations. Most rescue crews are equipped partly with electric lamps and partly with safety lamps burning naphtha or oil. Though both have their merits, these lamps have often been found wholly insufficient in respect to the light they give for penetrating the dense smoky atmospheres commonly met in fighting mine fires when wearing breathing apparatus. When such atmospheres dense with smoke and fumes are encountered, the lamps mentioned are practically worthless, the oil-burning lamp being often extinguished, while even the electric light fails to penetrate the obscurity.

It is a recognized fact that if a rescue crew is to work efficiently, the best possible light must be given them. Without it, the workers cannot proceed intelligently, but must hesitate and lose confidence in themselves, and perhaps be unable to keep their bearing. All of these are imperative in rescue work and largely depend on the presence of a strong light that is able to penetrate the gloom.

In nongaseous mines, the open carbide lamp has long proved its value in respect to the illumination it affords. The fact that the acetylene safety lamp, which adapts the carbide light to use in the presence of gas, has not been recognized in connection with mine-rescue work and adopted as part of such equipment, can only be explained by assuming that this lamp is not widely enough known. The acetylene safety lamp has been proved to be reliable and safe. It is sensitive to gas, though not quite in the same degree as a naphtha-burning lamp, but far more sensitive than the common Davy. burning oil.

ADVANTAGE OF ACETYLENE FLAME

Acetylene safety lamps give a very bright and steady light, but what is of equal importance is the fact that they require very little oxygen in burning, which makes them particularly suitable for mine-rescue work, which must be generally performed in atmospheres deficient in oxygen, where oil-burning safety lamps would burn dim or be entirely extinguished.

It is thus clear that the disadvantages of both oil-burning and electric lamps, for such work, are overcome by the use of the carbide, gauze-protected lamp, known as the acetylene safety lamp, and it would seem that their adoption as a standard lamp for rescue stations is of the utmost importance.

In the same connection, it can be said that this lamp should find an important application in the work of the fireboss or mine examiner, whose duties are manifold and of grave importance in relation to the safety of lives and property. In making his inspection of the mine, the fireboss must observe carefully that the working places are free from every danger. For that purpose, he must have a light of the greatest illuminating power.

At present, many firebosses are obliged to carry two lamps; an electric lamp and a safety lamp, for testing purposes. In my opinion, the acetylene safety lamp furnishes considerably more light than both of these lamps together, and accomplishes both purposes for which it is necessary to carry the two lamps.

It is my belief that the use of the acetylene safety lamp in firebossing would not only facilitate the work of firebossing, but make it possible to do it more thoroughly. There is, of course, no need to emphasize here the results of making an efficient inspection of a mine.

Charleston, W. Va. PROGRESSIVE.

Storage Battery Locomotives

Letter No. 1—A reference that I saw recently in "Coal Age", in regard to the improvement of mine equipment as emanating largely from the users of such equipment, reminds me of an incident that shows that this is particularly true in regard to the use of storage-battery locomotives in mines. This type of locomotive is being constantly improved, and these improvements generally come through the suggestions of users that are worked out by the engineers in charge of their manufacture.

An order was recently placed with one of the large manufacturers of storage-battery locomotives, for a locomotive to be furnished with two complete batteries, in removable battery boxes. The order requested specifications on a battery that would be suitable for operating a mining drill. It was explained that the drill was to be run during the night and driven by a 3 hp motor. The idea was to run the drill from a locomotive battery, the drillman using the locomotive to move his drill from place to place.

It was explained that this would do away with the necessity of operating the power plant, at night, solely for the purpose of running the drill. The fact that the locomotive was to be equipped with two complete batteries, in removable boxes, would make it possible to do this, since one battery could be charged during the day, while the other battery was in use on the locomotive. The work of changing the batteries would only be a matter of 10 minutes.

The concern that manufactured the locomotive had previously had no idea of the varied service to which the machine could be put; and the request of this operator was a revelation to them. As the old saying goes, necessity is the mother of invention. In this instance, it was the necessity of running the power plant during the night, for the sole purpose of operating the drill which work was performed by the nightshift, that gave rise to this suggestion and which unquestionably broadened the application of this type of locomotive in mining practice. Similar varied uses of other equipment are brought out, from time to time, that would be overlooked were it not for the necessity that brought them to light.

AUTHORITY OF SHOTFIRERS

Only recently I learned of a similar instance where a portable pump had been used to pump the water out of a few low places at different points in a mine. Although this work required but a few hours, it was necessary to be done in the early morning, just before the beginning of the day's run. Previous to the installing of a storage-battery locomotive in that mine, it had been necessary to employ a nightcrew to operate the power house, to supply the necessary power for running the pump.

In this case, also, the locomotive was equipped with two batteries, and the pumpman used the locomotive, both to move his pump from place to place and to operate it for pumping the water out of the places where it had accumulated. Instead of employing the nightcrew and the pumpman itwas only necessary, now, for the latter to come out early in the morning, take the locomotive and proceed with his work.

In the use of storage-battery locomotives, complaint has been made, at times where the work was very severe, that it was impossible to get a full day's work from the battery. Equipping the locomotive with two sets of batteries, as just mentioned, overcomes this difficulty also.

During the period of the war, when machinery of any kind was at a premium and operators were compelled to take anything that they could get, it was impossible to furnish batteries that would not show signs of deterioration after a limited service. Also, there was a general falling down of some of the cheap chain-driven machines that were then put on the market. This class of machinery, naturally, deserved severe criticism, although all of the trouble cannot be ascribed to the batteries employed, but much of it was often due to the inferior machine the battery had to operate.

The stress of war work is now past, and the larger manufacturers of mining equipment are devoting more time to the perfection of the machines they put out. This is particularly true of the storage-battery locomotive that is so well adaped to the work of gathering coal at the face that it is now rapidly coming into its own.

Ashland, Ky. J. A. S.

INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD

Authority of Shotfirers

Kindly permit me to ask for the opinions of "Coal Age" and its readers in a disputed question that has arisen between the miners and the shotfirers employed by the Norton Coal Co., at this place.

To explain, our loaders prepare their own powder in two sticks, while the shotfirers tamp and light the shots. Some of us have refused to fire shots prepared in this way by the loaders, claiming that even when using a copper-tipped tamping bar there is a liability of the bar striking a spark, by coming in contact with a sulphur ball.

The miners want the shotfirers to tamp the open powder. They say that if the powder is put in the hole without opening the end there is a vacant space left between the two sticks, which is liable to cause one stick to fire first; and if the second stick fires it will do so later and cause a windy shot.

The refusal of the shotfirers to fire such shots caused the miners to take the matter up with the Mine Committee, and the result was that the mine foreman, at the request of the committee, ordered the shotfirers to fire the holes. The committee held that there was no danger to be feared of a windy shot resulting from this manner of charging the holes. It was stated further that the Examining Board of Illinois had recommended that method of shooting. However, this did not satisfy the shotfirers, who still refused to fire the holes.

Again, let me ask: Should a mine examiner decide that a hole is not safe to fire, has the Mine Committee any authority or right to demand that he shoot the hole? If the judgment of the examiner differs from that of the men, who has the right to decide the matter?

Nortonville, Ky. SHOTFIRER.

Assuming that black powder is used, or even permissible powder, and made up in two sticks with open ends, so as to bring the powder of the two sticks together, there is some question whether such a charge can be inserted into the hole without more or less of the powder being scattered along the hole. In that case there is every possibility that the scattered grains of powder would be ignited, in the process of tamping the hole, and a premature explosion result.

The work of shotfiring is dangerous, at the best; and it is this consideration that has caused the shotfirer to be given supreme authority in respect to what shots he shall fire, which is plainly specified in the mining laws of several of the coal-producing states, including Colorado, Missouri, Iowa, and the bituminous districts of Pennsylvania.

In the opinion of COAL AGE, this is a safe provision in respect to the firing of shots in blasting coal in mines. It is only logical to allow that the person firing a shot should be permitted to use his own judgment as to its safety. In other words, where a company, or the miners working in a mine, employ men to fire their shots, they place themselves in a position that compels them to submit to the judgment of those they employ, since no man can be expected to willingly risk his life through the whim of another.

Therefore, let us conclude that no man or committee of men can demand that a shotfirer accept their judgment in jeopardy of his own life; and, in this respect, it is our opinion that the shotfirer should be protected by the state mining laws or mine regulations. In the performance of his duties the judgment of the shotfirer should be supreme. It will be of interest to learn the opinions of shotfirers on this question.

Widening an Airway

The air-course in our mine is 5 ft. in height and 10 ft. wide. The volume of air passing is not sufficient for the development of the mine, and it is proposed to increase this circulation by widening the airway, the height remaining the same, because the coal is only 5 ft. high and we do not want to brush the roof or lift bottom. At present, the mine is passing 150,000 cu. ft. per min., and it is desired this quantity to 200,000 cu. ft. per min. Kindly show the method of calculating the width of airway required to produce this result, assuming the power on the air remains unchanged.

Oliphant Furnace, Penn. JOHN H. WILEY.

The first step in the operation is to write the equation for power, expressed in terms of the airway and the quantity of air passing; thus,

$$u = \frac{k\,l\,o\,q^3}{a^3} \quad \ldots\ldots\ldots\ldots 1$$

Now, disregarding the factors u k l, all of which are constant, it is observed that the quantity (q) varies directly as the sectional area (a) and inversely as the cube root of the perimeter (o). In other words, the quantity ratio is equal to the area ratio, times the cube root of the inverse perimeter ratio, which is expressed as follows:

$$\frac{q_2}{q_1} = \frac{a_2}{a_1} \times \sqrt[3]{\frac{o_1}{o_2}} \quad \ldots\ldots\ldots\ldots 3$$

Now, since the height of the airway is to remain unchanged, the area will vary as the width (w) and the perimeter as the sum of the height and width (h + w). Hence, we can write for Equation 2 the following:

$$\frac{q_2}{q_1} = \frac{w_2}{w_1} \times \sqrt[3]{\frac{h + w_1}{h + w_2}} \quad \ldots\ldots\ldots\ldots 3$$

Substituting the known values for their respective symbols in equation 3, $q_1 = 150,000$; $q_2 = 200,000$; $w_1 = 10$; $w_2 = x$; and $h = 5$; we have,

$$\frac{200,000}{150,000} = \frac{4}{3} = \frac{x}{10} \times \sqrt[3]{\frac{5 + 10}{5 + x}} \quad \ldots\ldots 4$$

Then, cubing each side of the equation, transposing and simplifying, we have, finally,

$$\frac{x^3}{5 + x} = 158; \text{ or } x^3 - 158\,x = 790 \quad \ldots\ldots 5$$

The value of x in equation 5 is found most easily by trial. For example, trying successively x = 12, x = 13, x = 14, it is finally found that the value that will satisfy equation 5 is practically, x = 14.5. Therefore, to produce the desired results, the airways must be widened 14.5 — 10 = 4.5 ft., or 4 ft. 6 in.

EXAMINATION QUESTIONS

ANSWERED BY

JAMES T. BEARD

Mine Examiner's Examination Springfield, Ill., Nov. 11, 12, 1919

(Selected Questions)

Ques.—What kind of oil is used in a Davy lamp?

Ans.—The oil burned in a Davy lamp is usually sperm, cottonseed or lard oil. These are frequently mixed with petroleum in proportions varying from one-third part of the latter to equal parts of both, for the purpose of increasing the illuminating power of the lamp.

Ques.—What percentage of marsh gas can be detected with a Davy lamp?

Ans.—Many firebosses can detect the presence of marsh gas when but 2 per cent. of the gas is present in the still air of a chamber or room. Others often fail to see a cap in 2½ per cent. of gas. Most firebosses have no difficulty in detecting gas when 3 per cent. is present in the air current flowing in an entry. It is always easier to observe a flame cap in still air than in a moving current.

Ques.—What is a regulator and when can it be used to advantage?

Ans.—A regulator is a device for distributing the air passing in two or more splits so as to proportion the air supplied to each split according to its needs. In other words, a regulator is used to obtain a different distribution of air from what would be produced if the air current was permitted to divide naturally between the splits.

A regulator can be used to advantage when the natural division of the air gives more air in one split or district and less air in another than what is required. This always happens when the splits are of unequal length, since the longer split, where the greater number of men are generally at work, naturally takes the smaller proportion of air, while the shorter split working fewer men receives the larger proportion of the air. To overcome this, a regulator must be placed in the shorter split, which has the effect to increase the resistance in that split and force some of the air to pass through the longer split.

Ques.—If there was 30,000 cu. ft. of air passing in the return airway, and this quantity contained 3½ per cent. of marsh gas, how many cubic feet of gas are there?

Ans.—The quantity of gas in the return current, in this case, is $0.035 \times 30,000 = 1050$ cu. ft. per min.

Ques.—Where would you expect to find the following gases, in making an examination of a mine: Firedamp, blackdamp and whitedamp?

Ans.—In the examination of a mine, the fireboss expects to find the different gases mentioned, accumulated at the roof or floor, or at the face of a rise or dip, according as their density is less or greater than that of air. For example, the specific gravity of firedamp, which is an inflammable or explosive mixture of marsh gas and air, is generally less than that of air or unity; and firedamp is therefore to be found accumulated at the roof or in rise workings. Likewise, blackdamp has a specific gravity greater than unity and is to be found accumulated at the floor, or the face of dip workings or other low places in the mine.

It happens, at times, that these gases are generated in such quantities in certain places in the mine that there is little chance for their accumulation according to their densities. For example, firedamp may be generated in considerable quantity at the face of dip workings or in other low places in the mine; or blackdamp may be coming from the roof in rise workings, being generated in a worked-out overlying seam, or finding its way from other sources through crevices in the roof. In such cases, the specific gravity of the gas is no indication of where it is to be found, until it has had an opportunity to accumulate in a still atmosphere.

Whitedamp (carbon monoxide) has a specific gravity but slightly in excess of air (0.967), which would cause this gas to accumulate at the roof or other high places, if it was present in sufficient quantity in the mine. However, that is never the case, under normal conditions of working. Whitedamp, being the result of combustion of carbonaceous matter in a limited supply of air, must be sought in poorly ventilated and abandoned places in mines, or in the return from a mine fire.

Ques.—State by what means firedamp, blackdamp and whitedamp can be detected in mines. Also, say which of these gases is more easily removed and which the more difficult to remove.

Ans.—Firedamp is detected by observing its effect on the safety lamp, either in the formation of a flame cap or by the action of the flame, which is enlarged and lengthened and often rendered unsteady in the presence of this gas.

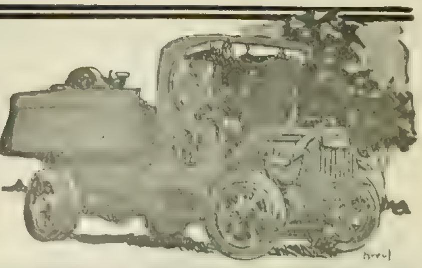
Blackdamp is detected by observing the dim burning or extinction of the flame of the lamp, as well as by its effect to produce headache, nausea and pains in the back and limbs when a person has worked long in such an atmosphere. Whitedamp must be detected by observing its effect to prostrate small caged animals such as birds or mice, preferably the former.

Firedamp accumulated at the face of a steep pitch or on a high fall and blackdamp accumulated at the face of dip workings, or in swamps and low places in the mine, are the most difficult to remove. When firedamp is generated at the face of dip workings, or blackdamp at the face of a pitch or in rise workings, the removal of the gas is less difficult, it being assisted by the relative density of the gas and air, which causes it to flow naturally from the place where it is generated in those cases. The removal of whitedamp will depend on the ability to properly ventilate the places where it is generated.

Ques.—The total rubbing surface of a square airway being 160,000 sq. ft., the length of the airway, 5000 ft., the quantity of air passing, 80,000 cu. ft. per min., what is the velocity of the air current, in feet per minute?

Ans.—It is necessary, in this case, first, to find the perimeter of the airway by dividing its rubbing surface, in square feet, by its length in feet; thus, $160,000 \div 5000 = 32$ ft. Then, the airway being square, each side is $32 \div 4 = 8$ ft., and its sectional area, $8 \times 8 = 64$ sq. ft. The quantity of air in circulation being 80,000 cu. ft. per min., the velocity of the current is $80,000 \div 64 = 1250$ ft. per min.

COAL AND COKE NEWS



WHAT HAPPENED IN OCTOBER

[The bracketed figures in the text refer to the number and the page of the volume in which reference to the matter noted may be found and should the reader desire further information he can obtain it in the place indicated.]

Oct. 1—The finals of mine rescue competition of the national first aid and mine-rescue meet is held in Pittsburgh, Penn., in conjunction with dedication of the Bureau of Mines buildings [XVI, 615].

Oct. 1 to 4—The Eighth Annual Safety Congress of the National Safety Council is held at Hotel Statler, Cleveland, Ohio, [XVI, 618 to 623]

Oct. 7—Some 5000 miners are still out on strike around Johnstown, Penn. [XVI, 657]

Oct. 10—The operatives of the Central Competitive district meet (at Hotel Bellevue-Stratford, in Philadelphia, Penn., with the officials appointed by the United Mine Workers of America, in a wage conference [XVI, 657].

Oct. 12—The wage conference of the Central Competitive district and officials of the United Mine Workers of America adjourns without having come to any agreement [XVI, 657].

Oct. 14—Senator Myers, of Montana, denounces Congressional investigation of industrial trouble [XVI, 690].

Oct. 15—An order is issued to members of the United Mine Workers of America, in the [illegible] regions of the United States, [illegible] at midnight of Oct. 31 1919 [XVI, 657]. Secretary of Labor W. B. Wilson summons John L. Lewis, acting president of U. M. W., and Thos. J. Brewster, spokesman of the bituminous coal operators, to meet him on Oct. 17 at Washington [illegible] [XVI, 657].

Oct. 17—[illegible] at Washington [illegible] Wilson, secretary of labor; John L. Lewis, acting president U. M. W., and Thomas T. Brewster, representing the coal operators of the Central Competitive district. A meeting was [illegible] Oct. 21 [illegible] to negotiate the issue in question [XVI, 690].

Oct. 21—[illegible] workers in [illegible] agreed at the Oct. 17 conference [XVI, 691].

Oct. 24—From 3000 to 5000 miners meet at [illegible] of Guyan field. Governor Cornwall wires acting president John L. Lewis, of the [illegible]

Oct. 24—[illegible] to avert the coal strike fails. Even an appeal from President Wilson, to the operators and [illegible] no results.

Oct. 25—President Wilson issues statement [illegible] a grave moral and legal wrong against the Government, and that the law will be in[illegible]

Oct. 25—Numerous strikes are on in the No. 11 [illegible]

Oct. [illegible] Oil Co., at Carlinville, Ill., breaks all rec[illegible] 763].

Oct. [illegible] 764]

Oct. [illegible] [XVI [illegible] the Y[illegible] & O[illegible] at Amsterdam, Ohio. As a result [illegible] lose their lives and thousands of dollars are lost [XVI, 792].

Oct. 29—A conference of the International Executive Board, Scale Committee and District Presidents of the United Mine Workers of America, meets in Indianapolis, Ind., to consider the strike situation, especially President Wilson's request that the strike order be recalled. District Presidents and Scale Committee leave for their homes to direct the strike.

Oct. 30—The Executive Board of the United Mine Workers of America continues in session at Indianapolis, Ind.

Oct. 31—The Executive Committee of the Central Competitive field meets in conference at Cleveland, Ohio, to take action on the nation-wide strike scheduled for midnight. The conference then adjourns. Troops are secretly moved to stragetic points in coal states to be affected by strike order at midnight.

Oct. 31—Federal Judge A. B. Anderson issues a temporary restraining order to prevent union officials from issuing instructions to union members' relatives to the strike or to paying strike benefits from union funds. This order was issued at request of special assistant U. S. Attorney, General A. B. Ames

Charleston, W. Va.

Production of coal erratic during pre-holiday week. Car shortage develops the latter part of the week. Not expected to improve soon. Diversion of coal ceases. General resumption of work in Kanawha field without definite agreement as to application of 14 per cent. wage increase. Most of New River mines working without check-off system.

The production of coal reached two extremes during the pre-holiday week, in this section of West Virginia, growing at a rapid pace during the first four days of the week, only to be seriously curtailed during the last two days of the same period. The upward curve in production followed a resumption of work by miners in the southern part of district No. 17 on Monday, Dec. 15, in response to instructions from Indianapolis; the difference in conditions being most marked in the section referred to because of the fact that miners had been idle most of the time during the entire six weeks of the strike. The difference was less marked in that part of this section within the confines of district No. 29 (United Mine Workers), where miners had been at work since the first rescinding order had been issued, even though the check-off had been abolished; but even in district No. 29, there was an increase during the week ended Nov. 20, amounting to possibly 20 per cent.

On Friday Dec. 19, however, a sudden car shortage developed in this section, cutting production down to just about half of what it should have been under favorable conditions; though the shortage of cars was felt to a less extent in district No. 29, or the smokeless area, than in district No. 17. As showing the effect of the sudden car shortage, even though it had not been unexpected, loadings on the Chesapeake & Ohio dropped from 117,000 tons on Thursday to 85,000 tons on Friday, and on Saturday there were still further decreases; there was little prospect that such conditions would be alleviated during the next few weeks, at least no hope was held out by C. & O. railroad of[illegible] conditions would be improved. [illegible] shippers in the area had experienced some financial relief through [illegible] from the rail[illegible] loans general and there were still large amounts [illegible] during the latter [illegible] November. However, through the receipt of cash from the [illegible] generally [illegible] by a strike with the further assistance of banks, to meet their Christmas payrolls.

Diversion of coal originating in this section had largely ceased during the third week of December, only a few cases of such irregularities having been reported; owing to that condition most of the coal produced in this part of the state was moving forward to oroginal consignees in the regular channels, although embargoes still prevailed with respect to coal from some of the high volatile fields and there was still an inhibition against any export shipments. More coke was also being shipped, permission having been granted for the use of open top cars in the shipment of this fuel.

General resumption of work on the part of miners in the Kanawha district, at the outset of the pre-holiday week, made for a large production in that district as long as the car supply was maintained. In fact there were a good many miners who reported for duty as early as Saturday Dec. 13, or just as soon as they received word of the settlemen effected at Indianapolis. Most of the miners, however, waited until Monday to return to work, and from that time until Friday the nineteenth, there was a steady gain from day to day in the production of the Kanawha region; but the sudden slump in the car supply forced many mines to shut down and miners deprived of an opportunity to earn as much as would otherwise have been possible in the week just before the Christmas holidays. Production of C. & O. mines in the Kanawha field by Wednesday the seventeenth, had reached 35,000 tons, but by Friday it had slumped to 23,000 tons and was still on the downward curve. Labor trouble also developed at certain mines on Coal River, but it was largely of a local nature.

Miners of the Kanawha district were at work, although there had been no agreement reached as to just how the 14 per cent. wage increase should be applied, whether on a flat basis of 70c, computed according to the scale in the Central field, or on a basis computed on the prevailing rates in the Kanawha field; there had been no agreement reached by Dec. 20, although conferences between miners and operators had been held, each side adhering to its original contentions. However that was not permitted to make any difference as to working conditions, the miners continuing at work. There was seen, however, that there might be some difficulty when it came time to meet the first payroll under the increase.

The car shortage prevailing throughout the length and breadth of the C. & O. territory during the week ended Dec. 20, affected operations in the New River field less than in other districts, there being only a small reduction of the output as the result of a car shortage. The peak of production at C. & O. mines in the New River field was reached about Wednesday, when a total of 26,000 tons were produced. From that point the output dropped to about [illegible]000 tons a day during the remainder of the week. It was generally believed, however that during the last weekly working period of the month the general car shortage would overtake the New River field also.

Although district officials of the United Mine Workers in the New River field were making every effort to secure a restoration of the check-off which became automatically abrogated when the New River miners broke their contract on Nov. 1 most of the mines in the New River field are still being operated without the check-off being in existence. Despite that fact production was steadily increased during the greater part of the week, advancing from about 70 to 90 per cent. and dropping off a little only when cars made it impossible to load coal. Of eight mines in the New River field not in operation during the week, only two were

The movement of coal from the New River field was largely to the eastward, a large tonnage being consigned to tidewater, but none of it for export purposes. Diversion of New River coal had largely ceased and virtually all of it was going to original consignees.

Much difficulty was still being experienced by New River operators in securing financial returns for coal shipped during the latter part of October and during November.

Bluefield, W. Va.

Car shortage limits production in extreme southern fields of the state. Situation most acute in Pocahontas region. To continue for several weeks. Miners leaving field for their old homes for Christmas week. Most of smokeless coal goes to tidewater.

With empties at a premium in the extreme southern fields of West Virginia, production in that part of the state was materially decreased during the week ended Dec. 20, especially during the latter part of the week, when several of the larger operations were forced to cease even attempting to load coal for a day or so because of the absence of cars. While the shortage was more pronounced in the Pocahontas than in the Thacker and Tug River fields, nevertheless mines in the last two named fields also experienced the same difficulty in securing an adequate supply and as the week drew to a close cars became scarcer and scarcer.

The opinion was ventured by railroad officials of the Norfolk & Western, that a continuance of the car shortage might be expected for several weeks, the principal difficulty, according to their version, being the large amount of equipment in the far West which is not being returned to the territory in which it was used prior to the strike. In other words, with the resumption of operations in the West, the total equipment available is not sufficient to go round, and it is regarded as certain that western producers and railroads are utilizing much equipment belonging to the Eastern Car Pool.

Another factor in limiting production during the week ended the twentieth and during the early part of Christmas week was the absence of quite a large number of miners from their working places on account of the holidays.

The larger part of smokeless coal from the extreme southern part of the state was being moved to tidewater and other eastern destinations; the western shipments were somewhat limited. However, the car shortage has so greatly curtailed production, that producers are finding it next to impossible to catch up with their contract deliveries, interrupted by the strike.

The output of the Tug River field during the working period ended Dec. 20 dropped to 77,500 tons, and on Monday the twenty-second only 13,000 tons of coal were produced, that representing the smallest Monday's loading recorded in some time. One effect of the continued serious shortage has been to deprive a number of Tug River mines of empties for three consecutive days. The output of coal during Christmas week was expected to be quite light because of the inadequate car supply and because of Christmas week.

Throughout the last half of the week ended Dec. 20, in the Pocahontas region, the car supply was far below normal; conditions during the earlier part of the week showing little change as compared with the previous week, so that the car shortage in the Pocahontas field alone closely approximated 50,000 tons. The shortage in the Pocahontas region was particularly acute on Thursday, the eighteenth, a number of mines finding it necessary to suspend operations, while during the remaining two days of the week loadings were limited. In fact it is generally predicted that the first of the year will find the situation more serious than it is even at present. Another cause contributing to the reduction of output in the Pocahontas region, was the general movement of miners to their old homes for the Christmas week, well supplied with funds and ready to enjoy a week's holiday.

Huntington, W. Va.

Car shortage reduces Guyan production below that maintained during the strike. Output 195,000 tons for third week of month. Coal now shipped to regular customers. No diversion.

The Guyan field is winding up the [illegible] year with a greatly reduced production as compared with that maintained throughout [illegible]

[illegible]

[illegible] 40,750 tons. It was not believed that production [illegible] until Christmas eve.

[illegible] in the Guyan [illegible] relaxation on their part as might have been expected, although, of course, a large Christmas [illegible] shortage [illegible] by operators will be continued, is very apt to cut into the earnings of both operators and miners.

There are still large amount outstanding for coal shipped during the period of the strike, although nearly all the product of the Guyan region is now being shipped to regular customers without diversion. However, it will require a period of several months and even longer, operators estimate, before most of the companies are fully reimbursed for the large amounts it has been necessary to borrow.

While the grand total of cars handled by the C. & O. R. R., during the week ended Dec. 20, was 1554 cars in excess of cars moved during the previous week, the gain was due to the resumption of operators in areas heretofore affected by the strike; losses being sustained in those districts which during the strike had produced coal regularly.

The total number of cars of coal transported during the week ended Dec. 20 was 12,115, or about 605,650 tons of coal, as against 10,561, or 528,050 tons, handled during the previous week, [illegible] 77,[illegible] tons.

Fairmont, W. Va.

Production of northern West Virginia fields halved by about worst car shortage of the year. Relief possible by Jan. 1. Little coal diverted and most of it flowing east again. Miners ready to work, but hampered by short car supply.

The worst car shortage of the year, with one exception (that experienced in August), played havoc with the production of coal in the Fairmont and other northern West Virginia fields during the week ending Dec. 20, cutting production virtually in two. For the first two days of the week, while it was plain that a shortage of empties was impending, nevertheless producers were able to mine and load a normal supply of coal, but by the seventeenth there were not more than half enough cars to meet requirements, even normal requirements, and consequently in many instances it became necessary to suspend operations.

The acute shortage continued throughout the last four days of the week, and on the eighteenth only about 500 cars were available for loading on the Monongah division of the Baltimore & Ohio, similar conditions being prevalent in other parts of northern West Virginia. There was, therefore, a marked difference in the production of coal as compared with loadings during the week ended Dec. 13. Hope was held out by railroad officials that it might be possible to secure the return of enough empties from eastern terminals during Christmas week, to improve the situation somewhat, but it was not thought that much of the equipment in the West would be returned in time to relieve the car shortage before the first of the year.

Those in the first seven priority classes began to receive their coal regularly from northern West Virginia during the early [illegible]

[illegible] been during the strike as indicated by the [illegible]

Norton, W. Va.

Labor and car shortage cause most of decreased output from Virginia fields. Coal now moves freely to destination. Financial distress due to no payment for coal.

[illegible] the pre-Christmas week reached a total of 162,000 tons, with production losses for the same period amounting to 45,000 tons. Of that loss 20,000 tons was attributable to labor shortage, 17,000 tons to car shortage and the balance to other causes. The best part of two days was lost by mines on the Southern Ry., while the supply on the Interstate R. R. [illegible] per cent. of normal. Coal from the Virginia fields is now moving freely to destination and stored coal on Southern Ry. tracks is being rapidly cleared. Operators are beginning to feel more than ever the financial pressure owing to the large amount of coal confiscated, which the railroads as yet have failed to pay for, except to a very limited extent, and banks are hard pushed in their efforts to carry large accounts. On some confiscated coal to Memphis the railroads have not even yet furnished weights to operators.

Salt Lake City, Utah

Bureau of Mines investigating smoke nuisance in Salt Lake City. White panels and panes of glass placed in many sections of the city. Laboratory established. Demonstrations of firing of local coals in stoves conducted.

Investigations looking to the suppression of the smoke nuisance have been conducted for years in many of the big cities using bituminous coal. Tests have recently been made in Salt Lake City, Utah, by the United States Bureau of Mines, which directed smoke investigations, paying especial attention to soot precipitation in various parts of the city. These tests are to furnish evidence as to the injurious effects of soot upon houses and buildings. The exterior walls when defaced with soot attract more attention than do the interior furnishings, but the damage done to the latter may mean considerable loss and annoyance. Efforts made to remedy the smoke nuisance have been attended with considerable success in most of the large cities of the East and the middle West.

The Bureau of Mines smoke investigators in Salt Lake City are using specially constructed wood panels 6x12 feet in dimension and painted white. These panels are being installed in various parts of the city. One-half of each panel is covered to prevent the collection on its surface of atmospheric impurities, while the other half is exposed. By this method, after the lapse of a month or two, officials at the Bureau say that a determination can be made of the extent to which soot and other impurities circulating in the atmosphere are precipitated. It is expected that a decided contrast will be presented between the exposed surface of the panels and the half which has been covered.

The "Salt Lake City News" further states that pieces of transparent glass a foot square are being placed throughout the city, which will be examined after a time to ascertain the extent to which soot excludes light. Skylights and windows gather a surprising amount of soot and dirt, due to the smoke in the atmosphere in Salt Lake City.

A new laboratory [illegible] for the smoke investigations [illegible] completed at the University of Utah, and is equipped with modern apparatus for work of this character. This [illegible] is located in the same building where the other Bureau of Mines activities are conducted. Stoves are being used in the tests here in which local coals are burned and standard methods in the firing of domestic equipment are developing as a result of these tests.

PENNSYLVANIA

Anthracite

Hazleton.—The remodeled breaker of the M. S. Kemmerer Co., at the Sandy Run colliery, north of here, recently began the preparation of coal for market, after being idle seven months. Considerable electrical equipment has been installed to facilitate handling the output.

Lykens.—Fire recently destroyed two buildings of the American Brickette Co., a subsidiary of the Susquehanna Collieries Co., with a loss of $75,000. The buildings have a capacity of 75 tons of coal a day. No coal was lost in the fire, only 15 tons remaining in the building after the days' work.

Hazleton.—The Lehigh Valley Coal Co. is arranging to mine the coal in the Porter swamp tract near Eckley. During recent years the coal from the old Eckley colliery has been sent to the Drifton breaker for preparation. It is stated that this body of coal was not worked in the early days of anthracite mining owing to insufficient top rock to permit of underground development.

Bituminous

Washington.—Shortly the Carnegie Steel Co. will begin construction of a large coal storage basin at Wilson, on the Monongahela River. It will have a capacity of more than 400,000 tons, which will be stored there in case of emergency. The basin will be 800 ft. long and 600 ft. wide and be built of concrete. According to present plans the plant will be completed by next June.

California.—The tipple at the Crescent plant of the Pittsburgh Coal Co., between here and West Brownsville, was completely destroyed by fire on Dec. 18, causing a loss estimated at between $100,000 and $150,000 The blaze, which is believed to have started from a spark from a locomotive on the Monongahela division of the Pennsylvania R. R., burned with such rapidity that a train of loaded coal cars was damaged before it could be moved to safety. A barge containing 2,000 tons of coal, in the Monongahela River, was sunk to prevent its destruction by the flames.. A short time after the fire was discovered the tipple was a mass of ruins. Between 1000 and 1500 men are employed at the plant and they will be thrown out of work.

Reynoldsville.—H. B. Miller, a mining engineer of Pittsburgh, Pa., and G. F. Miller, of Lewisburg, Pa., have taken under option about 835 acres of coal lands in Jefferson County, which are now being drilled. On these tracts, the top bed (Lower Freeport) is 6½ ft. thick, which will be stripped. Some 130 acres, with an average overburden of about 17 ft., will be stripped. To provide transportation, a branch line 1¾ miles in length will have to be built from O'Donnell, which is on the Low Grade division of the Pennsylvania R. R. Pittsburgh parties are interested in the project.

Another stripping proposition is being taken up near Allens Mills, near Reynoldsville, which will be drilled in the near future. About one mile of railroad will have to be built to the property. The coal that will be stripped is the Lower Freeport seam which is about 4 ft. thick. The average overburden of approximately 15 ft. consists principally of shales. Pittsburgh parties are said to be interested in this proposition.

Heilwood.—T. R. Johns, general manager of all Bethlehem Steel Cos. coal properties, makes the following announcement with reference to the Penn Mary Coal Co.:

"This company has been reorganized since acquiring the property of the Elkins Coal & Coke Co., at Morgantown, W. Va., this latter purchase representing an acquisition of 220,000,000 tons of by-product coal. The following appointments have been made: On the Pennsylvania division, with headquarters at Heilwood, Indiana County, Penn., Frank Pardee, recently assistant general manager of the Rochester and Pittsburgh Coal and Iron Co., has been appointed general superintendent, effective Jan. 1, 1920; R. E. Abrams, superintendent; K. M. Quickel, chief engineer. On the West Virginia division, with headquarters at Morgantown, W. Va., Samuel Steinbach, formerly division manager for the Consolidation Coal Co., in the Somerset field, has been appointed general superintendent, effective Dec. 1, 1919; R. E. Pearson, chief engineer. T. R. Johns, general manager, will temporarily reside at Heilwood, Penn., but will establish offices at Bethlehem, Penn., Heilwood, Penn., and Morgantown, W. Va.

WEST VIRGINIA

Fairmont.—Owing to the fact that a fire in the Gypsy mine of the Consolidation Coal Co. is still smouldering, an examination just made by experts of the company having discovered that fact, no attempt will be made to operate the mine for the time being, the headings in which the fire is still burning having been sealed after the inspection.

Macdonald.—Mine officials affiliated with the mines of Fayette County, W. Va., propose to organize early in January what will be known as the Fayette County Mining Institue for the mutual benefit of the officials of that county.The Institute will be ushered into existence on Jan. 5. The place of meeting has not so far been determined, however. On the same date the new Mine Rescue Station, several of which are being established in various parts of the state, will be opened at Macdonald, all preparations having been completed with all equipment installed. The training of mine-rescue crews will be begun at once under the direction of Robert Lilly, director of such work on behalf of the Department of Mines.

Bluefield.—So far as it has been possible to secure such information, 8,933 cars of smokeless fuel were seized by the Railroad Administration, under instructions of the Fuel Administration, during the period of the strike. Information as to the final disposition, either partial or complete, has been furnished as to 5,788 cars of the number above given, no information having been vouchsafed as to the other 3145 cars. Up until Dec. 17, 201 cars out of the 8933 had been paid for. It is believed that outside of the 8933 cars, and including cars shipped since the information covering the 8933 cars was furnished, will show a larger number of cars paid for, the railroads having been disbursing large amount for coal seized and consumed by them. It is said, however, that there are 5000 cars in connection with the movement of which it will be necessary to obtain further information. Efforts will be made to have the 5000 cars referred to traced, so that payment on the tonnage represented may be expedited. The 8993 cars would represent a tonnage of 446,650.

Morgantown.—Attorneys representing West Virginia claimants have filed exceptions to the report of the referee in bankruptcy in connection with the sale of the properties, personal and real, of J. V. Thompson, of Uniontown; taking the position that the state courts of West Virginia alone have jurisdiction to pass upon the sale of properties of the Thompson estate in West Virginia, in cases where lien attachments are held. The West Virginia attorneys take the view that the West Virginia creditors holding lien attachments will receive 100c. on the dollar for their claims unless the sale of the Thompson properties to the Piedmont Coal Co. is confirmed, in which event the total amount of $1,000,000, alloted to West Virginia creditors, as their share of the sale of the properties of J. V. Thompson to the Piedmont Coal Co. for $5,000,000, will fall short about $250,000 of satisfying the West Virginia claims. It is pointed out that the West Virginia courts had jurisdiction over the lien attachments before bankruptcy proceedings were instituted against Thompson.

OHIO

Jackson—Operators in the Jackson field have turned their attention to the planting of commercial orchards both on worked over coal land and also on present operations. It has been found that the soil of Jackson and adjacent counties is adapted to the growing of fruit trees, and as a result thousands of acres have been set out in orchards. This plan should have more to commend it than the mere money return; any scheme which will tend to make mining regions more attractive, should have a direct beneficial effect on the population about the mines.

Columbus—W. D. McKinney, of the Southern Ohio Coal Exchange, estimates a loss of approximately $126,000,000 during the coal strike in the Central Competative area and in other sections where mining ceased. It is believed that the loss in Ohio was about 26,000,000, which was divided as follows: Miners, $11,000,000; operators, $6,500,000 and railroads $10,000,000. In the country at large the loss according to Mr. McKinney, was, railroads $40,000,000; miners $60,000,000 and operators $26,000,000. This does not include the loss caused indirectly to railroads and industrial plants which were closed down because of lack of fuel.

Columbus.—A meeting of a number of Ohio operators, particularly those in the Hocking field, was held at Columbus recently to discuss prices, in so far as to determine what increase must be added to contract figures to cover the increase of 14 per cent. in the miners' scale. After taking all matters into consideration, it was believed that something between 25 and 30 c. should be added to contracts for coal supplied from the so-called thick-vein district of Ohio. In other fields a higher increase will be added because of the higher cost of production in those fields. In the thin-vein district cost is higher, as is the case in the Jackson and Bergholtz fields.

Columbus—Something of a mix-up has occurred over the selection of the place for holding the next general convention of the United Mine Workers of America. Because of the fact that about 2200 delegates attend the convention, only large halls can be used for the meetings. It was felt that the convention should be held about Jan. 5, and at that time the large hall in Indianapolis was taken, and so the international officers turned their attention to Columbus where Memorial Hall, seating 5000 people could be secured. Just as it was practically decided to hold the convention in the Buckeye capital, John Moore, president of the Ohio organization informed the international officers that hotel arrangements for that number of delegates could not be secured in Columbus. So the time and place for holding the meeting is still unsettled.

KENTUCKY

Louisville.—A new state mine inspector will be appointed shortly by Governor Edward Morrow, who took office recently. J. C. Norwood, who has been mine inspector at various times for 30 years, resigned on Friday, Dec. 19, effective Jan. 15, when he will return to the University of Kentucky as head of the Department of Mines and Metallurgy. Politics in Kentucky changed from Democratic to Republican rule in the November elections.

ILLINOIS

Springfield.—Mines in this district are operation 75 per cent. with about 90 per cent. of the men back at work; three-fourths production after an idleness of forty-one days. Mines which normally produce 1000 tons of coal are now producing 750 tons and 2000-ton mines are producing 1500 tons and so on. Mine No. 58 of the Springfield District Mining Co., located at Taylorville, is hoisting the most coal of the company's mines at the present time.

Duquoin.—The Aluminum Ore Co., owning large coal tracts near Tilden, 15 miles east of here, recently closed a deal whereby they became owners of the Southern Traction Co., an uncompleted line extending from East St. Louis to Belleville and beyond that town into the rich coal producing territory in southern Illinois. The right of way of the line runs close to the tract of coal land owned by the Aluminum Ore Co., and it is expected that the line will be immediately rushed to completion and that developments be started on the tract. The Southern Traction Co., was organized some years ago and much had been done toward pushing the line into the coal fields in southern Illinois, when work was abandoned; at the time the Aluminum Ore Co. purchased the property, the rails (which were already in place) were worth much more than their original value. The coal which lies in the tract owned by the Aluminum Ore Co., is of good quality and hopes are now held out that the long felt need of an electric line outlet to St. Louis from the southern Illinois fields is about to take place. This hope is almost guaranteed by the fact that the Aluminum Ore Co., whose plant is near eastern St. Louis, needs the coal for its own use, and this proposed line should provide satisfactory transportation.

INDIANA

Evansville.—Reports from surrounding districts show that five shot firers have been killed recently as a result of premature explosions, two men being killed in one accident, and three in another.

Sullivan.—A disastrous fire has been raging in the Glendora mine, three miles northeast of this place, owned by the Consolidated Indiana Coal Co. A force of miners fought the flames all of one night; the fire started from a shot which was set off after the miners left the shaft late in the afternoon. About 175 men are thrown out of work as a result of the fire.

Evansville.—Auditors of the Drexel banking interests of Philadelphia have visited here and other places where the St. Bernard Mining Co. has offices, preparatory to the visit of Philadelphia capitalists to Earlington, Ky., it was reported in local mining circles. Some of the largest mines of this company are at Earlington. The Drexel interests have been endeavoring to take over the St. Barnard interests, including stores, lands and mineral rights by Jan. 1. St. Bernard stockholders, most of whom live in the east, were said to have asked $2,500,000 for their holdings. Other eastern capitalists are said to be merging independent mines in the Madisonville-Earlington districts.

Terre Haute.—Production of coal in the Indiana fields is rapidly increasing according to reports received at the headquarter in this city from the Indiana Bituminous Coal Operators' Association. The north field, in this vicinity, produced 34,225 tons on one day recently, while the south field, comprising the Greene and Sullivan Counties' mines, produced 24,054 tons, making a total of 58,279 tons. Practically all mines are now at work, with the exception of two in the Clinton field, where the men refused to accept the terms of the agreement which ended the nation-wide strike. The men at the Fayette mine, in Fayette Township, who refused to work on one occasion because their working clothes had not been properly dried, have returned to work.

Indianapolis.—Cary Littlejohn, State Mine Inspector, has completed a report for the Indiana year book covering the state fiscal year ended Sept. 30, 1919. The report Peerless-Elkhorn Coal Co., organized by J. B. Ramey and others with $100,000 capital. Development work is to start at once. Beefhide Creek, in eastern Letcher County, is to be opened by a several-mile branch line of the Baltimore & Ohio's detached branch, which will start from the main line at Myra. Large Northern interests will develop the Joe Bentley coal land tract of several thousand acres.

"The headwaters of the Kentucky River is another new section to be opened in the Elkhorn field—a branch of the Louisville & Nashville, to be extended several miles to the Potter-Wright tract, which is to be developed by the Detroit-Elk Coal Co., a million-dollar Detroit company. S. L. Bastin, Mater, Ky., will be at the head of this work.

"A further extension of the Rockhouse Creek branch road is to be made from Caudill's Branch, where purchases and leases have been made. A few weeks ago the L. & N. completed its branch road to Caudill's Branch, supplying a half dozen coal companies, including the Rockhouse Coal Co., the Midland Coal Co., the Caudill's Branch Coal Co., the Marion Coal Co. and others. Another new extension is the Carr's Fork branch out from Hamden. A recent contract was let for its further extension to Yellow Creek, in Knott County, where the Knott County Coal Corporation is starting the work on an extensive development.

KANSAS

Topeka.—A strip mine with a 14-inch seam of coal is said to be operated near here. It is the first coal produced in this vicinity in many years.

.**Topeka.**—The Kansas supreme court has issued an order directing the receivers to turn back the coal mines to their owners. The order provides that this be done at once, and that the receivers proceed to wind up their affairs as quickly as possible.

Industrial News

Connersville, Ind.—The Burr Mining Co. has increased its capital stock from $30,000 to $200,000.

Charleston, W. Va.—The Hazy Creek Coal Co. is arranging for the early development of about 1100 acres of coal properties.

..**Harlan, Ky.**—The Shawnee Gas Coal Co. has increased its capital from $90,000 to $110,000, for proposed business expansion.

Lexington, Ky.—The [illegible] Coal Co., has [illegible] with a capital of $200,[illegible] by [illegible] B. Perkins, J. H. Bowling and others.

Covington, Ky.—The Elkhorn Junior Coal Co. has increased its capitalization from $2[illegible] to [illegible], to provide for general business expansion.

Cleveland, Ohio.—The Kempton Coal Co., has been chartered with a capital of $25,000 by W. [illegible] John T. Curry, F. G. Johns, L. C. M[illegible] and C. H. [illegible]

Louisville, Ky.—Nothing new has developed in the reports that Philadelphia capitalists would buy the big properties of the St. Bernard Mining Co., in western Kentucky.

Louisville, Ky.—The Centertown Coal Co., of Louisville, has filed amended articles changing its name to the Tucker Coal Co., and decreasing its capital from $250,000 to $200,000.

Charleston, W. Va.—A controlling interest in the Bregle Coal Co. has been secured by Max Kriegle. This company has an operation at Dana, on Campbell's Creek, in the Kanawha County field.

Pineville, Ky.—The Meadow Martin Coal Co., which recently filed notice of a change in its corporate name to the Cain Coal Co., has increased its capital of $25,000, for proposed business expansion.

Cleveland, Ohio.—The Cleveland-Massillon Coal Co., has been chartered with a capital of $51,500 to mine and sell coal. The incorporators are: Isaac F. Orr, W. R. Sheppard, R. B. Graham, H. Anderson and Robb O. Bartholomew.

Cleveland, Ohio—The Cleveland Macksburg Coal Co., has been chartered with a capital of $95,000 to mine and sell coal. The incorporators are: Herman C. Schneider, William Kaiser, Albert Schneider, and Homer J. N. Stafford.

Sprigg, W. Va.—The Crystal Block Coal Co., in Mingo County, is understood to be having plans prepared for the construction of a large new coal tipple at its plant for increased operations. The structure is estimated to cost $50,000.

Boomer, W. Va.—Boomer, Charleston, and Mt. Hope investors have announced plans for development of 12,000 acres of coal land in this district of Fayette County. They will begin with a drift mine and contemplate an annual output of 200,000 tons.

Dora, Ala.—The Ferrier Coal Co., in Walker County, recently incorporated, has perfected its organization, and is arranging plans for the development of coal properties, to have a daily capacity of about 150 tons. M. McCutcheon is president.

Charleston, W. Va.—The King Fuel Co., of Logan, W. Va., has incorporated with a capital stock of $500,000. The incorporators are: A. A. King, Huntington, W. Va.; H. B. Smith, D. W. Hill, T. B. Price and A. B. Hodges, all of Charleston, W. Va.

Bluefield, W. Va.—The Northwest Fuel Co., of Goodwill, has been organized, the company having a capital stock of $25,000, with the following principal stockholders: J. E. Biggs, Mary J. Biggs, Frank C. Biggs, E. E. Hartsook and H. J. Hartsook.

Charleston, W. Va.—Some new equipment is being installed, at the mines of the Babcock Coal and Coke Co. at Clifftop, an increase of production being the purpose of the purchase of such new equipment. The Babcock company is headed by George Bean, of Charleston.

Charleston, W. Va.—The Brewer, Harrison Coal Co., of Elkins, W. Va., has been incorporated to operate mines in Lewis County, W. Va.; capital stock $125,000, incorporators: W. W. Brewer, of Belington, W. Va.; W. H. Young, of Clover Lick, W. Va.; and E. A. Bowers of Elkins, W. Va.

Elkins, W. Va.—The Greenmar Coal Co. has been incorporated with a capital of $50,000 to engage in general coal mining operations in the vicinity of Adrian, Upshur Co., W. Va. J. F. Brown, A. F. Martin and E. A. Bowers, all of Tallmansville, are the incorporators.

Williamson.—Fire completely destroyed the tipple and the machine shop of the Crystal Block Coal and Coke Co. at its No. 2 plant in Mingo County, during the last week of November, the fire being of unknown origin. The tipple was located not far from Spriggs, W. Va.

Mohawk, W. Va.—In connection with proposed improvements at the plant of the Mohawk Coal Co., to facilitate operations, arrangements have been completed for the construction of a new coal tipple and retarding conveyor system. It is planned to rush the work to early completion. L. E. Tierney is president.

Red Rock, W. Va.—The Mineral State Coal Co., Munsey Bldg., Baltimore, Md., is understood to have completed arrangements for the proposed improvements at its plant in the Red Rock district, Upshur County. The work involves the installation of a new generator unit, as well as new coal mining machinery and equipment.

Bluefield, W. Va.—The Hamlin Coal Co., whose plant is located near Dante, Virginia, has changed hands, E. S. Reid, A. S. Adams and others having purchased the holdings of the company for a consideration of $[illegible], it is understood. The purchasers contemplate making extensive improvements and will erect a large number of dwellings for miners.

Louisville, Ky.—A report from Middlesboro, Ky., is to the effect that the Peabody interests of Chicago have closed a deal for [illegible] acres of coal and timber land on Red Bird, Bullskin, Hell For Sartin and Troublesome creeks in Clay and Leslie counties which results in the Peabody interests having a total of 300,000 acres of coal lands in that section.

Morgantown, W. Va.—Mines in Monongalia County will be operated by the C. E. Watson Coal Co., which has just been organized by Morgantown people with a capital of $25,000, the following being active in the organization of the company: Charles E. Watson, Mary Watson, A. M. Nouse, James R. Mooreland and Robert E. Guy, all of Morgantown, W. Va.

Wheeling, W. Va.—Pennsylvania capitalists will organize a $500,000 company for the purpose of developing coal land in this state. They have obtained a charter of incorporation under the name of the Gowen Coal and Coke Co. George H. Leathers, of Oakmont, Penn.; Frank Newington, of Apollo, Pa., and Harry W. Cannon, of Monongahela, Penn., are among the incorporators.

Wheeling, W. Va.—Pennsylvania capitalists will organize a $500,000 company for the purpose of developing coal land in West Virginia. They have obtained a charter of incorporation under the name of the Cowen Coal and Coke Co. George H. Leathers, of Oakmont, Penn.; Frank Newington, of Apollo, Penn.; and Harry W. Cannon of Monongahela, Penn., are among the incorporators.

Princeton, W. Va.—West Virginia and Virginia investors organized a $400,000 company for coal mining near Princeton. They have incorporated as the Monticello Smokeless Coal Co., with a capitalization of $400,000. H. E. De Jarnette, of Princeton; Ernest Merrill, of Beckley, W. Va.; Richard Hancock, of Lynchburg, and John R. Morriss, of Charlottsville, Va., are among the incorporators.

Charleston, W. Va.—Fire which visited the plant of the Royal Block Coal Co., at Morrisvale, in Boone County, on Thursday, Dec. 18, destroyed the power house of the company at a total loss of $20,000, only partly covered by insurance. The fire started in the boiler house of the plant, it is stated, and spread to the power house. It became necessary to suspend operations as a result of the destruction of the power house.

Huntington, W. Va.—Further details of the plans of the Sprigg Coal Co., whose organization has been previously mentioned, have been learned. The plant to be established at Sprigg will cost between $25,000 and $50,000, and the plant will be able to produce coal at the rate of about 100,000 tons a year. The company is now arranging to purchase mine cars, steel rail and later will purchase electrical equipment.

Davy, W. Va.—The Atlantic Smokeless Coal Co., recently organized, is completing arrangements for the installation of mining equipment for the proposed development of about 2100 acres of coal properties in the Davy district, McDowell County, to provide a daily capacity of about 500 tons. It is understood that the cost of machinery and equipment is placed at approximately $150,000. George Wolfe is president, treasurer and manager.

Columbus, Ohio.—The authorized capital of the Bixler Coal Co. has been increased from $75,000 to $200,000. The company operates additional acreage which has been purchased at the company's mines, near Barnesville, in Belmont County, and new equipment will be installed. It is planned to erect a new tipple at a later date. J. E. Jones is general manager, and the offices are in the Columbus Savings and Trust Building, of this place.

Pittsburgh, Penn.—A change in the merchandising policy of the R. D. N[illegible] Co. of this place, has just been announced, effective Jan. 1, 1920. Under the new arrangemen the Westinghouse Electric and Manufacturing salesmen throughout the United States will handle the railway and mine products of the R. D. Nuttal Co. All Nuttal industrial lines and other products, however, will be taken care of through the main Nuttall office, at Pittsburgh, Penn

Pineville, Ky. The Kentucky Collieries Corporation, recently incorporated with a capital of $150,000, has perfected its organization, and is having plans prepared for the development of about 4800 acres of coal lands in the Pineville district of Bell County. Complete mining equipment and machinery will be installed, and it is proposed to have a daily initial capacity of about 400 tons. T. C. Hughes is president and treasurer; R. W. Moon, vice president, and Shepard Sawyer, secretary.

Pittsburgh, Penn. W. E. Moore & Co., engineers of this place, are designing a new carbide plant for the Farmers Standard Carbide Co., at Freydenburg Falls, N. Y. A waterfall of 46 ft. will be developed to a capacity of [illegible] hp. A Moore 3-phase carbide furnace will be installed, together with crushing, screening, can-making and packing machinery, to handle an output of 30 tons per day. W. B. Ragaz, of the Union Carbide Co., has been engaged as works manager.

Charleston, W. Va.—Announcement has just been made of the formation of a new coal concern, known as the Barren Creek Colliery Co., which will develop a tract of land on the Elk River, two miles north of Clendenin, in Kanawha County. Officers for the most part are the same as those of the Hartland Colliery Co. John Hart is president, Robert McCabe, vice president, and Edward Hart, secretary and treasurer. Eight hundred acres of coal land, 397 in fee and the balance in lease have been acquired.

Calgary, Alta. A settlement has been effected between the coal mine operators of Alberta and representatives of the United Mine Workers of America, under which the miners will receive an increase in wages of 14 per cent. An order embodying this arrangement has been issued by W. H. Armstrong, Director of Coal Operations. Members of the "One Big Union" are not included in the agreement and will be debarred from working in the mines of district No. 18, which includes Alberta and eastern British Columbia.

Huntington, W Va.—Thousands of acres of coal and timber land in the mineral and timber regions of West Virginia, Ohio and Pennsylvania are to be developed through the activities of the Tri-State Coal and Timber Land Association. The organization has been chartered here with $600,000 capital. Pennsylvania and West Virginia capital will finance the enterprise. The incorporators are J. K. Oney, A. K. Kessler, L. H. Cammack, Huntington; G. H. Leathers, Harry W. Cannon and Howard H. Pratt, Pittsburgh, Penn.

Bluefield, W. V.—What was formerly the Buckhannon Coal Co. is now the Mayers Coal Corporation, a reorganization having been effected following the purchase of the company by W. R. Crenshaw and others of this city. The capital of the new company has been fixed at [illegible]. The plant and holdings of the company are near Drill Va., on the Clinch Valley division of the Norfolk & Western R. R. It is understood that the reorganized company has secured additional acreage and will increase production to 1,000 tons a day.

Logan, W. Va.—Southern West Virginia coal men and capitalists are interested in the Faulkner Coal Co., which has just been organized with a capital stock of [illegible]. The company has a tract of coal land near Faulkner, in Logan County, which it expects to [illegible] general offices, however, at Huntington. Among those active in the organization of the new concern are W. E. Deegans, Huntington; G. E. Scholl, [illegible], J. M. Turner, Welch; J. H. Taylor, of Pinson Fork, all of West Virginia.

Uniontown, Ky.—The Union County Mining Co., with headquarters at [illegible], has been organized for the development of [illegible] coal property located in Union County. The plans include the installation of complete mining equipment, the construction of a power plant (the machinery to be electrically operated wherever possible) and the construction of one-half mile of railroad. It is proposed to have a daily capacity of about [illegible] tons. D. H. Lang is president;

W. L. Jarvis, vice president; Burton Vance, secretary, and Fred Russ, treasurer. R. F. Peters is manager.

New York, N. Y.—The firm of Willard Sutherland & Co., with headquarters at this place, has incorporated and after Jan. 1, 1920, the name will be Willard, Sutherland & Co., Inc. The officers of the new corporation are to be Le Baron S. Willard, president; John E. Sutherland, vice president; Frank Stocks, treasurer; Henry W. Goddard, secretary. This firm has been actively engaged in the bunkering business for about 15 years, and has offices in New York, Philadelphia, Baltimore, Newport News and Norfolk. The firm is also the American representative at important coal depots at many parts throughout the world.

Sydney, N. S.—President D. H. McDougall, of the Nova Scotia Steel and Coal Co., who has returned from a two-months trip to England and the European continent, in the interests of the company, states that the result of his visit has been highly encouraging. The company has formed valuable connections abroad and arranged for important business in Belgium and elsewhere. The Nova Scotia company purchased for $2,000,000 the Belgian interests in the Acadia Coal Co., giving the company extensive and valuable coal areas in Pictou County and enabling them largely to increase the scale of their operations.

Chicago, Ill.—Fairbanks, Morse & Co., will build a $1,500,000 foundry in Beloit, Wis., which it is stated will be one of the most modern plants of its kind and equal any in size and output. When completed it will be 900 ft. long and 550 ft. wide, and have an ultimate capacity of 350 to 400 tons of gray iron daily. The big foundry will eventually employ 1500 men, and 1500 additional men will be required in other parts of the works to meet the increased production that will result. Fairbanks, Morse & Co. will then employ 7000 men at the whole plant. When the 11-acre foundry is completed, it will not only be the most complete as regards efficient handling of materials, but also in provisions for ideal working conditions.

Valparaiso, Chile.—Efforts made by Japanese to establish themselves in Chile, particularly in the coal and iron fields, are exciting considerable interest. Already they have made much progress in Peru. In Chile also, they are beginning this work and it has been said here that they seek particularly to gain a footing in regions that are strong both from a stragetic and industrial point, as for example Concepcion Bay, where there are many coal mines. According to newspaper reports, Japanese have acquired an option on some of these mines, including the mines of Pilpilco, for which an offer of £180,000 (normally about $875,000) has been made. The Japanese syndicate, it is reported, plans to develop the coal industry at Concepcion and introduce modern machinery.

Williamson, W. Va.—While so far unconfirmed, rumors are to the effect that the Red Jacket Consolidated Coal Co. and the Red Jacket Junior Coal Co. properties in the Williamson field have been sold, though to whom it is not known; the same rumors naming the U. S. Coal and Coke Co., the Solvay Colliery Co. and the Italian Government as possible purchasers. Belief that the U. S. Coal and Coke Co. may be a possible purchaser is based on the fact that that company recently acquired a large acreage from the United Thacker Coal and Coke Co., a part of such coal land purchased being on Mate Creek, adjoining the Red Jacket property. Some time ago it was believed that a sale of the Red Jacket properties was in prospect, as an inventory was at that time made of the plants of the company, but at that particular time the sale fell through. The Red Jacket companies have extensive holdings on Mate Creek as well as in other parts of Mingo County.

St. Louis, Mo.—The American Steam Conveyor Corporation, of Chicago, announces that the Atlas Machinery and Supply Co. is now handling the sales of the American corporation's products in its St. Louis territory. The Atlas company has offices at 1416 Syndicate Trust Bldg., St. Louis, Mo., and is a new sales organization in that vicinity. It is headed by William H. Patton, who recently returned to the United States after two years' service in the army, during which time he was in nine branches of the service, gaining experience of great practical value. Associated with Mr. Patton is his brother, W. R. Patton, who for the past 20 years has traveled the Central West, engaged in the sale of power plant equipment. During the past four years he has represented several large manufacturers as district manager. N. B. Stewart, who has been identified with the power plant machinery business at St. Louis for 25 years, has also associated himself with this company.

Ottawa, Canada.—The Research Council of Canada announces that reports received from the Lignite Utilization Board indicate that a plant for the briquetting of lignite will be in operation near Estevan, Sask, in August next, which will produce 30,000 tons of briquets per year. These briquets will sell for about $9.40 per ton in Winnipeg. It is expected that this may be the beginning of an industry which will in a measure help to solve the fuel problem of the Canadian West. The Council has appointed a Fuel Research Board to undertake the investigation and standardization of the coal of western Canada, the reason for this step being that the Alberta coals are not of equal value. The use of inferior varieties in Winnipeg and other cities east of Alberta, tends to discourage the use of western coal. If the coals were standardized, the better varieties of soft coal might replace the soft coal now imported into Manitoba and Saskatchewan from the United States.

Huntington, W. Va.—Pittsburgh and Huntington business men have joined in organizing the Tri-State Coal and Timber Lands Association with a capitalization of $600,000. The company will maintain offices in the Columbia Building, at Pittsburgh, Penn. and at 821 Fifth Avenue, Huntington. It is not the purpose of the company at this time to attempt operations anywhere but to deal in coal and timber leases, particularly in Logan and Boone County fields, where, since the strike has been ended, there has been an additional demand for coal lands. However, the company has made it plain that it may ultimately attempt to develop some of the properties which it may acquire. Officers of the new concern are: J. C. Oney, president; G. H. Lealters, vice president; L. H. Cammack, secretary and Judge John L. Whitten, treasurer and counsel. Others largely interested in the new concern are: Howard A. Pratt, a Pittsburgh merchant; Harry W. Cannon, of the Allegheny County bar, and Dr. A. K. Kessler, of Huntington.

Victoria, B. C.—It is reported from London, England, that re-organization of the Canadian Collieries, Ltd., operating collieries on Vancouver Island, British Columbia, has been decided upon. As a result, the property will be handed over to the bond-holders; or, rather, the changes contemplated virtually will have such an effect. On Jan. 19 a meeting will be held to authorize the plan. In this connection the London Times observes: "To what extent the company will be able to pay interest on debentures will depend upon the ability to sell the coal it can produce. The company has coal but the difficulty is to sell it in sufficient quantities, but trade on the Pacific no doubt will expend." No statement has been given out by the company's local management, whose headquarters are in Victoria. The Canadian Collieries, Ltd., has extensive holdings on Vancouver Island. It has producing mines at Comox, Extension and South Wellington, and coal rights throughout a large section of what is known as the Esquimalt & Nanaimo Railway belt.

New York, N. Y.—The Central Railroad of New Jersey has had in operation for several months, what is said to be the largest and most up to date coal terminal in New York Harbor, known as Pier 18, Jersey City, N. J. It is located in the Communipaw section of the Jersey City waterfront, west of Ellis Island, northwest of Bedloes Island, northeast of Black Tom Island, and, having a depth of 30 feet of water at mean low tide, it is accessible for large vessels. This terminal, costing in excess of $3,000,000, consists of a reinforced concrete pier 970 ft. in length (on which two McMyler Car Dumpers are now in operation), two thawing houses, a yard layout with a capacity of 1500 cars and a modern power house for furnishing the necessary steam and electric power as well as compressed air for the manipulation of the machinery of the terminal. These facilities, combined with its central location in the harbor, afford many important advantages. The plant can dump 50 cars per hr., giving a daily turn over of 400 cars per 8-hr. working day or an annual capacity of 7,000,000 tons.

New York, N. Y.—It is announced that negotiations have been completed whereby Jenkins Bros., of this place, will in the near future, increase their manufacturing [illegible] by owning and operating a plant in [illegible] port, Conn. This plant will be devoted entirely to the manufacture of the [illegible] valve an engineering product which [illegible] back to 1869 when Nathaniel [illegible] vented and first introduced the [illegible] type of valve. It is expected that [illegible] V. Barrington, who has a wide experience in the manufacture of valves [illegible] vice president of the company [illegible] in charge of the [illegible] [illegible]

Reading, Penn. Announcement has just been made that the Reading Iron Co. has acquired the plant of the E. & G. [illegible] Iron Co., at [illegible], Penn. The acquisition of this important property adds to the already extensive manufacturing equipment of the Reading company, [illegible] furnaces, with a three-high [illegible] mill, a [illegible] three-high skelp mill with [illegible] heating furnaces, and a [illegible] of 7[illegible] nail machines, the latter long known as one of the landmarks of the eastern Pennsylvania iron industry. Through this addition to its [illegible] the Reading Iron Co.'s [illegible] capacity is [illegible] by 2800 tons per month, with a corresponding [illegible] in the [illegible] of [illegible] wrought iron pipe. The purchase of the E. & G. [illegible] Co. represents the second step in [illegible] expansion which the Reading company has made since the present executive management took charge a few months ago. Through the acquisition of the George B. Lessig Co. plant at Pottstown, Penn., last October, the Reading company secured an additional muck bar capacity of 2600 tons per month and incidentally became the largest manufacturer of cut nails in the United States. Through the acquisition of these plants the Reading Iron Co. is enabled to bring its muck bar and skelp capacity up to the capacity of its tube works and thus absolutely to control the quality of the material entering into its wrought iron pipe. The Reading Iron Co. now possesses the imposing total of 136 double puddling furnaces equivalent to 272 single furnaces, or considerably more than double the number owned by the company's largest competitor.

Personals

Hugo L. Siegel, formerly general sales manager for the Ford Roofing Products Co., is now with the Walter A. Zelnicker Supply Co. as assistant to the president.

G. B. Livingood, who for the past two years has been one of the sales engineers of the Traylor Engineering and Manufacturing Co., of Allentown, Penn., has been appointed assistant sales manager of the mining and crushing department of this company.

Percy P. Kuhleman, who for several years was traffic manager for the Rutledge & Taylor Coal Co., Fisher Bldg., Chicago, has resigned to accept a position with the Sterling-Midland Coal Co., of Chicago. Both companies have properties in southern Illinois.

Albert A. Casey has joined the sales engineering staff of Henry P. Thompson, of Cincinnati, Ohio, who is a direct representative of the American Steam Conveyor Corporation, of Chicago. Mr. Casey is a graduate of the Ohio State University and a mechanical engineer.

J. F. White, [illegible] W. Va., has been appointed district mine inspector by W. J. Heatherman, chief of the Department of Mines. Mr. White will have charge of the [illegible] He was formerly connected with the Boone County Coal Corporation, as superintendent at [illegible]

John R. Porter, who for the [illegible] been [illegible] of mines of the [illegible] Co. operating in the New River [illegible] Virginia, has resigned to enter the oil business in the West. Mr. Porter had been in the service of the New River Co. for a number of years, first as mine foreman and later as superintendent.

[illegible] ship.

[illegible] Light & Power Co., of St. Louis, delivered [illegible] time Mr. McAuliffe was manager of the Fuel [illegible]

John W. Meyer, formerly with the Security [illegible] and the Monitor Block Coal Co., of Carterville, Ill., is now superintendent of the mine owned by the Southern Gem Coal Co., of Chicago, which is located at Sesser, Ill. The [illegible] tion and the mine at Sesser has lately been sunk; a daily output of 2000 tons is expected when the mine is running full capacity. Mr. Meyer has been connected with mining in southern Illinois for a number of years.

E. A. Graig, who has been associated with the Westinghouse Air Brake Co. for [illegible] years, [illegible] of the new department beginning operations on Jan. 1. This export department was organized, with headquarters in the Westinghouse Building, Pittsburgh, Penn., in order to provide facilities adequate to handle the increasing export business and to develop the company's foreign trade to a greater extent than has been heretofore possible. This department will be represented in the New York office by W. G. Kaylor and in South America by B. M. Oates.

Henry Devlin will fill the position made vacant by the death of John Newton. Mr. Devlin has long been a service member of the Mines' Inspection Staff, and for years has shared with the late Mr. Newton the responsibilities of the inspection of the Nanaimo district. He has had jurisdiction over the Comox and Extension coal mines. Pending another appointment Mr. Devlin's place is being taken by James Dixon, a member of the Board of Examiners, and who, under the terms of a recent amendment to the Coal Mines Regulation Act, also is an acting inspector.

Alexander Sharp, C. E., read a paper on "Coal and Its By-products" recently at one of a series of winter lectures being held under the auspices of the British Columbia Chamber of Mines. After speaking of the waste involved in the use of coal direct from the mine he observed that the principles of carbonizing coal should be adopted to supply cheap fuel for manufacturing and domestic purposes. Then the provincial iron ores would be smelted with a coke sold at $5 a ton. Then years from now, he asserted, not a scuttleful of raw coal would be consumed in the City of Vancouver, and the foundation would have been laid for a great by-product industry.

Robert Dick, of this city, recently purchased a half interest in the mine near Hurst, south of here, formerly owned by [illegible] Mr. Dick has been identified for a number of years with mining throughout this district. The [illegible]

[illegible] fice and supply house [illegible] buildings were com- [illegible] other [illegible] the direction in which the flames traveled, it was impossible for these to be used.

Obituary

[illegible] Blackwood [illegible]

[illegible] Sr., at Norristown, Penn. He had gone to Philadelphia to consult specialists, but be- [illegible]

Trade Catalogs

Zelnicker's Bulletin No. 275. The Walter A. [illegible]

Motor Operated Brakes for Alternating-Current Service. [illegible] Pp. 4; 8½x11 in.; illustrated. Descrip- [illegible]

Steam and Water Jet Apparatus. The Star Brass Works, Chicago, Ill. Bulletin No. 6. Pp. 10; 7⅛x10½ in.; illustrated. Description of the company's syphons, ejectors, exhausters and vacuum boosters, their application and operation.

Morrow Shaking Screens. The Morrow Manufacturing Co., Wellston, Ohio. Pp. 32; 8½x11 in.; illustrated. Descriptions and illustrations of types of equipment and complete coal mining plants designed and built by this company.

General Applications of Ball Bearings. The Gurney Ball Bearing Co., Jamestown, N. Y. Bulletin [illegible] Pp. 42; [illegible] in.; illustrated. The object of this bulletin is to assist the designer and practical engineer in making applications of ball bearings in his work correctly and successfully. Such applications to various types of machines are shown

Sullivan Utility Forge Hammer, Bulletin No. 72-D. **Sullivan Power-Driven Air Compressors,** Bulletin No. 75-R. **Sullivan Tandem Compound Corliss Air Compressors, Class "W C",** Bulletin No. 75-U. The Sullivan Machinery Co., Chicago, Ill. Respectively pages 16 and 24; 6x9 in.; illustrated. Description of the machines and uses to which they may be put

Coming Meetings

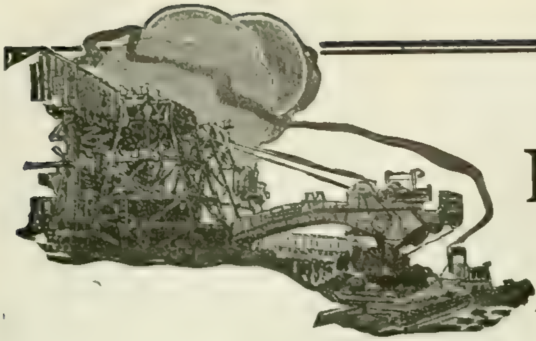
Northern West Virginia Coal Operators' Association [illegible] George T. Bell, Fairmont, W. Va.

National Conference of Business Paper Editors will meet at the Astor Hotel, New York [illegible]

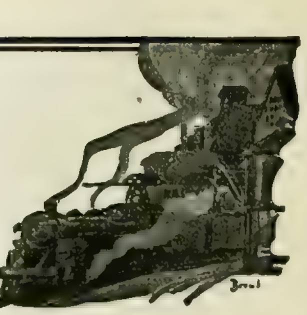
American Institute of Mining and Metallurgical Engineers [illegible] York City.

The Wholesale Coal Trade Association of New York [illegible] New York City.

The Rocky Mountain Coal M[illegible] will hold its [illegible] at the A[illegible]



MARKET DEPARTMENT



Production is curtailed by advent of Christmas holidays—Operation in nonunion fields is up to expectations—Industries hard up for fuel—More fuel oil to be used.

BECAUSE of the Christmas holiday when a large number of foreign-born miners stay away from the mines, sometimes until even after the first of the year, the production for the past week did not show the anticipated growth and even fell away. Although these men were not working, the railroad-car shortage was still a factor in the situation making it impossible in many sections to supply the heavy demand for coal. While the situation has been improved slightly, it will be some time before the coal industry can again be normal.

Many mines have been working short-handed, or with equipment which is not to their liking and not even enough of that. The operating conditions in the nonunion fields have continued to remain favorable, but there too, because of the demand arising from the union mines, the car supply has also tightened. However, the Railroad Administration has taken energetic measures to meet the car congestion and lack of empties.

Without any certain assurance that the car supply will be adequately improved, it is difficult to state just what will happen in the next two or three weeks toward bringing the production up to closer conformity with demand. Although the producers are doing the best they can to take care of both contract and spot customers, there is such a scarcity of fuel in some sections of the country that the enforcement of fuel restrictions is under consideration and operators are refusing new business.

Although the possible withdrawal of the government price limits still seems within the range of reasonable hope there exists an impression that nothing can be gained by agitation for perhaps a month or two. The Coal Commission opened its important sessions on Dec. 29, and the industry will eagerly await the result of its deliberations. Will it decide that coal must be mined without profit because the product is valuable or will it decide that because coal is of great value those mining it are more justified, even than others, in expecting that a fair profit shall be allowed them?

Industries, in general, are hard pressed for fuel, especially the iron industry. In the Connellsville region, several furnace interests have been scouring both the beehive and the byproduct coke markets but with no avail. Manufacturing plants, in particular have been seeking to replenish their rapidly diminishing stocks.

Anthracite maintains its record for steadiness, while the domestic sizes continue in good demand. The retail trade has been reaping the benefit of the fine midwinter demand. Zero weather and what has been, in some sections, a rather heavy fall of snow have created a large demand for domestic sizes from the small consumer, who is unable to store coal.

Restrictions on the use of coal have been rapidly removed, the Director-General of Railroads having issued an order that an overseas movement of coal equal to 50 per cent of the quantity imported in October may now be shipped from the ports of Baltimore and Newport News.

The long strike will not be without its unfortunate consequences. The Brooklyn Edison Co. has contracted to receive 3,235,000 bbls. of oil a year for three years from the Sinclair Oil Co. This Brooklyn concern uses 350,000 tons of coal a year. If it is to be removed from the ranks of the coal users the change will be a severe blow to the coal industry of New York and highly suggestive of a drift to oil which will be harmful to the coal industry and, we fear, detrimental to the new oil users also.

WEEKLY COAL PRODUCTION

The total output (including lignite and coal coke) for the week ended Dec. 20, according to the reports of the Geological Survey, is estimated at 10,431,000 net tons. The average during the four weeks immediately preceding the strike, which may be regarded as normal, was 12,059,000 tons.

Compared with the week before, the output showed an increase of 4,631,000 tons, or 80 per cent. The recovery is the more significant when it is realized that in a single week the bituminous industry climbed from the depression of the strike period to a level of production higher than that of any week from mid-January to mid-August of the past year. Indeed, unless later returns cause a downward revision of the estimates, the curve of 1919 production has again crossed that of 1918.

The output of anthracite during the same week is estimated at 1,727,000 net tons. This was a decrease of 355,000 tons when compared with the week before and lower by 112,000 tons, or 6.1 per cent. than that of the corresponding week, last year.

A shortage of coke cars in the Connellsville region held the output of beehive coke during the week of Dec. 20 to a figure not greatly in excess of the preceding week when the curtailment orders were in force. The total production is stimated at 386,000 tons, an increase of 25,000 tons over the week before, but still 72,000 tons less than during the week of Dec. 6, just before the order curtailing output and restoring maximum prices went into effect.

The maintenance of the maximum prices on coke has weakened the strong premium upon converting coal into coke at the mine which existed during the period from Oct. 31 to Dec. 8, when the war-time prices had been restored for coal, but not for coke. The fact, together with the recurrence of competition from by-product ovens as the latter receive supplies of coal, is believed to be in part responsible for the present level of production.

Atlantic Seaboard

BOSTON

Only light shipments being made. Operators apparently indifferent about taking on new business. No pressure to get coal forward. Poor car-supply affects volume for tidewater. Hampton Roads deliveries below normal. Anthracite steam sizes being shipped on purchase of ten days ago, but no more sales. Domestic sizes shipped somewhat more freely.

Bituminous—Fortunately for New England there is no great anxiety over steam coal, else the present light volume both all-rail and by water would be disquieting. Most of the 4000 cars that were being held by the railroads have now been turned over to the original consignees, and while many operators are trying to replace coal that was confiscated the tonnage they have thus far been able to ship is relatively small. There has been a good deal of confusion over regulations covering distribution and even today there are different versions by different authorities of the rules governing shipments to tide-water. The result has been a general slowing up of deliveries all along the line and the trade is so diffident that there is practically no comment on the bituminous situation.

Even with permits in hand, operators are apparently in no rush to make shipments. Lack of cars and the attitude of labor are factors that keep production down and under the conditions it is not surprising that it is difficult to get assurances of shipment much before the first of the year. During the holidays output it expected to be very light and yet there is no snap to the business. There are some who predict a lively market in January, when present stocks are still further depleted, but at this writing there is no advance sign of any such demand. The whole industry is depressed by the limits imposed by the Government and until some settlement is reached that will make unnecessary the present fixed price schedule the market will doubtless continue in an unhealthy state. On contracts operators are free to add the wage increase, on spot sales they are not so privileged. It is easy to see therefore that wherever possible the bulk of the coal will move on contracts.

New England certainly betrays no uneasiness over continuing supplies either by water or rail. Rumors of a possible railroad strike early in January have put some consumers on a quiet canvass to get prompt coal but in general there is no pressure here from the steam trade. The recent "scare", so far as this territory was concerned, was largely artificial. At no time was there any genuine distress that could not have been met promptly by allowing coal to move to destination without interference.

The tonnage for the various tidewater piers has been considerably affected by poor car-supply. This has been notably true on the Baltimore & Ohio R. R. and we are beginning to see the result of withholding cars during the whole month of November. At New York and Philadelphia the volume of coal standing is by no means large, but yet there seems an ample supply for current requirements. Shippers are anxiously awaiting decision from Washington on the subject of export tonnage, a large amount of contract business being held up on this account.

Receipts of Pocahontas and New River at Hampton Roads are also below normal. Shipping plans were considerably deranged during the bituminous suspension and only gradually are the agencies able to straighten out their distribution. New England requirements from Norfolk and Newport News have been smaller the current year than for several seasons past, and there is no reason to suppose there will any lack either of boats or coal to fill contracts here that are still in effect.

Present prices on bituminous at wholesale range are as follows:

	Clearfield	Cambria and Somersets
F.o.b. Mines, per net ton	$2.95	$2.95
F.o.b. Phila., per gross ton	5.158	5.158
F.o b. New York, per gro ton	5.613	5.613
Alongside Boston, per gro ton	7.72	7.72

The legal price on Pocahontas and New River figures $4 692 per gross ton f.o b. Hampton Roads, or $6.752 alongside Boston.

Anthracite—A considerable tonnage of steam sizes was disposed of in New England when the bituminous strike scare was at its height, but now the demand has utterly relaxed. Barley was sold freely at $1.75 @ $2.00 per gross ton f.o.b. mines, and even a tonnage of pea was readily absorbed at circular prices.

Egg, store and chestnut are now coming forward in better volume. The cities, for the most part, are now well supplied. There remain, however, a number of smaller localities where there is much difficulty in getting forward even a limited supply. The outlook is that most of these requirements will be met within the next three or four weeks and that New England will then be over the hump.

NEW YORK

Domestic sizes continue to be short. Demand is good. Steam coal situation slow with stocks accumulating. Bituminous situation serious. Supplies short and restrictions as to shipments may be restored unless coal moves easier. Operators refusing new orders.

Anthracite—The flurry in the situation during the low temperatures of a couple of weeks back has disappeared and the trade has again resolved itself into one of supply and demand. Dealers are in the market for all the domestic coals they can secure but they are not urging deliveries. Many of their customers have eaten deeply into their bins and are now ready to replenish their stocks.

The trade is in a good position to take care of any urgent demand that may be made upon it, provided it is not too long-lived, and provided there would not be any interrpution in deliveries.

Production was considerably curtailed during the week because of the holiday and the slowness of the men returning to work, many of the mines either operating with a reduced force the balance of the week or suspending operations entirely. The same situation is expected to prevail this week because of New Year's Day.

It is not expected that mining will become normal again until next week, and by the time the [illegible] and then reaches its destination the [illegible] on hand will be badly depleted.

There is a steady but not urgent demand for [illegible] and New England. Salesmen [illegible]; from the [illegible] trade report that [illegible] have good stocks on hand and that their customers have been well provided for.

Stove and chestnut are in heaviest demand with egg and pea close seconds. There are plenty of orders ahead to take all the coal available and wholesale dealers report receiving many inquiries as to when deliveries may be expected. The peddler trade in New York City is now at its height and chestnut is the size most called for.

The demand for the smaller sizes is slow and there is considerable disappointment. Buckwheat is the shortest of the steam coals and the only one of the three sizes that is not causing any anxiety to the shippers. The company circular prevails in most instances but inferior grades are said to have been quoted at slightly lower figures. Rice and barley are in over supply and some producers are stocking them.

Dumpings at the local docks during the 7 days ended Dec. 26 were 4114 cars a decrease of 976 cars from the previous corresponding period.

Retail dealers in this city have been asked to increase the pay of their drivers, yardmen and engineers, etc., the increases ranging from 65 per cent. to 100 per cent. and which will mean, if granted, an increase of at least 25c per ton in the cost of coal. The committee of dealers to whom the work of bringing about a settlement of the controversy has been delegated has not yet made its report, but it is expected that there will be an increase in pay granted.

Following is the company schedule of prices for domestic and steam sizes at mine and this tidewater:—

	Mines	F.O.B. Tidewater
Broken	$5.95	$7.80
Egg	6.35	8.20
Stove	6.60	8.45
Chestnut	6.70	8.55
Pea	5.30	7.05
Buckwheat	3.40	5.15
Rice	2.75	4.50
Boiler	2.50	4.25
Barley	2.25	4.00

Individual domestic coals are generally quoted at 75c per ton higher than the above prices. Quotations for domestic coals at the upper parts are generally 5c higher on account of the difference in freight rates.

Bituminous—The local situation is not encouraging. There is a shortage of coal at the local piers and unless conditions improve quickly it may be necessary to reinstate the rules of the Fuel Administration, insofar as they relate to shipments to consumers who have reserve stocks of coal.

Since the discontinuance of the rules a few weeks ago deliveries have been freely made with the result that some consumers having reserve stocks, have received almost daily deliveries, while public service corporations have been able to secure barely enough to see them through. With some of these corporations the situation has been serious and it is feared that unless movement of coal quickens other consumers may have to use less coal.

With production reduced and a car supply which gives some mines barely 50 per cent. of their needs, receipts have been at low ebb and considerable of this has been taken by the railroads for their own use.

The mine workers have not yet returned to the mines in as full force as was expected but larger numbers are looked for after the holiday season. Some operators are not complaining at this time because of the poor car supply pointing out that with their curtailed working force they would not be able to load any additional cars to what they now receive.

The supply at the various harbor docks is low and there is much complaining of slow loading. The [illegible] is [illegible] with empty bottoms while extra charges continue.

Shippers are sold far ahead and some are refusing new orders even at the full Government price.

With the removal of restrictions governing the bunkering of coastwise vessels, that end of the industry showed an immediate improvement.

The dumpings at the local railroad piers during the 7 days ended Dec. 26 amounted to 3017 cars an increase of 971 cars over the previous 7 days. The number of cars on the tracks at the piers on Dec. 26 was 3156 as compared with [illegible] on Dec. 19.

PHILADELPHIA

Anthracite activity maintained by wintry weather. Retail ordering only fair. Predicted heavy current consumption will create lively demand later. Dealers ask for more stove and nut. Egg quiet, and pea inclined to heaviness. Change of sizes again discussed. Trade in good shape financially. Fair call for steam coals. Bituminous demand on best grades. Fair tonnage arriving. Car shortage handicaps.

Anthracite—With snow-covered ground and moderately cold weather prevailing the retail trade is moving along at a fair rate. Certainly there is no snap to the trade, as the big supplies that most consumers have are sufficient to carry them along for weeks. However, with a continuance of the present weather there is bound to come a time about February when there will be a strong desire on the part of the public to replenish supplies. With the month of December closing it must be said that taken altogether it has been a real winter month and the consumption of coal has been heavy and it is because of diminishing coal [illegible] in the cellars that the [illegible] are showing any interest at all in ordering. [illegible] that the few orders that are being placed are not urgent, as shown when the consumer still maintains his insistence for stove and nut.

There have only been moderate receipts recently, as the holidays have cut down production very considerable and this is not expected to pick up until January is well under way, and even then should the weather be severe at the mines it will be sure to be considerably curtailed. It is quite likely that the slowing up of production for a few days was the only thing that saved the pea coal situation. The dealers are growing more inclined than ever to hold orders on this size, as many of them fear they will not be able to move all they have on hand. Of course they are making good deliveries of this size, as the weather is entirely favorable to the movement of pea. Egg coal is also none too easy to move, as the urgent demand for this size has disappeared and the current call is only moderate. At this time all dealers display an entire willingness to take all the stove and nut that is mined, and many of them insist that they are not being treated fairly. The claim is repeatedly made that these sizes are bringing heavy premiums in New England and this market suffers accordingly. Despite this claim the operators state that they are alloting their coal in equal proportions to all territories. This may possibly be the case with the companies, but with the independents it is more than likely true that they are still taking advantage of more favorable prices in other districts.

With the demand of the trade almost entirely centered up in the two sizes—stove and nut—the old question of the operators shipping only two sizes has again cropped up. It will be recalled that an attempt in this direction was made just prior to the war. At that time there was some sort of agreement among the producers to mix stove and nut, making a size for the range, and then combine nut and pea for domestic heating plants. Due to a lack of concert the scheme promptly fell flat. It is really believed that if the plan were to be adopted the retailers would be strongly in favor of it. For one thing it will require just one-half the bin room and obviates much of the trouble of the people insisting on certain sizes. Certain it is if pea continues to fall in public favor it will be up to the operators to take some drastic step to move their product. The dealers point out that the one great trouble with pea now is the heavy admixture of buckwheat, and there is no doubt that the other sizes have been dilated in similar manner. It is a sure thing that if the retailers are first consulted on the question of two sizes they will insist that a standard of preparation be agreed upon and lived up to rigidly. At any rate the proposition has not as yet passed beyond the gossip stage but there is a general tendency to agree that next spring is really the opportune time for the change if there is to be one.

There has not been the least tendency among the chronic price cutters in the retail trade to shade the price of pea coal. Usually this was the first size to feel the effects of such practices. Evidently the price-cutters have come to realize that there is nothing to be gained by attempting to move this size without a fair margin of profit. In this connection it is doubtful if the dealers as a whole are now able to get a gross margin of profit of $2 50, as established originally by the Fuel Administration. This margin has been considerably cut into since that time by greatly increased wages and the rising costs of material, equipment, etc. However the business continues to be operated on as near a cash basis as possible as the public still has the money to pay for what it wants. For this reason every [illegible] is in the best of financial condition [illegible] year closing has been one of prosperity to most of them.

The steam coals are not at all active. The demand for buckwheat is about reaching its height, as it always does in the winter season and for that reason the current production, including washeries, is well taken up, and coal of this size is moving from storage in good volume and long before spring comes will probably be cleaned up. But the same is far from being true regarding the other steam sizes. The best that can be said for rice is that the demand is good, but nothing to boast of. Much the same can be said of barley. [illegible] a lot of these sizes the consumption is greater than ever, but the production has also been greatly increased during the [illegible] year by the [illegible] the consumption has not [illegible]. It is thought, nevertheless, that both rice and barley will be amply taken care of in the next year or so as [illegible] being introduced which [illegible] very satisfactorily and new installations are being made all the time.

Bituminous—[illegible] is no particular strength to the steam trade. There is of course a strong demand for coals of the better grades, but very little of this coal is reaching the spot market. Inasmuch as the wage increase can be added to the contract price it naturally follows that the bulk of the production is being thus applied. There is [illegible] little fuel being offered at spot, but [illegible] are grades that ordinarily are not [illegible] although the shippers are [illegible] asking the top price of $2.95 per [illegible], the same as for the best grades which they are allowed to do under Government regulations.

There is only a fair volume of coal arriving in this territory, as the Railroad Administration has directed that good shipments continued to be made to the territories which suffered most during the shortage. In addition the mines are badly handicapped by the car supply, which has lately grown acute. In the Pennsylvania districts most mines report but a [illegible] per cent supply, with some as low as 10 per cent. The wagon mines producing superior grades are able at this time to find a limited market, despite the fact that they are charging 50c a ton in excess of the $2.95 figure, which they are allowed.

BALTIMORE

Holiday period reached with the coal trade still in a state of uncertainty on many vital points. No satisfaction to be had on government payments on seized coal despite protests. Loading fell off due to poor car supply. Anthracite demand light here in face of cold weather.

Bituminous—Christmas has come and gone and New Years is at hand with the coal trade here in a state of uncertainty as to many vital issues. The throwing of responsibility from one government agency to another, not alone in the matter of wage and price fixing possibilities, but in regard to payment for coal actually seized by the government and other important points as to distribution, etc., keeps the coal men guessing. In the matter of pay the trade here, which is affected to the tune of hundreds of thousands of tons seized from fuel at the piers or running there before Oct. 31, can get no one in Washington to assume responsibility for a ground of settlement. Shippers who made contracts with mines are being pushed for settlement and serious financial entanglements are becoming manifest as the result of the dallying policy at Washington.

One government agency talks of settlement at the price this coal was sold for to export interests, another talks of settling at the [illegible] contract price, and another even talks of settlement at the government price, although the coal was shipped and sold before the government price was declared effective. The whole thing is a fine mess. Several prominent coal men have recently spent [illegible] in Washington [illegible] to [illegible] the tangle but [illegible] from western Maryland and [illegible] Virginia complaints have [illegible] car [illegible] [illegible] that the miners were [illegible] the production [illegible] taken care of. All this [illegible] car supply [illegible] [illegible] normal but this has [illegible] now running only from 21 [illegible] per day on the Connellsville, Western Maryland, Monogah and Cumberland and Pennsylvania R. R. While the Pennsylvania has announced that Canton is again open for shipments of coal on coastwise, bay and harbor account, and Curtis Bay of the Baltimore & Ohio R. R. is receiving shipments under permits, the total of loaded cars at both piers at this writing is not much above 200. Local industries are being kept going by careful distribution of the line coal received here, but there is no oversupply anywhere. Demand fortunately is not over heavy.

Anthracite—While real cold weather has developed here and a fairly heavy snow has fallen, the local demand for anthracite is now but moderate. There was a brief spurt in orders, but this let up when it was found that some dealers were short of certain popular sizes. Now everybody has spent for Christmas and it will probably be mid-January before there is any real rush to get fuel to supplement part-season supplies laid in last summer and fall. Unless the winter is unusually hard the expected shipments between now and Jan. 15 should take care of the situation fairly well, although yard reserves here are admittedly very short.

Lake Markets

PITTSBURGH

Car supplies probably about normal, but much under requirements. Steel mills not fully supplied.

There are conflicting claims as to the extent of the coal car shortage in the Pittsburgh district. A fair guess is that on the whole car supplies are about equal to the normal average, whereby they fall far short of the number desired, for coal operators are desirous of getting out maximum tonnages and large consumers are all anxious to build up stocks again. They fear two things, a serious railroad blockade on account of winter trade interprets the action of Dec. 22, whereby the operators called off the meeting scheduled to be held in Cleveland to consider the arbitration plan, as indicating that the operators accept the plan, as the miners have done, but it is thought a slip may occur nevertheless when the award is made.

Practically all the steel mills that closed early in December on account of lack of coal are in operation again, but many are not fully supplied and cannot operate as many departments as desired. Coal shortage is even referred to in the prognostications of some interests as likely to be more or less of a factor during the entire first quarter of 1920 in limiting steel production.

The coal market is quiet, there being little free coal through contract shipments absorbing the great bulk of the output, but there is enough turnover to make a market, the market being of course at the full Government limit: Slack, $2.10, mine-run, $2.35; screened, $2.60, per net ton at mine, Pittsburgh district, with a 15c brokerage allowance in some instances.

CLEVELAND

The local fuel situation is better in every way. Slightly more bituminous than is needed for minimum requirement is being received. Anthracite and Pocahontas shipments also are increased. The market is strong, ready to boom when government price restrictions are taken off.

Bituminous—With the great majority of southern and eastern Ohio mines again in operation, steam coal is moving into Cleveland in tonnages approximating normal. Estimates of receipts this week range from 70 to 85 per cent. of normal. Not only have all industries been supplied, but some of the larger ones getting fuel on contract are beginning to refuse it. For more than a week now the local fuel committee has not been functioning, and the only evidence of anything abnormal in the market is the government price schedule. Freeing of the market will not cause large increases, operators say, because pre-strike prices were not more than 15 per cent. higher than the government maximums.

So far the threatened car shortage has not made itself felt, and shipments are limited only by the labor supply. Steam coal users [illegible] a desire to contract and with the recent shortage in mind, it is expected some of the largest stockpiles in local history will [illegible] as production permits. There is little demand for bituminous from [illegible] construction. With other [illegible] the market for coke has almost disappeared. The $15 price has gone, and coke can be had in any quantity for $11, the lower figure of the strike-period spread of $11 @ $15.

Anthracite and Pocahontas—Anthracite is more plentiful now than Pocahontas but the demand is even lighter than in the usual holiday time dullness. Prices remain unchanged, but dealers believe a slight advance will be made about the middle of January. Dealers plan to make a large effort to get domestic consumers to stock in the spring and expect to stimulate demand greatly, with the fresh memory of the recent strike. Receipt of both of these grades are about 65 per cent. of the pre-strike average, but is sufficient to meet all requirements.

Prices of coal per net ton delivered in Cleveland, with bituminous prices largely nominal, are:

Anthracite—Egg, $11.75 @ 11.90; Chestnut, 12.00 @ 12.20; Grate, 11.75 @ 11.90; and stove, 11.90 @ 12.10.

Pocahontas—Forked, $10.00 @ 10.50; shoveled lump, 10.00; and mine-run, 7.40.

Domestic bituminous—West Virginia splint, $7.50; No. 8 Pittsburgh, 7.20; Massillon lump 8.25 @ 8.50; Cannel lump, 10.50; and Coshocton lump, 7.50.

Steam coal—No. 6 slack, $5.25 @ 5.50; No. 8 slack, 5.10 @ 5.50; Youghiogheny slack, 5.25 @ 5.50; No. 8 ¾ lump, 6.00 @ 6.25; No. 6 mine run, 5.25 @ 5.50; and No. 8 mine run, 5.75 @ 5.90.

BUFFALO

Considerable increase of bituminous output. Feeling not confident. Jobbers would have preferred no settlement. Anthracite plentiful.

Bituminous—The situation improves slowly to all appearance, for the supply of coal is enough to meet the moderate demand, but the shippers do not like the looks of things, for they fear that the government is going to play into the hands of the miners and that the operators will submit rather than to try the strike all over again. As it looks now it might have been better to let the strike settle itself, which it might have done before now, if the miners had not believed that the national authorities would finally give them a big concession.

The demand for bituminous is still light, but as the supply is not very certain it is well that it is so. The consumers laid in a big stock, only those with small storage capacity. The shippers did well by these and nobody in this territory suffered, but the supply was getting somewhat low when coal began to come in again. Jobbers report a wide difference as to amounts received. Some of them, who stand pretty close to the operators, are getting a good supply, while others are not doing much. They all find that most consumers are pretty well supplied. Canada seems to be well supplied. The fact that it is impossible to sell either breeze coke or steam sizes of anthracite here or in Canada shows that the consumer is not badly off.

All that the trade here can do is to wait for developments. Some of the mine owners are able to report a good output. The miners came back readily enough, though they are not in good working trim yet, after their long lay-off. One or two mines kept active all the time and have turned out a nice revenue to the owners. It is all a mixed mess, in some respects worse than it was with the men out, but if the proceedings promise an early settlement of the difficulties it would be easy to stand it all, but the promise is none too good.

Anthracite—The situation is easy. The shipping companies had promised that as soon as the lakes were closed they would continue the shipments and turn the coal into the city retail trestles and they did so, as they had done last winter. The result was that from the first there was all the coal that the retailers could well handle and the consumers were rapidly supplied. They found that there was coal enough and they did not buy more than they needed. It is not expected that anything short of a strike will change the situation.

It is reported by jobbers who are handling independent anthracite that they are also feeling the increase of supply and are not able to get the big premiums on their output that they have been getting. It may easily happen that they will soon have to sell down close to circular prices. Quite an amount of smallpox has developed at various points in Canada, and a quarantine has been set up here, nobody being allowed to cross the border this way without being vaccinated, which many people look upon as a big hardship. Then the money exchange is so high against Canada that it adds much to the cost of everything. Sometimes as much as 12 cents on a dollar is charged.

Coke The demand for any grade of coke from the best to [illegible] some of the jobbers report a [illegible] sales of coke for furnace [illegible] prices, $9 for 72-hour Connellsville [illegible] $8 for 48-hour furnace [illegible] and $7.75 for domestic size [illegible] market for breeze coke [illegible] used to handle quite an [illegible] that it can hardly be [illegible] iron furnaces in this district [illegible] normally, apparently experiencing no difficulty from strikes.

COLUMBUS

With a short car supply and indifference on the part of some of the miners, there is a still further reduction in the output in all Ohio mining regions. Demand for all grades is good. There is no marked scarcity in any grade. Some coal is reaching the market from West Virginia and Kentucky.

The reduced car supply is now worrying operators and shippers in Ohio territory. With thousands of Ohio cars in the West and Northwest and with little prospects of return before a month, the car supply in Ohio districts amounts to about [illegible] per cent of normal. In some sections the supply of equipments even lower than that figure. Railroad officials hold out no hope for immediate improvement and consequently production will be in a reduced basis for some time. This state of affairs in the face of a strong demand for all grades is causing considerable apprehension in the minds of coal men. With severe winter weather in prospect, it is feared that a fuel scarcity may result

Production in the Hocking Valley district during the past week has been about 40 per cent. This is caused not only by lack of cars but also because of the disposition of some miners to wait until a final settlement of the wage scale is effected before returning to work. This is most apparent at the smaller mines. In some instances smaller mines have not resumed operations at all and others are operated with a small working force. In eastern Ohio the car supply is about 50 per cent. and production is about 35 to 40 per cent. Pomeroy Bend has about 50 per cent. production while Cambridge and Crooksville report about 40 per cent. output.

The domestic trade is firm in every regard. Demand from dealers is strong and all ask for immediate shipment. Retail stocks are depleted and few have any reserves to speak of. In a few instances dealers had 25 to 40 cars of coal come in when the fuel regulations were lifted, but those were exceptional cases. Consumers have placed orders for larger deliveries and many are in the market for their remaining winter's supply of fuel. Retail prices are still unsteady, depending on the price paid by the dealer. A tendency to standardize these prices is noted now. Hocking lump retails prices $6@$6.50, while mine-run is about 25@50 cents less. Pocahontas lump is quite scarce and sells around $8.50 Some Pocahontas mine run is found West Virginia splints retail in the neighborhood of $7.50 for lump and $7 for mine run.

The steam trade is also strong with the possible exception of screening where there is a slight slackening. Steam plants are in the market for reserve stocks as they used up a large part of surplus during the suspension. Rubber plants are good purchasers and the same is true of iron and steel concerns. Public institutions and public service concerns are buying actively. General manufacturing is also in the market. Railroads are not taking a large tonnage at the present time

CINCINNATI

Coal receipts in the local market last week were curtailed because of the Christmas holiday. There was little or no change over the previous week, the car shortage still remaining the prime factor for hindering production.

An acute car shortage throughout all the coal-producing regions of West Virginia during the last half of this week largely counterbalanced the gains made in the production by the resumption of operations on a normal scale in the organized fields of West Virginia. Production following the strike settlement reached its pinnacle about the middle of last week in West Virginia. From that time on the dwindling car supply cut down the output from day to day. Local coal men expected the car shortage, but it [illegible] Chesa[illegible] by the [illegible]

[illegible] dealers.

[illegible] with outside conditions. The trade is not suffering from the lack of coal, although it cannot be said to be entirely satisfied with the tonnage on hand.

Jobbers have had a strenuous time filling the orders placed in the summer and fall months. These orders have been pretty well cleaned off the books and comparatively few new orders are being received. Reports show that the receipts of bituminous coal here for the last week were far from normal owing to a majority of the miners not re[illegible] mas. Operators are of the opinion that as soon as the railroads remedy the car shortage production will be brought to normal, as a majority of the mines in both West Virginia and Kentucky are back to work

DETROIT

With shipments of bituminous still falling short of the movement before the strike, free coal is not plentiful.

Bituminous Various causes appear to be interfering with the restoration of bituminous shipments in the volume that was arriving in Detroit before the recent strike. Coal is coming from the reopened mines, but in smaller quantity than before. Jobbers say this is in part due to insufficient supply of mine labor, owing to miners in some distrits having entered other lines of industry, and in part, also, to the inability of the mines to get sufficient car supply to handle normal shipments.

Some of the mines that were shipping heavily during the strike period are reported to be sending out less coal now either because of the inadequate car supply or because the mine workers feel the time is opportune for taking a rest to celebrate the holiday period.

The consumers of steam coal who have contracts find their position is advantageous as a considerable part of the coal now moving is to apply on these obligations. The operators, however, are giving notice that prices will be a little higher than at first arranged because they are availing themselves of the contract privilege of making adjustments in selling price to meet the higher scale of wages now in effect at the mines. This means an advance of 25 or 30c. a ton in cost of the coal to the buyer.

With the supply of free coal very much curtailed, buyers who have been satisfied to pick up coal as they could, without contracts, are finding it less easy to meet their requirements, though they still have the privilege of buying at the prices established by the Fuel Administration.

Anthracite—Jobbers say that a week or so of extremely low temperatures would probably bring such an active demand for anthracite from domestic consumers that retail dealers would be unable to supply their customers. Stocks on hand are of small size, while shipments are irregular with delivery uncertain. The improvement that was expected to materialize following the close of the lake navigation is not yet apparent

Lake Trade Failing to force a passage through ice in the Straits of Mackinac, the steamer B. F. Berry, bound from Buffalo to Milwaukee with 10,000 tons of hard coal, has been placed in winter quarters at St. [illegible] her cargo

TORONTO

Market quiet. Bituminous supplies exhausted. Dealers awaiting shipments. Government prices not yet fixed. Plenty of anthracite on hand

The market is quiet as domestic needs [illegible]

Retail--

[illegible]

BIRMINGHAM

Demand for steam coal good but not [illegible]. Domestic grades scarce, the supply [illegible] short of requirements for the better grades.. Output of coal considerably reduced during the holidays. Car supply ample to move all coal mined

The demand for steam coal, though not [illegible] to absorb all the coal available above contract requirements at this time, as the mines are [illegible] diverted to other courses during government distribution of fuel. Until such delayed shipments are caught up with, the [illegible] tracts will necessarily be restricted. Operators are very cautions in taking on new business of any great volume in the way of contracts until conditions become more settled. There is no surplus coal of the better grades available, but some tonnage of Carbon Hill and other medium and lower grades can be had.

Domestic grades continue to be scarce. No retail yards have any considerable stock, but the retail demand at this time is spasmodic, being governed by the changing weather conditions, and the receipts, while light, have about equalled the outgo so far

The Alabama field produced 32[illegible] tons during the week ending Dec. 20, as per figures compiled for the Geological Survey, closely approximating the output of Oct. 25, 1919, of 334,000 tons, which was the record production since the relinquishment of Government control last January. Production for the present week was crippled considerably by the shortage of labor during the holidays. Car supply continues sufficient to meet all requirements.

LOUISVILLE

Holiday layoffs and car shortage holding back production. Demand for all grades good. Continued mild weather making supplies go further. No serious shortages being reported.

Operators claim that holiday layoffs are further decreasing production throughout the fields, while car shortage is having its effect, as many mines loaded up with empties last week had trouble in securing supplies this week. Shipments as a whole have been very fair up to the present time. However, miners in many districts have not returned to work in any great numbers, or have walked out again over closed shop arguments.

Operators realize the need for collective bargaining and accord it, but will not deal with a union, and it is merely with the men as to whether or not they will work. Real facts of the case probably are that there are many small mines that cannot operate profitably today on Government prices, and therefore are down and making no effort to resume. The wagon mines have entirely been lost as a result of higher wages and reduced sales values, with the result that many of the smaller mines are not turning a weel.

The retail demand for coal is fair, only there is not being any special activity shown by domestic consumers in efforts to secure fuel. Retailers are getting fairly good deliveries, and report that deliveries are moving fairly well, but at that there isn't much snap to the present demand.

Louisville retailers, as a whole, report that profits on the year will run much below normal, due to the fact that summer stocking was done on a very low margin of profit, and winter business has not been sufficient to keep the retailers busy. Jobbers report very little business, as they could not secure coal from producers, who are dealing direct with industrial buyers and retailers.

River shipments to both the Cincinnati and Louisville markets were heavier during October and November, due largely to the strike situation. In October, Louisville received 4823 tons by water, as against 4530 tons in 1918; and in November, 4112 tons as compared with 569 tons last year. Cincinnati has been averaging nicely all year, her lowest river tonnage being 11,613 tons in January, with 197,563 tons in September. However, in July, 1918, Cincinnati received 791,532 tons by river in one month, and hasn't gone beyond the 100,000-ton limit but once this year, whereas she shipped in 116,851 tons in May; 190,647 tons in June and 781,532 tons in July, 1918. However, her shipments this year have been much steadier than those of last season. Louisville in 1918 had 40,357 tons in July, whereas her best showing this year was 17,046 tons in June. There has been good river stages all year, and coal has been received every month, but tonnage is lacking.

Coke

CONNELLSVILLE

Car supplies very poor. Many blast furnaces short of coke.

Coke car supplies in the Connellsville region continue to be very scant, and production is little if any above the reduced rate of the one week in which there was Government limitation of output. Coal car supplies have been fairly plentiful. All the coke output appears to be going against regular contracts, leaving nothing to be offered in the open market, while there is a heavy inquiry for both small and large lots of furnace, with a moderate run of inquiry for foundry coke. One consumer has canvassed the trade, both the beehive producers and the by-product operations, for 10,000 tons of prompt furnace coke and has secured nothing. Nearly all the furnaces interests that regularly use Connellsville coke would take on more or less if available at the Government limit. All the furnaces that have contracts for coke are hoping that Government price control will be continued indefinitely, as they fear removal of the restriction would result in some of the coke that is due on contract being sold at fancy prices for prompt shipment. The market remains quotable at Government limits, $6 for furnace and $7 for foundry, per net ton at ovens.

Middle West

MID-WEST REVIEW

The coal market in the Middlewest is still far from settled. The same spirit of uncertainty and doubt which prevailed immediately before and during the strike is still with us. This, to a very large extent, is entirely due to the fact that all of the old powers of the Fuel Administration are now invested with the U. S. Railroad Administration, headed, of course, by Walker D. Hines.

The operators and jobbers of Illinois and Indiana coal have not forgotten how, earlier in the season, Mr. Hines' organization did everything they could to weaken and batter down a coal market which was, at that time, quite weak enough. It is not exaggeration to say that the coal trade is not looking to Mr. Hines for any favors.

Before the strike practically all the producers and jobbers of good coal had on their books enough business to run them for some time say anywhere from six to ten weeks, perhaps further. This being the case, as soon as the strike was temporarily settled and the men back at work the operators began filling all of their old orders at the old prices. They were entitled to do this under a ruling of the Fuel Administration dated Nov. 13. In addition to shipping coal at the old prices a number of operators have added from 24c. to 26c per ton extra on to the pre-strike prices. In other words, if a man bought a car of good southern Illinois prepared coal at $3.25 at mines, he now pays $3.50 or $3.51 for the same thing. This is strictly within the rights of the operator, as all of their contracts carry a clause providing for additional payment should the cost of mining be increased. Beginning in the middle of last September the coal market started to strengthen and advance slowly but surely. The summer months in this territory were particularly noteworthy because there was practically no demand for coal. The public was not interested and did not want to buy. As a result buying was very largely concentrated from after Sept. 15 to Nov. 1, the date of the strike. As a result the average operator had more orders on his books than he could comfortably take care of.

Naturally he does not take kindly toward entering orders for shipment at Government prices, these prices approximately are $1.00 per ton lower than the orders which he has on file. Of course some of the larger and better known operators are taking care of their established trade whether or not they had orders placed prior to Nov. 1. The situation which has been brought upon us is going to work an undeniable hardship on a number of retail dealers and factories, because they cannot pay more than the Government price for the coal, and the operators have so much higher priced business already on their books that they cannot see their way clear to accept further obligations at a lower price.

The car situation has been only fair since the ending of the strike, and indications are that it will not improve very materially as the season advances. Coal operators read with a sigh of relief that a definite date at last has been set for the return of the railroads to private ownership. The service rendered by the railroads, while under the supervision of the Railroad Administration has proved anything but satisfactory to the operators. The labor situation still remains doubtful. In a great many cases the men returned to work, and are doing their best to make up for lost time, but in other cases the miners are showing a spirit of unrest and dissatisfaction, which at a later date may develop into serious trouble. Uncertainty is the keynote of the whole situation in the middlewest.

CHICAGO

Taken all in all the coal situation is fairly satisfactory. Very few factories now are liable to close down on account of no coal. Practically every householder is fairly well supplied.

Chicago is now back to normal, as all restrictions brought about by the coal strike have been lifted. Coal from different producing fields in Illinois and Indiana is arriving in the city in liberal quantities and dealers who have been dangerously out of fuel now have an opportunty to renew their stocks. It cannot be said that there is anything like enough coal today, but there is enough to keep the wolf from the door for some time.

Anthracite coal continues to arrive in fairly satisfactory quantities, and some eastern coal is coming in. We understand that the Railroad Administration has a big tonnage of diverted eastern coal on hand and is now undergoing some embarrassment as to the disposition of this diverted tonnage.

Bituminous Coal

Government prices for bituminous coal are as follows.

Illinois

Southern Illinois—
Franklin, Saline and Williamson Counties, etc.

	f. o b. Per Ton	Chicago Rate to
Prepared sizes	$2.55	$1.32
Mine Run	2.35	1.55
Screenings	2.05	1.55

In some cases, mines with extra facilities for preparing coal very carefully, are allowed to add 10c. per ton for special preparation.

Central Illinois—		
Springfield District		
Prepared sizes	$2.55	1.32
Mine Run	2.35	1.32
Screenings	2.05	1.32
Northern Illinois—		
Prepared sizes	$3.25	$1.24
Mine Run	3.00	1.24
Screenings	2.75	1.24

Indiana

	f. o. b. Per Ton	Chicago Rate to
Clinton Fourth Vein District—		
Prepared sizes	$2.55	$1.27
Mine Run	2.35	1.27
Screenings	2.05	1.27
Brazil Block—		
Prepared sizes	$3.60	$1.27
Mine Run	3.30	1.27
Screenings	2.05	1.27
Knox County, Fifth Vein District—		
Prepared sizes	$2.55	$1.37
Mine Run	2.35	1.37
Screenings	2.05	1.37

West Virginia

New River and Pocahontas—		
Prepared sizes	$2.60	$2.60
Mine Run	2.35	2.60
Splint—		
Prepared sizes	$2.75 to $3.00	$2.60

MILWAUKEE

Following are the current prices of coal per ton at Milwaukee. An extra charge of 75c. per ton is made on coal carried into bins, and an additional charge of 25c. is added on all orders of less than one ton:

Anthracite

Chestnut	$12.70
Stove	12.60
Egg	12.40
Pea	11.20
Buckwheat	9.75

Bituminous

West Virginia, splint screened	8.00
Hi-Heat	8.00
Hocking, screened	7.75
Pittsburgh, screened	7.75
Pocahontas mine run	8.75
Pocahontas, screened	11.00
Cheerful Chunks	9.50
Smithing	8.75
Cannel	12.00

Steam Coal

Youghiogheny, screened	7.00
Youghiogheny, pile run	6.75
Youghiogheny, screenings	5.75
Pittsburgh, screened	6.75
Pittsburgh, pile run	6.50
Pittsburgh, screenings	5.50
Hocking, screened	6.75
Hocking, pile run	6.50
Hocking, screenings	5.50
West Virginia, splint screened	7.00
West Virginia, pile run	7.00
West Virginia, screenings	5.75
Kentucky, screened	7.75
Kentucky, pile run	7.50
Kentucky, screenings	5.75
Pocahontas, mine run	7.75
Pocahontas, screened	11.00
Pocahontas, screenings	6.75
Smithing	7.75
Kanawha Gas	sold up

Bunker Coal for Steamers and Tugs

Pittsburgh, lump	6.25
Pittsburgh, pile run	6 00
Youghiogheny, lump	6.50
Youghiogheny, pile run	6 25

ST. LOUIS

Conditions almost normal in St. Louis. Good demand for everything. Mines working steady with plenty of equipment. No high grade coal. Country conditions still bad.

The local situation is in fine shape, everything considered. The weather thus far has been ideal. It has been just cold enough to justify an even demand for fuel.

There has been a good tonnage of Mt. Olive and Standard coming in regularly, the mines working steady, having plenty of equipment, although most of it is eastern equipment, principally hoppers, which the trade in the west is unaccustomed to using and in many places these hoppers cannot be unloaded.

There is practically no Franklin County coal coming in at the present time and very little from Carterville. The dealers must pay $3.50@3.60 for this coal when the Government contends that the price should be $2.55@2.65. The dealers in St. Louis and vicinity are protesting to Washington and have asked the United States Attorney General to take some action against the Franklin County Operators' Association to compel them to ship on the unfilled orders at the price prevailing at time of shipment.

There is not anthracite coming in and practically no smokeless coal.

The Government price prevails on Standard and Mt. Olive coals, being $2.55@2.70 for the domestic sizes, $2.35@2.50 for mine run, and $2.05@2.20 for screenings.

The retail prices for coal are, f. o b. sidewalk, Carterville $6.20, Mt. Olive $5.70 and Standard $5.45.

COAL AGE

Volume 17 New York, January 8, 1920 Number 2

Let the Old Year Die

By R. Dawson Hall

THE NEW YEAR is the time to clear the books, to forget the past and take a bright, fresh view of things. Too many of us carry over glum looks and bitter memories into the New Year as part of our stock in trade. They will surely never pay either wages or dividends. Like bad debts, the sooner we write them off the better.

Let us, therefore, dispose of our mental junk and stale stock and start the New Year afresh. There is a selling price for cheeriness and optimism; for the brain that says "Do it," not "It can't be done;" and for the hand that does things and does not hesitate.

The best of good stock to lay in for the New Year is a confidence that there will be difficulties, and that it is a pleasure, not a misfortune, to meet them. There is all the difference between the child who crys over its problems and the manly little fellow who says, "That's some problem, but I'll bet I can solve it." After all, disappointments, difficuties, misfortune and worries change their complexions when we term them problems and view them as being both inevitable and easily solvable.

"Breasting the waves" and "facing the storm" are very different similes from "struggling against innumerable billows," and the difference is all in the point of view. The optimist is a man who can't see difficulties; the pessimist is he who sees them and whines at them or is afraid of them. The really sane man is he who sees and despises them, confident that the right attitude and the right action will meet and overthrow them.

After all, difficulty is inherent in accomplishment; censure and blame are the daily bread of the man in control of affairs; discontent and disloyalty are not new difficulties. Every man who aspires to leadership and to success must meet and face them. If he is the right man, he will take such difficulties for granted. He will forget the past and have a keen relish for the battle of the present, with an unwavering reliance on the future.

In the coming year there can be no better advice than the now somewhat hackneyed, "Turn the dark cloud inside out and smile, smile, smile." Difficulties are not the incidentals of business; they are business itself. No industry can ever be conducted without them. The only sane way is to look at their overcoming as the purpose of business, the very aim of industry. Then you will meet them with a cheerful, and not a troubled, resistance.

Most of the discontent of today and the recrimination arise from the fact that we cannot put an equal heroism into the smaller affairs of peace. A big loss, a big trouble steadies and straightens us, but a disturbance in the established order that is merely an annoyance finds our unguarded spots. In 1920 let us get back to the Olympian temper of 1918, when we had a contempt for little matters and a full assurance that we were on the way to large accomplishments.

There is in us all a sense of finality and fatality in dealing with inanimate bodies, and all the shortcomings of such things never trouble us as much as the ineptitudes of human kind. If we could only be as patient about the wrongfulness of human nature as we are about the inflictions caused by material things, there would be far less irritation and spleen in business life.

A not very wise French king who combined clock making and statecraft wisely remarked that if he could not make his clocks keep time he could not expect to make his people keep straight. He had a keen sense that human nature rebels more readily against a human foible than against a physical phenomenon. But mere protest and denuniciation will not help. What is needed is constructive thought and circumventive action unhampered by worry.

Possibilities of the Geophone in Locating Mine Fire Areas*

Many of the Inventions Brought About as a Direct Result of the War are Assuming Important Places in the Arts of Peace. Among These Is the Geophone, a Sensitive Mechanism Developed by French Sappers, and Now Used to Advantage in Locating Mine Fires

By L. D. Tracy† and Allan Leighton‡

ONE of the greatest dangers to which the coal mining industry is subjected is the occurrence of fires on the inside of mines. Often not only property, but life itself, is endangered and at such times a rapid location of the limits of the fire area is imperative, if no fatalities are to ensue.

In the past, the only means of definitely ascertaining this area has been by an exploration of the supposed danger zone by men trained in the use of oxygen breathing apparatus which enables them to withstand the deadly gases formed by the combustion of the coal. In mines generating a quantity of explosive gas, commonly known as methane or "fire damp", this is an exceedingly dangerous undertaking. Moreover, the intense heat from the burning coal often prevents a near approach to the fire. If some means could be devised by which the location of a fire area could be traced on the surface, it would be of inestimable value in mine recovery work.

During the late war quite a simple instrument, known as the geophone, was developed by French scientists for the purpose of detecting the sapping and mining operations of the Germans. Since the War, the sensitiveness of the original model has been improved by American engineers.

This instrument, briefly, is somewhat similar to a physician's stethoscope, and has been amply described in the technical press. The principal advantage over other listening devices lies in the absence of any electric battery, together with its extreme sensitiveness to sound waves.

Since the cessation of hostilities, the engineers connected with the United States Bureau of Mines have been carrying on a system of investigations to determine the practicability of the geophone for use in determining the location of any men who might be entombed in a mine through a fall of rock, or by deadly gases produced in an explosion. During the course of these investigations, there has been developed the possibility of definitely locating, with the geophone, a fire area in a burning coal mine, and thus enable the planning of a systematic method for extinguishing the fire.

Several tests have been made at mines in which fires have been known to have been burning, the object of which was to ascertain the nature of the sounds caused by the fire and which were transmitted through the intervening strata to the geophone; also to identify, if possible, these sounds with the phenomena causing them. In all cases so far tested, these sounds at the different mine fires have been identical.

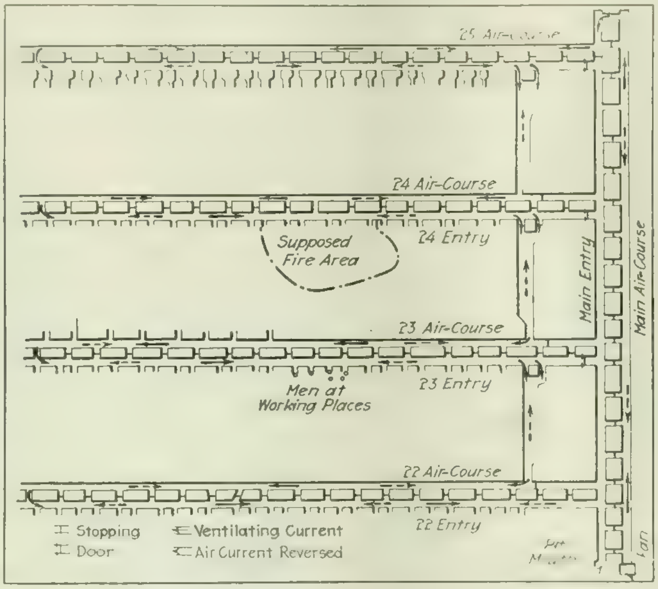


FIG. 1. DIAGRAM OF A MINE VENTILATING SYSTEM

In connection with the practical use of the geophone to the accurate location of mine fires, one of the most important adjuncts is a blueprint or other plan, which accurately shows the more important surface landmarks such as houses, township roads, steam and electric roads, etc. in their proper relation to the underground workings. This may readily be seen from the fact, that no matter how definite a surface location of the fire area may be made by the geophone, it is useless unless the corresponding location underground can be identified.

It is also advisable to have a general knowledge of the surface elevations because any attempt to use the geophone beyond certain limits in the thickness of the cover would prove futile. These limits have not yet been ascertained, but it is hoped that they will be defined by further experimentation.

It is possible that in case the cover is too heavy, a location may be determined by using the geophone in the interior of the mine. The main obstacle to inside listening lies in the fact that the smoke and gas from the fire would probably prevent a near enough approach to the burning area to make an accurate location.

Fig. No. 1 illustrates in a general way the ventilating system of a typical coal mine. By observing the direction of the arrows it will be noticed that the fan is a blowing fan, which is forcing the air into the mine. On entries Nos. 23, 24, 25, are shown doors which permit passage up and down the entry, yet at the same time directing the air to the proper channels. In case a particular section of a mine is on fire, and men are known to be behind the burning area, it is essential to learn its exact location in order that the air current can be so regulated that if possible, the combustion gases may be diverted from them by a change in the air current; or if no lives are in danger, it is equally essential to obtain a knowledge of the fire area in order to control the ventilation so that a determination may be made as to where stoppings may be built which will effectively prevent any fresh air from reaching the flames and thereby furnish oxygen for further combustion. If this can be accomplished, and the fire area sealed off, in time the fire will be smothered for lack of air necessary to support combustion.

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*Published by permission of the Director of the U. S. Bureau of Mines.

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As an illustration, suppose a fire should originate on No. 24 entry in Fig. 1. Then by following the direction of the arrows it can readily be seen that the gases of combustion would be carried with the air and reach the men working on No. 23 entry. If for any reason, such as a fall of slate or roof, these men could not reach fresh air they would probably be overcome. If by the use of a geophone, the fire area could be quickly located and platted on a map, as shown by the broken line, the officials of the mine could readily see that by reversing the air currents, fresh air would be supplied to the men, enabling them to exist until assistance could be given them. The reversed air currents are indicated by the dotted arrows in Fig. 1, and from an inspection of the location of the fire area on the plan, the best means for sealing on the danger zone could be worked out. This is a simple case, but serves to illustrate the possibilities of the utility of the geophone in mine fires. It is in the determination of this fire area that, in the future, it is hoped the geophone will play an important part.

In three instances in which the geophone has been tested for this purpose, the results have been highly encouraging. One of these occurred at a mine in the Pittsburgh district. At this mine, the coal comes quite near to the surface in the vicinity of the power plant, and it is supposed that some years ago the heat from the boiler ashes penetrated the few feet of surface and in time ignited the coal pillars underneath. As this section of the mine had been pretty thoroughly worked out and abandoned, little attention had been paid to the fire. Recently, however, indications pointed to the fact that the fire was approaching dangerously near to one of the entries, used for the ingress and egress of the miners going to and from their working places, in the main part of the mine, and preparations were made to safeguard this entry. In this instance, while the exact site of the fire was not known, yet the knowledge of its general location was such that the work of protecting the entry could be effectively carried on. Briefly this consisted of sinking boreholes from the surface, so located that a thick mixture of clay and water could easily flow by gravity through them to the workings below and form a mud barrier between the fire and the threatened entry.

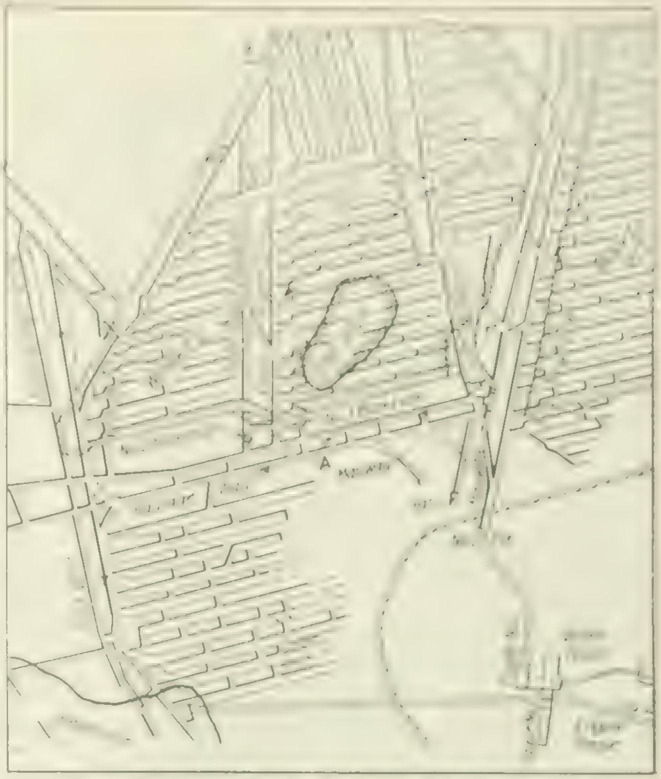

FIG 2. FIRE AREA AS SHOWN BY GEOPHONE

During the course of the hydraulic filling operations, engineers of the Bureau of Mines decided to make a test of the geophone in order to ascertain if it would be possible to utilize this instrument in locating fire areas, and if so, to work out a practical method of operation for future use.

The geophone was placed on the surface directly over the supposed fire area. Sounds could be plainly heard through the thirty or forty feet of surface, which were described as if currents of air were being drawn through the crevices in the rocks. This might be caused by the air currents induced by the combustion of the coal. In addition, sounds of breaking and falling rock were noted, caused no doubt by the disintegration of the coal and slate under the influence of the heat. The geophone was then moved to another position where the same sounds were heard. This procedure was continued until the sounds were too faint to

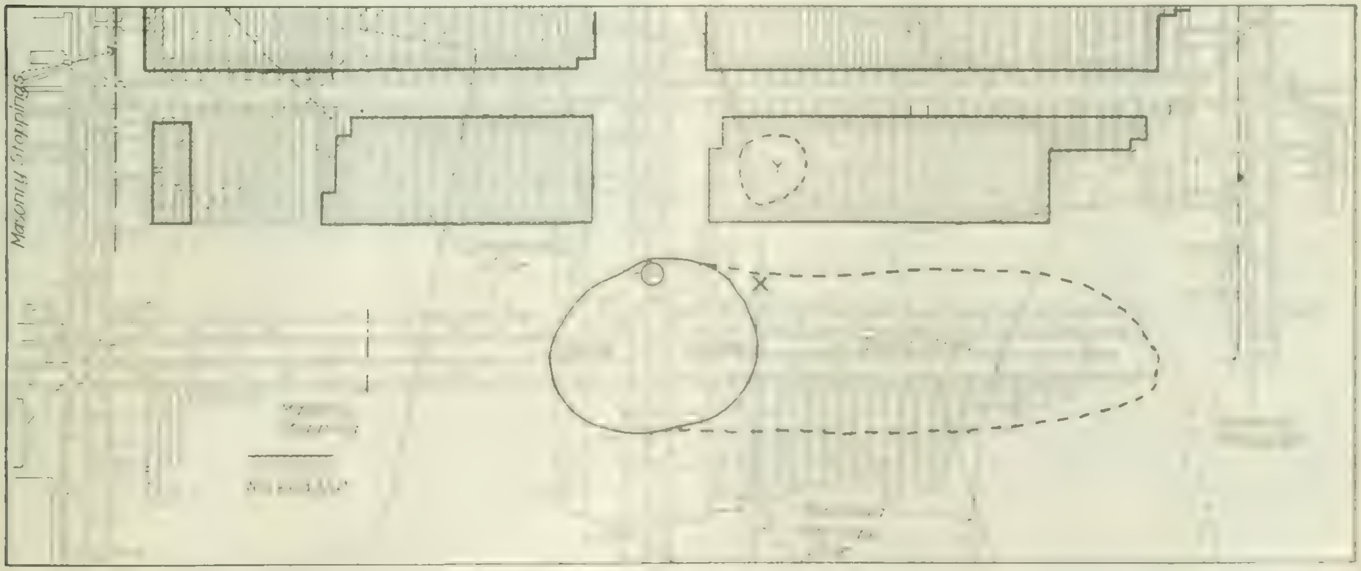

FIG. 3. DETERMINATION OF A FIRE AREA IN A MINE HAVING 300 FEET OF COVERING

be noticed. In this manner the line defining what might be called the "sound area" was determined. Fig. 2 indicates the location of this area. The geophone was then taken into the mine and tests were made by placing the apparatus in niches out in the side of the entry marked "manway", and it was found that sounds similar to those noted on the surface could be heard only at one point in the entry, marked "A". It will be seen that this point is on that part of the rib nearest to the "fire area" as located on the surface.

This location by the geophone has been substantiated by an exploring party wearing breathing apparatus, which penetrated the affected area. The fire could then be easily seen in No. 1 room stump on First Right entry.

FIRES HAVE CHARACTERISTIC SOUND

A second test was made with the geophone at a mine fire which occurred at a mine in the Connellsville coking region. In this instance a fire had been burning on the surface which caved thus allowing the fire access to the mine, and the fire area was more or less definitely known. However, this was rather an advantage as it served to determine more precisely the nature of the sounds characteristic of a mine fire. It was found that these sounds resembled quite closely those which had been observed at the fire in the mine in the Pittsburgh district.

Fig. 3 represents a test made at a mine having a cover of about three hundred feet. After the fire had started, men equipped with breathing apparatus approached near enough to locate approximately the fire area, marked the "origin of the fire." It will also be noted that a railroad track on the surface runs a short distance from this point. The distance from the point of curve of the track (marked "X") to the origin of the fire was scaled on the mine map.

Accompanied by the engineer of the coal company owning the mine, the Bureau's representatives walked down the track to the point of curve above mentioned and measured out therefrom the same distance which had previously been scaled. Placing the geophone on the ground at this point, heavy dull sounds were audible, as if pieces of rock or slate (weighing perhaps fifty pounds or more) had been dropped eight or ten feet. These sounds were traced throughout an area indicated on Fig. 3 by a heavy irregular line. The surface contained in the areas represented by the irregular broken lines was tested, but no distinct sounds were noticed. It will be seen, from an inspection of Fig. 3, that the "sound area" is directly over the origin of the fire as determined by the geophone.

It may be of interest in this connection to note that a gas pipe line was located by the geophone, and the throbbings of a pump some two miles distant were distinctly recognized.

THICKNESS OF OVERBURDEN TO BE DETERMINED

There now remains the problem of determining the maximum thickness of strata, through which the sounds produced by a mine fire may be definitely heard. Experiments have shown that such sounds as those produced by the blow of a sledge on the rib of a mine may be distinguished through 300 ft. of surface, and under favorable conditions, 500 feet. Also the same sounds will be transmitted horizontally through coal seams from 600 to 1500 feet in the ordinary workings of a coal mine. From these data it is hoped that a mine fire area may be traced through a fairly heavy surface.

If this can be successfully accomplished, it would seem as if the use of the geophone would be of great assistance in the fighting of mine fires and in the rescue of entombed men.

Only One Coal Stripping in British Columbia

This illustration shows the stripping at No. 3 mine of the Corbin Coal and Coke Co., East Kootenay District, British Columbia. It is the one instance of a strip-pit coal mine in that province though opportunities for stripping coal are doubtless numerous. The mine is locally known as the "Big Showing." The coal is stripped and loaded into dump cars, and another shovel is used to load the coal into the railroad cars.

Four separate benches are being cut and this prevents interference in the stripping and loading. The railroad in the open cut is in the form of a horse shoe, the steam shovel being on the inside and the track on the outside. Where the coal is hard, the material is blasted.

ILLUSTRATING THE OPEN CUT AT THE No. 3 MINE OF THE CORBIN COAL AND COKE COMPANY IN BRITISH COLUMBIA

A standard-gauge railroad eight miles long runs with switchbacks up to this mine. The grade is steep despite the switchbacks, for the elevation of the stripping is 6,200 ft. above sea level. Much snow is encountered, and in winter the snowplow is busy.

The pocket of coal now being worked is 280 ft. thick. It is estimated to contain 1,000,000 tons of coal. The ratio of coal exposed to surface removed is 2 to 1 instead of 1 to 10 as is the case in some Kansas strippings.

Ignition Tests of Explosives

By [illegible]*

[illegible]

> *Because several disastrous explosions of black powder and other explosives have been attributed to ignition from open flame lamps or to the container completing an electric circuit, the series of experiments here described was undertaken in order to determine the possibility of an explosive being ignited by either of these means. The results secured substantiate the belief that powder or other explosive could be thus detonated.*

BECAUSE OF SEVERAL accidental ignitions of black blasting powder in kegs, which were attributed to open flame lamps or to contact with electrical circuits, the following tests were carried out to determine the possibility of ignition by the above causes.

The first test was that of ignition by open flame lamps. This was conducted in order to determine the possibility of igniting black blasting powder contained within kegs by the naked flame of a lamp such as a mine might carry. The explosives upon which the test was made were:—1. Unglazed FFF black blasting powder pressed in rollers and packed in two 12½-lb. sausage-like double thickness paper cartridges, which were in turn packed in long 25-lb. sheet-iron kegs with slip-on tops. The powder and container were those employed in the anthracite fields of Pennsylvania. The samples used were denominated as B—2549, A, B, etc.

The next sample was FFF black blasting powder (glazed) packed in bulk 25-lb. to the keg. The kegs were of the common or short type as used in most sections of the country and the samples tested were denominated B—2571, A, B, etc. The serial numbers are shown in Tables 1 and 2.

Each keg was denominated by letter. Thus, B—2549—A and B—2549—B indicates two separate kegs of the same powder.

For purposes of comparison, two permissible explosives and one sample of dynamite were also ignited. These were: One—A permissible explosive of class 1-a. This was denominated D—2538—A. Two—A permissible explosive of class 4. This was denominated B—2403—A. Three—A sample of 40 per cent. straight nitroglycerin dynamite. This was denominated B—2335. All of these high explosives were packed in 1¼ × 8-in. cartridges. The keg numbers, as indicated above, are used throughout this article.

The apparatus employed was as follows: For the lamp ignition test a keg rack was constructed. To a 12-in. base board two side boards 18-in. long were nailed. The lamps were placed on a board or "carriage" which slid between guides on the base board so that the flange could be pulled under the keg from a safe distance. Two sheet-iron wind shields were placed, one on the base board and one on the carriage so that when the lamp was in place it was only slightly affected by the gentle breeze which prevailed during some of the tests. The keg was placed across the two side boards and secured with wedges in a position with its axis normal to the axis of the rack. The flame was applied to the center (lengthwise) of the keg.

In the comparative tests with permissibles and dynamite the same rack was employed. It was, however, lined with sheet iron so as to prevent too rapid combustion of the wood. Four cartridges of the explosive were wired around a ⅜-in. copper rod which was placed across the rack as in the case of the keg.

In all cases, the distance from the top of this wick to the powder keg or explosive was ¾-in.

Two kinds of lamps were [illegible] [illegible]. One—An open flame [illegible] lamp. This lamp was [illegible] in. high from the base to the top of the spout, the effective inside diameter of the spout used being [illegible] in. Two—An open flame [illegible] lamp. This lamp was [illegible] in. high from the base to the top of the spout, while the effective inside diameter of the spout was [illegible] in. In both lamps the spout was double-walled.

The lamps were wicked with medium wicking and when "sunshine" was used, the brass rod was placed in the center of the wick. In all cases, the lamp was burned at least 30 min. at some time prior to the test. Fig. 1 shows the keg rack, types of kegs, lamps and typical results of explosion.

In conducting these tests, the procedure was as follows: The explosive was first placed in the rack. All kegs of B—2549 were placed so that a part of the cartridge was in contact with the keg at the point heated. Where two or more trials were made on the same keg, an unscorched part of the cartridge was placed in contact with the keg where heat was applied in each instance. The lamp was then lighted. The observers retired to a safe distance and the lamp was pulled under the keg and the time noted. The results were also noted as they transpired.

The results of the tests are shown in tabular form in Table 1.

There was a marked difference between the concussion arising from the explosion of B—2571 and B—2549, in all cases that of the former being more violent. This was to be expected as the powder was in bulk, so that the flame could travel more rapidly. The confinement was also greater, as in B—2549, the cover was held on only for friction.

The products of combustion of the black powder attacked paint vigorously even at a distance of 40 ft. This was probably due to the hot sodium carbonate.

Photographs were made at the moment of ignition of several tests. These are shown in Figs. 2, 3, and 4. All of the experiments here described were carried out at the Bureau of Mines Explosive Experiment Station at Bruceton, Penn. They were conducted by A. B. Coates and myself.

The second series of experiments were conducted upon the possibility of ignition of explosives by electric energy, the object being to determine the possibility of firing a keg of black blasting powder when the walls of the keg complete an electric circuit. The tests in this series of experiments were carried out on B—2571.

The apparatus in this case consisted of two empty powder kegs of the short type tied together with twine while a common stranded cable was soldered to each. The cable was then connected to one side of a 220-volt circuit fed by a 250-volt, 210-amp. direct-current motor run from a generator. Two more kegs were prepared in the same manner and connected to the opposite side of the circuit. The kegs were then placed horizontally in a frame which held the

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*Assistant Explosives Engineer, U. S. Bureau of Mines [illegible] Station, Pittsburgh, Penn.

TABLE I

RESULTS OF IGNITION TESTS ON BLACK BLASTING POWDER IN KEGS, USING OPEN FLAME LAMPS

METHOD										RESULTS				
Test	Explosive	Date Sept. 19	Lamp	Fuel*	Flame of Lamp Inches	Position of Keg	TIME Hrs. Min. Sec. A. M.	TIME Min. Sec.	Action	Flame of Explosion Observed	Keg	Rack	Lamp	Remarks
M15[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Crimp down 2 in. from flame.	10:50 :51 :52	0: 0 1: 2:	Flame applied. Blue smoke.† Ignition, slight concussion.	Ball 6 ft. diameter, 20 ft. high rolled up in air. Lasted 4 sec.	Open flat as if developed top attached, bottom blown off. Keg thrown 9 ft.; bottom thrown 12 ft. See Fig. 1.	Both sideboards and both windshields blown off. Sides thrown 12 ft. and 18 ft., windshields thrown 40 ft. and 45 ft. Rack scorched.	Put out, uninjured. Thrown 15 ft.	[illegible] scorched.
1566	B-2571-A Short keg.	[illegible]	Miners	O	2½	Crimp up.	11:46:30 47:30 50:30	0: 0 1: 0 4: 0	Flame applied. Blue smoke.† Ignition; concussion followed by hissing sound.	Ball 20 ft. diameter rolled up 50 ft. Lasted 3 sec.	Opened and folded; both ends blown off. Side thrown 17 ft., top thrown 31 ft. and bottom thrown 36 ft.	One sideboard and one windshield blown off. Side thrown 13 ft., windshield thrown 11 ft. Rack scorched.	Extinguished. Thrown 15 ft. Uninjured	[illegible] der fused to [illegible]
1572	B-2549 Long keg.	23	Miners	O	3 Wick too tight, when withdrawn flame 1 in.	Crimp up.	(P.M.) 10:04:10 11:15	0: 0 70:50	**Flame applied.** **Flame withdrawn.** **No ignition.**	None.	Soot ½ in. deep. (max.) deposited where flame applied.			Paper, etc. [illegible] Powder in [illegible] when flame was [illegible] into compact mass.
1573	B2549 Long keg.	24	Drivers	S	3½	Crimp down. 2 in. from flame.	A. M. 9:38:20 39:20 10:08:00	0: 0 1: 0 29:40	**Flame applied.** **Blue smoke.†** **Withdrawn; no ignition**					Same kegs as test M-1572. Scorched etc. [illegible] Paper etc. scorched [illegible] Powder fused [illegible]
1574	B-2549 Long keg.	28	2 Drivers placed spout to spout.	S	6	Crimp half down 5 in. from flame.	9:24 9:31	0 7	Flame applied. Ignition. Slight concussion followed by hissing sound.	20 ft. diameter rolled 30 ft. in air. Ctg. seen turning in air; duration 5 sec.	Burst at crimp; held at both ends thrown 3 ft. top thrown 15 ft.	Scorched. Uninjured.	Uninjured. Extinguished. Carriage pushed out of rack.	Same kegs as Test M-157[illegible] scorched etc. [illegible] H S odor [illegible] Burning etc. [illegible]
M1575	B-2549-B Long keg.	28	2 [illegible] spout to spout.	S	6	Crimp up.	10:11 12 13 14 17	0 1 2 3 6	Flame applied. Blue smoke.† Clicking.‡ Clicking.‡ Ignition; slight concussion, second conc, hiss -like big skyrocket.	20 ft. diameter rolled 20 ft. in air. Burning cartridge dropped from keg in its flight for 9 ft.	Keg thrown 52 ft. uphill like skyrocket. Bottom blown loose 1 place. Some paint scraped off keg. Lid thrown 6 ft.	Scorched. Uninjured.	Uninjured. Extinguished. Thrown out of rack	(Grass burnt [illegible] path of ke[illegible] No H S [illegible]
1577	B-2571-D Short keg.	29	Drivers	S	5		P. M. 5:10:30 12:20	0 1:50	Flame applied. Ignition.	See Fig. II.		1 Side Board blown off. See Fig. I.		Demonstration [illegible] exercises [illegible] per M-1565-B. N[illegible] noticed.
1578	B-2571-E Short keg.	29	Drivers	S	4		5:10:40 15:00	0 4:20	Flame applied. Ignition.	See Fig. III.				Run at same time and for same purpose as M-1577. See M-1577.
1579	B-2549-C Long keg.	29	2 Drivers spout to spout.	S	6		5:21 25	0 4	Flame applied. Ignition.	See Fig. IV.	Opened along crimp. See Fig. I.	Rack ignited. Platform on which rack rested also ignited.		See M-1577.
1580	B-2549-D Long keg.	29	2 Drivers spout to spout.	S	4		5:21	0	Flame applied. Ignition; slight concussion hissing sound.	15 ft. diameter 35 ft. high.	Opened at crimp.	Rack and platform ignited.		See M-1577.

TABLE I—Continued.

1569	D-2538-A	23	Miners	0	3	9: 9:30	0	Flame applied.		Scorched.		Explosive burned quietly. Few Products of comb. No explosion.
						9:40	:10	Smoke.				
						:50	:20	Exp. burning	6 to 8 in. high some sparks.			
						11:10	1:40	Burning briskly.	18 in.			
						:50	2:20	Burning briskly.	3 ft.			
						12:15	2:45	Ctg. fell off rod.	3 ft.			
						13:00	3:30		1 ft.			
						13:50	4:20	Exp. out.			On fire.	
M1570	D-2403-A	23	Miners	1	3	9:23:00	0	Flame applied.		Wood burning under sheet iron		[illegible] burned [illegible], [illegible] products of comb. No explosion.
						:20	:20	Smoke.‡				
						:30	:30	Exp. burning				
						:40	:40	Exp. burning briskly	4 ft.			
						24:00	1:00	Exp. burning briskly	6 ft.			
						:20	1:20	Exp. burning briskly	2 ft.			
						:30	1:30	Exp. burning briskly	1 ft.			
						:50	1:50	Exp. burnt out.			On fire.	
1571	D-2335	23	Miners	0	3	9:35:00	0	Flame applied.		Wood burning under sheet iron		[illegible]
						:10	:10	Smoke.				
						:15	:15	Ignited.				
						:25	:25		Bright.			
						:40	:40	Burnt briskly.	4 ft.			
						:50	:50	Burnt briskly.	6 ft.			
						36:00	1:00	Burnt briskly.	3 ft.			
						:35	1:35	Exp. out.			On fire.	

†Sunshine.
†As of paint burning
‡Probably due to heating of keg
§Miners lamp oil.

TABLE II

RESULT OF IGNITION TESTS ON BLACK BLASTING POWDER IN KEG, USING ELECTRICAL ENERGY

Test	Keg	Date		Circuit Breaker	Circuit Breaker	Volt Meter	Ammeter	RESULTS Keg
M		Sept. '19		No. 1	No. 2	Volts	Amperes	
1567	Empty.	23	Keg standing. Circuit Closed	Set at approx 60A —opened.	Set at approx. 60A —opened.	220–230	Circuit opened too soon to read	No effect.
1567	Empty.	23	Keg [illegible] Circuit Closed	Set at approx. 60A. Opened almost instantly	Remained closed.	220	60	[illegible]
1567	B-2571-B Short keg.	23	Keg [illegible] Circuit Closed	Set at approx. 60A Opened almost instantly.	Set at approx. 60A; remained closed.			[illegible]
1567	B-2571-B Short keg.	23	Keg [illegible] Circuit Closed	Set approx. 60A. Opened almost instantly	As above.			[illegible]
1576	B-2571-C Short keg.	29	Keg [illegible] Circuit Closed	Set [illegible]A opened almost instantly.	Set 600A remained closed.			[illegible]

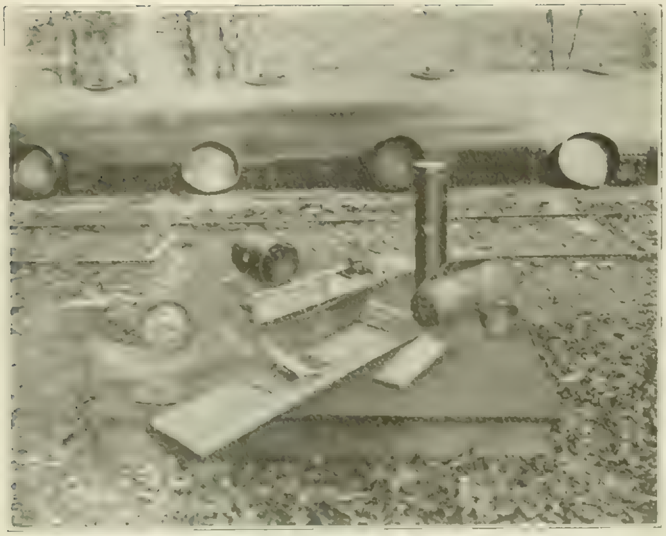


FIG. 1. APPARATUS FOR IGNITION OF BLACK BLASTING POWDER IN 25-POUND KEGS BY OPEN FLAME LAMPS AND RESULTS OF TWO IGNITIONS.

adjacent kegs of opposite polarity 1 in. apart. The frame was so arranged that the keg to be tested could be placed on top of the other kegs thus bridging the circuit. The keg tested was fitted with a rocker arm which permitted its being rolled back and forth on the electrically charged kegs.

The instruments in the line were as follows: In the engine room, one volt meter, an ammeter, a No. 2 circuit breaker and a No. 2 line switch, at the testing ground there were installed a circuit breaker No. 1 and a No. 1 line switch.

Fig. 5 shows the empty powder kegs, frame and switchboard at the testing ground before test M—1576. The keg of powder B—3571—C is not in place.

The procedure pursued in connecting these tests was as follows: The circuit breaker No. 2, line switch No. 2 and circuit breaker No. 1 were closed. A keg was placed in the rack. It was then rolled back and forth over the empty kegs and while being thus moved, the empty kegs were thrown on the line by means of line switch No. 1. The results of this procedure were then noted.

The results of these tests are shown in table 2, and a photograph taken at the moment of ignition during test M—1576 shows the detonation of a 25-lb. short keg of FFF black blasting powder while bridging a 220-volt circuit. During these series of tests, E. J. Gleim, of the electrical section, coöperated with Mr. Coates and the writer.

The conclusions to be drawn from this series of experiments are as follows:

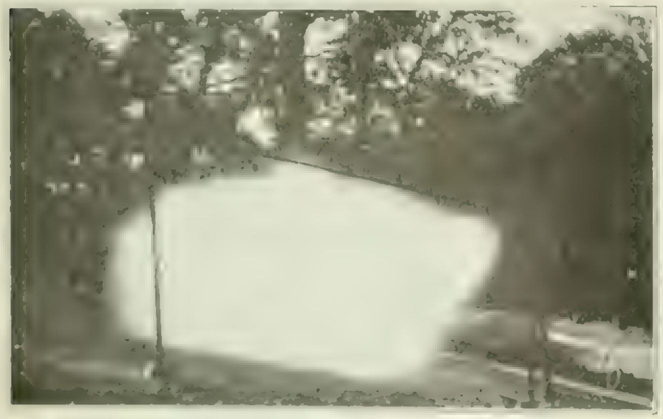


FIG. 2. 25-POUND KEG OF FFF BLACK BLASTING POWDER B-3571-D, AT MOMENT OF IGNITION BY OPEN FLAME MINER'S LAMP. TEST M-1577

1. That black blasting powder of the type tested can be ignited in kegs by open flame lamps.

2. That a keg of black blasting powder can be ignited through the completion of an electric circuit passing through the walls of the keg even though several containers of the same kind are in the circuit, providing an arc is drawn.

3. That open flame lamps should not be used near black blasting powder even if in unopened kegs.

4. That since the current required to ignite a keg of black blasting powder seemed to be less than 160 amp., and is certainly less than 210 amp., and since a single mine motor with a full trip will draw a current of this order of magnitude, all practicable precautions should be taken to keep kegs of black blasting powder away from electrical circuits at all times.

5. When hauled in a motor trip, black blasting powder should always be inclosed in nonconductive receptacles. Dry wood, blind nails, or fiber, are appropriate nonconductive materials.

6. Black blasting powder should not be placed nearer than 5 ft. to an electrical circuit.

7. Excellent recommendations, laws or rules covering the subject discussed in this article are as follows:

(A.) From the mining laws of West Virginia, 1915, Sec. 80, p. 48:—"Where permissible explosives are used, the detonators and explosives shall be kept separate; no black powder, high explosives or detonators shall be hauled on any trip operated by electric haulage motors unless inclosed in nonconducting boxes approved by the district inspector."

FIG. 5. VIEW OF EXPLOSIVES EXPERIMENT STATION DURING DEDICATORY EXERCISES. APPARATUS FOR ELECTRICAL IGNITION TESTS SHOWN IN LEFT BACKGROUND

(B.) From the Industrial Accident Commission of California Mine Safety Rules, 1916, Sec. 45 p. 63:—"Explosives shall not be placed or left within 5 ft. of live electric wires."

(C.) Recommendations to the Governor of Pennsylvania by the coroner's jury investigating the disaster in the Baltimore tunnel No. 2, Wilkes-Barre, Penn., Coal Mine Fatalities, June, 1919, p. 16. "That, in order to minimize danger from blasting powders and explosives carried in the workings in the mines, all powder or explosives shall be transported in separate and distinct trains; that in no case shall it be permitted that men ride in the same cars or in the same trains with said powder or explosives.

Where electric motive power is used, the powder should be encased in containers of nonconducting and noncombustible material and that the only persons permitted to accompany said powder or explosives on cars or trains supplied with such motive power shall be the persons necessary to man the mechanism employed."

(D.) From the Department of Labor, State of Michigan, Act Regulating the Operation of Coal Mines, 1913,

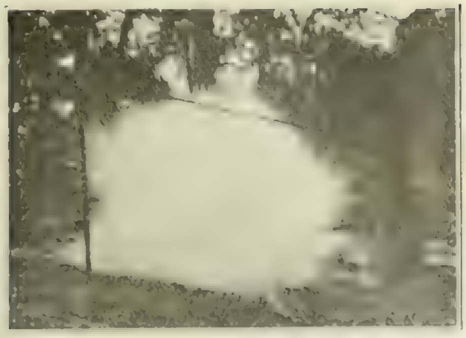
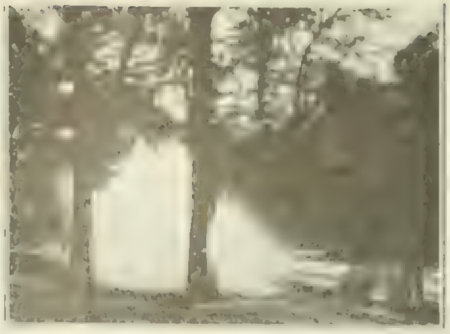
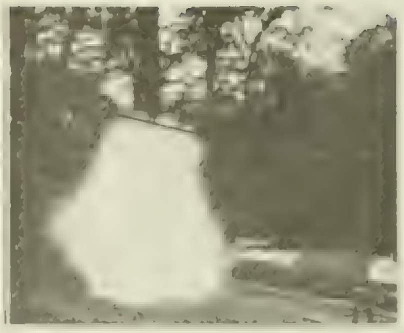




FIG 3. 25-POUND KEG OF FFF BLACK BLASTING POWDER (BURNING) AT MOMENT OF IGNITION BY OPEN FLAME DRIVER'S LAMP (TEST M-1578) FIG. 4 25-POUND KEG OF BLACK POWDER AT MOMENT OF IGNITION FROM TWO OPEN FLAME DRIVER'S LAMPS (TEST M-157[illegible]) FIG. 5 25-POUND KEG OF FFF POWDER (BURNING) AT THE MOMENT OF IGNITION BY BRIDGING A [illegible] CIRCUIT WITH THE WALLS OF THE KEG

Sec. 34, p. 11:—"blasting powder or explosives must not be taken into or out of a coal mine or moved from place to place in a coal mine along any entry or haulway where there are electric wires while the power is on such wires, except when such powder or explosives is conveyed in insulated cars or packages."

8. That in the haulage and handling of black blasting powder, open flame lamps should be kept at a distance of not less than 5 ft.

9. That the danger zone from the ignition of a 25-lb. keg of black blasting powder in the open is at least 50 ft. and greater than 50 ft. in restricted areas.

Use of Grease in Lubricating Mine Cars

It has long been recognized by mine managers that one of the most wasteful practices around the coal mines is that of oiling mine cars with what is commonly known as black oil. This is a cheap residue with small lubricating value. Due to its lack of lubricating quality it is necessary to lubricate mine cars every day. This requires a greaser, who is ordinarily a careless, incompetent boy. He draws the black oil from a tank into a powder can and carries it to the point where the cars are to be greased. His path is usually well marked by puddles of wasted oil.

After he has his supply ready to use he employes a gun made of a piece of pipe. This gun holds possibly a pint of oil. Boy fashion, he takes delight in squirting the oil on passers-by or on the side of the car, while some of the oil gets in the wheels. He does not seem to care whether or not the wheels are already full of lubricant, but seems to feel that he must put a gun full of oil into every wheel regardless of whether or not it is required. Any person who has seen the empty tracks in mines where greasing is carried on (where ordinary all the way from 1 to 2 in. of oil may be found all over the floor) can realize the great waste of material and money arising from this method of attempting to lubricate mine cars.

Lubricating men in general have realized for some time that a light grease would be the proper lubricant for mine cars, and in many instances cars have been used with such a grease. In many cases the lubricant company has furnished to the coal company a grease gun which generally is operated by a crank or plunger but which is much harder to operate than the old fashioned oil gun. Because of this hard operation such grease guns always seem to get out of order in a short time. Quite frequently they are run over by a trip of cars or a locomotive. Whether or not this is done intentionally is hard to say. In any event scarcely any of the coal operators have continued to use grease because of difficulty in putting it into the mine car wheels.

With the idea in mind of making this operation easy entailing little labor and no waste of material, the Newton grease gun was developed. With this system which can always be used advantageously it is only necessary for the greaser to push the gun into the hole in the wheel cap. He has no grease or oil to carry, no valve to turn and, in fact, it is almost impossible for him to waste any material.

Another advantage of this system is that by using a light grease it is necessary to lubricate the cars only about once every 60 days thus dispensing entirely with the employment of the greaser boy. In the case of the Sunday Creek Coal Co. two competent men were put on one day in every 60 which, of course, is quite a saving over the constant service of a greaser boy. The savings in using light grease worked out as follows, at mine No. 2, Sunday Creek Coal Co., with 210 mine cars, capacity 700 tons per day, black oil at 15½c per gal. and grease at 9c per lb:—

When using black oil this mine has consumed an average of 8 barrels per month. Using light grease it now requires one barrel of 300 lb. per month.

8 bbl. of 50 gal. each @ 15½c per gal.....	$62 per month
300 lb. grease @ 9c per lb.	$27 per month

showing a saving of $35 per month on material.

Labor, using black oil, requires a grease boy at $3.24 per day working 20 days per month which would be $64.80; using grease requires 2 men but once every two months at $5 each, which would be $10 for each two months, or $5 per month. Thus the saving on labor is $59.80 per month. This plus the saving on material of $35 makes a total saving of $94.80 per month.

In addition to this saving there will be with the grease no burned out mine car wheels which are common when using black oil. With mine car wheels costing about $6 each this becomes quite an item in a year's time.

Almost any light grease can be used in this gun. In fact it is also well adapted to use with black oil as it does away with much waste, but the real savings come from using a higher grade of lubricant.

Coal Deposits on the Amaga Railway in Columbia, South America

The Amaga Ry. passes through extensive coal beds, which are found on the western watershed after passing "La Quiebra." In several places the railway cuts pass through three horizontal strata of coal. Locomotives can thus be fired at the tracks. In the valley one coal property alone is said to contain 5,000,000 tons of coal. It is bituminous in character, quite light and highly volatile; from 45 to 60 per cent. volatile matter. The cost, delivered in Medellin, cartage from railway station paid, is $4 per ton. The cost to the railway at the coal beds does not exceed $0.65 per ton mined and sacked on flat cars. Although this coal will not coke, such a grade can be found just north of

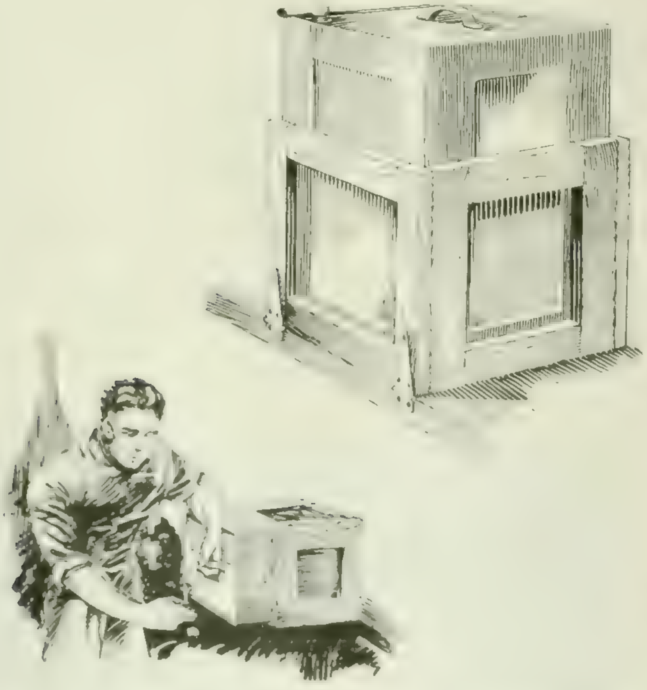
Medellin on the Antioquia Ry. Mining operations are carried on in the most primitive manner, the mines being mere one-man incline shafts and the coal being carried out on men's backs. No scientific examination has ever been made of these coal beds, and no data as to their extent or value is available. It is believed, however, that the supply is large enough to furnish all the needs of transportation and industry in Antioquia for hundreds of years

A consular report states that only one coke-oven plant was seen in the French Lorraine area, namely, at the Moyeuvres works of Messrs. De Wendel, where there are 105 Koppers' ovens installed, for producing coke for their own needs. Here is used in the ovens about 75 per cent. of Saar coal (from their Petit Rosselle mine in Lorraine, a continuation of the Saar coal field), and about 25 per cent. of Westphalian coal; it makes a coke which can be used in the blast furnaces at these works, but can not stand transportation, being too friable. It is generally agreed that it is necessary to add a minimum of 25 per cent. of Westphalian coal to the Saar coal, as the local product alone is not a strongly coking coal and is unsuitable for transportation. This was confirmed by observations at the steel works in the Saar Valley, where there are many coke-oven installations following the same practice, although coke was being made in one works (Neunkirchen) from Saar coal alone.

Efficient Oil Can Tipper

By Chas. H. Willey
Concord, N. H.

The accompanying illustration shows a simple yet handy scheme for making a tipping rig that will enable the easy handling of a 5-gal. oil can. Anyone who has ever attempted to fill a small squirt can from a large 5-gal. container knows that it is tiresome to lift the heavy can and difficult to pour its contents into the smaller can without overflowing or spilling.



By making a small square wooden crate and hinging one side of it to the bench top, as shown, it is possible to set the heavy can in place and while holding the small squirt can in one hand the large can can be tilted to a convenient filling angle with the other by aid of this hinged tipping rig.

Corrosion in Wire Ropes

In a circular issued to managers of mines on the Rand, S. A., it is pointed out that experience has shown that wire ropes of compound construction subjected to corrosive influences are likely to deceive engineers as to the strength remaining in them. Where reduction of diameter, or circumference, of the rope has taken place, not accounted for by the evidence of wear, the part of the rope under examination should first be fully loaded, and then relieved of the load. Any noticeable difference in circumferences under these circumstances, and the slackening of the outside wires when the load is off, will indicate that internal corrosion has taken place. The extent of corrosion inside the strand can only be estimated by the slackness of the outside wires. The corrosion between the strands can be further examined by untwisting the rope or displaying the strands sufficiently with a marline spike.

Engineers are apt to imagine that reduction in the size of a rope may be due to some collapse of the hemp core. In a test at the Mines Department mechanical laboratory of a 1.28 in. diameter rope, the hemp core was entirely removed for about 5 ft. of the length. The specimen was gradually loaded up to 30 tons, but beyond a slight increase of the lay from 10½ in. to 11 in., subsiding after test to 10¾ in., there was practically no alteration in the shape or size of the rope.

In some recent tests of corroded ropes, the following results were obtained:

Original Diameter in Inches		Breaking Load	at Test	Breaking Load at Test
Rope	Wire	lb.	Inches	lb
1.5	0.099	222,208	1.41	191,960
1.5	0.099	222,208	1.40	166,660
1.5	0.099	222,208	1.30	137,260
1.5	0.099	222,208	1.23	66,880
1.5	0.102	220,000	1.22	97,260
1.25	0.115	148,700	1.23	137,660
1.25	0.115	148,700	1.00	78,920

In all the above-mentioned cases the outside wires were less than half worn, but the internal corrosion was excessive. The wires were brittle also. Experience has shown that the remarks concerning corrosion on the certificate of bi-annual tests are taken as merely applying to the test specimen and not considered as having a bearing on the state of the rest of the rope.

Labor Disputes in South Wales

Our Sydney correspondent writes, under date September 30: When the coal miners practically secured all the demands peremptorily insisted upon by the unions, it was understood that the Government made the concessions on the condition that industrial peace was to prevail, but since the increases of wages and betterment of working conditions have been granted, there have been at least 30 stoppages; and, further than that, the Australasian Coal and Shale Employees' Federation, which promised the Acting Prime Minister that no application for altered conditions in the industry would be made until the end of 1920, is now formulating a demand for altered hours. Although the Newcastle coal fields are almost worked out, there is practically an unlimited field around Maitland. It is estimated that there are 153 square miles of coal land in the northern field, and a total gross quantity of workable coal of 1,893,000,000 tons. Since the opening of the field at Greta in 1893, 15 collieries have been established, resulting in a dozen new towns, with a population of approximately 20,000. New collieries are being opened up in various parts of the district.

Power Factor as it Affects the Cost of Energy

By G. M. Kennedy
Lansford, Penn.

This article attempts to explain in nontechnical terms what constitutes power factor and how the power factor of any installation affects actual power consumption. An equitable charge for electrical energy should take into account the power factor of the consumer's installation.

At the present time, there is much discussion in regard to the proper method of charging for electrical energy. Possibly, the main cause of this controversy lies in the subject of power factor. While this subject is of the utmost concern to all central stations furnishing electricity for power, for whatever use as well as to the consumers who are buying the energy, this article is intended, primarily, to apply to central station power purchased for coal mine service, although it's scope extends to all electrical industries.

A few years ago, it was customary for each and every coal company to operate it's own power station or stations, and these companies were not concerned about purchasing power, neither did they, as a general rule, have data or at least, accurate data as to the cost of the power supplied from their own stations. This was because the central boiler room furnished steam not only to the power stations, but also, to steam-driven hoists, fans, pumps and other machines, and if a division of the boiler room costs was made it was a nominal rather than an accurate one. Another reason for the lack of accurate figures on the cost of this power arose from the fact that the use of watthour meters for measuring the power drawn from the station was the exception rather than the rule. It is obvious therefore, that data on the costs of power were almost necessarily assumed.

Of course, in those days the large-capacity central station was out of the question, because of the prohibitive cost of the generating units. These were comparatively small for they were of the reciprocating type, and the large steam turbine had not then been developed. However, with the introduction of the steam turbine, as it exists today there commenced a new era in the electrical industry. This machine created a field in electricity which previously, did not exist and, at the same time, made possible the large central station. This was due to the comparatively low cost of the large-capacity turbo-generator as contrasted with the small capacity of the old reciprocating-engine type of unit.

Many of these small coal-mine power stations are in service today and considerable numbers are still being installed, but nevertheless, the large central stations will furnish the power to coal mines and other industries in the future. This change is coming rapidly and with it there are new problems arising which will demand solution.

One of the most important of these questions, if not the most important of them, is the proper method of charging for power consumed. As indicated above the chief problem involved in the cost of this energy lies in the power factor.

Those, in the coal-mine industry, who are purchasing their power hear so much of this question of power factor and in many instances know so little about it, that it might be well to describe in a comparatively simple way what power factor really is.

Many of the old mine power stations were of the direct current type, while the large central station generates three phase alternating current. There are reasons for this, but they are not essential for the purpose of this article.

In forcing direct current through a circuit, resistance to the flow is the only important consideration, while in alternating current there are three items to contend with, viz; resistance, capacity and inductance, the two latter being known as reactance. Of course, whether direct or alternating current is used, the circuits and equipment require attention, but for the sake of this discussion, this can be neglected.

The power measured in watts in a three phase circuit is equal to the product of the square root of three, times the electromotive force in volts, times the current in amperes, times the power factor.

In direct current, the electromotive or driving force and the current (the amount flowing) work together—arm in arm, so to speak. With alternating current, if there is no reactance, or, if there is sufficient capacity reactance to offset the inductive reactance, the current and electromotive force will behave exactly as in the case of direct current, that is the two will operate together. In practice, however, it is impossible excepting perhaps, in extremely rare instances to attain this condition.

The result of capacity reactance is to cause the current to lead or precede the electromotive force in phase, while the result of inductive reactance is to cause the current to lag behind the electromotive force in phase.

From the angle between the current and the electromotive force, whether the current is leading or lagging is where power factor is determined. The cosine of this angle of displacement between the electromotive force and the current is termed power factor.

This angle varies with the amount of current flowing and consequently, the power factor varies, because the cosine of the angle changes with the angle itself.

When a condition exists similar to that encountered with direct current, that is when the electromotive force and current keep together, so to speak, the angle between them is zero, and the cosine of an angle of zero degrees is unity, or, 1. The power factor, therefore would also be unity.

When the power factor is unity it is termed a 100 per cent power factor. If the cosine of the angle of displacement is .8 the power factor would be termed 80 per cent, if the cosine is .74, the power factor would be termed 74 per cent and so on.

The question now arises as to how power factor enters into the cost of electrical energy. To explain this point, it is necessary to know that all electrical equipment, whether it be an alternator, transformer, motor or what not, is rated as to capacity according to the heating of that particular machine, and it is the current flowing which causes the heating—the amount of heat varying with the square of the current flowing.

As stated above, the power in watts in a three phase alternating current circuit is equal to the product of $\sqrt{3}$ times the volts, times the amperes times the power factor.

This is usually written $P = \sqrt{3}\ E\ I \cos\theta$.

Where P equals the power in watts, $\sqrt{3}$ equals 1.73, E equals the electromotive force in volts, I equals current in amperes, and Cos θ equals the power factor.

In all present systems, power is purchased at a fixed voltage, so that practically the only varying quantities at the central station are the current in amperes and the power factor. For a given amount of power required by a consumer, if the power factor is of low percentage the current will be high and if the power factor is 100 per cent or nearly so the current will be low.

As an example of this principle, it can be assumed that a customer requires 1500 kilowatts (one kilowatt equals a 1000 watts), that the electromotive force is 11,000 volts, and the power factor 90 per cent.

By using the formula given above,

$$P = \sqrt{3}\ E\ I \cos \theta$$

we have, $1,500,000 = 1.73 \times 11,000 \times I \times .9$ or $I = \dfrac{1500000}{.9 \times 1.73 \times 11000}$

Thus $I = 87.5$ amperes.

Now, if the power factor were 70 per cent instead of 90 per cent, the other conditions remaining the same the current would be:

$$1,500,000 = 1.73 \times 11,000 \times I \times .7$$

$$\text{or } I = \frac{1500000}{.7 \times 1.73 \times 11000}$$

or in this case, $I = 112.6$ amperes

Remembering as stated above, that generators are rated according to their heating, and that this heating varies with the square of the current flowing, it is readily seen that the central station would acquire a much larger unit for the 1500 kilowatts at 70 per cent power factor than would be necessary if the power factor was 90 per cent. The copper in the transmission line would also be larger and heavier in the case of the 70 per cent power factor than would be required in the case of the 90 per cent power factor.

ANOTHER SCHEME OF DETERMINATION

Another way of demonstrating the same principle is as follows: If a central station had a unit of 12,000 kw. (or kilovoltamperes) capacity at unity or 100 per cent power factor, this same unit a 70 per cent power factor would only have a capacity of .7 of 12,000 or 8400 kilowatts. That is to say, full load current the equivalent of 12,000 kw. and unity power factor would be flowing through the unit at 8400 kw. and 70 per cent power factor.

With the above explanations, it is apparent that the customer who has an average power factor of 80 per cent should pay less per kilowatthour for his power than the customer should pay who has an average factor of 70 per cent.

This leads to the hardest part of the solution of the problem—how to obtain the power factor accurately. There is no instrument that records power factor with exactitude. The power factor indicator reads angles and not wave form. If the wave shape of the electromotive force and the current is distorted to any extent, it increases the inaccuracy of the power factor indicator, as these instruments are designed on the assumption that the curves of electromotive force and current are sine curves. Consequently, any charge based on the readings of the power factor indicator may be somewhat inaccurate.

Several methods in addition to the use of the power factor indicator are employed for obtaining the power factor, but I believe probably the most satisfactory one at the present time, is the use of two watthour meters, one connected in circuit so as to read the true power consumed and the other so connected as to read the "reactive" power.

By some such means as this a uniform system of charging could be maintained for all purchasers. Each customer could be charged for the true power consumed at a certain rate per kilowatthour and another smaller rate per kilowatthour for the reactive power. This method would be fair to all concerned, and it seems reasonable to suppose that it would eliminate many differences of opinion in executing contracts for purchased power.

The lower the power factor, the higher would be the reading on the reactive factor meter and the more it would cost the customer for the reactive power, whereas with high power factor, the reading on the reactive watthour meter would be less and the customer would have less of this power to pay for. In other words, the reactive watthour meter would simply be a penalizing meter for power factor, which is, no doubt, just.

When the customer would realize from his monthly bill what his penalizing cost is; he would in the majority of cases, be ready and willing to hear and learn of and install power-factor correcting devices, of which there are many, and the central station officials would have more absolute knowledge of the conditions, so that they could discuss the situation with the customer more intelligently from the average customer's viewpoint. The result would be increased efficiency and economy and should tend toward lower rates per kilowatt hour for power.

THE QUESTION OF FIXED SET OF RATES

Some central stations have a fixed set of rates which are supposed to cover poor power factor, and no doubt they do to a certain extent, but such a system of charging encourages poor efficiency, high operating costs and in some instances restrains prospective customers from purchasing current because of its excessive cost.

The above discussion has dealt entirely with the kilowatthour charge, but before concluding, it seems that something should be stated in regard to the method of charging for service or, maximum demand as it is termed.

There are several methods of making demand charges which are not fair. This is especially true of the method of charging on the basis of the horsepower rating of the motors connected to the line. The method of taking 3, 5, 15 or 30 minute demands by instruments seems unfair to the customer as it certainly increases his service or demand charge.

Since the alternators have certain full load ratings and hourly overload ratings, it seems fair to all concerned to base the demand or service charge on the demand covered over a period of one hour, and the printometer manufactured to print a record of the consumption each hour operates quite satisfactorily and introduces less error in printing every hour than would be introduced in printing every 3, 5, 15, or 30 minutes.

This article is not supposed to be a technical discussion of the subject, but is intended to furnish a fair idea of some of the factors causing discussions that create misunderstandings in the purchase of electrical energy.

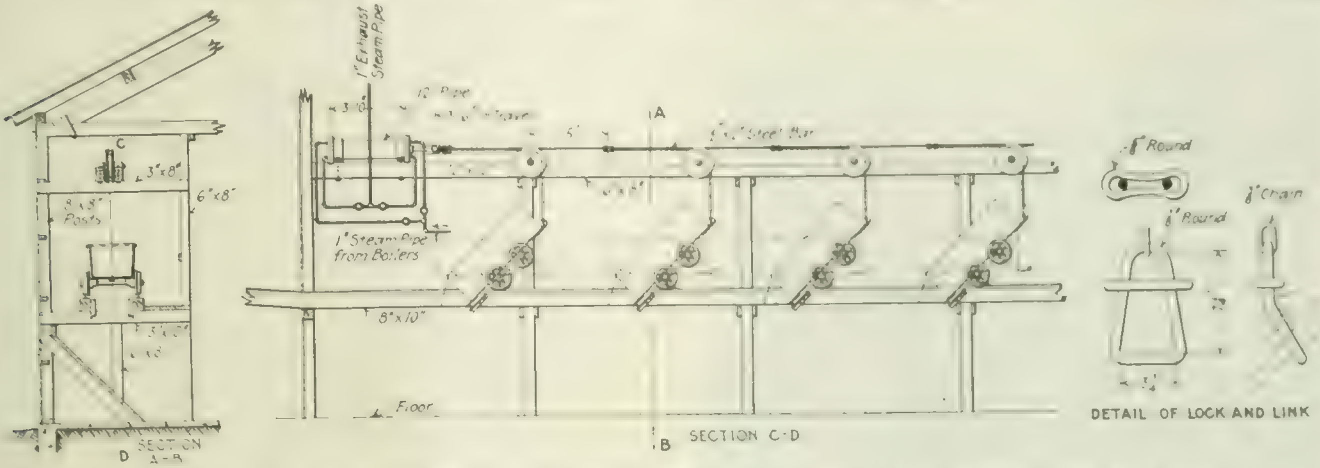
It is noted in recent Commerce Reports that machinery is being recovered from Germany and from points in France and Belgium, on the way to Germany, where it was left at the time of the armistice. Some of this is badly worn by hard usage and some is damaged in transit.

New German-made machinery is available for quick delivery. The low value of the mark at the present time has created an inducement which cannot be overlooked by industries which must study economy regardless of other considerations. The supply of this machinery is limited, however, and there is no reason to believe that the Germans can arrange to give long credits in large amounts. Still, it is true that this situation provides the entering wedge for German machinery manufacturers, who may be expected to take full advantage of every chance to build up their business on a profitable basis for the future.

Dumping Boiler Fuel Into Coal Bunkers

By E. H. Weitzel
Pueblo, Colo.

The mechanism here described and shown in the accompanying illustration for simultaneously dumping six pit cars directly into the boiler coal bunkers was installed last March at the No. 1 mine of the Colorado Fuel and Iron Co. at Sopris, Colo. It has proved to be highly satisfactory and inexpensive in operation. The construction and operation will be readily apparent upon an inspection of the drawing.



CONSTRUCTION DRAWING OF THE CAR DUMPING MECHANISM. DETAILS OF LOCK AND LINK ON RIGHT

The apparatus consists essentially of a long steel bar to the underside of which chains are fastened at suitable intervals by means of ½-in. U-bolts. One end of the bar is attached to the crosshead of a simple steam cylinder having a sufficient length of stroke to raise the end of the cars the necessary height for dumping. The piston is caused to move in either direction as desired by proper manipulation of the valves. Of course, a four-way valve substituted for the four simple globe valves shown would greatly simplify the control.

The loaded and empty cars are handled by a small hoist, and the entire operation of dumping the six cars does not exceed five minutes and is easily accomplished by one of the firemen. The apparatus was devised and built by A. C. Tolliver, mine mechanic, from old material picked up about the operation.

Illinois Mining Institute Holds Meeting

By Martin Bolt

The Illinois Mining Institute held its seventh annual meeting on Nov. 29 in the Council Chamber of the City Hall at Springfield, Ill. Notwithstanding the unsettled conditions in the coal industry which made it necessary that many of the members absent themselves from the capital city to transact more important matters elsewhere, the attendance at this meeting was large, and much interest was taken by those present both in the business and technical parts of the session.

At 10 A. M. on Saturday morning the Hon. Charles T. Baumann, delivered the address of welcome and William Hall, the acting president, responded. Thomas P. Back, state mine inspector of the Third District read an interesting paper entitled "The Relation of the Mining Inspection Service to the Coal Industry." In the general opinion of all those present the coal-mine industry as a whole is sincerely desirous of complying with all the provisions of the general mining laws.

After the members returned from their noon recess the officers for the year 1920 were elected. The nominations were quickly offered and as a result William Hall, of Springfield, Ill., was elected president, George Bagwill, of Harrisburg, Ill.; Frank F. Tirre, of Breeze, Ill., became the vice presidents, and Martin Bolt, Springfield, Ill. was elected secretary-treasurer. Thos. P. Back, Canton, Ill., Henry Fishwick, Springfield, Ill., Samuel T. Jenkins, St. Louis, Mo., Chas. Karrel, Georgetown, Ill., and James Taylor, Peoria, Ill. were reëlected members of the executive committee.

Thomas English, superintendent of the mine-rescue station at Springfield, Ill., then presented an excellent paper entitled "Breathing Apparatus and First Aid in Mining." This paper was freely discussed. The Institute later voted to recommend the extension of mine-rescue and first-aid work adding to it as their recommendation one for the provision of new equipment of such character as would maintain the stations at the highest state of efficiency. The institute decided that its next semi-annual meeting would be held in Chicago some time during the month of May.

A banquet followed at 7:45 p. m. It was held in St. Nicholas Hotel and was the occasion of much jollity. William Hall acted as toastmaster with his usual grace of manner. Addresses were made by Joseph C. Thompson, director of the Department of Mines and Minerals, Springfield, Ill., Samuel T. Jenkins, of St. Louis, representing the Goodman Mfg. Co., and Thomas Moses, general superintendent, United States Fuel Co., Georgetown. Vocal numbers rendered by Master Apblett and the "Auld Scotch Songs" of Harry Marshall drew rounds of applause.

An Engineering Index

The library of the United Engineering Societies, of New York, regularly receives over 1100 periodicals, which represent the leading literature of the engineering profession both in this country and abroad. The annual volume of the Engineering Index, published by this society, has heretofore been based upon the classified system. It has long been the opinion of many who use the index, that a strictly alphabetical arrangement would greatly enhance the value of the volume. Accordingly, the journal of the American Society of Mechanical Engineers states that the items which form the 1919 Engineering Index will be alphabetically arranged, with liberal cross-references provided. A good index adds wonderfully to the value of a book as well as to knowledge in all other forms. Unclassified knowledge falls far short of hitting the mark.

SNAPSHOTS IN COAL MINING

Two Villages in British Columbia

On the left a village on Coal Creek, Omineca Mining Division of British Columbia, where are five seams of fairly good coking coal. The following analyses have been obtained: Moisture, 3.3 and 3.9; volatile matter 34.5 and 31.2; fixed carbon, 56:1 and 55.1; and ash 6.1 and 9.8 per cent.

Coalmont, a Mining Village of the Coalmont Collieries Ltd.

This village is situated in the Similkameen Mining Division. The mines are distant about five miles and located on the north fork of Granite Creek. They were closed down for about two years but work was resumed in the spring of 1918, an airshaft for ventilation having been provided. The production is still not large, but the field is promising. Canadian coal mining engineers have different problems than their American brethren.

A New Thawing Device

The rapid handling of coal cars to and from the tipple during the winter with the least possible delay is the ambition of all mine owners, because this accomplishment means a great saving in time and labor, more important now, under present acute conditions than ever.

VIEW OF THE DEVICE

Returned empties with open hoppers frozen or clogged with ice, are hard to handle. Such cars necessarily have to be switched to a side track and in most cases labor-consuming methods employed to get them in condition for use.

One means of saving most of the delays, loss of time and labor, is to use the oil burner shown in the accompany-illustration. The manufacturer claims that one of those burners will thaw out hoppers and gate mechanisms on coal cars in four or six minutes; and that one man with one of these burners will do the work of eight men without it. The saving in labor alone pays the cost of the outfit within a short time.

As may be seen from the picture, the nozzle of the burner is so constructed as to shoot the flame upward against the hopper door without loss of heat. The flame flashes along the frozen door, thawing it almost immediately. The long handle makes the device exceptionally easy to use.

Besides thawing out gates and hoppers on freight cars, the same burner may be successfully used for thawing out frozen mechanisms on loading booms, conveyors, melting ice around water tanks and drips from water pipes, thawing out switches and the like.

This thawer is built for hard service and rough usage. Any laborer can easily handle it. The complete equipment consists of a 12-gal. steel tank for oil equipped with powerful 2-inch brass pump, gage, fittings, one 12-foot length of special oil resisting hose and burner with special elbow nozzle. The latter is an entirely new feature, assuring better satisfaction. The burner consumes from two to three gal. of kerosene oil per hour. This device is manufactured by the Hauck Manufacturing Co., of Brooklyn, N. Y.

Reductions in Freight Rates and Prices Will Stabilize Coal Market

Summer reductions in freight rates and coal prices as a means of fostering continuous operation was suggested by different coal companies to the American Mining Congress, who had sent out an inquiry to these companies asking their opinion of a resolution, adopted at St. Louis, asking for "such legislation as will permit coal operators to fix a definitely lower price for coal during such period."

There is now employed in the bituminous coal mining industry approximately 50 per cent more of active capital, coal mining machinery, labor and transportation facilities than would be required to meet the consumption demand of the country, if operation could be made continuous. If this surplus of capital, equipment and men could be released from the coal industry, the man-power remaining would be sufficient to meet the demand for coal—in other words, one-third of the total effort now applied or ready to be applied to coal production might be released for other enterprises in which the production of life's necessities would decrease the cost of living.

Any possible reduction of freight rates during the summer would not be sufficient to induce the purchase of coal by domestic consumers. Those industries which are operated continuously do not need this inducement, but, the domestic users of coal are disinclined to purchase coal during the summer months for the same reason as one correspondent expresses it that "we are unwilling to buy lawn-mowers and garden hose until we need them even though they could be purchased at a much less price in the fall".

The differential, to be effective, must be sufficient to represent: First—The interest upon the money from the time of purchase of coal until the coal is required for use. Second—The cost of storage and the waste and depreciation of coal during the period of storage, and third,—the possibility that the price of coal may become less during the winter months as a result of competition, or otherwise.

An inducement must be offered which will justify advance purchases. This means that the price of coal must be so stabilized that the producer is assured that the price is less than will be offered at the time of required use. This requires a stabilization of coal prices, which, under present conditions, seems to be entirely impossible.

A Prize Poster

It is customary every year for each division of the Engineering Department of the Lehigh Valley Coal Co. to vie with one another in getting out a cartoon indicative of the division.

The Susquehanna division poster shown below was entitled to first place. As this division was formed on Dec. 1, 1919, the cartoon is self explanatory.

WINNING POSTER OF THE SUSQUEHANNA DIVISION

Handling Fires in Stored Coal

By H. A. Ward

In the spring and summer of 1918 we stored 4000 tons of West Virginia nut and slack coal in an area about 140 ft. by 75 ft. This made a pile from 15 ft. to 20 ft. high. We endeavored to keep track of the temperature by occasionally going over the pile with ⅜-in. round rods sharpened at one end. By thrusting the rods down into the pile and allowing them to remain a minute or two and then withdrawing them we could tell by feeling the rods if the coal was heating and just how far the warmest spot was from the surface.

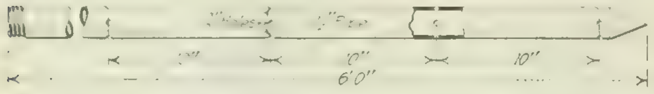


FIG. 1. THERMOMETER PIPE TO SINK IN COAL PILE

When we found a place which seemed to be getting too warm for safety, we would put down a 1-in. pipe and let a thermometer down into it so that we could determine if the temperature was still going up. The 1-in. pipe was prepared as follows: About 15 in. of one end was heated and flattened, thus closing the end. This flat portion was then given a twist like a drill or bit. By inserting this end into the coal and turning the pipe, at the same time exerting downward pressure, the pipe was easily driven through the pile.

Most of the coal was under a shed and in one small area it reached the roof of the shed. This interfered with the use of the ⅜-in. rod, and evidently this part of the pile was not carefully surveyed, as a fire developed about 15 ft. below the surface. To make sure that every part of the pile would be surveyed we put down 1-in. pipe as previously described, every ten feet.

We prepared ten pieces of sash chain the length of the pipes, placing rings in one end of each chain to prevent their being lost in the pipes. The ten chains were then let down into the pipes. By the time the last chain was placed, the first chain would become approximately the same temperature as the pipe. By letting the chain pass through the hand as it was withdrawn it was easy to tell the approximate temperature of the station. It was also easy to tell the relative temperature at the various depths at the station. The stations varied in temperature from cool to red hot. In a case of a warm station not in the fire area we usually found that the bottom of the pile was cold, and that the temperature increased, to a point about 8 to 6 ft. from the surface, where it was maximum. From this maximum point the temperature fell as the surface was approached. Every second or third day the entire pile was surveyed, using a cross-section sheet as in Fig. 2.

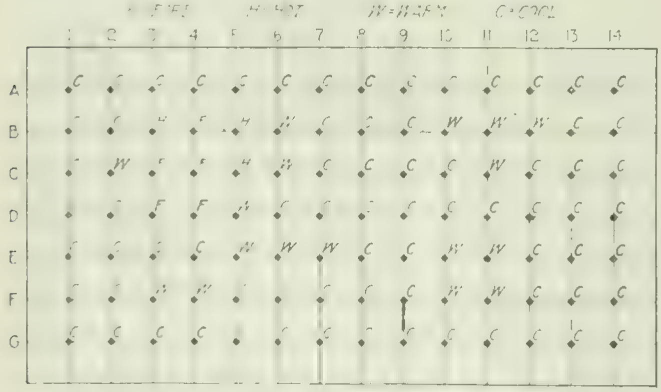


FIG. 2. TEMPERATURE-LOCATION CHART

For a week previous to the starting of the fire the weather had been very hot. We found several stations remote from the fire heating to a dangerous point. As all available labor was employed in digging out the original fire, I decided to try water on the hot stations. Two pieces of 1½-in. pipe each 6 ft. long were prepared as follows: One end of one of the pieces was closed by drawing it to a sharp point. In circles starting at this closed point and spaced 10 in. centers I drilled four ⅜-in. holes 90 deg. apart. These perforations extended the length of the one piece of pipe. The second piece pipe was fitted to couple to the first and to the fire hose. Then we sunk the perforated section into the coal at a hot station, coupled the second section to it and sunk them to the predetermined depth. After the water had been on 30 min. the pipe was moved to another point in the warm area, and so on until the area had been covered. This treatment brought the temperature down immediately. In some cases the treatment had to be repeated from time to time. We still have on hand the part of the pile, which was the most persistent in heating, and it has not had an application of water since the middle of November.

HOW ONE FIRE WAS CONTROLLED

The surveys soon demonstrated that the fire was spreading faster than our force could follow it, and that it must be headed off or the entire pile would be affected. By carefully checking between the pipe stations which seemed to be just outside the affected area to see that the fire had not extended a finger in between, I established a line just outside the affected area. The pointed ⅜-in. rods were used for checking between stations. On 6-ft. centers along this line we put down 1-in. pipe prepared as already described, but with the addition of ⅛-in. holes on circles 18-in. centers. This line of perforated pipes was connected with a common water supply pipe, the water kept on continually. The perforations above the surface of the coal were stopped with wooden plugs. This held the fire within the affected area. With this barrier established we sunk perforated 1-in. pipe into the heaviest of the fire and occasionally turned water into them. This checked the fire but did not put it out. I also did away with much of the smoke and gas which interfered with the digging out of the fire. Although the fire area extended over a space 50 by 40 ft., the fuel loss was comparatively slight. The coked areas were thin and only at the point where the fire originated did we find any indication of ashes.

TEXT BOOK VERSION IS QUESTIONED

Nearly all the literature I have found on the subject of heating and firing of stored coal has advised that as soon as the temperature of a station reaches 150 deg. F. the hot spot should be dug out. This is not always practical, as too many hot places may develop at the same time. Many of the articles advise that water seems to aggravate the trouble. I am inclined to believe that if a small quantity of water is used this may be true. The water leaving the hot coal flows through or under other parts of the pile not affected and thereby furnishes the initial heat to spread the trouble.

If a relatively large quantity of water is used, as in the case cited, the temperature of the water flowing through the coal approaches normal. For the same reason I believe that if water is used on the fire it should be in sufficient quantity, or the area treated should be sufficiently small to insure that the water flowing away through the pile should be of comparatively low temperature power.

News From the Capitol

By Paul Wooton

Republicans Review the Work of Mr. Palmer

THAT the Republicans will lose no opportunity to make political capital of what they term the Attorney-General's surrender to class interests is indicated by a statement issued by the Republican Publicity Association in which the following points are made in connection with Mr. Palmer's negotiation with the officials of the United Mine Workers:

"1. The coal miners repudiated valid wage agreements, many of which would not expire until April, 1920, and demanded a 60 per cent increase in wages, with other concessions.

"2. The operators refused to grant the demands, but offered to arbitrate.

"3. The miners refused to arbitrate and ordered a strike.

"4. President Wilson denounced the strike as unjustifiable and unlawful, and called upon the miners to return to work.

"5. Attorney-General Palmer brought an injunction suit upon the allegation that the strike was unlawful, and secured a mandatory writ ordering cancellation of the strike order.

"6. The strike order was cancelled, but the miners did not return to work—which return was the chief purpose of the suit.

"7. While the miners were thus engaged in what the President and the Attorney-General declared to be an illegal act, the Attorney-General negotiated with them concerning compliance with the law and made terms satisfactory to them by which their return to work was secured.

"8. These terms included a concession of a material part of the strikers' demands, the appointment of a tribunal satisfactory to them to determine what additional concessions should be made, and conveyed an implied forgiveness of the illegal acts already committed.

"9. Although the operators had offered to arbitrate all the demands, as made at the time of the threatened strike, the Attorney-General granted part of the demands and then insisted that the operators had agreed to arbitrate the remainder, which they had never offered to do.

"10. If the agreement of the Attorney-General shall stand, the miners gain at least the concession already made, and may gain much more through the arbitration, forced upon the operators, thus demonstrating that unjustifiable and unlawful acts are profitable—in other words, that dishonesty is the best policy.

"11. If the Attorney-General's agreement shall stand, the Department of Justice thereby establishes the policy of negiotiating terms with criminals—for the Attorney-General declared the strike criminal, but said he preferred to prosecute the case in the civil courts.

"12. Success of the unjustifiable and unlawful acts of the striking miners will be due notice to all class interests that the way to win is to repudiate agreements and imperil the public welfare, thereby forcing the Government, through its duly authorized agencies, to yield at least a part of the demands and make agreements that may give to the lawbreakers all that they ever expected or hoped to secure."

T. W. Dawson States

"For the past fifteen years it has been the uniform experience that production has decreased in the proportion in which the pay to miners has been increased." The foregoing statement was made by J. W. Dawson of Charleston, West Virginia while testifying before the Senate Sub-Committee which is investigating the coal situation. Mr. Dawson was production manager for the Fuel Administration of southern West Virginia during the war. For the fifteen years just previous to the war he was president of the coal association of West Virginia. Other verbatum extracts from Mr. Dawson's testimony are as follows: "The Kanawha District of West Virginia was a very profitable coal region prior to 1902, at which time it was converted from a nonunion to a union district. From that time until 1916, with the exception of 1907, there was practically no profit in the coal business in that district. There was little or no increase in the tonnage of the district. In the Logan District of West Virginia and the Hazard District which are nonunion, there has been great development. While the Kanawha District stood still as to tonnage, the nonunion districts developed to their present capacity, due almost entirely to the difference between union and nonunion labor."

In an attempt to justify his statement that "the miners are now earning good wages and have plenty of money on which to live," Mr. Dawson laid before the Senators a set of statistics showing that the Washington wage agreement resulted in increases varying between 43 and 164 per cent. They received, according to Mr. Dawson, therefore, five years normal advances at one transaction. It gave them an advantage over other labor because they received a greater advance than was customary, or was given to other labor during the war."

Mr. Dawson challeneged the figures of the Secretary of Labor because he did not take into consideration that rents and many other of the costs of living at the mines have remained stationary for fifteen years. Mr. Dawson discussed living conditions at the mines at length and declared that miners pay more to the union by way of dues than they do for fuel. He estimated that the income of the miner's unions is at least $11,000,000 a year from dues. He gave actual figures covering workers' profits at the Cannelton Coal and Coke Company. On these he based various estimates as to miners' profits. He testified that an energetic pick miner can earn between $250 and $350 a month, if he takes advantage of all opportunities to work. Despite the fact that there is some irregularity in the operation of coal mines.

Mr. Dawson pointed out that in the Kanawha District the miners this year have worked only 62 per cent of the time that they could have worked. "They do not want to work regularly. They can earn enough money without doing it. That is the actual record," he said. He also declared that while there was some response to the patriotic appeal to produce more coal during the war, there was a great deal of deliberate idleness. Mr. Dawson told the Committee that he had written the President several times during the war calling his attention to a situation which he typified by an example at Ashland, Ky. There the passenger train running between the mining district and the town was crowded day after day with men going into frolic "because they had so much money they did not know what to do with it". Mr. Dawson told the Committee that he regards the present wages of the coal miners as entirely commensurate with living conditions and favorably comparable with the wages of other skilled labor.

Mr. Dawson characterized the Washington wage agreement an unnecessary burden of 45 cents a ton on the cost of coal. Including the 14 per cent increase just allowed, $500,000,000 have been added to the cost of coal this year. He also told the Committee that he thinks he knows the very mine on which Mr. McAdoo based his 2000 per cent profit statement. "It is an old property in the Kanawha District," he said, "that had not been worked for 15 or 20 years. It had gone into the hands of receivers and was sold under the hammer for $1800. During the war that mine made $30,000 or $40,000, and undoubtedly did make its profit of 2000 per cent on that cost of $1800. That mine has not made a single dollar this year."

No Agreement Say Operators

On Dec. 20, after President Wilson's letter to the members of the Coal Commission was made public, the Executive Committee of the Bituminous Coal Operators' Association issued a formal statement saying the operators had "not agreed to any memorandum such as that mentioned in the President's letter....involving a basis of adjustment of the coal strike."

The statement said the operators had not been consulted in the strike settlement negotiations.

The text of the operators' statement follows:

"The operators have not agreed to any memorandum such as that mentioned in the President's letter to Messrs. Robinson, White and Peale, involving a basis of adjustment of the coal strike.

"The operators were not consulted as to the terms and conditions of the agreement entered into between the Government and the miners."

Attorney-General Palmer also issued a statement asserting that failure by the operators to agree to the Government's plan for settling the coal strike now "would be an amazing repudiation of their own statements." He added that the operators "official representatives have repeatedly agreed to" the settlement plan.

Mr. Palmer's statement also referred to testimony given recently before the Senate Coal Investigating Committee by Alfred M. Ogle, chairman of the executive committee of the coal operators, alleging the Attorney-General had suggested to the operators a compromise with the miners involving more than a 14 per cent wage increase before the settlement negotiations between the Government and the miners began.

Ogle told the committee the operators considered this proposed compromise "a cowardly and dastardly surrender of the rights of the public and the Government."

After quoting this portion of Ogle's testimony, Mr. Palmer's statement said:

"There is not a word of truth in that statement.

"Some difference of opinion had been expressed in the newspapers as to whether the offer to the operators of a 20 per cent increase in wages had been conditioned upon an increase in the price of coal. Mr. Ogle came to me on Friday, December 5, to deliver a written copy of the offer which had been made by the scale committee in the joint conference with the miners.

"I told his committee the Government had not the slightest intention of making any compromise of any kind or character, and proposed to stand squarely upon the position it had already taken, as announced several times by the President and myself.

Congress Thanks Miners for War Services

Mr. Goodykoontz on Dec. 18, 1919, introduced the following joint resolution, which was referred to the Committee on Military Affairs and ordered to be printed:

Thanking the American coal miner for distinguished services rendered the Government in time of war.

> Whereas the war with Germany—the greatest war of all time—being over, and the soldiers, sailors, and marines of America, victoriously bearing the flag—the banner of freedom—having returned to their homes in this, the great Republic of the New World; and
>
> Whereas the thanks of Congress, voicing the will of the American people, by appropriate resolution duly adopted, were extended to these honored soldiers, sailors, and marines; and
>
> Whereas there is, among others, another class of men to whom credit is justly due, namely, the American coal miner, who, by unremitting toil and patriotic devotion, rendered a fundamental service to the country; who went down deep into the bowels of the earth and dug the coal that fired the furnace that forged the artillery and the boilers of the locomotives and the great ships that transported the troops and the munitions of war: Therefore be it
>
> *Resolved by the Senate and House of Representatives of the United States of America in Congress assembled*, That the thanks of Congress are hereby extended to the American coal miner for distinguished services rendered the Government in time of war with the Imperial German Government.

Operators to Co-Operate with New Commission

Mr. Brewster stated on Dec. 22 that the operators as a rule have been clamoring for arbitration. More than that, they repeatedly stated their prefect willingness to go along with the Government in any plan that the President suggested. Their allegation now that they were not consulted about the form of the memorandum which was submitted to the miners' conference is absurd.

It was in fact submitted by my secretary to their representatives in Indianapolis, who communicated it to Washington, and no objection was made. The operators remained absolutely silent until after the men were back in the mines. Then for the first time they begin to object.

The miners went back to work in obedience to the law and the orders of the court without having their demands granted. They relied, as they had a right to rely, upon the promise of the President that immediately upon complete resumption of operations a commission would be appointed to take up the matters at issue.

The officers of the Government had an equal right to rely upon the good faith of the operators in their previous declarations of agreement with this programme. The Government will not assume that the operators will break faith, and indeed ways will be found to see that all parties keep faith in this vitally important transaction.

The commission will proceed with its work, and I have no doubt that upon further reflection the operators will see the wisdom of hearty coöperation with this newly appointed body.

President's Indianapolis Statement

"In accordance with the request of the President, as contained in his statement of Dec. 6, the miners will immediately return to work with the 14 per cent increase in wages which is already in effect. Immediately upon a general resumption of operations, which shall be in all districts, except as to wages, upon the basis which obtained on Oct. 31, 1919, the President will appoint a commission of three persons, one of whom shall be a mine owner and operator in active business, which commission shall consider further questions of wages and working conditions as well as profits of operators and proper prices for coal, readjusting both wages and prices if it shall so decide, including differentials and internal conditions within and between districts. Its report shall be made within 60 days, if possible, and will be accepted as the basis of a new wage agreement, the effective date and duration of which also shall be determined by the commission."

This memorandum was telegraphed to the President and approved by him.

When the Attorney General's attention was called to the mine workers' interpretation of the memorandum, in which they say: "Under the present plan the mine workers are insured an immediate increase of 14 per cent in wages with the probability of further increases in all classifications of labor", he declared that it was the language of hope rather than an interpretation of the memorandum.

Commission Members Appointed

President Wilson appointed Henry M. Robinson, of Pasadena, California, John P. White and Rembrandt Peale members of the commission to investigate wages and working conditions in the coal industry, provided for in the strike settlement agreement.

Mr. Robinson will represent the public; Mr. White the miners, and Mr. Peale the operators.

During the war all three appointees were prominent in war work for the Government, Mr. Robinson with the Shipping Board, and Mr. White and Mr. Peale as advisors to Fuel Administrator Garfield.

Each of the appointees received in his letter from President Wilson, a review of conditions and actions taken in the past, together with suggestions which state that the public is to be protected. The importance of the new commission and its lasting service to the coal industry and to the country was emphasized.

The commission may set the price of coal according to instructions which read:

(1) If a readjustment of the prices of coal shall be found necessary, I shall be pleased to transfer to the commission, subject to its unanimous actions, the power heretofore vested in the Fuel Administration for that purpose."

Operators Oppose 3 Man Commission

The commission appointed by President Wilson to settle the bituminous coal strike is not "either in purpose or effect a public tribunal" and cannot effect a permanent solution of the difficulty, Thomas H. Watkins, chairman of the Central Pennsylvania Bituminous Coal Operators' Association, declared in a statement here last night, in which he protested against the limitation of the commission to three men.

"It isn't fair or reasonable to expect two men whose life work has been in the coal industry to reach a decision which may vitally effect the future of their associates," he said.

"There are questions of principle at stake which should only be dealt with by a tribunal upon which the representatives of the public outnumber representatives of the interested groups."

Mr. Watkins said that the operators considered the President's instruction to the commission "fine" and broad enough to cover the situation.

Frehlinghuysen Sees Public Buncoed

In a denunciation of the agreement reached between Attorney-General Palmer and John L. Lewis, acting president of the United Mine Workers of America, for settlement of the coal strike on a proposition submitted by the President, Senator Frehlinghuysen (N. J.), chairman of the Senate investigation committee, on Dec. 22 expressed the fear of a secret arrangement somewhere in the deal which would plunder the American public.

Attorney-General Palmer in a statement declared the stand taken by the coal operators against the proposal was the merest quibble, and he concluded:

"The Government will not assume that the operators will break faith, and indeed ways will be found to see that all parties keep faith in this vitally important transaction."

With this threat, he says he believes the operators after reflection will see the wisdom of coöperation in the settlement proposed.

Northern Coal Co. Case Dismissed

The Interstate Commerce Commission has dismissed the case of the Northern Coal Co. operating near Millstadt, Ill., against the Mobile & Ohio R. R. The coal company, the operator of a stripping proposition alleged that the railroad was subjecting it to unjust discrimination in the allotment and distribution of coal cars.

The commission held that in view of the coal company's physical disadvantages, recurring interruptions in operations and irregularity of production, that the record does not show that it was possible for the coal company to have loaded more cars than actually were furnished by the railroad, notwithstanding the fact that it received a relatively less percentage of its pro rata than did the shaft mines.

Hines Talks Coal to the Cabinet

On Dec. 23, Director General Hines of the Railroad Administration was called before the regular meeting of the cabinet. He said he had no information as to what President Wilson intended to do with regard to turning back the railroads.

The cabinet was in session less than two hours. Secretary Lansing, who presided, said Mr. Hines was summoned for a discussion of the coal situation, and that the reports he made on production were encouraging. The railroad question was not discussed, Mr. Lansing said.

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Uneasy College Students

EVERY EMPLOYMENT draws on three elements —craft (a training of the body and of the mental reflexes), education (a training of the brain) and business (a training of the judgment). The engineering profession requires parts of all these elements. The college student usually persists in overlooking all but the second one, or in thinking that his college training will give him all three.

Repeated operation and repeated use will alone give accuracy, rapidity and certainity in any kind of labor. It is doing and redoing and doing again that gives us a craft. The college professor gives a scholar a problem once and he solves it perhaps with accuracy but usually without rapidity or certainity. Practice is the only thing that will add craftsmanship to knowledge.

When the everyday labor of the student brings him face to face with a certain problem day after day, then it becomes a second nature, something done almost without thought. In fact knowledge is really not properly acquired till it becomes so rooted as to operate without mental effort.

The college student has been passed so rapidly from problem to problem in his years of instruction that when he enters the professional world he is discontented. If his professor had taught him the same principle on two successive days he would have regarded it as a waste of time. In his new occupation he may do the same thing repeatedly, for days and even years together. The value of his training is that it teaches him not to solve once a single problem, but how to solve it repeatedly, and he has to learn the duty of enduring the sameness of almost endless repetition.

Facility, rapidity and accuracy must be added after the student leaves college. In college he must learn to think and, after college, to work without over-much thinking, at the main duties of his profession, rather from an acquired habit than from an effort of mind, and he must give labored thought only to forming the right habits and methods and in the meeting of the occasional and exceptionally difficult problems. In short his profession and his art must eventually become largely a craft. The hand must save the head. Until that time comes, his work will be labored and not productive.

Furthermore, in college he was regarded as a product, on which must be bestowed labor, care and skill. After he leaves college, he becomes a producer. The trinity of attention just mentioned is not now to be expended on him, he is to expend it on his product. He is no longer therefore principal interest. Over the college might be written "Here we make men" and over the mine "Here we produce coal." It will be seen that the man is no longer the end product but the means. The glory of the college man is gone and should be forgotten. He rides no longer; he is now to put his shoulder to the wheel. If he forgets that, he overlooks the whole purpose of his college life.

Not much so far has been said of the forming of the character, the judgment or the business quality of the man. Too many young men from college cannot listen. Some are too prone to talk and interrupt the speaker but still more cannot concentrate on what is said to them. Part of that quality is the mere exuberance of youth, and part a result of an attempt to appear well posted and competent, while part arises from a superabundance of conceit.

A somewhat dull but attentive, patient, modest college man will often succeed where an average student, who is in addition hasty, impatient and self opinionative, will fail. Let no one think that the ignorance of a graduate, if confessed, will do him much harm. The chief to whom he is accredited will usually be ready to explain; in fact, let it be said in secret, it rather flatters him to do so. If the chief crows a little over it, do not be alarmed, it is only a sure sign that he is the more flattered. If he blusters, do not worry, for, if after explanation, even laboriously given, he gets the results it is a triumph for both. But if he offers suggestions and they are unheeded, if he gives orders and they are unfulfilled and as a result the work is done wrong or not on time or at great expense or men are laid idle, the fault can hardly be excused. The man is neither a good worker nor a capable tool, and nothing can be said for him.

As for the student's judgment be it said there are a lot of socialists among students in colleges and a lot of bumptious autocrats among those who come out in the world. They talk in college halls a lot of nonsense about the equality of all men and come into the field with all kinds of overweening ambitions and longings for authority and too often with a horror of that work which in college they so generously lauded.

In closing be it said that colleges have violated the rules of advertising. They have spoken too freely of their ability to fit men to work. They fit only those men who can be fitted and do it only in a degree and that is all that can honestly be claimed. The promises they make to their students are usually too large. They give only a third, the important third perhaps, of the training required. The atom hydrogen is necessary to the forming of potassium hydroxide, but it is no more necessary than are the atoms of potassium and oxygen. Similarly education is necessary to the engineer, but so also are craftsmanship and judgment. The college must leave these to the mill and to the mine, for the first comes only with toil and the second only with trouble.

Not What We Get But How We Get It

SHOULD A MAN GET a gift of money it is his by right, but if he gets it by compulsion, that is stealing; or by conspiracy and combination, that is, or should be regarded as, an illegal act. If with others the miner denies to his neighbors coal for their domestic fires, fuel to run their machinery and heat to bake their bread that is a form of compulsion, whether peaceful or militant. It may be fair to take the highest wage offered, to shop around one's talents, to create a demand for one's ability and energy, but it is unfair to combine with others to suddenly cease work and let the world go cold and hungry.

Many do not understand this difference, a difference on which the good fortune of the world is based. Under natural economic laws if a service or a product is much needed much will be offered for it and more of that service or product will be forthcoming. If it is not needed the service or product is withdrawn from the market and the man who has rendered the service or furnished the product looks around for a service that *is* needed or a product that *is* demanded. There is an advantage in the higher price, for it draws out the needed service or product, and an advantage in the lower price, for when the need is satisfied further production should be discouraged.

With unions of workmen and unions of employers—the latter alone, for some inscrutable reason, we term trusts—prices when raised at a time of big demand are apt to be forcibly kept high when the demand fails. It is not well that a union should profit unduly by high demand because when the demand ends the wage will be sustained by the contracts it has made.

The unions say that winter prices are high, therefore wages shall be raised, and with this specious argument they demand a contract running over the summer months when prices would normally be lower if the wages were not advanced. A trust cannot be dealt with as if it were an industry that is still responsive to the law of supply and demand. It must not be allowed to use the law in the winter and hold it in abeyance in the summer to the disadvantage of all who must buy of that trust.

Profits under the law of supply and demand may well be allowed to be unduly large at times, for at others they are apt to be inordinately small, but the profits of trusts are so certain that they may well be kept at a reasonable level. Where there is provided the security of a bond, then the compensation must be regulated, and the excessive profits of one season must not be made the normal profits of all the months of the year.

Paying Dearly for His Dilatoriness

EQUAL TREATMENT TO ALL is not to be the rule of the coal industry if Railroad Director Hines has his way. He is insistent that the coal which is overdue to the railroads be delivered first, and that other coal users wait till the needs of transportation are fully satisfied. The reason for his demand is that the railroads are in hard straits for coal, and if they do not get it, the movement of industry will stop.

There is no denying the logic of Director Hines' position, but it is to be regretted that he did not think of the need for coal earlier, in that period of the year during which the railroads in their private ownership days had been accustomed to stock coal. He would not buy fuel then, but when the strike came he commandeered coal right and left, and he now follows that action by jostling his way ahead of the waiting line like a late arrival at the ticket window.

The necessities of the situation cannot be denied, but there is little excuse for them. Had Director Hines stocked up in the spring, his coal piles would not now need replenishing and his cars would not be so generally distributed the country over. It will be a menace to the public if once the railroads learn to depend on a sort of right of eminent domain to help them out of the fueling difficulties in which they may involve themselves by their dilatoriness.

Childish Presumption

FOR 23 MONTHS the railroads have been conducted at a financial loss of 548 millions of dollars. The actual deficit is probably more as the railroads are not being properly maintained. The freight and passenger rates are set by the Government yet they fail by 548 millions of being adequate to supply transportation under the aegis of the United States Railroad Administration.

How can it be expected that the Interstate Commerce Commission can prognosticate what percentage any given freight and passenger rates will pay? It has been guessing for years and it invariably guessed wrongly. The judgment of the Commission is like the judgment of a gambler who figures that the roulette wheel is going to stop opposite his figure. It may or it may not. The chances against him are ten to one.

The Interstate Commerce Commission always concludes that, if a good year comes, a fair profit will be made at the phenomenally low rate allowed. Only rarely does the good year come. Usually a bad year is all that presents itself, and the rate is found wholly inadequate. The profit in the full years is not enough to make up for the losses in the lean years. The Commission goes daily along guessing at the industrial barometer as the Weather Bureau guesses at the weather barograph, and the railroads go further and further to perdition.

Is it not pertinent to ask this question: If the United States Railroad Administration spending the Government's money has not courage enough to put up rates where they belong, will the Interstate Commerce Commission find the courage to do so while spending not their own but the railroads' money?

More Society Conscious than the Socialists

MOST OF US, fortunately, are more social than the socialists. That is most of us believe that selfishness is not rampant in the world. We believe in our fellows; we know they do many acts for the good of the public and not for their own advantage, but the socialists believe that every one is greedy and grasping and for this reason they would change the order of things.

But if we are more selfish than social, then socialism appeals to, and, if established, must endure, if it does endure, by reason of, a quality to which socialism denies existence; that is it must be a failure. When we remove reward from toil and financial risk and embrace socialism, no one will toil or take risks, unless men are what socialists affirm they are not.

Most of us believe there is a large degree of honesty in mankind, that many of us like to work even without reward, that many have a sort of institutional or craft pride that keeps them busy. Many a hard-working laborer, clerk or capitalist has those qualities that would make them almost mainstays of socialism, should such a system be by any unhappy chance introduced, but unfortunately they are not so general, or rather so universal, that we could rely on them to turn the trick.

Strange to say the socialists claim that these virtues are not to be found or are seldom to be found and, if that is so, where is the hope of socialism, for that creed is based on the idea that in the perfect State everyone will have a co-operative mind and an honest intention and will assist without reward in the upbuilding of the State.

Unfortunately for socialism, the socialists are with a few admirable exceptions, the greediest of the greedy. Jealousy is one of their most marked traits. They have a grouch because they cannot outvie others in ease, in comfort or control. They are like the superdemocrat who believed that "one man is as good as another—and some a durned sight better." They believe they are among the better and should have more than others and be masters of their destinies. Their socialism is not socialism at all but revolution—a mere overturning by violence, in which they hope to be gainers.

DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

Standardizing Mining Equipment

Letter No. 1—The Foreword, "Coal Age", Oct. 30, on the need of standardizing all equipment in coal mining, was an excellent and timely article viewed from the standpoint of economy and efficiency.

Next to labor, good equipment is essential to maximum production. It goes without saying that the best is always the cheapest in the end. The most uptodate mines have the best locomotives, pumping machinery, drilling and cutting machines obtainable; and the most reliable manufacturers are putting on the market only the most improved mining equipment.

However, like all other equipment, even the best types of mining machinery have a limited life. No machine will last forever under the severe service to which it is subject in mining; but repairs and renewals must be made from time to time, and it is these items that cause an expensive handicap when there is a lack of standardization of the parts that require most frequent renewal.

The chief concern of many uptodate companies is to keep on hand a sufficient supply of all renewal parts to avoid delay when a breakdown occurs. This plan makes it possible to repair the damage and put the machine in operation again with as little loss of time as possible. Every operator realizes the importance of keeping these parts on hand, since he never knows when a breakdown will occur. It may result from the parts being worn and, in that case, he is able to estimate about when a renewal will be necessary. But, the breakdown may result from a defect in the parts or be caused by a wreck neither of which can be foreseen; hence the need of being prepared for such occurrences.

It is clear that where two or more types of locomotives, mining machines, pumps and other equipment are in use, the number of repair parts required to be kept on hand will be so large as to be a burden, and an operator will often take a chance and delay ordering when any of these parts kept in stock are exhausted, thus putting far off the evil day.

IMPORTANCE OF STANDARD EQUIPMENT

For these reasons alone, it behooves the operator to standardize his equipment as far as that is practicable, and avoid the use of too many different types of machines for performing the same work. It is easier and more economical to keep all, or nearly all, of the most essential parts of a machine on hand, than it is to have about one half of the parts of two or more types of machines.

The standardizing of the equipment of a large mine employing different types of machines is a difficult matter and cannot be accomplished in a day. In many instances, it will not pay to change the equipment in a mine for the sole purpose of standardization. It is a question that must be determined by the existing conditions, and these may require different types of machines working in different places in the mine.

However, the standardization of a particular part of the machinery, as for instance, the adoption of a standard mine car, standard track material, etc., will generally prove of great advantage. The average mine has a car-repair shop, where men are kept constantly employed renewing the broken or worn parts of the mine cars. It is evident that much time and labor will be saved with a proper standardization of the cars in use. The same is true of track frogs and switches.

Repairs and renewals on a single type of any class of mining equipment require a considerable stock of supplies to be kept on hand at a large outlay. What would be the nightmare of costs for repairs where several different types of machines are employed in a mine? Besides the actual cost of the part renewed, there is the labor required, to say nothing of the delay caused when the needed part is not on hand.

In a few years, much if not all of the mining equipment will be standardized; and not until then will we be forcibly reminded of the present inefficiency in this regard. Standardization of mining equipment is as necessary as the standardization of threads on bolts and pipes.

Thomas, W. Va. W. H. NOONE.

Letter No. 2—Many men engaged in the practical operation of coal mines, as well as manufacturers of mining equipment, have doubtless been greatly interested in reading the Foreword that appeared in "Coal Age" Oct. 30, urging the careful consideration of the adoption of fixed standards, such as were recently suggested and discussed at a meeting of the American Mining Congress.

The most casual observer, who is at all acquainted with mining conditions as they exist today, can hardly fail to note the great lack of standardization in the equipment of coal mines. This is particularly true in respect to certain large mines that have been in operation a number of years. Perhaps, in no class of equipment is there a greater variation noticeable than in the size and style of the mine cars in use. Some are large, others small; some have large wheels and others much smaller wheels; while it is not unusual to find the capacity of the cars varying almost a ton.

Any of the workers in the mine, from the superintendent down to the trapperboy, can tell you that some of these cars came from such a mine, and others were brought over from another place that was soon to be abandoned. The conclusion is that the purpose of the company has been to economize by utilizing material that would otherwise be sold at a great loss or scrapped.

The argument in support of such plan for economizing by sending into the mine any class of equipment that is available appears at first glance to be well advised. However, viewed from another point, it is questionable economy and cannot fail to add more to the cost of operation than is saved by utilizing the old material.

Take, for example, a mine that was originally equipped with a size and style of car that was adapted for use in that particular mine. As time rolls on, some of the cars are worn out and others so demolished by wrecks that they are beyond repair. At the same time, the steady development of the mine requires more cars to handle the growing output. It frequently happens that the owners of such a mine have an overplus of cars at another mine that is nearing completion. Although these cars are of a different style and capacity and may even require having their axles replaced owing to a difference in trackage in the two mines, it is thought that a saving can be effected by utilizing the old cars in the operation of the newer mine.

When such conditions of promiscuous equipment have taken place two or three times in a mine, it requires no wise head to discern that there is trouble in store in the future. The difference in the capacities of the cars may not make so much difference in operation, although it requires the same amount of time and labor to handle a small car from the face of the coal to the tipple as a larger car, within reasonable limits.

The chief trouble arises when the sizes of the wheels and axles do not correspond to those already in use at the mine, and it is necessary to keep on hand these different sizes. Superintendents, mine foreman and other officials who are responsible for keeping up the output of a mine and increasing the daily tonnage will not fail to recognize the handicap that this lack of standardization means in the daily operation of the mine.

COMMON CAUSE OF DELAY IN MINES

For example, the following, though not an actual occurrence, is an accident that is being duplicated every day in mines where the equipment is not standardized, as any practical foreman well knows. Assume, for instance, that, in a mine where a motor is hauling a long trip of loaded cars of various styles and sizes, one of the cars is derailed. The fact is at once known to the motorman by the action of his locomotive; but, before he can bring the moving loads to a standstill, the jumping of the derailed car over the ties has caused a broken wheel.

If this mine was well equipped, such an accident would mean only a short delay in getting another wheel to replace the broken one. In this instance, however, no surprise is felt when, another wheel being brought, it is found not to be the required size. Then, a hunt is started for a larger wheel, and someone remembers that there is an old car with a broken axle in the mouth of an abandoned room, a distance up the entry. It takes time to pry the wheel off from the axle of this car; but, alas, when it brought it is found that the bore of the wheel is too small for the axle of the car and this wheel, like the preceding one, is thrown aside as useless.

Under the circumstances, there is nothing else left to be done but to get the car to a place where it can be set aside for the nightshift to handle, if indeed they are fortunate enough to find a wheel that will fit the axle. This causes a long delay and hard work is required to get the car to its resting place.

In a large mine, other motormen waiting on a passing track are delayed by the accident, and it is nothing unusual for the entire mine to be tied up by such an occurrence, which all practical mining men know can be avoided by a proper standardization of the equipment employed. What seems to be economy is thus shown to result in unnecessary expense and curtailed production.

This country has always been the home of standardization of both methods and material. The idea originated here in the development of the system of interchangeable parts, in the manufacture of instruments and machines of every description. The lack of standardization was a serious handicap to England, at the start of the war. Almost every machine was a separate creation.

The beauty and efficiency of standardization, in manufacture, was shown in the rapid building of the enormous number of Liberty motors in this country, for transportation across the sea. Henry Ford's success in the production of his "Tin Lizzies" is another striking illustration of standardization. Everything about a Ford will fit any other Ford, and a missing or broken part can be obtained at almost any dealer of auto supplies and at many department stores.

One great need of standardization, in coal mining, is in the adoption of a uniform track gage. The standard gage of railroads, in this country, has been the basis of the great expansion of that business; but, in this respect, our mines are still holding to the practice of the dark ages.

Standardization is evident in the moving-picture business, electric lighting, gas fitting, and plumbing and in numerous other industries. There is even a universal keyboard for typewriting machines. But, our mines are flooded with coal-cutting machines of every kind and make; and there is little standardization of wheels, cutting bits and other parts of mine equipment. The question of standardization may well be considered in respect to the armatures and fields of motors, electric fuses for pumps and other machines and, in fact, in every department of mine equipment.

It would not be good policy to advocate excluding the new models of machinery that are being constantly added to the equipment of mines, because of the lack of standardization and need of maintaining a larger number of supply parts. On the other hand, the introduction of these new models would be greatly advanced if there was more standardization in the manufacture of both old and new machines. Coal mining is yet in its infancy. It is readily recognized that it may be impracticable to standardize all classes of equipment; but much can be done, in this regard, in the manufacture of mine-car wheels and axles.

Roscoe, Penn. ALEX. S. DIXON.

Boiler House Economies

Letter No. 1—I was glad to see and read the article by E. P. Humphrey, "Coal Age", Oct. 2, p. 570, who draws attention to the great waste of fuel that occurs in the generation of power. As he states, little attention is paid to the matter of economizing fuel, in the power house of large collieries, where seldom any account is taken of the coal burned under the boilers.

Allow me to mention a few points based on my own experience, in relation to the firing of boilers and the equipment necessary for generating steam with a view to economy of operation. The subject is one that should appeal to coal operators and mine officials just as strongly, in respect to lowering the cost of operation of the mine, as it does to manufactures and shop superintendents, in reference to the generation of power, heating and lighting.

Frequently, the size of coal used in the colliery power house is too small for the grate, which was originally intended for burning a larger coal. As a result, much of the fine coal in use falls throuh the grate into the ashpit and goes out to the dump with the ashes.

The average fireman at a colliery and in many industrial plants as well has no exact knowledge of the amount of coal that can be burned economically, per square foot of grate surface. The tendency is with many firemen to pile too much coal on the grate, which is done at the expense of efficiency in burning the coal. Less heat is transmitted to the boiler and a larger amount passes into the stack, partly owing to the stronger draft required to maintain the fire, and partly to the fact that less heat is radiated from the surface of the burning coal. In addition, there is a greater tendency for the coal to clinker, and this requires more shaking of the grate and cleaning of the fire, and much partly burned coal drops into the ashpit with the cinders.

To overcome this difficulty, forced draft is employed, with the result that a larger proportion of heat passes into the stack, the heating surface of the boiler being insufficient to absorb its due proportion of the heat from the burning gases. Every fireman should understand the proper amount of air required to burn a given weight of coal. Too much air cools the flame, burns out the coal and carries too large a proportion of the heat into the chimney.

BURNING DIFFERENT GRADES OF COAL

Particularly at collieries, firemen are compelled to burn different grades of coal, for which there is not the present demand. In that case, it is well to remember that the finer the coal the greater will be its tendency to cake. Such fine coal should be spread over a larger area of the fire to secure its more rapid combustion; and greater care is required in cleaning the fire to prevent the fine coal from falling into the ashpit.

In the firing of the size of coal that is adapted to the grate, the fresh coal should be heaped in a little pile on the front of the grate and allowed to remain there until sufficiently kindled that it can be spread over the surface to the burning coal, without damping off the heat by smothering the fire. This method of firing is known as the coking method, and has the effect to maintain a more uniform temperature in the furnace.

Too often, a fireman will fairly smother a fire with fresh coal, and it may require 10 or 15 min. for this coal to kindle and restore the heat of the furnace. In the meantime, the steam pressure has dropped, the furnace cools, and loss results before uniform normal conditions can be again established. As a rule, these green hands at firing know it all and cannot be told anything. They have fired boilers too long to need any instruction in that line.

In the design of a power plant, it often happens that the boiler is too small for the steam pressure required, in which case, there is no end of trouble ahead. The steaming capacity of the boiler is not proportioned to the amount of coal that must be burned to accomplish the desired results. The grate area, which generally bears a fixed ratio to the amount of heating surface, depending on the type of boiler in use, is not sufficient to burn the required weight of coal per hour.

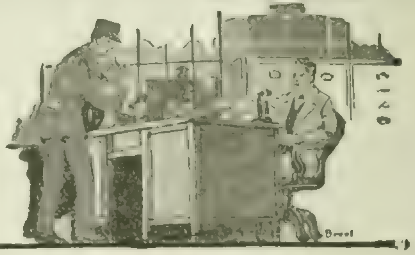
STEAM PIPES AND BOILER CONNECTIONS

A word or two regarding boiler connections will not be amiss here. All steam pipes should be covered with a fireproof material that is a poor conductor of heat. This will reduce the condensation of steam in the pipes and lower the cost of generating power. Where pipes are uncovered, there is a large loss of heat due to radiation, and other trouble arises from the condensation of the steam in the pipes. This produces wet steam and requires the separation of the entrained water, which is liable to be carried over into the cylinder and, perhaps, cause a cracked cylinder head or do other damage.

Boiler connections should be so constructed as to avoid low places in the pipes where water will collect from the condensation of the steam. This will produce water-hammer, which may be of sufficient violence to burst the pipes, blow out a valve, or break a pipe elbow. Wherever there is an opportunity in a pipe line for water to collect, drip-cocks should be placed at such points. Also, whenever two or more boilers are connected to the same steam main, forming a nest of boilers, there should be two valves on each connection, so as to insure against danger to the workmen when making repairs on a boiler that is cut out for that purpose.

Rawdon, Quebec, Canada. C. McMANIMAN.

INQUIRIES OF GENERAL INTEREST



ANSWERED BY JAMES T. BEARD

Return Wire in Trolley Haulage

In our mine, we are using the trolley system of hauling and have had to consider the question of installing a return wire. In this connection, I want to ask, At what distance from the trolley wire should the return wire be placed to insure safe operating conditions and where it would not be injured by the pole. We are using direct current, with a pressure of 550 volts. Also, let me ask, At what distance apart should the taps be placed connecting the return wire with the rails?

Albert, Tucker Co.,W. Va. MINE ELECTRICIAN.

Judging from the information given in this inquiry, we assume that it is desired to install a return wire for the purpose of improving the service, the possible poor bonding of rails having rendered the rail return inefficient. Before replying directly to the questions asked, regarding distance apart of the trolley and return wires, and the taps connecting the latter with the rails, however, we would suggest improving the bonding of the rail, so as to enable a good return through them, which would do away with the necessity of installing a return wire. If this is a main-road haulage and must be maintained for some time to come, it will pay to rebond the rails and fix up the roadbed so as to secure the best possible results in haulage.

But, assuming that it is absolutely necessary to install a return wire that is to be operated in conjunction with the return through the rails, which seems to be the idea presented by the suggestion of taps, it can be stated that it will be necessary to have as many taps connecting the return wire with the rails as there are imperfect bonds between them.

If this is not done, whenever the locomotive occupied a position between two imperfect bonds it would have an imperfect return, or perhaps no return at all, except what might result from the grounding of the track. For this reason, each section of rail between imperfect bonds should be connected with the return wire by a tap. At the best, the plan suggested is a very poor one, and is liable to give no end of trouble.

If such a wire is installed it should be hung from the timbers, on the opposite side of the entry from the trolley wire. Some will prefer to lay the return wire at the side of the track as close to the rail as practicable, in order to reduce the length of wire required for the taps connecting it with the rails. If this is done, the return wire should be suitably guarded to protect it from injury by falling roof or derailment of cars, either of which is liable to occur and cut the wire.

Guarantee of Work of Mine Fans

A discussion, which took place at a mine foremen's monthly meeting that I attended recently, developed a question that is of much interest in the purchase and installation of a mine ventilating fan. We were arguing on the effect that would be produced on the water gage should the fan be cut off from the mine. I claimed that there would still be a pressure at the fan, but was unable to explain how this was produced, and agreed to write COAL AGE for an explanation.

In the same connection, the question was asked whether it is the custom for manufacturers of mine fans to guarantee that the fan will produce a given volume of air, against a certain specified water gage, when the fan is running at a given speed, say 60, 80, or 100 r.p.m.

Also, in making such a guarantee, do fan manufacturers take into consideration the mine resistance, or does the guarantee refer to the fan running in the open, that is to say cut off from the mine? I hope I have made my meaning clear and that COAL AGE will soon resume its regular weekly visits that have been interrupted by the strike of the printers.

McIntyre, Penn. THOMAS HOGARTH.

Twenty-five years ago, it was the custom of mine operators and fan manufacturers to estimate the capacity of a fan by its yield in cubic feet per minute. When ordering a fan, the operator would state the volume of air required to be delivered, and the manufacturer would guarantee his fan to produce the specified volume of air, but making no mention of the water gage, ignoring the fact that it is the measuse of the resistance against which the fan must operate and a determining factor of the volume of air the fan will produce at a given speed. At that time, even the speed of the fan was seldom mentioned, so that if a fan failed to produce the required quantity at a normal speed, this was increased until it met the requirements of the guarantee of its maker.

Attention has since been drawn to the fact, which is now clearly understood and recognized, that, for any given power on the air, the unit pressure or water gage varies inversely as the volume of air circulated, in a given airway or mine. It has been further shown that the unit pressure or water gage is due to the resistance offered to the passing of the air circulated by the fan.

In order, therefore, to estimate correctly the capacity of a fan, it is necessary to specify both the speed of the fan and the water gage at which it will produce the required volume of air. Today, the three elements, volume, gage, and speed, are all specified in the guarantees made by reliable fan manufacturers.

The foregoing explanation should make clear the fact that when a fan is run in the open, by which is meant both the intake and discharge orifices of the fan are open to the atmosphere, the fan may produce a large volume of air but there will be no resisting pressure, except that due to the circulation of the air through the fan, and no water gage will be produced in the fan drift now open to the atmosphere.

On the other hand, assuming the power applied to the fan shaft remains constant and the fan is either exhausting or discharging air into the mine, a resistance is set up in the fan drift and the volume of air produced by the fan is greatly decreased. The amount of this resistance is measured by the water gage.

It is evident, therefore, that the same fan operated by the same power will produce a different volume of air, at mines having different powers of resistance. The resisting power of a mine is measured by the ratio of the quantity of air in circulation to the square root of the unit pressure. This ratio is properly termed the mine potential, and is an important factor in all fan calculations.

Expansion of Spiral Fan Casing

It was with deep interest that I read and studied the reply to a recent inquiry entitled, Design of Ventilating Fan, "Coal Age", Oct. 30, p. 724 It is this sort of information that many of the readers of "Coal Age" are desirous of obtaining, especially those of us who have such work in charge and are responsible for the proper design and construction of all mining equipment.

As stated in the reply to this inquiry, the proper proportionment of a centrifugal fan is a difficult problem. I fully realize that the several dimensions of the fan depend on a number of factors, which greatly complicate the solution of such a problem. However, I want to ask one question. How is the proper expansion of the spiral casing of a centrifugal fan, at the point of cutoff, determined? Without knowing this factor, it would be impossible to construct the circular templet mentioned in this reference for laying out the spiral of the casing. It is stated that the diameter of this templet is three-eighths of the expansion of the casing at the point of cutoff.

Greensburg, Penn. W. A. UNDERWOOD.

The expansion of the casing of a centrifugal fan, at the point of cutoff, must be such that the velocity of the air at that point shall be equal to or slightly greater than the velocity of the blade tips. This velocity (u) of the blade tips (ft. per sec.) depends on the theoretical water gage, which may be assumed as 1.4 times the gage in the fan drift. The blade-tip velocity required to produce the water gage w. g. in the fan drift, under normal conditions, is then calculated by the formula

$$u = 56\sqrt{w.g.}$$

expressed in feet per minute, the blade-tip velocity (v) is

$$v = 3360\sqrt{w.g.}$$

Now, calling the sectional area, at the foot of the chimney or the point of cutoff, A (sq. ft.); the breadth of the fan, b (ft.); expansion of casing, e (ft.); quantity of air in circulation, Q (cu ft. per min.); velocity of blade tip, v (ft. per min.); and the mine water gage, w. g. (in.); we may write as follows:

$$A = be = \frac{Q}{v} = \frac{Q}{3360\sqrt{w.g.}}$$

whence,

$$e = \frac{Q}{3360\,b\sqrt{w.g.}}$$

This last formula gives the value of the expansion of the spiral casing in feet, at the point of cutoff. The expansion of the spiral must be started at a point distant from the point of cutoff equal to the distance between the two consecutive blade tips.

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Miscellaneous Questions

Answered by Request

Ques.—Name the gases found in coal mines, stating which are explosive, and which nonexplosive and giving the chemical symbols of each.

Ans.—The principal gases found in coal mines are the following: Methane or marsh gas, sometimes called light carbureted hydrogen (CH_4); carbon monoxide (CO); which is the "whitedamp" of miners, carbon dioxide (CO_2), which, mixed with nitrogen, forms the chief ingredients of the blackdamp of miners. In addition to these principal gases, occur, in limited quantities, hydrogen sulphide or sulphurated hydrogen (H_2S), the stinkdamp of miners and the heavy hydrocarbon gases that are associated to a limited extent with methane; namely, ethene or ethylene (C_2H_4) belonging to the olefine group; and ethane (C_2H_6), belonging to the paraffin group.

Of the gases named, methane, olefiant gas, carbon monoxide and hydrogen sulphide form explosive mixtures with air in certain proportions. Carbon dioxide and the nitrogen of the air are the only ones that are not explosive.

Ques.—Name the instruments used in connection with coal mining.

Ans.—The instruments in common use are the anemometer, water gage, barometer, hydrometer or psychrometer, the miner's compass and tape, and the clinometer.

The anemometer is used to measure the velocity of the air current; the water gage measures the unit of ventilating pressure, each inch of water gage or water column corresponding to a pressure of 5.2 lb. per sq. ft. The barometer, either the mercurial barometer or the portable aneroyd indicates the atmospheric pressure. The hydrometer (psychrometer), consisting of a wet and a dry-bulb thermometer, is of use in calculating the hygrometric state of the atmosphere or, in other words, the percentage of moisture or the degree of saturation of the air. The miner's compass is used in putting up sights for driving entries and rooms or determining the direction or bearing of headings. The tape is used for taking measurements in the mine and the clinometer for finding the angle of inclination of the strata.

Ques.—What are safety lamps used for?

Ans.—Safety lamps are used to enable the miner to work in a gaseous atmosphere where an open light would be unsafe. In the safety light the flame is isolated from the outside atmosphere by being inclosed in a chamber called the combustion chamber of the lamp, and formed by a cylinder glass surmounted by a wire-gauze chinmney. In the Davy lamp, which is much used for testing for gas, the flame is entirely surrounded by a gauze chimney. Besides affording protection to the miner while at work, safety lamps are used for testing for gas or detecting its presence in the mine air.

Ques.—How should a person who has received an electric shock be treated?

Ans.—The first consideration is to break the current or short-circuit it at a point between the generator and the victim of the accident, should he be lying helpless across the wire or held in contact with the conductor so that he cannot let go. A current can often be short-circuited by throwing a drill crowbar or other implement across the conductor on the side of the victim tward the generator. Then, by the use of a dry cleat or board, attempt to drag or push the victim from the wire. While so doing, care must be taken not to stand in a wet place or to use the bare hands in contact with the victim. In any case, no time is to be lost, but quick action must be supplemented by sending for a doctor, so as to give the victim the best treatment possible after his removal from contact with the current.

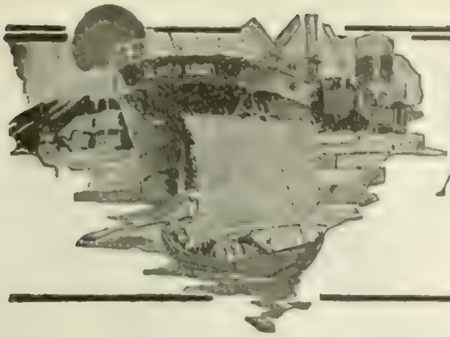
Remove the patient to fresh air if this can be done quickly. Place him on his back with a coat or roll of blankets under his shoulders, at the same time lossening the collar and clothing. See that the mouth is clear, the tongue drawn forward so as not to impede the throat passage, and proceed to revive the man by performing artificial respiration, if there are no signs of returning consciousness.

In the giving of artificial respiration, many will prefer the Schaefer method in which the patient is turned over on his stomach with arms extended and the head turned slightly to one side so as to free the mouth and permit easy breathing. The operator then kneels astraddle of the patient and placing his outstretched hands over the man's back and lower ribs(alternately throws himself forward and back, at the rate of 12 to 15 times a minute, in imitation of the rate of breathing. This must be continued without intermission until there are signs of life. Hope must not be abandoned for one or two hours, or until absolutely certain that life is extinct.

Ques.—A "foot-branch" 16 ft. wide and 350 ft. long is timbered with collars 14 in. in diameter, set at 2-ft. centers. The roof is badly broken above, causing a great deal of weight to rest on the timbers, some of which are badly decayed. We wish to replace these with new ones of the same size. Describe in detail how you would direct such work to be done at the least expense, yet insuring the safety of the workmen.

Ans.—If 14-in. collars are set 2 ft. apart, center to center, the space between the collars is $2 \times 12 - 14 = 10$ in. In order to prevent an undue fall of roof, it is necessary to place a new set of timbers between the old ones before removing one of these old sets. To do this it will be necessary to first wedge apart the two old sets so as to permit a new collar to be placed between them.

To make the work continuous, the movement in wedging should be confined to the rear set of timbers only, and, to accomplish this, 10-in. blocks must be inserted between the first two or three sets in advance, so as to prevent their movement. The old set in the rear being now wedged back 4 in. gives room for a 14-ft. collar to be placed in position. This done and the new set being completed, the next old set in advance is carefully removed to prevent an undue fall of loose material. There is now an open space of 24 in. between the new set and the next old set; and another new set of timbers can be placed before removing the second old set. In this manner the work can be continued till all the old sets have been replaced by new ones.



FOREIGN MARKETS AND EXPORT NEWS

Review of European Coal Situation

Considerable American coal is now being received in Southern Europe. The regions affected by the war are slowly recovering while Germany is supplying France according to the terms of the Peace Treaty.

ITALY

Large amounts of American Coal are arriving in Italy according to a report of the Department of Commerce, dated Dec. 19, 1919 which reads as follows:

In recent months a great change has taken place in the relative position of the United States as a supplier of coal to Italy. During the month of October it is estimated that shipments of American coal to Italy will exceed 400,000 tons, while receipts from Great Britain will be in the neighborhood of 300,000 tons. The Italian Government has made contracts in the United States aggregating about 2,000,000 tons, and it is hoped that it may be possible to increase the total shipments of American coal both for Government and private account to 500,000 tons per month. This amount would be almost equally divided between the Government, whose importations of coal are practically all intended for use on the state railways, and private shipments for industrial use.

Italy's dependance on the United States for coal has been the result of necessity. Shipments from England have been seriously interfered with by labor conditions, so that instead of increasing the quantity supplied to Italy there has been a reduction, and there is an uncertainty as to the future. Belgium has been unable to furnish the 50,000 tons of coal monthly which it had agreed to supply, so that shipments from this source have been negligible. France is in no position to export coal, and receipts from Poland and Germany are too small to deserve serious consideration. Switzerland has agreed to accept German coal destined to Italy, permitting Italy to make use of a corresponding quantity of American coal destined to Switzerland, but as matters stand the quantity involved makes this arrangement of no special importance.

Of course, the strike has upset these calculations, for foreign shipments have been suspended since Nov. 1, and under the most favorable conditions it will probably be several months before the volume of exports is back where it was in October.

In October vessels carrying 423,000 tons of coal cleared for Italy from American ports. In October, 1918, there were no coal shipments from this country to Italy, and the exports to Italy during the entire year amounted to less than 10,000 tons. Exports to that country in other recent years were as follows: 1917, 560,000 tons; 1916, 1,735,000 tons; 1915, 2,931,000 tons.

POLAND

Poland and its annexed territories are stated to require 13,000,000 tons of coal yearly, whereas the output, including that part of the Teschen district which is under Polish administration is at the rate of only 5,500,000 tons per annum. Efforts are being made by the Government to obtain supplies from Upper Silesia (600,000 tons per month), but the output there has reached only 40 per cent. of its normal figure. In the Teschen district the production is now estimated at 75 per cent. of the last pre-war month, but political and transport difficulties hinder free supplies from either quarter. Transport difficulties are being largely surmounted and the coal shortage prevailing in Poland is attributed to general causes affecting the whole European Continent.

The introduction of the 8 hour day, [illegible] strikes [illegible] have caused a reduction of 40 per cent in the production of the Dombrowa and Krakow mines. The [illegible] requirements for the whole of new Poand, for example, are given as 1,080,000 tons, whereas the production from all sources amounted to 445,000 tons or 41 per cent only of the demand, the contribution of the several districts to the total being as follows: Dombrowa, 288,000 tons; Krakow, 89,000 tons; and Karwin, 58,000 tons. Even under the best possible conditions the Dombrowa and Krakow mines can not cover the demand, though there is no doubt that the output can be increased, and the Polish Government has sent a special commission to these areas to investigate the possibilities of such increase.

PORTUGAL

Owing to the small margin of coal available, the shipments of British coals to Portugal have been cut down to a very sharp extent, and that country consequently has had to utilize wood fuel to a large extent and to lean upon the United States for supplies of coal. In normal times the imports of coal into Portugal totalled over a million and a quarter tons per annum, about half of which was utilized for the bunkering of ships. This country previous to the war supplied almost the total coal imports into Portugal, South Wales doing most of the trade. The scarcity of coal has led to importers seeking supplies of American coal. This coal has given considerable satisfaction, 43,000 tons being imported in 1916 and 35,000 tons in 1917. It is understood that efforts are being made to impart larger quantities of American coals this year, but the difficulty lies in respect of suitable tonnage. The coal deposits of Portugal have been worked to a larger extent, but the seams are thin and the coal is not adapted for steam raising purposes. The supplies of British coals sent to Portugal during the war period were made possible as the result of the authorities allocating supplies. The total, however, was insufficient for the needs of the country which suffered to a great extent from coal scarcity and higher prices.

RUSSIA

The situation in the Donets coal fields, though difficult, is improving daily. The difficulty is one of transportation, the existing means of which are insufficient to handle the output, which averages about 484,000 tons. Under Bolshevik management the production dropped to 161,000 tons, while the monthly output in normal times previously was 2,420,000 tons. Despite reports to the contrary, the pits are in good order and very few remain flooded.

There is a shortage of labor because for a long time the region formed part of the front. Inducements are being offered miners and there is now a reassuring influx of labor. There is a shortage of horses, which were all driven away during the fighting and the Bolshevik occupation. The Government is [illegible] by sending a large [illegible] and are giving credit freely to all in the restoration of the mines.

ENGLAND

Coal shipped at Hull from the [illegible] collieries by river and rail totaled 124,257 tons for the month of September 1919 according to a report dated Dec. [illegible] from the Dept. of Commerce, as compared with 170,774 tons in 1918, a decrease of 46,517 tons. The total arrivals for the nine months ended Sept. 30, 1919, reached [illegible] tons against [illegible] tons for the corresponding period of 1918 and [illegible] tons in 1913. [illegible] shipments abroad [illegible] 1919 consisting of [illegible] tons to France and the total foreign cargoes for the same month only amount to [illegible] tons. The [illegible] are explained by the [illegible] labor troubles [illegible] short, [illegible] and ships are not obliged to proceed to other ports to bunker [illegible]

BELGIUM

Although the rate of output of coal has now reached [illegible] per cent of the pre-war rate in Belgium, the fuel shortage is becoming very serious. It is said there are over 200,000 tons waiting in the Borinage and about 700,000 tons in the Charleroi district for empty trucks. The shortage of house fuel, as explained in a previous report, is principally due to the fact that the mines are obliged to burn domestic fuel, not being able to obtain the usual supplies to mix with their own smalls.

To counteract the reduction in the output due to the shorter working day, coal owners are now considering the question of introducing labor-saving appliances into the mines on a more extensive scale, is a report from the Iron and Coal Trades Review of a recent issue.

HOLLAND

According to the annual report of the State mines in Limburg the coal produced in 1918 in the various mines (as compared with 1917 in brackets) amounted to: In the Wilhelmina mine, 562,228 tons (488,632 tons); in the Emma mine, 661,031 tons (557,237 tons); in the Hendrik mine, 179,013 tons (46,459 tons). Including the remainder of the previous year the total available stock was 1,409,424 tons, of which 1,377,149 tons were supplied to the Government Coal Distribution Office.

The average price of coal was 20.27 florins per ton, as against 15.32 florins in 1917, 12.20 florins in 1916, and 9.41 florins in 1915 (12 florins to the £ at par). A net profit of 2,000,000 florins acrued to the Dutch Government.

GERMANY

According to a reporter in the Iron and Coal Trades Review of Dec. 12 the provisional return shows that the production of coal in the Ruhr in November amounted to 6,100,000 tons, as compared with 6,200,000 in the corresponding month in 1918, and 6,940,000 tons in October of this year. The reduction, however, was solely due to there being fewer working days in November than in October; the daily output averaged 260,000 tons and 257,000 tons in the two months respectively.

It is announced from Berlin that 3000 trucks of coal are being sent to France every day, corresponding to about 900,000 tons of coal per month.

Brazil's Coal Imports during September

The consulate general reports from Rio de Janeiro that during September coal imports into Brazil totaled 9,294 metric tons, of which 5,388 tons were British coal and 3,906 tons American coal. In September, 1918, all the coal imported, [illegible] tons, came from the United States, and in the corresponding month of 1917 of the 25,365 tons imported 19,364 tons were American coal and the remainder British.

Coal in Chile

Bituminous coal is the chief coal imported into Chile and one of the largest industries using this is the nitrate. The temporary inactivity of the nitrate plants has reduced the demand for coal to a minimum. However, a good market may be expected in the future. United States coal is held in high esteem and some importers of coal who were compelled to close their business during the war are planning for trips to the United States or Australia for the purpose of renewing their connections.

Prior to the war, Great Britain and Australia were the largest exporters of coal to Chile, but since 1914 the United States has taken their place. It should be observed, however, coal has again begun to arrive from Australia, and if the United States is to maintain the lead it will require effort on the part of her exporters.

In the nitrate plants, the Pocahontas Valley coal is the one mostly used and very often this is mixed with the Australian coal. For domestic purposes, in the nitrate regions the Australian coal is used without mixing. Of course, the quantity consumed for domestic purposes will be very small.

The question as to who will supply the coal to Chile in the future will probably be decided by the freight rates. In ordinary times, it is a common practice to send coal to Chile as ballast on ships that are to carry nitrate back with them.

The native coal in Chile serves a number of purposes, but it is not as valuable as the imported coal for the reason that it possesses a very rapid combustion quality. The following shows the native production for Chile:

Year	No. Mines	Production in Net Tons
1912	18	1,194,808
1913	17	1,119,081
1914	17	944,829
1915	17	1,050,874
1916	15	1,202,252

The following shows the importation and exportation of coal for a period of five years:

Year	Importation (Tons)	Exportation
1912	1,577,221	263,072
1913	1,587,084	286,536
1914	1,304,470	266,972
1915	461,468	184,962
1916	519,884	173,695

Table showing the importation of coal into Chile for thet year 1917, which are the latest figures available:

Country	Weight	Value
Great Britain	72,306	1,338,222
Germany	484	17,000
United States	288,424	5,000,618
Peru	10	550
Australia	45,443	1,113,613
Total	406,667	7,476,003

Table showing the importation of coke for 1917:

Great Britain	25,480	780,925
United States	72,696	2,188,812
Australia	21	492
Total	98,197	2,9702 9

Table showing the exportation of coal from Chile for the year 1917:

Bolivia	9,200	1,012
Argentina	88,980	8,994
Total	98 180	10,006

N.B. All the weights herein given are expressed in kilos and the value is given in $ per 18 d., i.e. Chilean dollars—(A Chilean dollar is worth about 35 cents in United States Currency.

Both coal and coke are admitted free of duty in Chile.

Efforts to Increase Coal Production

The Government is now doing all in its power to increase the production of the mines and its efforts have been successful to a large extent thanks to the coöperation of the laborers and to the inauguration of a more intensive system of exploitation, employing three instead of two shifts of workmen. It is encouraging to note that owing to these measures, the mines of the Dombrowa coal basin are now producing fully 75 per cent of their pre-war output.

Furthermore, efforts are being made to impress upon coal consumers the necessity of saving that fuel as far as possible by the substitution of wood peat, and other combustibles, which till recently have been little used. It is stated that the reserve supply of wood in Poland could repace 600,000 tons of coal, but the present difficulties in railway transportation make delivery impossible. In addition, there is lignite, of which not more than 15,000 tons per month is mined in Poland. The local production of peat and other substitutes for coal is also small

Foreign Freight Rates

The Shipping Board rates, as of Dec. 22, 1919, by steam, are as follows:

Port	Rate	Tons of Displacement
Genoa-Leghorn	$26.50	1000
Spezia-Saxona	26.50	1000
Piraeus	28.50	1000
Trieste-Venice	31.00	800
Algiers	26.00	800
Cadiz-Bilbao	23.50	1000
Barcelona	26 00	1000
Antwerp-Rotterdam	22.50	1000
Lisbon	22.50	1000
Gothenburg	24.00	1000
Marseilles	26 00	1000
Stockholm	26.00	800
Hamburg	23 00	1000
Rouen	23.00	1000
Malmo	25.00	800
Pernambuco	16 00	500
Bahia	16.00	500
Rio	17.00	1000
Santos	18.00	600
Rio Grande do Sul	19.50	500
Buenos Aires or	16.00	1000
La Plata or		OR
Montevideo	17.00	750
Rosario	19.00	750
Bahia Blanca	17.50	1000
To Nitrate Range	14.00	....
Havana	7 50	600
Cardenas or Sagua	9.00	300
Cienfuegos	9.00	500
Caibarien	9.50	300
Guantanamo	9.50	500
	9.00	400
Manzanillo	9.50	300
Bermuda	9.00	300
Bermuda p.c. and dis. free		
Kingston	9.50	400
St. Thomas	10.00	500
St. Lucia	11.00	500
Barbados	11.00	500
Santiago	8.50	500
	9.00	400
Port of Spain, Trin	11 00	500
Curacao	10.50	500
Free p.c. Curacao		
Demerara	13.00	400

All above rates gross from charter.

Production by Fields

Statistics of production published by the Geological Survey have hitherto been given by states and counties, a grouping which, although capable of exact definition, is often less significant than the producing districts recognized by the industry. The following table apportions the 1917 and 1918 output by producing fields.

It is recognized that some of the districts shown, such as Illinois and Central Pennsylvania, may be further subdivided. The grouping, however, conforms to trade usage and is practically that established by the Fuel Administration.

PRODUCTION OF BITUMINOUS COAL IN THE UNITED STATES BY DISTRICTS, IN 1917 AND 1918.*

District	1917	1918
Central Penn.	59,044,000	61,629,000
Northern Penn.	7,381,000	8,051,000
Pittsburgh, Penn. & Panhandle of West Virginia	50,588,000	51,554,00
Westmoreland, Latrobe, Greensburg, and Ligonier	16,879,000	17,701,000
Connellsville	34,597,000	35,677,000
Somerset and Cumberland - Piedmont	13,848,000	14,267,000
Fairmont, West Virginia	17,568,000	20,104,000
Northern Ohio	26,849,000	30,287,000
Michigan	1,375,000	1,465,000
Southern Ohio	14,098,000	15,768,000
Northeastern Kentucky	6,454,000	7,109,000
Hazard, Kentucky	1,835,000	2,364,000
Kanawha and Kenova-Thacker	27,864,000	30,655,000
New River, W. Va.	15,096,000	14,448,000
Pocahontas and Tug River	24,947,000	23,128,000
Southwestern Virginia	8,604,000	9,041,000
Southeastern Kentucky	6,381,000	8,083,000
Tennessee and Georgia	6,313,000	6,898,000
Alabama	20,068,000	19,185,000
Western Kentucky	10,249,000	10,833,000
Indiana	26,539,000	30,679,000
Illinois	86,199,00	89,291,000
Iowa	8,966,000	8,192,000
Missouri	5,671,000	5,668,000
Kansas	7,185,000	7,562,000
Arkansas	2,144,000	2,227,000
Oklahoma	4,387,000	4,813,000
Texas	2,356,000	2,261,000
North Dakota	791,000	720,000
Montana and Northern Wyoming	7,029,000	7,606,000
Colorado	12,483,000	12,408,000
Utah and Southern Wyoming	9,899,000	11,502,000
New Mexico	4,001,000	4,023,000
Washington	4,010,000	4,082,000
	551,693,000	579,281,000

*Does not include production in Alaska, California, Idaho, North Carolina, Oregon and South Dakota.

Newfoundland Needs Coal

According to a report of the Department of Commerce of Dec. 23, the Government of Newfoundland has deemed it expedient to formulate regulations respecting the sale coal, which have been approved by the Governor in Council.

There is at present in St. John's approximately 2000 tons, or 4000 tons below normal, of anthracite coal, retailing at $28 per ton, and 7000 tons, or 20,000 tons below normal, of bituminous coal, retailing at $15 and $17 per ton. These prices, considering the long, cold winters, are rather hard on those of moderate means, and it is claimed by one of the prominent St. John's dealers if the United States and Canada do not come to the relief of the coal merchants soon there will be more or less suffering among the population.

Canadian Coal Settlements

"On Dec. 23, C. A. Magrath, Fuel Controller, met a few of those interested in the importation of bituminous coal in conference at Ottawa. The shippers and wholesalers of the provinces of Ontario and Quebec were represented, as were the Canadian Manufacturers' Association, the Grand Trunk Railway and the Canadian Trade Commission. The object of the conference was to decide on the best method to adopt in settling for the emergency coal. The meeting unanimously approved Mr. Magrath's ruling, which was that this coal must be invoiced to the Canadian Trade Commission by the United States shippers at prices in accordance with the United States Fuel Administration rulings.

World's Production of Coal

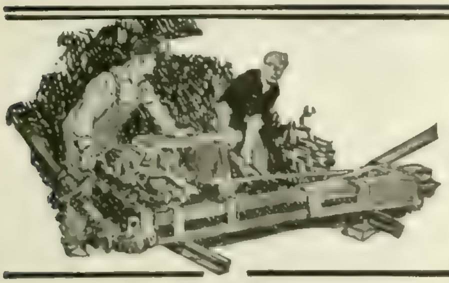
Comparisons of the production, price movements, currency expansion, and war debts of the principal countries of the world between the five years 1910-14 and the present year have been issued as a White Paper.

The output of coal as compared with United Kingdom, United States of America, France, Belgium, Netherlands, and Germany follows:

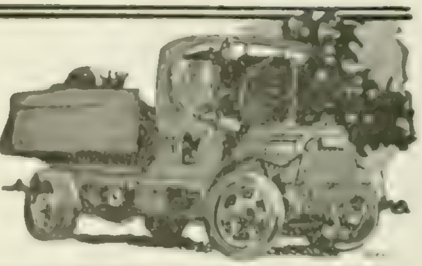
Monthly average.	Tons	Proportionate figures.
1913	87,270 000	100
1918	86,903 000	99.6
1919 (1st half)	70,326,000	80.6
1919 (2nd quarter)	69,327,000	79.4

Siberian Coal for Manchuria

In order to relieve the fuel crisis in the Far East and in consideration of the foreign exchange, the Osotop (fuel conference) has proposed a shipment of the Tcheremkhovsky and Transbaikal coal to Manchuria says a report which was translated in the Russian Division, Bureau of Foreign and Domestic Commerce from Russian Economist, Vladivostok, for July 21, 1919.



COAL AND COKE NEWS



Wilkes-Barre, Penn.

Lehigh Valley Coal Co. officials meet to discuss ways to Americanize mine workers. Plan to combat Bolshevism. Vice President F. M. Chase, General Counsel F. W. Wheaton and Mining Superintendent Thomas Thomas among the speakers at the conference. Many of the miners cannot speak English. Must be taught to appreciate the U. S Government and the country's institutions.

The second of a series of social meetings of the staff and field officers of the Lehigh Valley Coal Co was held in Hotel Redington, Wilkes-Barre, recently, 250 men, including clerks, foremen, assistant foremen and superintendents of four divisions, Luzerne, Lackawanna, Wyoming and Susquehanna, as well as the official staff, attending. The purpose of these meetings is to talk over the means of improving the relationship between the company and the rank and file of its 19,000 employees.

One of the main topics that was discussed at this meeting was the rising tide of Bolshevism in many parts of the country—to determine how far it has reached the anthracite regions, if it has reached it at all, and how to help stem it.

F. M. Chase (vice president and general manager of the Lehigh Valley Coal Co., presided, and Judge F. W. Wheaton of the company (general counsel), introduced the speakers.

Speaking of Bolshevism, Mr. Chase said: "There are signs of unrest and I think Bolshevism has not reached us here yet. But with your help we must try to keep it out. We must not let it rear its head. One of the best ways to accomplish this end is not to let it in at all.

"Among our 19,000 employees," continued Mr Chase, "I know there are few if any Bolshevists. We must prevent the others from becoming converted to these dangerous doctrines. Not only must we help them as employees of the company, but as American citizens. We must give them fair and honest treatment and not take advantage of them in any way.

Many of the men come to us from overseas, where they had hard taskmasters, and so they are used to becoming suspicious against authority. They are being told by men who have no love for this country of the evils wrought on them, of the wrong, imaginary as it is, that is being done to them by capitalists. They hear such reports from their fellow workmen and read them sometimes in the foreign-language papers. Very little has been done and is being done to combat these false and dangerous doctrines.

"Tell them that the evils the demogogs talk to them about do not exist. Convince them that this form of government is better than the Soviet form. Help them appreciate the United States and its institutions. Tell them that it is the greatest country in the world. Try to convince them it is better for them to be good, law-abiding citizens than to be creatures who try to overthrow the world and turn it upside down."

Following Mr. Chase, Judge F. W. Wheaton pointed out the democracy of America and the opportunities that are offered here to all, by taking his own life as an example. He said that he was born of comparatively poor parents and succeeded to the point that he has, only through his own initiative and energy. His opportunities were those of the average, he said. His career exemplified that of Mr. Chase and of other officials of the company, he asserted.

He contrasted this democracy with what the Bolshevists want to bring about. He said, "The object of the Bolshevists is to turn upside down this government which has existed so long, the greatest government of all time. They abandon all belief in the sanctity of the home. They [illegible] family. They are atheists. They want to destroy Christianity and all the authority which goes with Christianity. When our people get aroused to the purpose of these Bolshevists they are going to hold fast to the laws and to the administration under these laws."

He declared that one of the reasons for the present social unrest was due to malicious propaganda, which is being spread through the country's industries, he said. It was incumbent then upon the company's officers, such as foremen, assistant foremen who come into daily contact with the men to help combat its further progress.

Among the other speakers were Thomas Thomas, mining superintendent, Dr. S. P. Menger, head of the compensation department, and Frank L. Scott, purchasing agent, all of whom gave interesting talks.

Fairmont, W. Va.

Car shortage decreases production more than celebration of Christmas during holiday week. In Fairmont region, 110 mines shut down. Most of the coal goes to Ohio and Michigan. Future production expected to be restricted owing to car shortage and other causes.

A sharp shrinkage in production featured the Christmas week in northern West Virginia, as might naturally have been expected under all circumstances and in view of the holiday season; but what contributed to the decrease in tonnage, to an even greater extent than a celebration of the holiday, was a car shortage existing throughout most of the week. Early in that period there was a most pronounced shortage, Monday being the exception owing to a Sunday accumulation. However, by Christmas eve cars were so scarce that no attempt was made, to any appreciable extent, to produce coal, there being 110 mines alone, on the Monongah division of the Baltimore & Ohio, in the Fairmont region, shut down owing to the car shortage, the same conditions prevailing throughout the entire northern part of the state.

Of course production was at a standstill on Christmas day. There were possibly 30 per cent. of the miners at work, on an average, the day following Christmas when cars were somewhat more plentiful, the railroads having had an opportunity to catch up. There was a still better supply available on Saturday the twenty-seventh, but even then a good many mines were without cars.

As a result of the conditions described, there was a loss of fully one-third in the output of northern West Virginia regions, the total output in the Fairmont region being 4470 cars, or about 222,450 tons. While the number of cars on hand on the twenty-ninth was sufficient for that day's loading, nevertheless the supply of empties was below the usual Monday quota. By a perversity of fate or some peculiar circumstances, cars always appear to be plentiful when there is a shortage of men, because of a holiday or for other reasons, as was the case during the latter part of the holiday week.

The prospects were for a continuance of the shortage in the Fairmont region and in other northern West Virginia fields. During the holiday period the ratio of eastern to western shipments was about five to one most of the coal westward bound being for points in Ohio and Michigan. There was a decided decline, during the period referred to, in the tonnage of railroad fuel shipped, it being fully 50 per cent. less than during the week ending the twentieth.

While railroads appeared to be showing a disposition to settle for coal diverted and [illegible]

Upon the threshold of a new year northern West Virginia operators were none too optimistic as to the immediate future, being inclined to believe that, owing to a car shortage and other causes, production [illegible]

Charleston, W. Va.

Car shortage further decreases limited production of Christmas week. Prolonged poor transportation certain. High-volatile coal went West until Dec. 27. Then embargo is lifted and Kanawha coal goes to tide for export. Large number of New River mines shut down due to acute car shortage. Little relief by railroads in payment for coal confiscated and diverted.

Production in this territory was on the downgrade throughout the holiday week, a general cessation of work during the last three days of the week, of course, being in part responsible for the limited production, but the loss was fully as great from a car shortage alone. While there was a fairly adequate supply available at the outset of Christmas week by Wednesday, Dec. 24, there were only about 800 cars available for this portion of West Virginia and northeast Kentucky as against a normal supply of about 3200 cars.

Even after Christmas day, when the small number of men at work makes it unnecessary to have a large supply, there was not more than a 50 per cent. supply, and by Saturday the situation, from a transportation standpoint, had grown worse instead of better. There appears to be no certain relief in sight, although railroad officials hold out hopes of an improvement by Jan. 15. As to any such prediction, operators, generally speaking are skeptical. Some of the more pessimistically inclined operators even go so far as to predict that the car supply will be far from adequate for the next six months. Even those not so pessimistic regard a prolonged car shortage as certain.

While operators in this area had begun to receive compensation for coal appropriated by the railroads during the strike, such returns were still rather meagre and shippers were beginning to wonder just when the railroads would begin to settle in adequate amounts for coal taken, especially in view of published reports of what was being done to relieve the situation.

While, of course, there was a decided demand for coal from this section of the state, coal men said the demand was not particularly brisk, or in other words that buyers were not in particular haste to secure coal. An effort was being made by producers of both high-volatile and smokeless coal to make up the deficit in contract shipments, due to the strike, however, little progress was made in that direction owing to the car shortage and the cessation of work during the last three days of the week. Practically all of the high volatile coal had been forced into the West up until Saturday the twenty-seventh, when the embargo as to tidewater shipments was lifted, coal beginning to flow once again to the coast.

Loadings were limited in the Kanawha field throughout practically the entire holiday week owing to a car shortage and to the Christmas let up in operations. Cars were about as scarce as they have been at any time during the present calendar year the scarcity becoming most acute in the Kanawha region on the day before Christmas when as a sample there were only [illegible] cars in the entire Kanawha section, forcing many mines to shut down before the general Christmas-eve suspension. Even the general

Christmas suspension resulted in the accumulation of no cars for Friday and Saturday loadings.

Of coarse nearly all mines lacked full working forces as large numbers of miners were making the last half of Christmas week a vacation; but, even with a less number of cars needed, the supply was short, there being not over a 60 per cent. car supply on Friday, Dec. 26. On Saturday, the twenty-seventh, there was only about a 40 per cent. supply available. Of course under such circumstances little headway had been made in regaining ground lost during the strike and producers were consequently far behind with their orders. Operators were somewhat encouraged when the ban as to export shipments applying to high volatile coal was lifted on the twenty-seventh, owing to the fact that export coal brings a better price than is being received for coal shipped to domestic markets.

New River fared little better than the Kanawha region in point of cars furnished during the week ended Dec. 27. On Wednesday, Dec. 24, the day before Christmas, the supply had fallen as low as 113 cars, and on Friday the supply was equally poor, although it made less difference then, owing to the fact that miners were not working in large numbers. As a result of the acute car shortage, there were a large number of mines shut down in the New River field during the week, so that it became impossible to overcome a part of the tonnage loss sustained during the strike, and shippers were, therefore, falling behind with their orders. Despite repeated promises no relief, to amount to anything, has been afforded by the railroads through the payment for coal confiscated and diverted during the period of the strike emergency. While frequent meetings have been held by operators of the New River field, no change has been made as to the "check-off" and the contract of Sept. 1 still stands as abrogated. This has made no appreciable difference, however, in production in the New River region.

Bluefield, W. Va.

Production about one-third of normal in Pocahontas field during Christmas week. Car shortage and lack of miners limit output. Railroad motive power also inadequate. Ban on exports removed, smokeless goes to tide. Tug River field at a standstill for almost a week; labor and car shortage the cause.

While, of course, it was not to be expected that the production of coal would be maintained in the Pocahontas and adjoining regions during Christmas week, yet the output fell far below general expectations during the holiday period as much from car shortage as from a cessation of work on the part of the miners. There was a general relaxation of work throughout the southern part of the West Virginia mining fields, especially during the latter part of the week; but that would not account for the large loss in the output sustained, it being estimated that operations were limited to about two full days, so that production was only about one-third of normal. In fact little loading was done in the southern West Virginia regions between the twenty-fourth and the twenty-ninth of December. The car supply began to run short at the very outset of the week, interfering with plans to produce as much coal as possible before Christmas eve. In addition to the shortage of cars inadequate railroad motive power so blocked sidings that it was impossible to place empties or move loads.

Miners at various points in the southern part of the state began to desert the mines even as early as Dec. 13, there being a further exodus on Saturday, [illegible]. The day after Christmas an attempt was made to operate mines but the number of men it was possible to command was so small that the speak of was mined on the twenty-sixth or the twenty-seventh. It was not until about Jan. 1, in fact, that miners were reporting for work in sufficient numbers to restore production to noraml.

[illegible] being moved eastward during Christmas week for export, yet at the beginning of the following week, the [illegible] and [illegible] certain [illegible] for overseas shipment. Operators throughout the southern part of the state welcome the opportunity to resume export shipments, owing to [illegible] possible to obtain for [illegible] fuel on domestic shipments being such as to make it impossible for operators to quite meet their costs.

Only 669 cars were loaded in the Tug River field during the week ending the twenty-seventh, that representing a production of about 33,450 net tons, or little more than one-third of the amount of coal produced during the strike. Between the twenty-fourth and the twenty-ninth of December, production in the Tug River region was virtually at a standstill. While it is true that a part of the loss was attributable to the absence of so many mine workers, yet an even larger source of loss was the extreme car shortage. Still another handicap was the inability of the Norfolk & Western to move loads promptly through insufficient railway motive power. Full cars blocked loading at a number of operations during a part of the week. On Friday, Dec. 26, only 33 cars of coal were loaded in the entire Tug River field, 72 cars being loaded on the twenty-seventh.

Even the lull in operations during Christmas week failed to bring relief form a car supply standpoint, for empties furnished on the twenty-ninth were sufficient only for a 50 per cent. loading. Notice was received in the Tug River field just before the close of the year, that it was permissible to ship coal for export under certain conditions. Coming at the time it did,, the order permitting export shipments was gladly received because of the better price commanded by coal for export. There is still a large amount of money due Tug River operators for diverted and confiscated coal, it is stated.

A quite limited tonnage was produced in the Pocahontas region during the final full week of the year, owing to the fact that mining activities wer confined to about two days of the week. In the first place even with a reduced number of men at work the car supply was entirely inadequate, a number of mines finding it necessary to shut down even before Christmas. Of course in the two remaining days of the week following Christmas, there were many absentees and it was, therefore, impossible to secure any production either on the twenty-sixth or twenty-seventh, although on the North Fork and at one or two other places an attempt was made to start, but was given up when only five and six men at a time put in an appearance. As a matter of fact there was a shortage of miners until the first of the year.

Huntington, W. Va.

Logan output 50 per cent. of capacity during Christmas week due to acute car shortage. Labor shortage less troublesome. Further production losses predicted due to poor transportation.

Little more than half the capacity output of the Logan field was mined during Christmas week, but the holidays were not so much to blame for the greatly decreased production as was a quite acute car shortage lasting throughout virtually the entire week. The shortage cut into production to the extent of nearly 26 per cent., causing a loss of 67,139 tons; on the other hand, the labor shortage, which covers an observance of the Christmas holidays, entailed a loss of only a little more than 16 per cent. or 42,601 tons. The total production loss was 124,000 tons, being almost equal to the output for the week of 138,000 tons.

When the car supply was sufficient and other conditions were favorable, and in fact up until Dec. 15, the Guyan field was producing coal at the rate of 240,000 and 250,000 tons a week. However, the production for Christmas week of 1919 was nearly 70,000 tons in excess of that of the same period of 1918; the lack of demand being responsible for the loss of the earlier year.

At no time during the holiday week were mines able to secure a full supply of cars, and in a number of instances producers gave up trying to get out any coal closing down their mines for the holidays. At the outset of the following week cars were plentiful it being stated that there were enough cars on hand at the beginning of the week to last for three days; but when that supply was exhausted it was predicted there would be further production losses from car shortage.

For the first time in about two months Logan coal began to flow eastward in small quantities about the twenty-seventh when the embargo against eastern shipments was removed. Most of the eastbound gas coal and splint was consigned to tidewater.

Owing to the large tonnage of Logan fuel diverted during November and a part of December, Logan producers were behind with customer's orders and are now bending all their energies toward regaining ground lost during the strike. There is naturally an excellent market at the present time for the Logan product.

Ashland, Ky.

Northeast Kentucky production cut in two Christmas week. Labor largest source of loss; car shortage next. Output for 1919 about ten per cent. under 1918. Still $1,000,000 due operators for coal taken by railroads.

Christmas more than cut production in two in the northeast Kentucky region, the output during the period ending the twenty-seventh amounting to only 77,620 tons or about 45 per cent. of previous weeks. In fact during the period ended the twentieth, the output was right aroun1 160,000 tons. Full time production for the five working days of Christmas week should have reached 168,000 tons. The largest source of loss, of course, was from labor, amounting to 47,500 tons or about 28 per cent. Still the car shortage loss was not much below the above figures. It cost the production of 33,000 tons or 22 per cent.

As nearly as can be stimated, the production for the year in the northeast Kentucky fields was 6,000,000 tons or only about ten per cent. under the 1918 production. When it is taken into consideration that during the first five or six months of 1919, there was virtually no market at all, and that during the latter part of the year, a strike curtailed production, the 1919 output is regarded as being extremely satisfactory.

While payments for coal diverted and confiscated are somewhat more liberal than has previously been the case, there is still outstanding about $1,000,000 due operators for fuel taken by the railroads or else sent to others than original consignees.

There was a somewhat better supply of cars available on Dec. 29, and in fact right up until the end of the year when the supply began to dwindle again.

Topeka, Kan.

Members of Kansas Legislature considering state law to settle industrial disputes. Governor Allen interested. Administration program to include three dominant policies. Recent coal strike may develop an industrial court. Profiteers to be prosecuted. A new Workmen's Compensation law considered of vital importance.

Preparatory to the meeting of the Kansas legislature in special session on Jan. 5, members of that body have under consideration numerous plans for a state law which will meet the requirements of the present industrial situation, brought to an acute head by the recent coal strike. Governor Henry J. Allen, in his proclamation calling the special session, has asked the legislature to formulate some method whereby disputes between employer and employes (in essential industries) may be settled without a complete curtailment of production caused by strike or lockout, pending a settlement of the dispute. Arbitration of these disputes, Governor Allen declared, has proved inadequate. Some other plan, in the operation of which neither party of the dispute shall have a final voice, must be devised, he stated.

The administration legislative program as proposed will include three dominant policies. First, an indusrial court will be urged, it is said, with a possibility that the legislature may undertake the establishing of such an institution itself, and also recommend such as a solution of the current problem on a national basis. Profiteering laws will be second. Recourse by the public may be secured through a bill providing for a jury determination of profits. Another course in this particular may be through a commission or license system to retailers and affecting tradesmen, middlemen and producers. A third provision considered of vital importance is for a new workmen's compensation law. A commission was appointed by the governor at the request of the last legislature, which met the first part of this year, to investigate the operation of the present workmen's compensation law and to report recommendations for its revision or a new law. The World, Tulsa, Okla

Birmingham, Ala.

Interesting byproduct coke oven development in Alabama. Two iron making concerns step in at the Ensley byproduct plant as the Tennessee company retires. Four additional Alabama furnace companies using byproduct coke. Two other iron concerns building new plants.

There was more or less speculation as to what would become of the Semet-Solvay byproduct plant at Ensley when the Tennessee Coal, Iron and Ry. Co. recently blew in its additional complement of byproduct ovens, became independent of the Semet-Solvay coke supply and, therefore, decided not to renew the contract which expired Jan. 1, according to the Birmingham Ledger.

Continuing this paper says: "There need have been no speculation except as to who would use this plant. Two ironmaking concerns have already arranged to take over what the Tennessee company does not need. They will furnish the coal, just as the Tennessee company did, and they will also take the coke for furnace operation. The Semet-Solvay will continue to convert and market the coal-tar byproducts.

"The outcome of this change of service will be one of greater benefit to the district. Two more iron makers will operate on the economic output of the byproduct oven instead of the wasteful output of the pen beehive oven. Already we had four Alabama furnace companies making and using the byproduct coke, namely the Central Coal and Iron, the Tennessee, the Woodward and the Gulf States Steel. With two more getting the supply of the Semet-Solvay, and the and Sloss-Sheffield and the Birmingham Coke and Byproducts building new plants, soon there will be not as much waste of our coal, but, on the contrary, an additional economy in our iron production, and added wealth in the coal tar derivatives.

Thus are we effectively meeting the competition of other iron making centers that would otherwise put us out of business.

PENNSYLVANIA

Anthracite

Pottsville—The Pine Hill Coal Co., of Minersville, near this place, is putting down 12-in. bore holes on its property, by means of which this company hopes to combat a fire in its mine workings.

Hazleton—The G. B. Markle Co., with operating headquarters at Jeddo, north of this place, is negotiating with the Union Improvement Co., of Philadelphia, Pa., for a renewal or extension of a lease covering the mineral rights on the coal land, on which are Jeddo No. 4, Highland No. 5 and the Ebervale collieries. Some 1800 employees are affected by the temporary suspension of operations at these mines.

Scranton—The Langcliffe colliery of the Hudson Coal Co., at Avoca, near here, was taken over recently by the Suffolk Coal Co., composed of former Mayor E. B. Jermyn and his son, E. B. Jermyn, Jr. John Jermyn, father of E. B. Jermyn, was one of the pioneer coal mining men of the region. He was born in Suffolk, England, and the name of the company that took possession of the Langcliffe colliery is taken from the name of his birthplace. About 500 men are employed in and about the Langcliffe colliery. It was stated by E. B. Jermyn, Sr., that immediate improvements will be made to the plant and that every effort will be made to increase the daily output.

Bituminous

Hollsopple—Fire recently destroyed the mine tipple of the Flora Coal Co., located near here, in Somerset County. The tipple was formerly owned by the Salmore Coal Co., whose offices were in Johnstown; was purchased on Nov. 1 by H. H. Cassler, of this place.

Champion—Kelly Bros., of Snow Shoe, recently acquired the extensive coal mine interest of J. Fred Kurtz and P. McGinness, of Connellsville, and the Bygate estate, of Pittsburgh. The property purchased is at Champion, on the Monongahela River, in Fayette County, Pa., and the consideration was $347,000. It is said the mine when worked to its full capacity, has an output of 600 to 800 tons of coal per day.

Brownsville—It is reported that the property of the Orient Coke Co., at Orient, Fayette County, Pa., has been taken over by the Reilly-Peabody interests of Pittsburgh, Pa., who operate the American-Connellsville Coal and Coke Co., near Brownsville. The Orient [illegible] operation is said to be a model plant as [illegible]

Waynesburg—The following transfers of Pennsylvania coal lands have taken place recently: E. D. Patterson, of this place, purchased the coal underlying two tracts of land in Morris Township, near Deer Creek, Greene County. The tracts contain 147 and 98 acres, respectively. The price paid was $175 per acre, or $42,875 for the two tracts. David C. Cumpston, of Waynesburg, recently sold to E. H. McClelland and John Mackay, of Uniontown, the undivided one-fourth of the Pittsburgh seam of coal underlying two tracts of land in Springhill Township, Greene County. T. Riley Huffman and wife, of Waynesburg, sold to the Fish Coal Co. (a W. Va. corporation) six tracts of coal land (aggregating 277 acres) in Springhill Township, in Green County. Henry G. Dalton and wife, of Brandt, Ohio, sold to the Cleveland Cliffs Coal Co. an undivided one-third interest in 41 parcels of land in Morgan and Jefferson Townships, Greene County. Robert Hobson and wife, and Frances H. Whitten and wife, all of Hamilton, Ontario, Canada, sold to the Stelco Coal Co., an undivided one-third interest in 18 parcels of coal land in Morgan and Jefferson Townships.

WEST VIRGINIA

Bluefield—The Smokeless Coal Operators Association of West Virginia has elected the following governing board for the various districts in West Virginia, it has been announced from headquarters of the Association, at Washington, D. C.: Pocahontas district, T. E. Houston, of Cincinnati, Ohio, and O. M. Deyerle, of Bluefield, W. Va. New River district, C. C. Beury, of Charleston, W. Va., and R. H. Gross, of Boston, Mass. Tug River district, George Wolfe, of Winding Gulf, W. Va., and J. T. Wilson, secretary of the Tug River Association, Bluefield, W. Va. Winding Gulf district, P. M. Snyder, Pemberton Fuel Co., Mt. Hope, and E. E. White, Glen White, W. Va. J. J. Tierney, of Philadelphia, Pa., treasurer of the National Coal Association, was elected president of the Smokeless association, succeeding T. E. Houston, who declined reelection. Other officers elected were: G. H. Caperton, first vice president; Justus Collins, second vice president; W. R. J. Zimmerman, Charleston, treasurer; E. J. McVann, secretary, Washington, D. C.

Charleston—More wagon mines are in operation at the present time in West Virginia, as far as it is possible to tell, than at any time during the present calendar year or in fact, since the armistice became effective on Nov. 11, 1918, a general shortage of coal and weather conditions being contributing factors in causing a resumption. When the 75c. a ton allowance was eliminated by the Fuel Administration, wagon mine production in West Virginia ceased to a great extent, and a large number of mines were either dismantled or fell into disuse and decay. While the shortage of coal revived wagon mine production it has, at no time since such revival, reached the proportions attained during the war, the same incentive or stimulus not existing. Even when wagon mine operations were resumed, an order against the use of open top cars tended to discourage wagon mine production; and, while that order was rescinded just before the strike, a car shortage has materialy hampered operation of the wagon mines, such plants always being served only after tipple mines have been supplied with cars.

OHIO

Columbus—[illegible] United States Court rendered a decision in the suit brought by John H. Winder, formerly president of the Sunday Creek Coal Co, [illegible] ceiver for the stock of the Sunday Creek [illegible]

ILLINOIS

Carlinville—[illegible] of the Standard Oil Co. here have opened with about [illegible] During the strike [illegible] moved from Carlinville, and it will take time to bring [illegible]

Moweaqua—Miners reporting at the Moweaqua [illegible] there would be no work until mine operators are allowed to charge higher prices for coal. F. A. Schafer, owner of the mine said that he could not afford to continue operation if he were forced to pay a 14 per cent. increase in wages, but could not increase selling prices. He wired the Fuel Administration at Washington, explaining the situation, asking the right to [illegible] About [illegible] men were employed.

Carbondale—Movement of coal from the southern Illinois coal fields on the St. Louis division of the Illinois Central R. R. recently was the heaviest in the history of the road. The great increase in coal output which immediately followed the strike of the miners caused a great revival of business on the road. All the mines are working full capacity, much of the coal moving to Chicago and to northern Illinois, as southern Illinois was well stocked with coal during the strike. On one day recently 1400 cars of coal were handled on this one railroad. The Illinois Central has taken on many additional trainmen, brakemen and firemen.

Springfield—Coal production in central Illinois for the year 1919 will run approximately four million tons short of that of 1918. There have been [illegible] eras, one the great national strike and the other fostered by an insurgent element of the state miners' organization. Another reason for the decreased production was the failure of consumers to lay in their winter supply of coal during the [illegible] of 1919. More than 26,000,000 tons of coal were mined in central Illinois during 1918. The production of the 80 mines affiliated with the central bureau, amounted to 18,091,008 tons. The remaining tonnage came from the shafts operated by the railroad companies. There are several railroad mines in the vicinity of Springfield which are operated by railroads, among them being the Divernon Coal Co.'s shaft at Divernon and controlled by the Illinois Central and the Superior Coal Co.'s shaft at Gillespies operated by the Northwestern. Approximately 25,000 miners are employed in central Illinois shafts. They represent 31 nationalities with American born, including those of the colored race, ranking first. The Italians rank second, Austrians third, Germans fourth, Lithuanians fifth and English sixth.

KANSAS

Lawrence—The prize coal producing crew among the volunteers in the strip pits in the Kansas field came from the University of Kansas. The Kansas Agricultural College was second in production. The students from the University of Kansas manned Carbon No. 2 pit in Cherokee County. John Crawford, State Labor Commissioner, reported to Governor Allen that University of Kansas students produced 51 of the 170 cars produced by volunteers in the Crawford-Cherokee strip pits. Governor Allen is sending to each member of the college crews, which helped in the emergency, a personal letter of thanks and greeting from the state for the work done in the coal fields.

INDIANA

Indianapolis—The Rowland Powder Collieries Co. is to begin the extensive development of its extensive acreage of coal lands in Owen, Greene, Sullivan and Clay Counties. New capital to the extent of $900,000 was recently issued to Indiana, Ohio and Pennsylvania investors.

LaFayette—The Monon railroad has reported freight business for a recent week the heaviest in its history. For the week in question this company moved 13,651 loaded cars as compared with 7486 during the same week in 1918. The company moved 5265 empties during the week, 75 per cent. of which were coal cars and which were sent to coal mines and stone quarries on the Monon railroad in southern Indiana.

ARKANSAS

Fort Smith—Refusal to permit Thomas H. Shaw to inspect their mines, as state mine inspector, caused Mr. Shaw to close three more mines of the Central Coal and Coke Co., at Huntington. This makes seven Central mines in this vicinity which Shaw has closed. About 1200 miners are affected. The Central company refuses to recognize Shaw as mine inspector as a result of his removal from office by Governor Charles H. Brough. Shaw contends the governor is without power to remove him. Nine Central mine officials have already been fined from $50 to $100 by justice courts for their refusal to allow Shaw to inspect the mines. Governor Brough has called upon the state board of mining engineers to revoke Shaw's certificate of qualification as mine inspector. The Central company has headquarters at Kansas City.

Industrial News

Hazard, Ky.—The Midland Mining Co., has increased its capital from $190,000 to $300,000.

Williamsburg, Ky.—The High Splint Coal Co., has increased its capital from $300,000 to $400,000.

Whitesburg, Ky.—The Peerless-Elkhorn Coal Co., of Elkhorn City, has been incorporated by J. B. Ramey, Cora Ramey and others, with a capital of $100,000, and plans active development.

Sheridan, Wyo.—The Peabody syndicate of Chicago has purchased and assumed control of the seven coal mining properties in Sheridan County. The consideration was said to be about $7,000,000.

Cincinnati, Ohio—The Southeastern Coal Co., has been chartered with a capital of $25,000 to mine and sell coal. The incorporators are Walter A. Knight, Carl Phares, Lewis M. Hosea, Daniel J. Butler and Norma D. Berger.

Youngstown, Ohio—The Essential Coal Co., which was organized by Youngstown business men to operate an abandoned mine near this city, recently dumped 20 tons of coal on the principal street corners for the benefit of the needy. Police officers were used to see that only the needy were supplied with fuel.

Piedmont, W. Va.—The Kalbaugh Coal Co. has been incorporated with Dr. Z. T. Kalbaugh, as president and T. F. Shaffer, Cumberland, Md., secretary and treasurer. The company has already started to develop a mine on the old Kalbaugh farm, near Barnum, W. Va.

Columbus, Ohio—The Ganaden-Goshen Coal Co., has been chartered with a capital of $300,000 to develop a large coal tract in the Hocking Valley. The incorporators are S. R. Yoacum, L. C. Schaferm, George L. Stephenson, W. J. Eckart and Fred Anthony.

Charleston, W. Va.—Mines in [illegible] and Clay Counties, W. Va., will be operated by the [illegible] Coal Co., which has been formed having a capital of $[illegible]. It is understood construction work will be begun [illegible] on preliminary development work.

Pottsville, Penn.—The Hillvein Coal Co. recently incorporated with a capital of $50,000. This concern is a river operation at Gordon, Schuylkill County, and is now [illegible]. The president of this company is Frank McLaughlin and the treasurer [illegible].

Yeager, Ky.—The [illegible] Coal Co. in Pike County, is reported to be arranging plans for the development of additional mining properties. [illegible] new equipment will be installed for [illegible] and it is understood that the machinery will be electrically operated wherever possible.

Charleston, W. Va.—Philadelphia capitalists will undertake extensive coal-land development in the Warren district of Upshur County, W. Va. They have obtained a charter for the Philmont Coal Co. The capitalization is $100,000. The Phiadelphians include Llewellyn O. Knipp, George H. Grove and M. F. Pattersen.

Williamson, W. Va.—The Himler Coal Co. has changed hands, after being in operation for the last two or three years, the purchasers being John Matta, of Brownsville, Penn., and associates. The operation of the Himler company is at Himler in the Kenova-Thacker field on the Norfolk & Western Railway.

Bluefield, W. Va.—With a view to specializing in the export and bunker trade, the Virginia Smokeless Coal Co., it has been announced here, has established a sales office in New York City, with Benoit D. Weill as manager of the new branch. The company has plants in both Virginia and West Virginia.

Cincinnati, Ohio—The R. H. Elkhorn Coal Co. was incorporated with an authorized capital of $50,000. The incorporators are: J. M. Hamilton, president; D. E. Richards, treasurer; George V. Richards, secretary; F. R. Bayless and Walter E. Doll. The company will operate mines in eastern Kentucky near Pikeville. Its principal office will be in Cincinnati.

Charleston, W. Va.—While the Crown Hill Coal Co., with an operation at Crown Hill, already has mines in operation and is mining coal in the Coalburg seam, the company is making arrangements through the installation of a small plant in addition to the one now in operation to produce coal from the Cedar Grove seam. The Crown Hill company is said to be owned by the Richmond, Fredericksburg & Potomac R. R. Co.

Birmingham, Ala.—The Richardson, Phenix Co., of Milwaukee, Wis., lubricating engineers and manufacturers, announces the opening of an office at this place with James D. Scruggs as district manager. Mr. Scruggs knows the South, its people and its industries and has had a broad engineering experience in all matters connected with the efficient and economical lubrication of machinery in general.

Louisville, Ky.—Representatives of the Louisville & Nashville R. R., have asked for a reduction in rates from eastern Kentucky points to stations on the Manistee & Northwestern R. R., stating that present combination rates are prohibitive. A decrease of 80 to 85c. a ton was asked, with a rate of $2 a ton net from the mines to Anderson, Ind., and $2.10 to Muncie, Yorktown and other cities.

2 by the Hocking Valley Ry. officials that during the first three days of the week, starting Jan. 5, no coal consigned to shippers which are reached through the Toledo gateway would be accepted. This rule was made to aid in relieving the congestion. Also it is announced that no consignments of coal to Detroit shippers will be received without a special permit secured from the terminal distributor in Detroit.

Beckley, W. Va.—Smokeless coal in the Raleigh field will be mined by the Crab Orchard Fuel Co. of Crab Orchard, W. Va., this company having just been organized by Raleigh County citizens. Operations are to be on rather an extensive scale as indicated by the new company's capitalization, $350,000. Behind the new company are Prince E. Lilly, John Hornbrook, R. C. Hornbrook and E. F. Hornbrook, all of Lillybrook; C. E. Lilly, of Fireco, W. Va.

Philadelphia, Pa.—The Emmons Coal Mining Co., of West Virginia, Inc., with offices in the Land Title Building, of this city, has let a contract for its new tipple at Bayard, West Virginia, the equipment of which will be furnished by the Roberts & Schaefer Co., of Chicago; it will consist of a Marcus picking table screen, Roberts & Schaefer shaker loading boom, together with all transmission machinery and refuse disposal apparatus in connection with the plant.

Clarksville, Ark.—A new mining company has been organized here under the name of the Clarksville Anthracite Coal Co. The new company will open up a mine in the Spadra field, where it has a lease on 280 acres of a 40-in. seam of coal. W. N. Cunningham, formerly connected with the Smokeless Coal Co., is president, and Guy Johnson, secretary and treasurer. The other members of the company are J. H. Brock and Charles and Leslie Bryant.

Wayne, W. Va.—The Buterick properties consisting of about 2000 acres of coal land in Wayne County, owned by Elihu Root and wife, of New York, and James M. Buter, of Boston, were sold on Friday, Dec. 26, to L. A. Tinder and L. W. Hamilton, of Charleston, W. Va., for the sum of $40,000. The land is on Laurel Creek and the right fork of Camp Creek. The purchase of the Buterick properties is thought to presage early development in the Stonewall district, of Wayne County.

Dayton, Ohio—The Best Coal and Coke Co., has been incorporated with a capital stock of $200,000, according to a dispatch from Columbus, Ohio. Stock of the Best Coal Co. (with offices in the Reibold Building) was sold to the new company by John H. Best, sole owner. The incorporators are: A. F. Aker, of Pitsburg, Ohio; Russell V. Green, formerly with the Baltimore & Ohio R. R., at the Dayton offices; James Anderson and Robert H. Ball, of the Ball Coal and Mining Co.

Bluefield, W. Va.—The Carter Red Ash Coal Co. has changed hands, having been taken over by the S. L. Matz Coal Corporation. The plant of this company is at Raven, Va. Under the new owners extensive improvements are to be made, including the installation of a large amount of equipment. It is expected by the company that it will be jossible to increase the production from about 300 to about 1500 tons a day. The Matz Corporation is headed by Samuel Matz of Bluefield, W. Va.

Logan, W. Va.—Work is to be started at once, it is announced, on the new plant of the Faulkner Coal Co., at Mallory, Logan County, where the company expects to spend about $150,000 in development work. It will require a period of about six months to have the plant in operation. The company estimates that in time it will be possible for it to produce about 200,000 tons per annum. The company not only expects to install modern mining machinery, but also to erect a number of dewellings for miners.

Williamson, W. Va.—All doubt as to the sale of the Red Jacket Consolidated Coal Co.'s mines, at Red Jacket, in the Mate Creek region, and as to the identity of the purchaser, has been dispelled by the announcement that M. A. Hanna & Co. has secured control of the Red Jacket properties including large acreages of coal on Mate Creek, in Mingo County. It was rumored for a time that either the United States Coal & Coke Co. or the Solvay Collieries Co. was buying the Red Jacket holdings. The property is on the Norfolk & Western Ry.

Morgantown, W. Va.—Rumors were in circulation here during Christmas week to the effect that the Bethlehem Steel Corporation had completed a deal for the purchase of the Morgantown & Kingwood Railroad, a coal road operating between Morgantown and Kingwood, but there has been so far, no confirmation of such a rumor, although there has on the other hand been no denial. The understanding is that the active management of the railroad will be under the direction of the management of the Penn Mary Coal Co., a subsidiary of the Bethlehem concern. Of course the deal cannot be consummated, if the rumors be true, until after the railroads are returned to private control. The purchase of the railroad by the Bethlehem company has always been regarded as the logical sequence of the sale of the Elkins Coal and Coke Co., by the Elkins interests, since the railroad was always operated by the same interests and for the purpose of developing the rich Decker's Creek country.

Charleston, W. Va.—While the number of new coal companies launched in West Virginia during the month of November was not quite equal to that of previous months, yet out of a total of 69 resident corporations and charters, 12, or almost one-fifth of the entire number, were coal corporations. The total authorized capital represented by the 12 companies was $2,975,000. Considering the fact that conditions during November were not conducive to inviting the investment of capital in new coal enterprises, the number of companies formed is generally regarded as being most encouraging. In the list of prominent new companies organized during the period stated were the following—the authorized capital stock of each being given: Fairmont City Gas Coal Co., Fairmont, W. Va., $300,000; Soper-Mitchell Coal Co., Morgantown, W. Va., $250,000; Hazy Eagle Coal Co., Charleston, $200,000; Sprague Land Co., Tams, W. Va., $250,000; King Fuel Co., Logan, W. Va., $500,000; Lincoln Smokeless Coal Co., of Logan, operation in Fayette County, W. Va., $600,000; Imperial Smokeless Coal Co., Charleston, $600,000.

Foreign News

Valparaiso, Chili.—Several new coal deposits have been discovered in Southern Chili, according to reports published in Las Ultimas Noticias recently. Reports indicate that 10,000,000 tons can be mined, and it is said that development is under way.

Calgary, Alta.—Report from Calgary and other points on the prairies are to the effect that the shortage of fuel is likely to be felt more or less seriously in the western province of Canada this winter. Describing the situation in Calgary a writer points to its incongruity: The Drumheller and Three Hills coal fields are to the east, the Lethbridge and Crow's Nest coal fields to the south; the Bankhead and Canmore mines to the west, and the Brazeau and Edmonton fields to the north. Even with such conditions Calgary, having only 75,000 population, finds it hard to get enough coal for ordinary domestic use in cold weather. Of course the trouble is that the One Big Union strike of last summer prevented the accumulation of surplus stocks, and now that the demand is heavy, the coal is being shipped straight from the mines to the hands of the consumer. The city of Calgary is expected to undertake the introduction of a system both to increase the production and facilitate distribution.

Nanaimo, B. C.—The Wakesiah mine of the Canadian Western Fuel Co., which was opened up recently near here, is producing some 200 tons of coal daily. This mine has not been doing much until lately and the results now being obtained are considered satisfactory. The output, however, evidently is not to be allowed to remain at that level, it being the company's intention to bring it up to 600 tons a day in the course of a few weeks. Figures issued by the Canadian Western Fuel Co. indicate that, whereas a few years ago the bulk of Uanaimo's coal was marketed in the United States, today the reverse is the case. In 1917, 41.5 per cent of the coal mined by the Canadian Western Fuel Co. was sold in British Columbia. In 1918 the percentage had risen to 58.5 per cent, and for the first ten months of the present year, 70 per cent. of the output was sold in the province. In November when the big coal strike started in the United States, this percentage was further increased. Instead of shipping more coal to the other side, as might have been expected under the circumstance, the company sold 75 per cent. of its output in the province. The only coal going to the United States from this company's mines is coal for which contracts were made last summer, when there was not enough business in the province to take care of the output and the mines had to be kept running by seeking foreign contracts. Before the war the company sold most of its coal in the United States but when the war started this policy was changed, so that when the war ceased it found itself without foreign markets and more output than it could sell to the domestic trade. This resulted in the seeking of contracts in Seattle, Wash., which since have been retained.

Personals

H. A. Samcke, of New York office of the Consolidation Coal Co., has been appointed manager of this office.

G. A. Austin has been designated as acting assistant superintendent of the Marytown and Big Sandy plants of the Solvay Collieries Co.

Rex. L. Tomb, formerly buyer for the Black Band Fuel Co., has been appointed manager of stores for the Raleigh-Wyoming Coal Co.

A. E. Trumbare has just been appointed manager of the Export Department of the Consolidation Coal Co., with headquarters in New York.

Elmer H. Finch, geologist, has recently assumed duties of Chairman of the Mineral Division, Land Classification Branch of the United States Geological Survey.

F. E. Gould has been named as superintendent of the Lehigh plant of the Jamison Coal and Coke Co. He succeeds P. F. Shamblen, resigned. The appointment became effective the latter part of December.

J. E. Parsons, according to an announcement recently made, has been appointed manager of the Philadelphia office of the Consolidation Coal Co. [illegible]

C. B. Creid[illegible] this colliery.

C. P. Mutch [illegible] Eccles, W. Va.

Thomas M. Paul has been named superin[illegible] Standard Oil Co. He is a practical miner [illegible] held this position before, having resigned from it only last summer.

W. H. Kramer [illegible] appointed manager of the Pennsylvania division of the [illegible] Penn Mary Coal Co. in West Virginia.

J. E. Sale, [illegible] Colliery Co., has severed connection with that company in order to engage in business as a consulting engineer, at Bluefield, W. Va., where he has formed a partnership, the engineering firm being known as [illegible] & Sale.

David E. Parker, of Hillcoke, Fayette County, Pa., has resigned as superintendent of the Isabella plant of the Hillman Coal and Coke Co., effective Jan. 1, and will move to St. Clairsville, Ohio, where he takes charge as general superintendent of the group of mines of the Clarkson Coal Co., of Cleveland, Ohio.

Carl A. Baer, engineer, announces that he has formed a partnership with Merritt T. Cooke, Jr., who prior to the war was a member of the firm of Stuart, James & Cooke. The business of the new concern will be conducted under the firm name of Carl A. Baer & Co., engineers, with offices in the Land Title Bldg., Philadelphia.

Harry Whyel, of Uniontown, Pa., with large coal and coke interests, principally in Fayette County, Pa., is said to have recently taken action to dissolve the Sewickley Creek Coal Co., of which he is president. This company has been operating in the Irwin gas coal basin in Westmoreland County, Pa., and the plant will be dismantled on account of the exhaustion of the coal on this property.

Alva Gilliland, of Braznell, Fayette County, Pa., has resigned as superintendent of the Snowden Coke Co. He has purchased an interest in and will take charge of the operation of the Franklin Coke Co., at Tippecanoe, Fayette County, Pa. This plant is on the Pennsylvania R. R. between Brownsville and Uniontown. The company is mining the Pittsburgh seam and has 30 beehive coke ovens on the property.

C. W. Clark has been named as assistant general manager of the Standard Oil mining properties here. He is a brother of F. M. Clark, formerly general manager of the Carlinville & Wood River industries of the Standard Oil Co. Mr. Clark is a mechanical and an electrical engineer and had charge of installing all of the electrical work in the new Carlinville mines of the Standard Oil Co. He has been residing in Carlinville for about one year.

A. C. Fieldner, supervising chemist, Bureau of Mines Station, at Pittsburgh, Pa., recently read a paper on Fuel Analysis, at the annual meeting of the New Jersey Clay-Workers Association and the Eastern Section of the American Ceramic Society, held at Rutgers College, New Brunswick, N. J. The speaker [illegible] on this subject, covering such matters as the sampling of coal, methods of analysis, the determination of [illegible] bility of ash. He [illegible] survey of the fusibility of the ash of [illegible] from such sections as Pennsylvania, Virginia, West Virginia, Ohio and Tennessee.

Obituary

J. H. Wheelwright died Jan. 7 at Paris, France. Mr. Wheelwright was president of the Board of Directors of the Consolidation Coal Co., and formerly president of the National Coal Association. The news is a distinct shock to his many friends in the coal industry. Details are lacking as the paper goes to press.

John H. Reilly, aged [illegible] superintendent of the Nellie mines of the Reilly-Callaghan Coal and Coke Co., Georges Township, Fay[illegible]

D. M. [illegible]

Harry McKean Conner [illegible] position with the United States Gypsum Co. [illegible] took him to many of the coal regions of the [illegible] he has advised on the development of coal properties in Brazil and was in touch with such activities in other foreign lands. Mr. Conner was born in East Mauch Chunk, Pa., and was a brother of Eli T. Conner, also of Scranton, and a mining engineer whose specialty is managerial consultation on coal mining.

Publications Received

Power in Alberta. Water, Coal and Natural Gas. By [illegible] Commission of Conservation, Ottawa, Canada. Illustrated; pp. [illegible]

Hennepin and La Salle Quadrangles. By Gilbert H. Cady. State of Illinois Department of Registration and Education, Division of the State Geological Survey. Bulletin No. 37. Illustrated; pp. [illegible]

Trade Catalogs

Westinghouse Underfeed Stokers. The Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa. Circular No. 1615. Pp. [illegible]; 8½x11 in.; illustrated. Complete description of the stoker and detailed information about installations.

Davis-Bournonville Lead Burners Outfits. The Davis-Bournonville Co., Jersey City, N. J. Pp. 6; 8½x11 in.; illustrated. Description of apparatus for welding lead sheets, storage battery connections and all lead work. Notes as to its use.

Waterbury Rope. The Waterbury Co., 63 Park Row, New York City. General catalogue and price list. Pp. 220; 3½x6¼; illustrated. This handbook is a ready reference on information applicable to all hard fibre cordage, wire rope and music wire.

Coming Meetings

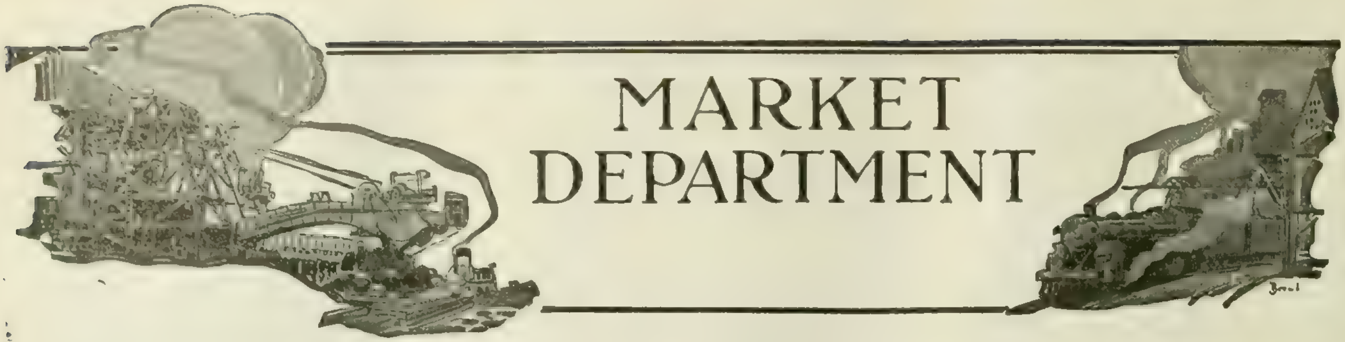
Northern West Virginia Coal Operators' Association will hold its next meeting Feb. 10, 1920, at Fairmont, W. Va. Secretary, George T. Bell, Fairmont, W. Va.

National Conference of Business Paper Editors will meet at the Astor Hotel, New York City, Jan. 16, 1920. Secretary, R. D. Hall, 36th St. and 10th Ave., New York City.

American Institute of Mining and Metallurgical Engineers will hold its next meeting Feb. 16 to 19, in New York City. Secretary, Bradley Stoughton, 29 West 39th St., New York City.

The Wholesale Coal Trade Association of New York will hold its next meeting Jan. 20, 1920, at the Whitehall Club, New York City. Secretary, Charles S. Allen, 1 Broadway, New York City.

The Rocky Mountain Coal Mining Institute will hold its winter meeting Jan. 19 to 22, 1920, at Denver, Colo., with headquarters at the Albany Hotel. Secretary, F. W. Whiteside, Denver, Colo.



MARKET DEPARTMENT

Weekly Review

Production in Bituminous Districts Shows Marked Change for Better—Coke Market is Unusually Brisk Operators Hoping for Best from Investigation Committee

COLD weather has briskened the demand for the domestic sizes of anthracite, and in New York City operators are sold up for weeks in advance. This is to be expected for the production in 1918 was 99,000,000 tons and in the present year it has been but 86,000,000 tons. There is no reason for panicky conditions, however, for Buffalo, where a lot of independent anthracite coal has been sold at a big premium, is puzzled to find a place for it.

Production in the bituminous mines increased this week. It is slowly approaching normal despite holidays and car shortages. However, with a generally recognized holiday, the New Year, the railroads had a chance to pick up, but the condition is not even yet satisfactory. It is cheering to note that practically all of the mines in Illinois and Indiana were working in the past week and that they added materially to the production. The operators are protesting against the price they are allowed to charge, and many will doubtless be obliged to shut down if relief is not afforded them.

The difficulties of the operators in supplying the demand for coal are intensified by the railroads requiring that where the operators are behind in their railroad orders the operators shall give the railroads their coal first and leave manufacturers and other users without. Unless the railroads get what they desire, it is feared that they will resort again to the commandeering of coal.

Coke producers are extremely wrathful at those few violators of the law who are charging an undue price for coke. They are determined to bring them to time by legal process. The scarcity of coke has made the market unusually brisk, the purchasers being convinced that coke will be scarce for some time to come.

Exporters are receiving more attention from the producers of bituminous coal, for they will pay a better price than can be received in the home market. The quantity of fuel that has been shipped since the bunkering of coal was forbidden has been enormous and the shippers are well satisfied with conditions. From now on the output of coal should be above normal. Several operators would like to close down as their mines cannot be run at a profit at such wages and prices as now exist by Government rule, but they do not like to appear to disobey the orders of authority even when those orders are violative of common justice. The operators are hopeful of the results of the investigation commission. They feel sure that it will grant them an increase in prices, and they do not want to lose their men by closing down their plants. They argue that quite frequently with inadequate prices an idle plant is more costly than one that is working.

WEEKLY COAL PRODUCTION

From a report of the Geological Survey dated Jan. 3, 1920, the output of 8,621,000 brought the total production from the beginning of the year to Dec. 27, up to the figure of 451,618,000 tons. With three working days remaining this suggests a total bituminous output for the year 1919 of 458,000,000 tons. This is the smallest in any year since 1915. Compared with the 579,886,000 tons of the record year, 1918, it is a decrease of more than 121,000,000 tons.

While the Christmas holiday caused a drop in total production, the rate per working day during the week ended Dec. 27 was practically the same as that of the week before. The average for the five working days was 1,724,000 tons and this was 85.5 per cent. of the daily rate for the four weeks ended Dec. 20 which may be regarded as normal.

The average for the week, [illegible] per cent normal, is not, however, a true measure of the extent to which operations have been resumed in the steam districts, for neither the day before Christmas nor the day after count as full working days. A better measure is found in the fact that on Monday, Dec. 22, the output was 101 per cent of normal, or in the fact that compared with production at Christmas time of last year, the week shows an increase of over 2,000,000 tons.

The output of anthracite during Christmas week fell to 1,351,000 net tons, a decrease of 396,000 tons, or 23 per cent., when compared with the preceding week. The holiday slump was not as marked as last year, when the output of Christmas week was only 1,289,000 tons.

The total production from Jan. 1, 1919, to Dec. 27 amounted to 85,400,000 net tons. The three working days remaining may raise this figure to 86,225,000 tons for the year 1919.

The holiday slump carried the output of beehive coke down to 322,000 tons during the week ended Dec. 27. Compared with the preceding week this was a decrase of 58,000 tons, or 15.3 per cent. The decrease was felt in all districts. The active state of the coke market, however, is indicated by the fact that in spite of the holiday season and a restricted car supply, the production was greater than at any time from mid-April to mid-July last.

The total production of behive coke from the beginning of the year to Dec. 27 was 19,440,000 tons. Allowing for the working days which remain, this suggests an output of 19,650,000 tons for the year 1919. Production in recent years has been as follows (in net tons):

1913—33,585,000   1916—35,464,000
1914—23,336,000   1917—33,168,000
1915—27,508,000   1918—30,481,000
1919—19,650,000

Competition of byproduct coke and the comparative inactivity of the steel industry during 1919 have thus resulted in the smallest output of beehive coke in many years.

Atlantic Seaboard

BOSTON

Market decidedly apathetic. Movement light via all routes. Operators confine themselves largely to contracts. Export ban lifted at Hampton Roads. Shippers query as to effect of releasing coal for overseas. Anthracite movement good. Signs of slackening demand.

Bituminous—The year opens with little interest in steam grades on the part of the buyer. New England steam-users are well supplied and it is difficult to see where any broad market can develop for several weeks to come. It is not unusual to find textile or other mills with reserves that will last until April or May, so generally foresighted have been most consumers in this territory during the past 18 months. There is a scattering inquiry for spot coal, but such request is practically all from small users and from retail dealers who are apprehensive lest mining or transportation be again interrupted.

Movement, however, continues very light. A large number of cars that had been held several weeks at destination have recently been released, and this is another reason why the market is apathetic. Water deliveries have been practically nil from New York and Philadelphia and yet there is no apparent anxiety in any quarter. From Norfolk receipts have been less than normal, but they have been sufficient to meet requirements of contractors. Notwithstanding what amounts almost to a certainty of higher cost coal next season there is apparently no effort to get forward shipments in volume.

The railroads have taken good care of themselves during the past 60 days, to judge from the number of cars of commercial coal confiscated, and while short car-supply and the lack of men prevail at the mines there is not likely to be any materially increased movement for the present.

Operators are, in fact, [illegible] to contract. Spot [illegible] are of course hampered by the [illegible] out of which the [illegible] pay the wage advance [illegible] that business will [illegible] basis. "Smithing" coal [illegible] and certainly there will be [illegible] to permit shipments on a renumerative basis, especially in the thin seam districts.

The ban against overseas shipment has now been practically raised, the announcement being made on Dec. 29 by the Railroad Administration permitting 50 per cent. of the tonnage that moved on export requisitions during October, this applying so far only to the Hampton Roads piers. The trade naturally expects, however, that export coal will be permitted to move via the Philadelphia and New York piers also within a few days. This will introduce another element into the price situation, for with $1.35 extra allowed on coal actually loaded into foreign vessels, and with a lot of tonnage due on high-priced contracts executed early in the year, there is bound to be a better movement to Tidewater. In time, if present mining conditions are continued, it may mean a better market for coal in our own markets.

There is some apprehension among Hampton Roads shippers over the number of steamers waiting for oversea coal cargoes. At one time it was said there were more than 100 of them on demurrage. Are coastwise vessels now to be detained waiting for foreign boats to load? No answer has yet been made to this question, although it is vital to coastwise shippers.

Anthracite—Domestic sizes are coming forward in such good volume that there is much less anxiety over the balance of the season. The demand for "premium" coal is now much restricted, and it would be no surprise to see the bottom drop out altogether, after a few weeks. There are still communities that will need current supplies for some time to come, especially if the weather continues cold, but in cities like Boston and Providence the edge is completely off the demand, except for steam purposes. The demand from householders has been insistent, but now it is slackening.

There is no call for steam sizes in any direction. The market lasted only long enough to enable retail dealers to move their surplus acquired in 1918, but not long enough to help out the producers to any measurable extent.

NEW YORK

Local anthracite market active with little coal to meet the demand. Chestnut coal easier. Weather conditions aid consumption. Demand for buckwheat strong. Concessions made to move barley. Retail prices advance because of wage increase. Bituminous market slow. Supplies at this tidewater low.

Anthracite—Good consumption temperatures added activity to the local market. Supplies, with the exception of the steam sizes, are about as low as at any time recently, and the shortage is felt severely by the local retail trade.

While the wholesale market was enjoying the holiday season the retail dealers were kept hustling to supply the demands of their customers. Receipts at tidewater were curtailed because of the holiday idleness at the mines, but the cars dumped at the local piers during the week exceeded those dumped the previous week.

There was not so much urgency for chestnut coal, but egg and stove were badly wanted, and pea coal was also scarce. A goodly tonnage continues to go westward and to New England. All sizes are made and many inquiries are received daily by the trade.

The steam sizes with the exception of barley, are in good demand. Buckwheat was the scarcest of the three sizes, and quotations were held near company schedule. Rice was also in fair demand with quotations firm. Barley was in over supply and concessions are necessary to move it.

There were 5618 cars of anthracite dumped at the various railroad piers in this harbor during the 7-day period ended Jan. 2, as compared with 4114 cars the previous week, an increase of 1504 cars. During December there were 22,660 cars of anthracite dumped here as compared with 23,331 cars in the previous month of November, and 26,261 cars in December of 1918.

The retail price of the domestic sizes including pea coal, were advanced by the dealers in Manhattan and The Bronx [illegible] per [illegible]

[illegible]

[illegible] little to be had, producers and shippers taking [illegible] as [illegible] as possible.

Reports received from the mines as to the [illegible] are not as satisfactory [illegible] it is said that [illegible] the reports are not as [illegible]

Operators complain of the poor car supply which they say prevents larger production. Because of the holiday season it is not expected that the movement of coal toward the seaboard will begin until the middle of the week, and it will be about a week later before the coal can be expected to reach its destination.

Locally, market conditions are unsatisfactory. The piers are lacking coal and deliveries are considerably delayed. The harbor is filled with empty bottoms and shippers complain of slow loading and frozen coal is causing much delay. Consumers are not suffering from the lack of coal, but they are ready to replenish their storage piles. The bunker business shows a gradual improvement.

Prices are holding firm. The trade does not expect any change in prices until the Fuel Administration relinquishes control of the industry. Operators are now receiving payment for the coal confiscated by the railrroads, some of them having received their first checks last week.

Dumpings at the local tide water piers for the seven days ended Jan. 2 were 4492 cars as compared with 3017 cars the previous week. During December there were 13,829 cars of bituminous dumped here as compared with 16,679 cars in November of last year and 25,169 cars in December of 1918.

PHILADELPHIA

Anthracite consumption heavy due to weather. Retail demand all on stove and nut. Customers decline pea. This size expected to move later. Change of sizes comes up again. Dealers favorite. Retailers encouraged to make closer payment of bills. Big retail change coming. Steam sizes in moderate demand. Bituminous demand mostly on high grade fuels. Contracts customers get the best. Ordinary coals bring top prices. Car supply off.

Anthracite—That there is a heavy consumption of coal in this territory can be said with the utmost truthfulness, yet the demand on the retailers is but moderate when the wintry conditions are considered. To date there has been a full month of real winter weather, snow-fall, alternating with low temperatures. Because of the good deliveries all summer long the dealers are not being heavily pressed at this time by their customers. This should not be taken to mean that they do not have the orders for delivery, for such is not the case, but the consumer is still holding out for either stove or nut.

Most dealers had hoped with the coming of continued cold weather that they would be able to quickly move their stocks of pea, but such has not been the case. While good deliveries have been made of this size, yet the receipts from the shippers have been almost equal to the deliveries. Some yards have actually held pea coal orders with the shippers and many others would like to if it were not for the fear that they might be cut off entirely from receiving stove and nut.

All dealers continue to complain of the small tonage of stove and nut received recently, yet the operators maintain that the tonnage of these sizes sent here recently is well up to and in many cases beyond the average. Certain it is that no dealer is able to keep a supply in his yards, for they all have orders on their books to take up every pound as fast as it arrives.

The steam trade remains quiet for the time of the year. As has been the condition all season, the only real demand has been for buckwheat and this size has been about taken up during the past week, especially since there has been some curtailment of the output due to the holidays. It is believed, though, that the size will strengthen considerably before long. Rice and barley continue to be in only the most

[illegible] there [illegible] are already [illegible]

[illegible]

There is also a slight shortage of the Fairmont [illegible] that heavy tonnages [illegible] are being taken by the railroads for fuel. However this is not felt so much here, as steel plants and brick manufacturers, the heaviest users of these grades, are operating under a reduced schedule due to the weather conditions prevailing. At this time there is a fair amount of business in certain grades, but the car shortage has operated to hold down the trade. The lack of bottoms continues to check the export trade.

Lake Markets

PITTSBURGH

Car shortage continues to hold coal production in the Pittsburgh district at far below the rated capacity, production being at about 75 per cent. of capacity. There has been little improvement in the past week in production, but progress is being made.

There has been an ample supply of domestic coal for local territory and public service corporation and other essentials are well taken care of. The steel industry on the other hand still has some complaints. Mill departments previously in operation are kept going but in some instances the opening of departments long closed, is delayed. By-product coke ovens are getting larger and larger shipments, but in several instances operations are still below capacity.

The coal market is extremely quiet, there being only very limited tonnages of free coal available, and full Government prices are obtained in all cases: Slack, $2.10; mine-run, $2.35, screened, $2.60, per net ton at mine, Pittsburgh district, with a 15c. brokerage allowance in some instances.

CLEVELAND

Ample supply of bituminous is coming in, while Pocahontas and anthracite receipts have fallen off. Production in the southern and eastern Ohio fields is near normal. A downward tendency in prices is noted.

Bituminous—Southern and eastern Ohio mines are reported practically as near 100 per cent. operations as can be expected in view of the labor and car shortage. Receipts of steam coal in the Cleveland district continue sufficient to meet all needs, but are not as large as would be thought. Last week a few plants were able to throw down a little bituminous; this week they have been glad to get their spot requirements. The situation, though, is by no means critical. It is believed that within ten days shipments will approximate normal. Steam-coal consumers are displaying great activity in seeking supplies, and it seems assured that the district will absorb in the next six months all of the steam coal it is allotted. Stockpiles that will be the largest ever are planned by practically all users.

By next week another price revision will have taken effect, and the tendency will be distinctly downward. Steam coal prices will have taken effect, and the tendency will be distinctly downward. Steam coal prices will not show a great deal of change, it is believed, though almost every grade will show a recession. No 8 Pittsburgh lump, now retailing at $7.20, will probably drop as low as $6.50. Other domestic bituminous coal may show a similar reduction. Demand for bituminous from apartment houses and other large consumers has shown a decided advance in the past week.

Pocahontas and anthracite—Receipts of both grades in the past week fell almost to nothing as only occasionally did a carload filter through. No suffering, however, was occasioned, but orders are piling up on dealers' books. Most dealers are entirely out of forked Pocahontas. [illegible] the price has been cut from $10 to $8.95, while one large retailer has advanced mine run Pocahontas from $7.40 to $7.75. Only contract anthracite now is coming through. Prices on all grades are unchanged. Coke demand, boomed during the shortage of the two smokeless grades, has diminished to practically nothing

Lake Trade Owners of vessels being operated in the coal trade between Lake Erie ports and Lake Ontario have met at Cleveland to discuss the question of higher rates for the 1920 season. The reduction made at the beginning of the 1919 season was too sharp, they claimed, and a committee was named to take the matter up with shippers of coal. The new rates, if any, would also apply to coal cargoes taken for Canadian points by the Emergency Fleet Corporation steamers built at Lake yards and taking coal cargoes on their way to the ocean.

Prices of coal per net ton delivered in Cleveland, with steam coal prices still largely nominal, are:

Anthracite—Egg, $11.75@11.90; chestnut, $12.00@12.20, grate, $11.75@11.90; and stove, $11.90@12.10.

Pocahontas — Forked, $10.00 @ 10.50; shoveled lump, $8.95; and mine-run, $7.75.

Domestic Bituminous — West Virginia.. splint, $7.50; No. 8 Pittsburgh, $7.20; Masillon lump,$7.50 to 7.60; canned lump, $10.50; and Coshocton lump, $7.50.

Steam Coal—No. 6 slack, $5.25@5.50; No. 8 mine-run, $5.75@5.90.

BUFFALO

Bituminous trade quiet. Shippers not satisfied with it. Unable to predict what is likely to happen. Cars scarce. Plenty of anthracite locally, but line trade scant.

Bituminous—The situation does not change much. The demand is pretty unsteady, some shippers reporting cancellations. The salesmen are out again and everybody is doing something, but there is an entire absence of the snappiness that so pleases the seller in any trade. It is going to take considerable time yet to get the trade back into line again. The miners do not work at a very brisk rate, but are expected to do better when the holiday feeling is out of the air. They are watching the turn of events and do not yet get down to real work

As to the chances of the strike breaking out again, not so much is said as was at first. The trade is uncertain enough now and most shippers say that too much discussion makes it worse. The prices are not steady, but present quotations are expected to continue, and adding of the mere 14c. a ton does not seem to be uniform.

Car shortage increases, but it has not troubled the coal trade yet as much as it has some other branches of business, probably for the reason that the movement has been so light. However, it will be one of the worst features of the trade as soon as the coal output is normal again.

Canada is still buying bituminous coal at a slow rate. The consumers there bought more heavily than we did, on account of being farther from the supply, but it will be sometime before the demand will be active there. The refusal of our people to accept Canadian money at par hurts the trade seriously. Sometimes the discount is as high as 12 per cent

Bituminous coal receipts by lake (coming from Sandusky, O., and the West Virginia mines for the Lackawanna Steel Co.) were 69,805 net tons, as against 112,840 tons in 1918 and 100,550 tons in 1917. Strikes cut down the business materially last season.

Anthracite—The city has all the coal it wants and the trade has been fairly dull during the past run of mild weather but the return of low temperature will now increase the demand. Lake Shippers are busy looking after their rail-line trade, quite a little of which used to be part of the lake trade.

The shippers who were in the independent anthracite trade are disgusted, for as soon as the [illegible] had shut off their lake [illegible], they filled the towns so full of coal that it was at once impossible to sell [illegible] coal at a premium. In fact it is not easy to sell it at all. Predictions that the regular anthracite would always [illegible] for the present

Coke

Buffalo—[illegible] market is [illegible] the demand is [illegible] as usual [illegible] bituminous [illegible] moderate [illegible] the bulk of it being bought of the producers direct. Quotations are $9.60 for 72-hr. Connellsville foundry, $8.60 for 48-hr. furnace, and $8 for domestic sizes. Stock and breeze coke are not saleable at present. The season's receipts of iron ore by lake total 4,837,981 gross tons, as against 8,707,599 tons in 1918 and 7,925,907 tons in 1917. The falling off is due to the steel strike and other labor difficulties. Stocks are ample in spite of it

COLUMBUS

With reduced car supply and some labor shortage, operations in Ohio fields during the past month have been cut 50 to 60 per cent. of normal. Demand for all grades continues strong. Car supply is expected to continue short for some time

With a strong demand for all grades of coal, operators are bending every effort to produce a large tonnage. Shortage of cars coupled with labor shortage and some small strikes is reducing the output to slightly more than 50 per cent.

Some hesitation on the part of miners to return to work after the suspension and also the fact that some miners left for other lines of employment is causing a shortage of workers in many mines. Then again some of the miners were rather "soft" physically after the extended layoff and they were not able to put in full time until they were again in condition. Taking it all in all the output in all Ohio fields has been a disappointment to operators and shippers generally. The car supply is short and will continue until cars sent to the west and northwest are returned, but it will require weeks for many of these cars to be returned.

The demand for all grades is good. Domestic sizes are eagerly bought up as dealers are trying to keep ahead of their orders which are coming in rapidly. Consumers are in the market for larger amounts as their first supply is now exhausted. Outside of a few instances the stocks in the hands of dealers are rather low. Retail prices are firm at the levels which have prevailed. More uniformity in retail prices is noted as a large part of that sold now has been purchased at government prices. Hocking lump sells at $6@6.50, while mine-run is about $5.65@$6. Pocahontas is quite scarce and retails around $8.25. West Virginia splints are more plentiful and sell in the neighborhood of $7.50 for lump and $7 for mine-run.

Steam business is active in every direction with manufacturing plants in the market for larger stocks. Reserves in practically all instances have been exhaused and an effort is being made to build them up again. Rubber plants are taking a good tonnage and iron and steel plants are also buying better. Public service concerns are good purchasers and the same is true of schools and public institutions, and railroads are taking a larger amount than during the previous week.

No changes have been made in the government prices in the Buckeye State and the list still maintains. A calculation of the increase on contracts necessary to take care of the 14 per cent. advance in wages shows that 25c. should be added in the thick vein district of the Hocking Valley, 26c. in the Crooksville and Cambridge fields, 32c. in No. 4 Jackson seam, 35c. in No. 5 Jackson seam, 40c. in No. 2 Jackson seam and 26c. in the Pomeroy Bend field

CINCINNATI

Taking in consideration the extreme cold weather here during the past week, the demand for coal was not as heavy as was expected. The demand for steam coal was fairly active. Government prices still prevail, with shippers getting only a limited amount for their regular business. There is little or no free coal to offer.

Coal is getting scarcer every day and if the car situation does not remedy itself soon a shortage will be felt. At the beginning of the new year less West Virginia coal was moving westward and more going eastward than had been the case during the greater part of December, owing to the removal of the export ban. As export trade brings a better price than producers are permitted to charge for domestic shipments the new export order was welcomed.

Much difficulty is being experienced by shippers in this locality in closing their books for the year 1919, owing to the large amounts outstanding for diverted and confiscated coal, the railroads not being as prompt in making remittances as they had indicated would be their policy

Following a week of inactivity in the Kanawha region when not more than one-half of the usual tonnage was produced, production picked up somewhat during the early part of last week, averaging 80 per cent. The supply received in Cincinnati depends almost entirely upon the output of the Kanawha and New Region fields.

All grades of Kentucky coal are in demand both in and out of the state, industrial plants being in the market for supplies. The domestic sizes were not much called for, despite the severe weather. Pocahontas producers wound up the year under somewhat more favorable conditions than had marked the course of events during Christmas week, when operations were limited to about two days out of the entire week, with little or no coal being mined between Dec. 24 and 29, but conditions even at the outset of last week were not as favorable as might have been expected from a transportation standpoint, because despite general cessation of operations over a priod of several days railroads had not accumulated more than half enough empties for shipping needs. The bright spot, however, was the permission extended to resume export business.

The demand for coal is so great both from industrial and domestic sources that producers are hard put to take care of contract consumers, shipment of whose supplies were deferred in many instances during the strike.

All coal cars after being emptied here are re-routed to the western section of the country, consquently increasing the car shortage at the mines. Local coal men say that the car situation will soon be remedied. River recepts were far below normal.

DETROIT

A new difficulty besetting the Detroit coal trade is an embargo, declared Jan. 2, on anthracite and bituminous shipments.

Bituminous—Just as jobbers and wholesalers in the Detroit markets were beginning to feel that favorable progress had been made toward smoothing out the complications created by the recent strike of bituminous coal miners, the Railroad Administration becomes an active factor in the situation by placing an embargo, effective Jan. 2, on all shipments of anthracite or bituminous for delivery in Detroit.

It is explained that the purpose is to relieve the present freight congestion in Detroit and Toledo and to head off a more serious stoppage of freight. There are said to be about 5000 cars of freight of all kinds on the railroad tracks in Toledo destined for delivery in this city or to points beyond. When the embargo was ordered there were about 1000 cars of coal on tracks in Detroit.

While jobbers concede that there is no present danger of a shortage in the coal supply of this city, it is felt that a considerable disarrangement of schedules and much inconvenience is likely to be the outcome. There is a certain amount of flexibility in the embargo order, as provision is made for the issuance of permits to those who will give assurance that shipments will be immediately unloaded on receipt of cars. Even with this arrangement, jobbers say there will be a loss of from two or three days to a week's time in the delivery of coal to consignees.

Detroit dealers explain that the delay in unloading cars is due to the difficulty in obtaining men. There is normally a general shortage of labor and now the exteremely cold weather has made it practically impossible to get men to work in the open.

Anthracite—Inquiry for anthracite has been greatly stimulated within the last few days by the continuance of near-zero temperatures. With many household consumers coming into the market to renew their supply of fuel, the retail dealers find that the small stocks at hand are vanishing speedily. The embargo still further delays the delivery of shipments that have been arriving irregularly and in small amounts throughout the earlier part of the winter, affording dealers little opportunity to establish reserves to meet such a contingency as now exists.

BIRMINGHAM

Little change in market conditions over a week ago. Inquiry for steam coal fair, while the demand for the domestic sizes continues strong. Holidays curtail production considerably and forces at the mines are slowly returning to normal. Equipment sufficient to move all coal taken out.

There is no material change in trade conditions over last week. Inquiry for the steam sizes are only fair, but the movement on contracts continues heavy as the output will permit, and there is little of the better grades of steam fuel available at this time, above the tonnage required for the contract trade. Little or nothing is being done in the taking on of new contracts though there is some inquiry and effort from consumers to book such business, but due to the continued unsettled conditions affecting the industry, mines are not inclined to book further contracts at this time.

Mine workers are slow in returning to the pits after the holidays and the output is running from 60 to 75 per cent. normal this week. Although a shortage of equipment has been reported in other fields the supply in this district continues adequate for all needs.

LOUISVILLE

Production considerably off during holidays. Demand keen for steam coal, with domestic sizes also in good demand. Conditions improving somewhat at mining points.

Miners have been taking their usual holiday vacations regardless of the fact that they were out and lost time during the previous two months. Production at mines has been very low during the past week, but with better car supply and heavier tonnage will be increased during the first week of January.

Steam demand continues keen with operators meeting a ready market for every ton that can be shipped. Prepared sizes are also in good demand, as retailers' stocks are very low as a whole, and demand is somewhat better. Mild weather is resulting in light domestic stocks holding out longer than expected, while most domestic consumers are stocked to run through February.

Conditions at the mining points are slowly improving. Miners are finding that the operators have no intention to give in over the matter of closed shops and recognition of unions, and in many cases have been out so long that they cannot afford to fight further for the issue. Again, the wagon mines and small mines are not operating, which results in a larger demand for jobs as a whole.

Many reports are coming out of Middlesboro, which is a hotbed in the Southern Appalachian district, relative to operators discharging numbers of union men, because they are union men, but these reports are wild. The operators are not discriminating against union men, but are steadfast in the matter of refusing recognition. It is reported that 400 miners are still out at Middlesboro, and also reported that one mine has discharged 70 union men.

Indications are that for the next few weeks mines will be able to operate as close to capacity as supplies of labor and cars will permit, as the country needs a lot of coal, and leading operators are of the opinion that it will take months to load up the country to normal. No trouble in selling coal is predicted before April or May at the earliest, although domestic sizes may be a little slow in April.

Foreign Markets

TORONTO

Coal situation relieved. Supplies of bituminous coming forward. Trade continues quiet and likely to remain so.

The coal situation has been relieved by the arrival of shipments of bituminous coal in sufficient quantity to fill the present demands of the market which continue light. Consumers are apparently not anxious to lay in large stocks ahead now that the danger of a shortage seems to be over. The domestic trade is quiet and likely to continue so for some time, being mainly confined to the class of small consumers.

Quotations for short tons are as follows:

Retail—	
Anthracite, egg, stove, nut and grate	$12.75
Pea	11.25
Bituminous steam	9.00
Slack	8.00
Domestic lump	9.00
Cannel	12.50
Wholesale f. o. b. cars at destination—	
Three-quarter lump	6.50
Slack	5.75

Coke

CONNELLSVILLE

Car supply still limits production, and blast furnaces are short. No contract negotiations.

Conditions in the Connellsville coke trade continue to be dominated by the car supply, which is inadequate. There was reduced production in the week of Christmas but not as great a reduction as usual, and the car supply in general seems to be loosening up. Blast furnaces as a whole are very short of coke and would take much more than is being shipped. The furnaces require more coke for their current operations and would also like to stock coke against traffic interruptions during the remainder of the winter, since such stocks as were previously accumulated have been consumed.

There are only very occasional offerings of coke in the open market at the Government limits, and then only of small tonnages, the quality often being inferior. Negotiations on contract coke seem to be suspended entirely. While this may be due in large measure to the fact that contracts could not be made at above the Government limits another factor probably is, that consumers still uncovered do not expect as high prices to rule as they did a month ago, when some very high priced contracts were made. The market remains quotable at $6 for furnace and $7 for foundry, per net ton at ovens.

The "Courier" reports production in the Connellsville and Lower Connellsville region in the week ended Dec. 27 at 205,850 tons, a decrease of 41,334 tons.

Middle West

Middle west is suffering the severest cold snap of the season. Out in Iowa and Minnesota the temperature is considerably below zero. Retail demand is good. Transportation slows down, but we understand the Railroad Administration is doing all they can to get shipments through on record time.

Practically all of the mines in Illinois and Indiana are now working. All of them have business enough on their books to keep them running for some time to come. The demand for steam coal is very active, and growing more active every day. This situation holds true, also, on domestic coal, and those dealers who were so unfortunate as not to have substantial orders booked before the strike, are now out of luck. Fortunately, however, both the steam and domestic trade bought very heavily before Nov. 1, so the situation is not nearly so serious as it perhaps might have been.

Unlike last summer, the average operator out here is not worrying about getting enough orders on his books to run his mines, but now has something else to bother him. Ever since the mines resumed operations, some weeks ago, there has been a scarcity of cars, and this scarcity has grown until it is now quite serious. In fact, in some districts it is a very bad problem. The labor situation is far from settled, although generally speaking, the men appear to be contented and are working steadily in all of the most important operating districts. In some of the outlying coal fields of less importance, there have been some disturbances, but these interruptions have not been considered at all serious. There is no question, however, but that the coal industry will have a great sigh of relief when the labor situation is settled definitely for the next few years.

CHICAGO

Weather cold. Retailers well stocked. Railroads pay for confiscated coal.

Operating companies and jobbers in Chicago are just now beginning to receive checks covering coal which was confiscated or diverted by the Railroad Administration during the strike. There has been considerable red tape in connection with these confiscations and diversions, and even now a great many cars of coal, shipped in the middle of October, but confiscated in November, have not been paid for. This is working hardships on a great many companies, especially operating companies, as a considerable amount of money has been tied up in these confiscations and reconsignments.

The weather in Chicago has been extremely cold and predictions [illegible] the cold wave will continue. It appears that the average retailer [illegible] coal in his bins to take care of his trade in a satisfactory [illegible] liberal shipments of coal have been made to Chicago since the strike was temporarily settled. This cold weather can continue for some time without causing any hardship or suffering.

ST. LOUIS

Seasonable weather is creating a good market, although business is inclined to be slow. Car supply holds up good, but equipment is poor for this market. Railroad movement bad. Embargoes in effect. Steam demand easing up. No high grade coal available.

The local condition is one that is fairly satisfactory in a way, were it not for the easing up in the demand for screenings. While the Government price is being maintained, it is only a matter of time until this will break on account of the surplus tonnage. This refers to standard coal.

The demand for all grades of standard coal otherwise is good, but it is almost impossible to secure 6-in. lump. The railroads are taking more than their share of coal right now, but it is practically forced on them through the hopper equipment furnished, as these cars cannot be unloaded by the trade in the country. Consequently, there is a shortage of fuel in the country districts, and the railroads are thus enabled to get more than their usual tonnage.

Working conditions are good, with a plentiful supply of cars, although labor is still short. The mines are working full time up to the present, and in the Mt. Olive field similar conditions exist.

The Government prices of $2.55 on domestic sizes, $2.05 on screenings, and $2.85 on mine-run, with the jobber's margin of 15c. prevailing.

Conditions in the Franklin County field are good. There is a plentiful supply of cars, and while labor is short, the demand for everything exceeds the supply.

The country demand is exceptionally good, but cannot be taken care of from any of the fields, and in many places the trade did not have coal up to the first of the year since the strike. The weather is seasonable, with no strike, but weather that holds a continuous calling for fuel. There is no change in retail prices and in a general way the conditions are satisfactory to both retailer and operator.

Conditions in the St. Louis territory grew quite serious about the first few days in January on account of embargoes against shipments to country points placed by the Wabash, Missouri Pacific, Chicago & Alton, Missouri, Kansas & Texas and Burlington R. R., thus shutting off shipments to Iowa, Nebraska and sections of Kansas, and almost the northern half of the state of Missouri, which territory was already short of coal. The only reason given is lack of motive power.

Prices per net ton bituminous coal f. o. b. mine today as compared with a year ago are as follows:

Prepared sizes, lump egg, nut. etc.	2.55@2.70	2.55@2.70	2.55@2.70
Mine-Run	2.35@2.50	2.35@2.50	2.35@2.50
Screenings	2.05@2.20	2.05@2.20	2.05@2.20

Williamson-Franklin rate to St. Louis is $1.07½, other rates 92½c.

MILWAUKEE

Coal market is quiet. Dealers undisturbed by the prospective advance in the price of soft coal, as stocks are seemingly sufficient.

The coal market is quiet, with the demand fluctuating with vagaries of the weather conditions. Milwaukee is not worrying over the prospective increase of 30c per ton or more in the price of soft coal, because of the advance in miners' wages. There is seemingly sufficient coal on the docks to bridge over the season and dealers say they will not advance prices on the coal on hand. All coal that may come by rail from now on, however, will have to stand the increased price. Interior points which have been deriving their supplies direct from the mines of Indiana and Illinois by rail will be the sufferers.

A leading shipper reviews the situation as follows: "Practically all coal is contracted for in the spring. These contracts, enforceable by law, contain a provision under which the buyer is liable for any increase in the cost of production and these contracts the Government cannot change. Free coal, or coal not sold under contract is practically unobtainable. Existing contracts are sufficient to keep the mines in full swing, and operators are bound to fulfill their contracts."

In Connection with the Vast Improvements to be Made in the Industry—

in the immediate future one of our readers writes as follows:

"To keep thoroughly posted on up-to-date appliances, new equipment and latest improvements in mining machinery, the most reliable sources are the pages of *Coal Age*"

"We are installing some new equipment and we have recently purchased through the Advertising pages of *Coal Age* the following:

AIR COMPRESSOR
TIPPLE AND SCREEN
MOTORS
MOTOR GENERATOR SET
COAL CUTTERS"

The above is just another instance of an alert, progressive General Superintendent using the advertising section of Coal Age as a Buyer's Guide. In keeping abreast of the times, no progressive coal mining man can afford to overlook the advertising pages. Scanning the pages will not accomplish results ---most of the successful men in the coal mining industry read each issue dilligently and carefully from cover to cover.

"To serve" is the function of the Advertising Section, and as such each coal man should use it regularly--and read and reflect.

COAL AGE

COAL AGE

Volume 17 New York, January 15, 1920 *Number* 3

This Year and the Next

BY FRANK H. KNEELAND

THE year 1919 was one of uncertainties, doubts, fears, forebodings, realizations and even actual despair. The war, so far as active hostilities were concerned, closed in November, 1918, and the beginning of the year following saw the letting down of the strenuous efforts that had been practiced during the period of the conflict. At the beginning of 1919 industry was attempting to make its transition from war to peace activities.

During 1918 large stocks of coal had been accumulated by many concerns, and these had to be consumed before new supplies were ordered. The net result was that the demand for coal at the mines languished during January, February and a large part of March. After this period of depression, business began to pick up, and from then on the loss of production from the cause of "no market" decreased to the vanishing point. Simultaneously with the decrease in no-market losses began an increase in the loss attributable to inadequate car supply. This cause of production loss was present in varying intensity until the close of the year.

This shortness in car supply was, in part, responsible for precipitating the general strike begun on Nov. 1 and which ended, in general, about the middle of December. This strike—if it was aimed at anything in particular—was a protest against the poor car supply and the irregular working time from other causes. While it was supposedly aimed at the operator it actually hit the public and caused no small amount of suffering, particularly in the West, where cold weather set in early and with extreme severity, considering the time of year.

The total coal production of 1919 is estimated at about 544,000,000 short tons, being a decrease of, roughly, 134 million tons, or approximately 20 per cent, as compared with the production of the preceding year. This decrease while in some respects discouraging is by no means disheartening, for in the past considerable recessions in output have repeatedly occurred, and yet the industry never required over two years to "come back" to and beat its former records.

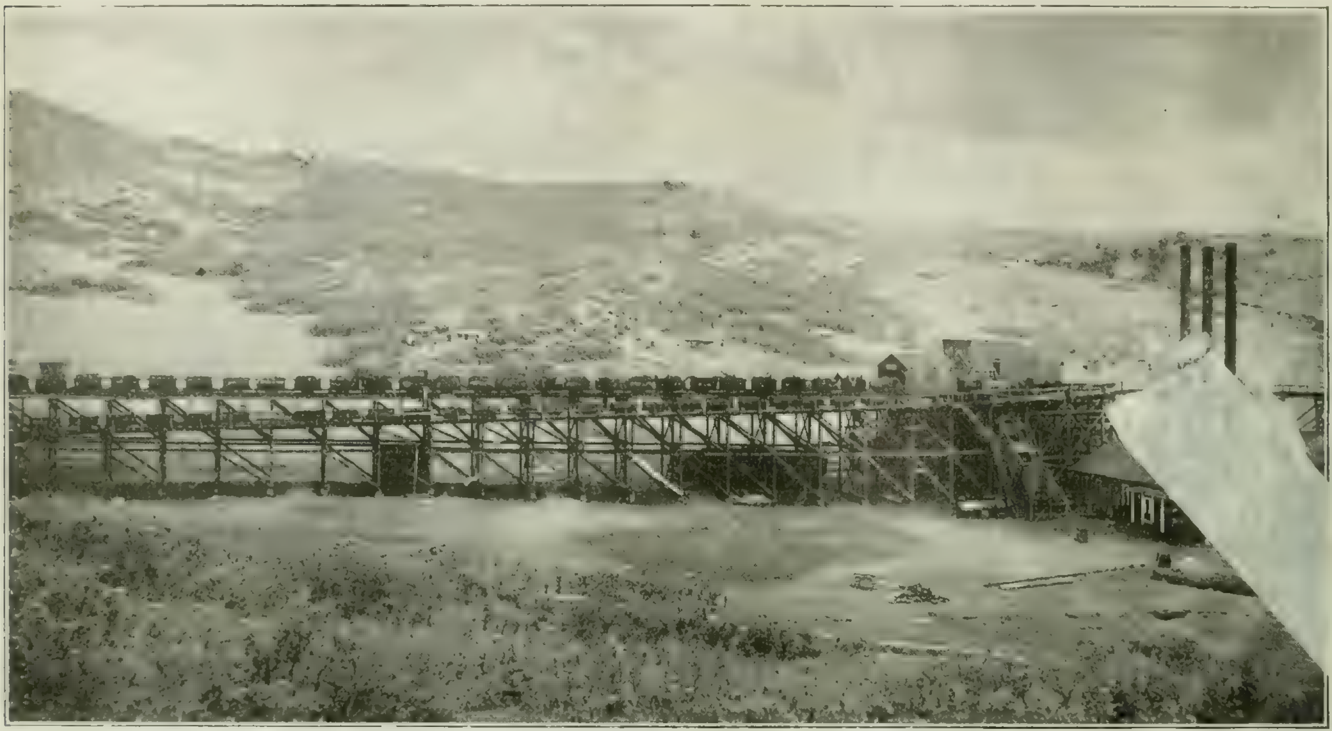
Barring some unknown and highly uncertain considerations, the outlook for 1920 is auspicious. If the miners can be induced to stick to mining—even though, as now, it be at rates that make the incomes of many educators and professional men generally look like the proverbial thirty cents—and the railroads and other consumers will lay in their winter requirements during the spring and summer, and if the Government can be induced to relax its stranglehold upon industry in general, and coal production in particular, the year 1920 should by all omens be a prosperous one. Peace industry long neglected has begun to attain appreciable momentum. The ravages and waste of war have been by no means replenished. The whole world is in need of goods, and the way to prosperity is clear. Unfortunately there is no royal road to this goal, and the only means of its attainment lies in work.

Work, then, should be our motto, watchword and slogan throughout the ensuing year. Intelligent and conscientious effort is the means—and the only means—of obtaining that peace and plenty for which we all long. Work will be in 1920 the veritable password, the countersign, the shibboleth of prosperity.

Coal Mine Fatalities in 1919

By Albert H. Fay
U. S. Bureau of Mines, Washington, D. C.

RETURNS received by the Bureau of Mines from the various state mine inspectors for the first eleven months of 1919 indicate a reduction of coal mine fatalities of approximately 12 per cent as compared with the same period of 1918. The largest reduction in the actual number of fatalities was in those resulting from falls of roof or face with 1,000 in 1919, as compared with 1,210 for the first eleven months of 1918. Underground haulage shows a reduction of 116 and surface haulage shows a reduction of 33.



TIPPLE OF THE OAKDALE COAL CO., LA VETA, COL.
On Aug. 18, 1919, eighteen men were killed here as a result of a gas explosion.

Principal Coal Mine Disasters

The following table gives a list of coal-mine disasters during 1919 in which five or more men were killed:

Date 1919	Name of Mine	Location of Mine	Nature of Accident	Killed
Mar. 31	Empire	Aguilar, Col.......	Mine explosion	13
Apr 29	Majestic	Majestic, Ala	Mine explosion..	22
June 5	Baltimore tunnel..	Wilkes-Barre, Pa	Powder explosion	92
June 30	Alderson No. 5	Alderson, Okla	Mine explosion	15
July 8	Lansford colliery	Lansford, Pa	Gas explosion	8
July 18	Carswell	Kimball, W. Va	Gas explosion	6
Aug. 6	Weirwood	Weirwood, W. Va	Gas explosion	7
Aug. 18	Oakdale	La Veta, Col	Gas explosion	18
Oct 29	Amsterdam No. 2.	Amsterdam, Ohio..	Mine fire	20
Total				201

The monthly production of coal in January was approximately 50,000,000 tons while the minimum of about 36,000,000 tons was reached in February. From this date, the monthly production increased gradually to a maximum of about 63,000,000 tons in October, while the fatality rate, with the exception of the month of June, did not increase in proportion to the production.

Both production and fatalities fell off materially in the month of November, when the fatalities for this month were only 88 as compared with 157 for November, 1918, and 230 for November, 1917. This large reduction in fatalities occurred in the bituminous coal mines where a general strike was declared effective Nov. 1 and continued until about the middle of December. With no large disasters for the month of December, the total reduction in fatalities for the years should be approximately 300. During the year 1919, there were 10 mine disasters in which five or more men were killed resulting in a total loss of 201 lives.

The accompanying tabulations are self-explanatory.

FATALITIES AT COAL MINES IN 1918 AND 1919*

			(Increase or Decrease)	
Underground:	1918	1919	No.	Per Cent
Falls of roof or face	1,210	1,000	—210	—17
Haulage	470	354	—116	—24
Gas and dust explosions	124	173	+49	+39
Explosives	124	198	+74	+60
Electricity	86	64	—22	—25
Miscellaneous	116	128	+12	+10
Shaft:				
Miscellaneous	51	45	— 6	—12
Surface:				
Haulage	111	78	—33	—30
Machinery	40	20	—20	-50
All others	83	61	—22	—26
Total	2,415	2,121	—294	—12

* Period covered is for eleven months only.

COAL MINE FATALITIES BY MONTHS, 1917-1919†

	1917	1918	†1919
January	227	215	186
February	168	222	157
March	230	196	172
April	309	215	189
May	181	211	175
June	232	230	293
July	247	276	220
August	269	249	226
September	181	230	181
October	197	214	234
November	230	157	88
December	225	164	
Total	2,696	2,579	

† Subject to slight revision.

Coal-Land Sales in 1918 and 1919

Location	Acreage	Cost Per Acre	Cost Total	[illegible]	[illegible]	[illegible]	Coal Age Reference
PENNSYLVANIA							
Schuylkill County—Southern Anthracite District: 1918							
Pottsville	202.0	$700 coal 1200 fee		[illegible] & N[illegible]	[illegible]		[illegible] 17, '18 p. 7[illegible]
Greene County Field 1918							
Franklin Township....	333.314	400.00	$133,325.60	H. G. R[illegible]	Heirs James Ingram [illegible] Mrs. H. D. [illegible]		Sept. 19, '18 p. 572
Franklin Township.....	79.713	400.00	31,885.20	H. G. Rockwell, Chicago, Ill	J. H. Knox		Sept. 19, '18 p. 572
	346.525	443.57	153,706.50	H. G. Rockwell, Chicago, Ill	J. B. Scott		Sept. 19, '18 p. 572
	12,000.0	....	4,000,000.00*	U. S. Steel Corp..		[illegible] Monongahela River	Oct. 3, '18 p. 665
	2,566.0	569.00	1,460,098.03	J. I. D[illegible], N. Y. C.	J. V. Thompson Estate	Land in Cumberland, Dunkard and Monongahela	Dec. 19, '18 p. 1140
	330.0	121.21	40,000.00	Thomas M. Inghram and Edward Eady	Farmers & Drovers National Bank		Dec. 26, '18 p. 1182
	1,177.6	382.88	450,645.80	H. G. Rockwell, Chicago, Ill	J. V. Thompson Estate	Whiteley and Franklin Townships	Dec. 19, '18 p. 1140
Morgan Township.		700.00		Enterprise Coal & Coke Co.			July 13, '18 p. 83
	5,000.0	400.00	2,000,000.00	C. G. Rockwell, Atty., Chicago, Ill.			Aug. 1, '18 p. 240
	12,000.0	583.33	7,000,000.00	H. C. Frick Coke Co.	725[illegible] J. V. Thompson [illegible]	[illegible] Townships	Aug. 8, '18 p. 291
		513.48	56,482.91	Cumberland Coal Co.			
Greene County—Pittsburgh District: 1919							
	2,225.0	600.00	1,335,000.00	Cumberland Coal Co.	For U. S. Steel Corporation		Jan. 23, '19 p. 209
Waynesburg..........	110.0	513.48	56,482.91	....	Daniel M. Anderson.		Feb. 13, '19 p. 338
Waynesburg..........	1,500.0	168.00	252,000.00	J. W. Dunnan......	James R. Barnes..		June 5, '19 p. 1064
Waynesburg..........	453.5	500.34	226,905.00	....	James M. Heustead.		June 12, '19 p. 1102
	275.9	500.55	138,100.00	W. J. Kyle.........	Cumberland Coal Co.	(Sheriff's Sale)	June 12, '19 p. 1102
Waynesburg..........	177.3	500.88	88,805.00	W. C. Montgomery..	Paul J. Bickle, Cleveland, Ohio	(Sheriff's Sale)	June 12, '19 p. 1102
	249.29	464.98*	115,915.15	Cumberland Coal Co.	Lew Keener and F. H. Keener	186.97 ac. @ $620 = $115,915.15, ½ interest	
Washington County—Pittsburgh District: 1918							
Washington..........	160.223	100.00	16,022.30	George H. Thiess.....	The Hemphills	Independence Township	July 20, '18 p. 148
Washington..........	131.55	100.00	13,155.00	J. A. Bell	J. O. Scott	Donegal Township	July 20, '18 p. 148
Washington..........	194.556	251.85	49,000.00	John Steel.........	Joseph W. Brown	Cross Creek Township	July 20, '18 p. 148
Washington..........	142.599	100.00	14,259.90	G. H. Thiess	The Hemphills	Hopewell Township	July 20, '18 p. 148
Tylerdale............	92.591	300.00	27,777.30	Pittsburgh Coal Co..	Dr. George M. Kelly	Washington, Pa.	Aug. 1, '18 p. 239
Washington County—Pittsburgh District: 1919							
Washington..........	123.8	300.00	37,140.00	Pittsburgh Coal Co	W. F. Ellwood, Susan E. Mounts, Agnes E. Brownlee		June 5, '19 p. 1064
	552.0	350.00*	193,000.00	Vesta Coal Co......	Joseph Ulery Estate.........		Aug. 7, '19 p. 252
Fayette County—Pittsburgh District: 1918							
Uniontown...........	75.0	5,800.00		Stern Coal Co......	J. V. Thompson, Trustees........................		July 13, '18 p. 83
	150.0 ½ int.	803.40	60,255.00	Hecla Coal & Coke Co...............	C. H. Seaton and L. S. Bowman	Other half of property involved in J. V. Thompson Estate)	Aug. 29, '18 p. 419
Connellsville District:							
La Belle.............	44.0*	682.00	30,000.00*	La Belle Coke Co....	Tract in Harmor Township.......................		Oct. 3, '18 p. 664
Belle Vernon.........	100.0	520.00	52,000.00	W. H. Wilkey.......	....		Jan. 23, '19 p. 209
Spring Hill..........	311.0	128.62	40,000.00	Luke H. Frasher....	Sheriff's Sale, appraised at $25,000..................		June 5, '19, p. 1064
Armstrong County—Pittsburgh District: 1918							
South Bend..........	1,200.0	33.33	40,000.00*	Dr. J. C. McGregor, H. B. Puterbaugh, Harry E. Clark....	....		Aug. 1, '18 p. 239
Westmoreland County—Youghiogheny District: 1918							
	2,500.0	1300.00	3,250,000.00	Pittsburgh Coal Co.	Moore Interest..........	On the Youghiogheny River	Nov. 20, '18 p. 1007
1919							
Greensburg..........	2,200.0	1818.18	4,000,000.00	Pittsburgh Coal Co.	Mrs. Elizabeth Moore............................		Jan. 16, '19 p. 164
Greensburg..........	1,400.0	714.29	1,000,000.00	Pittsburgh Coal Co.	Mrs. Elizabeth Moore............................		Jan. 16, '19 p. 164
Irwin................	167.0	1047.90	175,000.00	Whyel Coal Co.	Helen M. Bygate J. Fred Kurtz		Feb. 13, '19 p. 338
Indiana County—Central Pennsylvania: 1919							
Buffington Township..	112.0	95.73	10,722.65	Vinton Land Co....	Etta Gibson, et al—purchaser for Vinton Colliery Co		Mar. 6, '19 p. 469
Clearfield County—Central Pennsylvania:							
	5,500.0	40.91	225,000.00	Pittsburgh capitalist	N. D. Kelly of Kelly Bros. Coal Co., Snow Shoe, Pa...		June 19, '19 p. 1142
WEST VIRGINIA							
New River District: 1919							
MacDonald..........	6,500.0	56.00*	364,855.25	New River Coal Co..	Keefer Coal & Coke Co. ...		July 3, '19 p. 36
Boone County—Kanawha Region: 1919							
	7,000.0	143.00*	1,000,000.00	Youghiogheny & Ohio Coal Co..........	Crane Real Estate Trust Co.......................		Jan. 23, '19
OHIO							
Vinton County: 1919							
McArthur............	7,019.0	15.53	109,000.00	F. C. Newbury, Phila., Pa......		(Sheriff's Sale)	June 12, '19 p. 1102

* Approx.

The Coal Industry and the Bureau of Mines

By Van H. Manning
Director U. S. Bureau of Mines
Washington, D. C.

Research, such as looking to the extension of the use of bituminous coal in gas manufacture; the use of lignite as a domestic and power fuel; the appraisal of Indian coal lands, experiments on the use of coal dust as an explosive, and an investigation of the fuel value of Nenana lignite were accomplished by the Bureau of Mines during 1919. Much of the bureau's work, such as the training of men in first aid and mine-rescue training, continues from year to year.

By a curious paradox, much of the work which the Bureau of Mines did in the war period had a purpose exactly the reverse of normal activities. Thus the gas researches originally made to protect the life of the coal miner were utilized for the production of gases intended to end the life of the Boche. Now the Bureau has turned its face from the arts of war to the fields of peace again. As a byproduct, war has developed another accessory to safeguard the miner, in the geophone, which has already been successfully used to locate men imprisoned in underground workings and for locating water main leaks. This ingenious device seems capable of further development that will be of much benefit in mining operations.

Unfortunately, so far as the coal industry is concerned, the year just past has not been altogether one of peace. The strike of November last has proved that the public needs to take part in the control of wages and prices in so fundamental an industry to protect its own interest. The balance of power is assuredly in the hands of the public, for the parties to this unfortunate controversy represent less than one-hundredth of the people who are dependent on coal for their heat, light and power.

Thirty-nine per cent of the population therefore suddenly found their livelihood threatened at a time when the development of ability to carry the burdens imposed by war required the highest rate of productivity in almost every line. It is significant that the Fuel Administration was called back to function in this national crisis. Little as the American people like public control of private enterprise, it is evident that they will not suffer their collective well-being to be threatened by disturbances at the source of basic supply.

Public Is Ignorant of Basic Factors

Equally unfortunate is the fact that the public is enveloped in a cloak of ignorance concerning the basic factors governing the coal industry. This is not remarkable, since the spokesmen for the miners picture the coal operator as a conscienceless profiteer who denies a reasonable share of his fabulous profits to permit a decent standard of living for the man underground. The operators, on the other hand, portray the miner as an incorrigible slacker who makes large earnings and seeks to get still more pay for less work. The net result is that the general public is bewildered and is inclined to cry "a plague on both your houses." It is to the interest of all concerned that the truth shall be known, for the American public has always been ready to do the reasonable and square thing, when matters are submitted to it on that basis.

Now what are the elemental facts that we have to deal with? One of them is that until the war conditions were thrust on us we had always had more coal mines and coal miners than the country really needed, and this situation resumed after the armistice. The reason for this is quite simple. The demand for coal in the winter months is much larger than in the summer; the daily rate of burning is greater because motive power requires more coal to compensate for radiation when the temperature is low; lighting companies, gas and electric, need more coal to furnish light when the days are short; and the whole consumption for heating purpose is confined to the winter months. Domestic consumers accentuate this situation by waiting until the approach of cold weather to lay in their store of fuel. The coal industry is equipped to meet the peak load of demand, which necessarily means that during periods of low consumption a considerable proportion of it must lie idle. But even with the miners able to furnish the coal, this does not solve the problem in winter, since often there has been a coal famine because of the inability of the railroads to carry the coal to consumers on account of snow blocking the roads, and extreme cold.

Mine Storage Will Not Meet Difficulty

In other words, the railroads are overloaded at the time of year when they are the least able to carry on their transportation business. Hence, the proposition of storing the coal at the mines, apart from the physical difficulty and expense of so doing, would not solve the problem. Storage at the point of use, however, would go a long way toward solution. However, it must be admitted there are reasons why this is not as simple as it sounds.

The cost of putting coal into storage and taking it out again, including breakage and other losses, is considerable. In addition bituminous coal when piled too high, or when fines and lumps are mixed together, often takes fire from spontaneous combustion. Such occurrences are sufficiently common to act as a decided deterrent to the general practice of storage. On the other hand, bituminous coal for the Great Lake region is mostly shipped on returning ore boats in the summer months and successfully stored for winter use on a large scale, despite occasional spontaneous fires. Not a little study has been devoted to ascertaining the precise cause of spontaneous combustion in coal, without arriving at any exact determination. It is extremely desirable, therefore, that investigations should be made on a sufficiently extensive scale so that the problem can be solved.

As above stated the inequality of production rate at the mines is coupled with frequent inability on the part of the railroads to move the coal at the rate it is offered. The roads should not be blamed for this, in most instances. Their equipment is available for use the year round, but the demand on it is seasonal, and in the autumn and early winter it is severely taxed to move the crops, let alone coal.

RAILROADS SHOULD MAKE LOWER SUMMER RATES

The railroads have many pressing problems of their own and as the handling of coal is a large part of their business, emergency service for other traffic must often be provided at its expense. Any complete solution of the coal production problem will therefore include some consideration of the problems of the railroads and their effect on coal traffic. The railroads should be authorized to put into effect a lowered freight rate on coal in the early summer months, when the demand is usually light. This should stimulate production, as well as furnish an incentive for dealers and consumers to put their coal into stock. Rates should be so adjusted that the total return to the roads for a year will not be decreased.

The objection may be raised that the plan outlined will, through enabling a small number of mines and miners to produce the present yearly output, force some others out of business. As far as the miners are concerned, this, except in some few individual cases, will not be a serious matter, for the general demand for labor is so great that no man needs to go without work. As far as the companies are concerned a shutdown would be only temporary, for the yearly increase of consumption of coal is so rapid that their output would soon be called for.

What we should look forward to is a state of organization of the coal industry in which the mines would work with the regularity and steadiness of a manufacturing plant. It is not worth while to point out that the miners do not work steadily, but lay off 20 per cent of the time when the mines are in operation. There is a saying "Like master, like man" and if the mines are irregular in operation the miners are likely to be also. In addition illness, religious and national holidays, and personal business cause absenteeism that can never be altogether eliminated. The prohibition of traffic in liquor may be expected to reduce irregularity in attendance of the worker at his work to some extent.

WHAT BUREAU OF MINES ACCOMPLISHED IN 1919

Turning now to a brief consideration of what the Bureau of Mines has been able to do for the coal industry in the year that is past, I would mention especially the research done for extending the use of bituminous coal in water-gas manufacture and the progress made toward an extensive investigation of the use of lignites for domestic purposes and power production. A comprehensive review of the explosion tests of coal dust at the experimental mine, near Bruceton, Pa., was completed during the year, and an appraisal of the coal lands in eastern Oklahoma belonging to the Choctaw and Chickasaw Nations was completed, in co-operation with the Bureau of Indian affairs. An investigation of the fuel value of the lignite in the Nenana field, Alaska, was also made.

Much of the bureau's work for the coal industry continues from year to year, such as the training of miners in first-aid and mine-rescue work, and the study of the explosibility of coal dust. In connection with the former, three new steel mine-rescue cars have been put into operation, and in Indiana a mine-rescue truck was presented to the bureau by the Operators' Association. The letters that have been received in acknowledgment of the assistance that bureau men have rendered in connection with the various mine fires and explosions that took place during the year have been highly gratifying. The large attendance of teams, from all parts of the country, at the Fourth National First Aid and Mine Rescue Meet held at Pittsburgh this fall was also gratifying evidence of the widespread interest in the work of safeguarding the life of the miner.

PITTSBURGH STATION DEDICATED ON SEPT. 29

The new experiment station at Pittsburgh, which was dedicated to the public service on Sept. 29, affords increased facilities for the work for the coal industry that is being carried on there. The work on permissible explosives and on safety lamps and coal-cutting equipment is so well known as to require no extended discussion. Study of breathing apparatus is being made to increase the safety and comfort of the wearer, thus increasing his efficiency.

Many chemical investigations dealing with the coal industry are in progress in the Pittsburgh laboratories, such as a study of the constitution of coal, the forms in which sulphur occur therein, the fusibility of coal ash, and a variety of other problems that bear on the preparation and use of coal. Mention should be made of the motion picture, "The Story of Coal," which was photographed under the direction of representatives of the bureau, the cost of making the picture having been defrayed by the National Coal Operators' Association. This is of much educational value and has awakened much interest.

In conclusion I wish to thank the men of the coal industry for the hearty spirit of co-operation they have manifested toward the Bureau of Mines, and to remind them that the bureau is their servant. Whatever they desire it to do will be done, so far as funds are available for the performance of the work. Constructive criticism is as welcome as praise, for it is my aim that the bureau shall render the maximum possible service to the industry that it was created to foster and promote.

Japanese Purchase Chilean Coal Fields

According to Commercial Attaché Julius Klein, Chilean mining and investment circles are much interested in the recent announcement that a Japanese syndicate, which owns extensive iron-ore deposits in northern Chile, is now negotiating for the purchase of coal lands in the vicinity of Concepcion, the center of the carboniferous area along the south coast of the republic. The properties in question lie to the north of the Bio-Bio River up to the boundary of Coelemu province and in the vicinity of the port of Talcahuano, the Chilean naval base, including Los Reyes Island. It is understood that negotiations are being concluded with the owners of the El Rosal mines and of the Tomás Rioseco properties. Other well-known coal lands now being examined by the above syndicate are those held under the names of Arce, Manuel Hurtado, Carlos Huerta, Fidel Cabrera, and Simon Rebolledo. These estates include some of the oldest and most extensive coalfields in Chile. (Refer to Latin American Circular No. 58 on The Chilean Market for Fuel, which was published Commerce Reports Sept. 2, 1919.)

The National Coal Association in 1919

By J. D. A. Morrow
Vice-President, National Coal Association, Washington, D. C.

SYNOPSIS — *The year 1920 dawns auspiciously. No stocks of any amount are now in the hands of consumers, and the demand is keen. During the year just past much information concerning the coal industry has been collected and disseminated to the parties at interest as well as to Congress and to the public. The work of the association is still going on and its machinery, temporarily inactive on account of government control, is ready and waiting when that control shall be withdrawn.*

NINETEEN-TWENTY, in my opinion, will be a good year for the coal industry. Almost every element in the present situation points to that conclusion. Compare conditions today with those at the beginning of 1919. Then the country was overstocked to the extent of not less than 30,000,000 tons; today stocks have vanished and the whole nation clamors for coal. Then "no market" conditions had started the industry on a seven-months' slump in production that fetched us up 100,000,000 tons short of the previous year's output; now the mines can't produce enough to meet the demand. Then we hadn't had a touch of cold weather and were started—although we didn't realize it at the time, of course —on the mildest winter in many years; now we've already had considerable cold weather and have two and a half to three months yet to go.

J. D. A. MORROW

It is reasonable to expect a better market this year than last. Business generally has accomplished some of its readjustment to peace conditions and is flourishing. Export requirements are large and depleted domestic stocks must be restored. With the railroads returning to private ownership on March 1 we are more likely to have a problem of production and transportation in the forefront instead of difficulties because of a lack of market for the product.

Once more the beginning of a new year finds the government in control of coal prices. The prices, incidentally, are the same as those in effect a year ago. How long they will remain in effect no man knows, nor can an intelligent prediction well be made. Certainly I should not like to guess at it.

This article is written a few days before the first meeting of the Coal Commission appointed to work out a solution of the strike demands. What wage increase will be allowed is a matter for determination. I should like to point out, however, that if the industry should be required to absorb either the 14 per cent. wage increase proposed or a larger wage increase on the basis of the present government prices, many mines will have to close down. They cannot operate and live under present prices with the increased costs.

The shortcomings of rigid governmental control of prices are strikingly illustrated by this fact, because among the mines that would be forced to close down would be many high-cost operations that have lived during the past years of severe competition which reduced profits to the vanishing point. These mines have lived because they were producing coal of special quality which was particularly needed by some classes of consumers to whom it was well worth the additional price. The flat government price takes no account of such conditions.

If such mines are forced into idleness, many consumers of special-quality coals will find their business seriously handicapped by the loss of the fuel on which they have depended for years.

The public has been given the impression that the application of government price limitations would merely put out of business inefficient mines that should not be supported by the public in any event. This conclusion is fallacious. Mines of the type just referred to are not inefficient and the consuming public has been benefited by being able to buy their output even at prices above the market figures for ordinary coal.

The lifting of Fuel Administration restrictions in 1920, however, will find coal producers in a much more advantageous position so far as market information is concerned than they were when the restrictions were lifted a year ago. At that time the producers, of the country were without adequate or accurate facts concerning the prices prevailing in the different fields. No machinery was in motion, none had been built whereby the producer of coal could gage accurately the state of the market. For years the industry had been virtually at the mercy of the buyer and the record contained many instances of flagrant abuse of the buyer's power.

It seemed imperative, when Fuel Administration restrictions were lifted about a year ago, that there should be established a clearing house for market information if coal producers were to avoid a repetition of this situation in the future. Some method whereby the statements of imaginative buyers could be weeded out and set apart from the true facts, appeared highly desirable. Accordingly it was determined to establish exchanges of market information for the chief producing sections, it being distinctly and clearly understood that the only information exchanged should be that relating to transactions closed and past.

Branch offices of the National Coal Association were established in Chicago and Pittsburgh and later in Cincinnati. Through these offices producers in the territories they serve are kept in daily touch with market conditions. They are advised of all sales made by all companies in their districts, the prices obtained in such transactions and other details regarding them. These advices go out daily from the branch offices and are seldom more than 48 hr. old in reaching producers.

Re-establishment of Fuel Administration prices last October has of course rendered this service unnecessary for the time being, as prices are being restricted by government order. However, when the government orders are lifted, as they will be some time, producers will find this clearing house machinery ready to start in motion and continue the information given them in the past. It took more than six weeks to inaugurate this service in the first of the branch offices last year. It will be waiting and ready this year on the day restrictions are lifted.

I suppose the readers of *Coal Age* are all familiar with the advertising campaign carried on by the National Coal Association last summer in the interest of prompt buying. I shall not, therefore, attempt to review that phase of the Association's work; but in view of certain criticisms, I should like to point out that the advertising was carried in about 200 papers; that its preparation was speeded all possible because of what appeared to be the imperative needs of the situation and that therefore there was little opportunity to study sectional conditions and prepare advertisements which would have been peculiarly fitted to sectional requirements. Some of the effectiveness of this advertising may have been lost in the speed with which it was prepared; but the concrete result was that production began to increase from the very day the advertising was first placed and within a month it jumped approximately 2,000,000 tons per week.

At Last We Know How to Figure Coal Costs

Another forward step taken by the National Coal Association last year was the presentation to the industry of a comprehensive, complete and detailed method of cost accounting. The necessity of knowing accurate costs is now apparent to everyone in the industry; yet it was only two or three years ago that Chairman Hurley of the Federal Trade Commission stated his conviction that 90 per cent of the coal producers of the country did not know how much it was costing them to produce coal.

There is no need now for any doubt on that score. The Cost Accounting Committee of the National Coal Association after months of painstaking labor perfected a manual which is a model of completeness. The committee's recommendations have been adopted by a great many coal-producing companies, and other firms are adopting them continually. Continuance of this movement will result in placing the entire industry on a uniform cost-accounting basis.

Association Gave Senate Needed Facts

The National Coal Association was called upon in September to place the facts concerning the industry before a Senate Committee conducting an investigation into the coal situation. Within a few days after the investigation was authorized by the Senate the basic facts had been collected, compiled and were ready for presentation in graphic form before the committee of inquiry. Officials of the association on the witness stand showed the baselessness of the charges brought both in Congress and out against the industry. The showing thus made would seem to have cleared the atmosphere. The testimony was given wide publicity and the facts were thus placed before the American people, as well as before the Senate Committee. The inquiry is still in progress, although no hearings have been held recently.

It developed during the course of this inquiry and afterwards when the attention of the entire nation was focused on the industry because of the strike situation that many of the elemental facts concerning coal were virtually unknown even to the coal-producers themselves. For instance, there was no accurate information as to the hundreds of millions of dollars invested in the industry. The sum of the total could be only approximated. Nor was there information relating to stocks in the hands of consumers; to prospective requirements of the country; to employment conditions; to earnings; to increased living costs among coal-mine employes as compared with such costs in other industries, and to a whole host of kindred subjects.

Profits Have Been Less Than Alleged

The need for such information is obvious. When the facts become known the basis for attacking the coal industry will be dissolved. Such statements as that recently uttered by a former cabinet officer to the effect that coal profits have been enormous can then be readily refuted. In the light of the facts, unwarranted criticism of the coal industry will fall; and such criticism as is warranted will be helpful in correcting such evils as may exist. Until the facts are ascertained, however, the existence or unknown existence of conditions requiring remedy remains in the twilight zone of uncertainty. It is therefore imperative that the facts should be learned.

The task of gathering the facts has been begun by the National Coal Association. At its meeting in December last the association's directors authorized the establishment of a Bureau of Coal Economics, voted funds to enable it to carry on its work and made an appropriation to cover the wide dissemination, through proper publicity channels, of the facts to be ascertained. The association was fortunate in obtaining as the directing head of the new bureau C. E. Lesher, whose excellent work as statistician of the U. S. Geological Survey is known throughout the industry. Mr. Lesher has taken active charge of the task and is pushing it now with his characteristic vigor. The results are already coming in and in the course of a comparatively short time it is confidently expected that this latest effort of the association will begin to bear fruit.

It would appear, therefore, that the coal industry made a long step forward in 1919, notwithstanding the troubles of that reconstruction year. The beginning of 1920 finds the industry far advanced along the pathway which leads to its better welfare.

Right to Cancel Mining Lease

It may be safely said that it is a well-established rule of law in Alabama that so long as a mining lease has been availed of by the lessee, and the lessor has not accepted part performance, the latter is free to bargain .... on the ground of a lack of mutuality of obligation, consisting in want of a provision in the agreement binding the lessee to institute mining operations. But where the lessor has permitted the lessee to commence and carry on operations, it is then too late to have the lease cancelled as being one-sided. Nor will a lease be cancelled on the ground that the lessee verbally represented to the lessor, when the agreement was entered into, that operations would be commenced very soon, and that the royalties accruing to the lessor would amount to a competence for her; there being nothing to show lack of honest intention to commence operations soon, and the representation concerning what the royalties would yield in the future amounting to the mere expression of an opinion. (Alabama Supreme Court, Anderson vs. Majestic Coal Co., 82 Southern Reporter, 483.)

Coal Exports in 1919

By Dr. Henry M. Payne
Assistant to the President, Bertha Coal Co., New York City.

IN THE ten months ending Oct. 31, 1919, there were shipped from the United States 16,905,250 tons of bituminous coal. In the twelve months ending the same period 19,662,619 tons.

Of this latter amount 7,549,060 tons passed through the ports of New York, Philadelphia, Baltimore and Hampton Roads. During the 5 months, Nov., 1918, to March, 1919, inclusive, 1,433,225 tons were exported through those four ports, exclusively through the Tidewater Coal Exchange by direction of the Fuel Administrator. From April, 1919, to Oct., 1919, inclusive, the export through these four ports was 6,115,835 tons, of which 50.2 per cent passed through the exchange.

The distribution of the entire year was as follows:

	Per Cent
Canada	59.9
Italy	9.4
Cuba	5.0
Brazil	3.6
Argentine	2.7
West Indies	1.4
Uruguay	1.0
Mexico	0.5
Chile	0.5
Panama	0.3
Other countries	15.7

In view of the difficulties surrounding the export trade during this period, and facing the demand for American coal abroad at the present time, we may well consider the export matter as worthy of earnest study.

The United States Shipping Board has done its utmost to effect efficient allocation, and at the same time has properly exacted of foreign nations possessing the requisite tonnage that their bottoms should be supplied for the transport of their own coal as far as possible.

Other Problems Confront the Foreign Buyer

Greater than the problem of ships, however, are the questions of classification and inspection. The exactitudes of the foreign buyer are no greater in coal than in any other basic industry. Clean coal, well prepared, from recognized mining districts is analogous to any standard article of merchandise exhibiting a high grade of workmanship, and a uniformity of product. To bring about such a condition in the export coal industry requires a broad, comprehensive, uniform and authoritative system of inspection, preferably at the point of loading, certainly not farther advanced than the scales, and absolutely not at Tidewater.

In connection with such a system of inspection, and functioning co-operatively therewith, there must be a still further classification of American coals available for export. To argue against such a grading and inspection is to become a modern "Don Quixote."

Given a classified list of available coal, and an assurance of its proper preparation, the foreign buyer may intelligently begin his negotiations. At this point, the seller, having safeguarded the consumer by asserting and certifying to the standard of quality of his product, may properly in turn protect himself through the provisions of the Webb-Pomerene bill against ruinous price cutting, and at the same time may establish for himself a personal reputation for his own product and retain his individual foreign agencies and customers if he so desires.

No longer may the doctrine of *caveat emptor* be arrogantly flaunted with any hope of commercial success by those who would flood the market with a coal unsuited to the requirements of the buyer whose delivered cost is approximately one-seventh the coal itself and six-sevenths transportation. In order to bring about the required conditions enumerated above, the coal export corporation developed through the efforts of the American Mining Congress and its export committee, is designed to provide the necessary machinery for both buyer and seller, in order that collective buying as already in vogue, may be met by collective selling, and at the same time offer the widest latitude to the individual operator, wholesaler or exporter.

Foreign Trade Requires Much Attention

From the standpoint of the industry itself, no single phase bears more directly on the equalization of working seasons for the miner than the development of the export trade. According to the estimate prepared by the Bureau of Mines, we may expect a minimum annual demand of 31,000,000 tons, of which 9,000,000 tons will be called for by South American and West Indian ports, while the balance will go to Europe. There exists an available world market for 90,000,000 tons of American coal per annum, if this amount can be mined and exported.

This must necessarily be supplied from the Eastern fields, much of whose product is at present going to the Lakes and the Northwest. To replace this tonnage will be the privilege of the Central and Western fields, who thereby receive direct benefit from any increase in export.

The fact that the bulk of export coal is normally shipped between May and October, both because of lower ocean freight rate and insurance, and on account of the inaccessibility of northern European ports in winter, offers the American operator the necessary opportunity to work his mines on full time during the heretofore dull season. This, coupled with Director Manning's recommendation for a railroad freight differential on coal during the summer months, would prove a potent factor in the accomplishment of the 300-working-day year for the miner.

The U. S. Bureau of Mines, viewing the export of coal to European ports as a relief measure analagous to food supply, has co-operated heartily with the export committee. The Shipping Board is earnestly working to equalize cargoes for the return trip on coal-carrying vessels. The results of the combined activities of these various agencies, centralized in an export organization cannot fail to assist in establishing a firmer condition in foreign exchange, whose rapid fluctuations at present militate against the closing of long-term contracts for export coal.

Hearty co-operation along the lines indicated, by all concerned, during the coming year, will create a permanent market for recognized American coals at a fair price throughout the world, and will do much toward satisfying the demands of labor.

What Well Known New York Coal Men Think of the Future—With Some Remarks on Coal Exports

To OBTAIN an idea of what representative coal men believe 1920 will hold in store for the industry, *Coal Age* has invited comment from a number of large jobbers and shippers who maintain offices in New York City. The following statements are typical of the many answers received, and are reproduced to show the spirit of optimism possessed by men in the trade who are in position to know what they are talking about.

C. ANDRADE, JR., *Treasurer of the Matlack Coal & Iron Corporation.*

THE exporters, ship owners and ship operators of the United States have had now over two years of Government control, and the universal opinion is that this control should end.

The President has come out unequivocally in favor of private ownership and control of merchant vessels, but in spite of this fact, he keeps in office the Shipping Board, and permits it to continue its operation of merchant vessels in competition with those of private owners. The result is disastrous to the privately owned ships, as they cannot enjoy a normal business as long as the shipping market is so largely controlled by the vessels of the United States Shipping Board.

Even during the most serious portion of the war period, there were times when ships were held by the United States Shipping Board for weeks, or sometimes months, idle and without occupation. This was during the time when ships were in urgent demand.

There were other instances in which steamers were made to do work which could have been done exactly as well by sailing vessels, thereby withdrawing a portion of the steamship tonnage badly needed to transport troops and munitions to Europe. The best known instance of this practice was the case of the triangular movement of steamers from Great Britain to the United States empty, from the United States to the River Plate with coal, and from the Plate to Great Britain with wheat or meat.

This involved a round trip of 15,000 mi. for the steamer. The same result could have been achieved by letting the steamer go back and forth from Europe to America, and allowing sailing ships to carry the coal down from the United States and the wheat and meat from the River Plate back to this country, transferring the cargoes from the sailers to the steamers at Atlantic ports.

By operating the steamers in the way they were handled they were made to travel 15,000 mi., while they could have done the same amount of work by traveling 6,000 mi., namely, from Europe to America and back. The steamers therefore wasted 9,000 mi. every round trip they made, and during all of this 9,000 mi. they were burning coal which was sorely needed at the time both in America and Europe.

It was stated under oath before the Senate Investigating Committee, when looking into the Cuban sugar question, that ships were held in American ports for long periods of time when sugar cargoes were actually waiting for them in Cuba.

Only a few months ago the Shipping Board did something which resulted in a great loss to American ship owners as follows: The freight rate on salted hides from the River Plate to the United States was $50. This was the Shipping Board rate, and it was the going rate for all vessels. On the strength of this rate, American merchants took ships on time charter for the South American trade. After these charters were closed, the Shipping Board suddenly dropped its rate to the extent of 30 per cent, that is, this rate was decreased from $50 to $35. The entire ship market instantly responded to this reduction; and many concerns that had taken ships on a time charter suffered a heavy loss in consequence.

Under the regime of the Shipping Board there was a period of seven months during the last part of the year 1918 during which this board prevented American merchants from carrying American coal to the River Plate ports in South America. This business, which was taken from the American merchants, was given by the Shipping Board to the British Ministry of Shipping. The result was that English merchants chartered ships of any nationality, sent them to Hampton Roads, loaded them with American coal, and sold their cargoes to the customers of American merchants in the River Plate. This led to heavy losses by the Americans who were in that trade.

Another instance in which the Shipping Board made a great mistake was in the form of the Norwegian sail charter, which contained provisions so drastic that it paralyzed American coal exports for some months. This charter form made the American merchant a virtual insurer of the ship's time, and favored the foreign ship owner in every way at the expense of the American merchant.

About two years ago the American Manufacturers' Export Association, embracing in its membership the largest manufacturing concerns in America, passed a resolution favoring private ownership and control of merchant vessels, and expressing the hope that Government control would quickly come to an end.

Under the act of Congress which created the Shipping Board, this body has the right to continue in existence five years after the declaration of peace, but it is to be hoped that its mistakes of the past will lead it to give up its hold on the American shipper long before that time has elapsed. In fact, it is the feeling in the best informed shipping circles in America that the abolition of the Shipping Board at this time would be advantageous to everyone concerned. This involves no reflection on the present personnel of the Shipping Board. Some of its members are gentlemen of proven ability. The trouble is not with the men involved, but with the system.

DISTRESSING EFFECT OF UNDULY LOW PRICES

The difficulties and hardships created by Government control of the production and distribution of coal are so well known to the trade as to be hardly worth repeating. Everyone will remember how the operators met in the spring of 1917, and agreed with Secretary Lane on a mine price of $3. This would have brought out the maximum production, but immediately the price was announced, the Secretary of War and the Secretary of the Navy stated that the price was too high, and insisted that it must be reduced. The result was that all the large jobbers stopped buying, as they did not wish to purchase on a falling market. As soon as they stopped buying, many of the mines had to shut down because there was no place where they could dispose of their coal.

The result was that throughout the summer of 1917 the coal production of the country was cut down materially, and the coal which would normally be moving by rail from origin points to destinations for winter storage, did not move at all. Late in August the President fixed the $2 mine price, which was below the cost of production for a number of mines, and which resulted in their immediate shutdown. This still further curtailed production, and led to the coal tie-up of the winter of 1917-1918.

DID NOT REALIZE CONDITION TILL WINTER CAME

Dr. Garfield really did not understand the seriousness of the situation until cold weather set in, and then frantic efforts were made to move the coal which should have been moving since the preceding April. Of course, it was physically impossible to do this; and the result was that the country had to go without fuel, even to the extent of shutting down essential war industries in many cases.

Any one at all familiar with the situation will concede freely that if the operators' $3 price agreement with Secretary Lane had been kept in force, and if the producers had been permitted to handle their own business of producing and distributing their coal, the country would have had a much better fuel supply than under government management.

The difficulties created by government control have been forcibly illustrated in the last few weeks. For as soon as the coal strike was announced, the Fuel and Railroad Administration began a drastic set of orders which tied up all the coal, and which prevented even the bunkering of ships for some little time when they were sadly needed in world transportation.

Many volumes could be written on the unnecessary hardships and inconveniences created by government control, and it is the general consensus among business men at this time that the industries of the United States should be permitted to resume the methods of procedure under which they flourished prior to the war.

From the beginning of our national history, down to the year 1917, our country was built up on the theory of individual ownership, management and control of its industries. The war was made an excuse by the Administration for trying socialistic experiments in the United States on a scale hitherto undreamed of. The result was disastrous to the individual manufacturers and merchants, as well as to the nation.

THE RESULT OF INDIVIDUAL OWNERSHIP

The United States won its pre-eminent place in the commerce of the world under the theory of individual ownership and control, and if the socialistic experiments of government control are continued much longer, we may look for a serious decrease in our industries and trade, and a loss of the place that we previously won in the world's commerce.

This is a subject which vitally concerns every merchant, manufacturer and individual in the United States, and as a mere matter of business precaution, every man who reads this article should write to his representatives and senators and urge such legislation as may be necessary in order to take the business of this country out of the hands of government officials, and put it back into the hands of the men who created it.

The great industries of the United States were not created by the government or by government officials. They were built up by men, who, like Carnegie, began at the bottom and worked to the top, men who created great industries because of their pre-eminent ability in this direction. It is the height of absurdity to take these industries out of the hands of the men who created them, and turn them over to a lot of political theorists, who never in a thousand years could have built up the machinery which now they are attempting to operate. They will wreck that machinery to a certainty if they are allowed to play with it long enough.

WILBUR A. MARSHALL *of W. A. Marshall & Co., President of the Wolf Den Coal Co., and President of the Wholesale Coal Association of New York.*

IT IS to be hoped that the year 1920 will bring forth better results than accrued from the efforts of 1919. Coal men generally anticipate an improvement. Except for the recent unfortunate events by reason of the widespread strike bringing into effect government control, we can practically say that the transition period from a war condition to a peace basis has been completed. This applies to all lines of business, and industrial activity.

THREE MONTHS OF PROSPERITY

For three months, August, September and October, the coal business enjoyed a most satisfactory condition. No control, allowing a natural freedom of action, a healthy demand with fair prices, but none that could be criticised existed, as well as a generous but not full car supply. These conditions resulted in a fair profit to all concerned and offset to a considerable extent the losses incurred during the previous months of the year.

November and December were affected by the country-wide strike and the blight of government control. This latter still exists at the time of this writing, resulting in a greatly depreciated volume of business, unbalanced deliveries to consumers and a maze of prices caused by unstudied regulations. However, it is expected that this control will soon be ended and confidence of good times ahead prevails. This is based upon the fact that consumers have largely used up the abnormally large stocks accumulated during 1918 and 1919 and that while not many have yet come into the market they will soon do so and that there will be as a result a greater buying demand than during the past year.

This confidence is dampened somewhat by the fear of fuel oil competition and there is no doubt but that oil will seriously affect coal in certain sections, as it has done already in some localities. It has made serious inroads upon coal in New England during 1919 and the indications are that it will do greater damage around New York, Philadelphia and Baltimore in 1920.

Many of the largest consumers are already making installations of fuel oil burning apparatus and others are preparing to do so. It is imperative that coal men bestir themselves to meet this competition.

FAVORABLE PROSPECTS OFFSET INVASION OF OIL

To offset this gloomy outlook, however, is the rapid increase in the number of new factories being erected as well as additions to old ones. This is going on in practically every town or city of manufacturing importance, and may to a large extent offset the loss of those customers turning to oil.

In addition to this there exists a favorable outlook for exports. For the two months previous to the advent of the strike, this country was exporting to the practical limit of the pier capacity of Hampton Roads, Baltimore and Philadelphia, and the trade naturally looks forward to an immediate resumption of this business. The great trouble, however, is that the capacity of the pier facilities takes care of but a limited proportion of the mine output of the East let alone of the country or of the steamer capacity. This available business will therefore be constantly annoyed and restricted by coal congestion at the piers and the resulting embargoes and necessity of the use of the permit system. This will result in a high cost of operation, heavy detention charges on steamers, disputes between shippers and exporters, damage suits, etc. As a whole, however, the export business at least for a time will be of a distinct benefit to the coal trade, and of direct advantage to those producing the high-grade fuels suitable for this class of business.

The demand will gradually tone down, however, unless there is an improvement in the exchange situation. If this is accomplished by the granting of a new loan of the size now mentioned in the newspapers ($35,000,000,000) we must expect another 100 per cent of inflation of values running the full gamut from wages to the finished product of all commodities. In such a case such inflation might affect this country only, as it will be the holder of the securities representing the loan. Such a situation might prove to be extremely embarrassing.

The labor situation is unlikely to give any further trouble for 1920 unless there is further inflation as before mentioned. The past year was as unfavorable for the miner as it was for the operator. Both suffered from the same causes—lack of business in the first half of the year followed by three months of good business and then a strike for six weeks. It is unlikely that any further material increase in wages will be granted if the operators present facts clearly and completely. A thorough investigation is almost certain to develop the fact that an industrious miner can earn a much greater amount of money with the same effort than can any other man equally skilled. Stress has been laid upon the fact that miners do not get steady work. This is true to a considerable extent—but inquire into other lines and see if it is not true there also.

The railroad situation affords room for thought. The trade looks forward to an increase in rates effective not later than April 1 next. What this increase will be on coal no one knows. Many look forward to the day when the roads will again be under private control, but the general results to the coal trade are unlikely to show any general improvement. In fact I look for a poorer average car supply than has existed under the pooling system adopted under government management. It is hoped that there may be found a way to continue this practice, as well as some of the others that have been recently germinating in railroad manipulation.

It is expected that the results of the year's work on reclassifying coals in the pools of the Tidewater Coal Exchange will be announced in the near future. Operators and consumers alike are showing considerable interest in the development of this work. I am in position to say that under the new classification a great improvement has been made, although there will be some irregularities to be ironed out pertaining to some of the high volatile fuels. However, it can safely be stated that pooling of coal has come to stay and that the irregularities will be removed in time as the necessities arise.

ARTHUR F. RICE, *Commissioner of the Coal Merchants' Association of New York City.*

WITH the war at an end and the passing of the Fuel Administration it was natural to suppose that the retail coal business would fall back into its old channels and comparatively tame existence. As a matter of fact, however, there have been inaugurated here and put into effect some of the most startling changes along constructive lines that have ever occurred in a single year. Conservation, co-operation and co-ordination are terms that took on a new and more significant meaning during the war, and men began—subconsciously perhaps—to apply them more in their own affairs.

The economic wisdom of combining many dealers into a few concerns had often been discussed in years gone by and a few abortive attempts made to bring this about; but the time had at last arrived when such things as overhead expense, long hauls and the unnecessary duplication of service began to receive the serious attention they deserved. As a result there have been absorbed into three concerns about 20 dealers, or about one-third of those doing business in Manhattan and the Bronx. While it may be too soon to accurately predict the results of this radical change in the structure of the retail coal business in this city, there seems to be no reason for doubting that both the trade and the community will profit by it.

The coal trade has for some time believed—or tried to believe—that fuel oil as a competitor of or substitute for coal was not to be considered as worth worrying about; in fact, a good many arguments have been discovered to prove this, but unfortunately some of them are unsound, as the fuel oil people have proceeded to demonstrate. Here in New York a start has already been made, several concerns having prepared to make the change. The same is true of Chicago and several other cities. (

If we should assume that oil will ultimately displace any considerable amount of coal here, as it already has in many other places, it would appear that the dealers must adopt one of two alternatives: either sit by and see a large part of their business slip away from them, or handle oil themselves in connection with coal, just as they now deal in wood and other fuels.

The marketing of the steam sizes has become more and more difficult, and now, with fuel oil coming into the field, the problem is a serious one. Even the soft coal strike did not noticeably stimulate trade in them, but there are forces at work which I believe will ultimately remedy this condition to a large extent.

One solution would be to utilize the small sizes in generating electric power in the vicinity of the mines and transmitting it to the large cities. The briquetting problem too seems in a fair way of being solved. A still broader opportunity lies in the practical and growing use of these grades in the form of pulverized coal.

There is still another means of helping the situation, namely, the utilization of buckwheat No. 1 for domestic purposes. With proper appliances there is no good reason why buckwheat should not be absorbed altogether in this way, thus taking at least 10 per cent out of a class of fuel that is most plentiful and adding that amount to a class that is constantly becoming scarcer and dearer. This is a proposition in which the wholesalers and retailers can and should work together.

Unlike most industries, the coal business is widely scattered and embraces three separate and distinct branches, each with its own methods and policies and sometimes seeking to insure its own prosperity at the expense of the others. When this business shall have been so co-ordinated that the producers, carriers and distributors work together like partners in one big concern, the results, in economy, efficiency and good feeling, will be of advantage to everybody. I believe the day is not far off when some of these results will be realized. A policy which is manifestly to the interest of all concerned should ultimately prevail.

C. W. PROCTOR, *President, Calumet Coal Co., of New York, N. Y.*

THE part of the trade whose business consists wholly, or in part, in the bunkering of vessels at ports along the Atlantic Coast will long remember the year 1919.

Bunkering is normally fraught with more hazards than beset any other branch of the coal trade, but the year 1919 contributed so many additional vicissitudes that it leaves considerable of "frazzled" news behind as it passes.

In every harbor along the coast labor troubles interrupted the delivery of coal either wholly or in part during a considerable portion of the year. In New York Harbor critical conditions obtained because of the second protracted strike of the longshoremen.

Barely six months of the twelve found the miners digging coal, and those engaged in transporting it by water, working at the same time.

The price of spot bunkers varied somewhat within a range of about two dollars a ton. Contracts on foreign owned vessels that started bravely forth at $7.50 or thereabout, the maximum Garfield price during both periods of government price control, fell below $6 and even $5.50 spot quotations during the spring and midsummer period. Red hot cables from abroad demanded to know why current quotations should vary as much as $2 from the price of a contract. It was hard to explain by wire 3,000 miles or more that these quotations were made on single barge loads of coal, or on coal for a single bottom, and largely by concerns not engaged regularly in the bunker trade, either able or willing to perform bunkering at a fair price when conditons should be reversed. However this condition led to the abrogation of many contracts either wholly or in part as regards the matter of price, and led to the birth of the "sliding scale contract" with a maximum of the old $7.50 government price, and such reductions therefrom as the buyer could obtain and the seller agree to make.

Prices for the coming year are largely "up in the air." The contracts for the large transatlantic lines are believed to have been closed at prices well in advance of $7 alongside, and those who closed in the early fall at $6.50 are surely not hoping for the arrival of many vessels on their contracts, under the conditions now ruling; for the last week of the old year saw owners begging for coal at the old maximum price of $7.50 alongside, and willing to pay demurrage at the loading port in excess of 48 hr. Recent experiences of both owners of vessels and would-be purveyors of bunker coal should tend to shake out of the business the concern that believes it can supply coal to shipping at the same price it can to buyers ashore.

LOOKING FORWARD

The trade looks ahead to 1920 with the hope that is half a prayer that the temperamental longshoremen and his friends on the river and harbor will continue in agreement with their employers, and that the gentlemen who dig the coal and their friends who assist them in getting their product to pit mouth and onto the railroad cars may consent to continue at some stated rate that will net them not more than twice the salary of the professor in our largest universities.

Fuel oil looms large on the horizon. The trade hears daily of the conversion of former coal burning vessels to fuel oil. Just how much of a menace oil will become is largely problematical and so many factors enter into the matter that its discussion at this time would be idle. The available supply of oil is largely determined by the discovery of new wells, the life of any being of comparatively short duration. Coal being a fixed quantity will not be seriously disturbed except during dull markets, when the tonnage already lost may be a factor to some extent.

With a peace actually completed and proclaimed, credits established here for the nations needing in abundance everything that we have, the trade would look forward with renewed confidence to 1920. At the present writing this seems not unlikely in the near future, and this situation, labor in this country consenting, would portend a steady uninterrupted movement of shipping from our shores which would mean necessarily business in the way of bunker coal.

The days of governmental control seem to be numbered. This will be something to be thankful for in 1920.

Anthracite Conditions in 1919

By Edward W. Parker

Director of the [illegible]
[illegible], Pa.

THANKS to the long established influence of the Anthracite Board of Conciliation for fairness in dealing with labor problems the representatives of the anthracite mine workers on the board in the latter part of September, 1919, proposed to their fellow members representing the operators that the terms of the supplemental agreement of Nov. 15, 1918 (supplemental to the agreement of May 5, 1916), should remain in effect until March 31, 1920, when the basic agreement of May 5, 1916, will terminate. In view of the continued high cost of living (to provide for which the increases in wages granted by the supplemental agreement of Nov. 15, 1918, had been made), the proposition submitted by the mine-workers was acceded to and on Sept. 29 at a meeting held in Philadelphia the wage scale agreed upon the previous November was extended until March 31, 1920, and the continuous operation of the anthracite mines throughout the winter of 1919-20 was assured.

The only disturbing incident in the otherwise even tenor of anthracite production and distribution during the calendar year 1919 was one of psychological conception following the relinquishment on Feb. 1 of the governmental control and supervision of the hard-coal industry. From the effect on the trade that immediately followed the releasing action of the Fuel Administration, it might have been inferred that buyers of anthracite, both dealers and consumers, had the firm impression that the prices of anthracite had been maintained at higher levels than conditions of the trade warranted and that with the withdrawal of Government support of such prices substantial declines would naturally follow.

LANDING OF PLANE AT PINE HILL COLLIERY NEAR MINERSVILLE, PA.

The attitude of the United States Fuel Administration toward the anthracite industry was not so well understood or appreciated by dealers and consumers as it was by those engaged in production. When the prices of bituminous coal were fixed by the Fuel Administrator, consideration was given to the difference in the cost of production in the various important districts and prices adjusted accordingly, the only real injury done to the industry being the temporary dislocation of markets through a zoning system of distribution. In the fixing of anthracite prices practically no consideration was given to costs of production nor to the fact that a material part of the output was being produced not only without profit, but at a loss.

In November, 1917, when it was found necessary to give the mine workers an advance in wages in order to meet their increased living expenses, it was estimated that the wage increases then made would add approximately 45c. per ton to the cost of production. The Fuel Administrator, however, evidently considered that the anthracite operators had estimated this cost favorably to themselves and permitted an advance of only 35 cents a ton. It has been shown, however, by R. V. Norris in a paper read before the American Institute of Mining and Metallurgical Engineers in February, 1919, that from figures taken from the books of companies producing more than 99 per cent of the total output, the actual increase in labor cost due to the increased wages was 76.3c. per ton, or more than 40c. per ton that was allowed by the Fuel Administration.

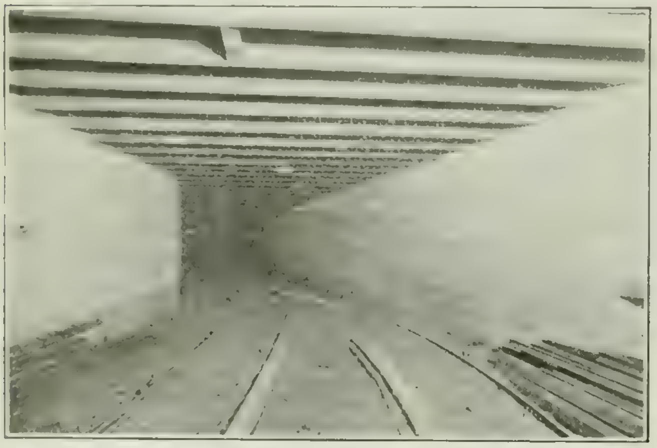
In November, 1918, it was found that because of the continual advance in the cost of living, a further advance in wages as a so-called "war bonus" was necessary in order to keep the men in the mines, since higher wages offered elsewhere were alluring many workers from the anthracite fields. It was estimated that the advance then proposed would increase the cost of producing the entire output 74c. a ton, or $1.05 if spread only over the prepared sizes. This time the Fuel Administrator permitted the advance of $1.05 on prepared sizes, but did not permit any additional advance in price to make up for the losses sustained through the agreement of the year before.

It was not until the Fuel Administrator was laying down the burden of his responsibilities on Jan. 31, 1919, that he made belated amends for the injustice which had been done to the anthracite industry by his Administration. He then admitted that the prices allowed for anthracite were not high enough to permit any considerable portion of the output to be mined at a profit. It might be well to quote here the exact words of the Fuel Administrator, issued at the time he relinquished control of the production, prices, and distribution of anthracite. He said:

> "For the purpose of arriving at a fair increase in price to cover the increase in wages recommended by the War Labor Board last October, an examination was made to determine the costs of the various anthracite-producing companies. The result of this examination showed that the general increases in the price of materials and labor have raised the cost of mining anthracite to such an extent that many of the companies were not receiving a fair return and that some producers of necessary coal were actually sustaining a loss on the sale of coal at Government prices, in spite of the two increases allowed on account of the advances to labor.
>
> "The above statement is made * * * out of fairness to those companies who have patriotically kept up their production to war needs, even at a cost which resulted in many instances in a loss, not only by individuals, but also by some of the railroad companies * * *
>
> "Had the Fuel Administration's active control over maximum prices on anthracite coal been continued, the cost examination above referred to shows that it would have been necessary, on the basis of the present wage scale, to raise these maximum prices possibly as much as 50c a ton * * * to prevent financial embarrassment and perhaps the closing of operations, producing a substantial per cent of the necessary anthracite output."

This statement did not receive the publicity through the daily press that it should have had, though it was published as an advertisement in most of the leading dailies in the anthracite consuming territory. Consumers accordingly did not realize that there would not only be no general reduction in the prices of anthracite, but that on the other hand, as shown by the statement of the Fuel Administrator, advances were justified and would probably be made. In addition to the hope for a reduction in prices, there was the fact that on account of the abnormally mild weather of the winter then closing, the majority of the consumers in the anthracite-burning territory had sufficient supplies of coal on hand to carry them over until the warm weather. Not only did dealers and consumers stop buying, but orders already placed were cancelled.

The effect of these combined influences was that the production of anthracite in February and March was scarcely 65 per cent of normal, the shipments in each month being less than 4,000,000 gross tons, against approximately 6,000,000 tons under normal conditions. The aggregate loss in output in these two months was between 4,000,000 and 5,000,000 gross tons, a deficiency that was for the time being well taken care of by the surplus carried over by domestic consumers as a result of the mild weather which prevailed during the preceding winter.



FOOT OF NO. 1 SHAFT, LOOMIS MINE, DELAWARE, LACKAWANNA & WESTERN R.R. CO.

In order to meet this situation, a vigorous "Buy Early" campaign was inaugurated. Although this was somewhat unorganized, it proved effective, for early in April market conditions changed for the better almost as suddenly as they had changed for the worse ten weeks before, and after about April 10 the demand for domestic sizes was fully up to the supply[1], indicating that the buying movement started none too early and that the "Buy Early" campaign was justified. It was felt, and rightly, that if consumers delayed laying in their supplies for the present winter it would be a physical impossibility for the mines to produce the tonnage needed for the anthracite consuming public. As it happened, no serious inconvenience has resulted.

The enforced idleness at the mines was not of sufficient duration to cause discontent among the miners, but may, on the other hand, be said to have been sufficient only to provide a season of needed vacation and rest, for these men had put in two strenuous years in loyal and praiseworthy efforts to meet the extraordinary demands growing out of the world war. It also furnished opportunity for needed repairs and for the prosecution of development work that had been neglected under the stress of securing maximum production.

In spite of the decreased production in February and March the output for the year will compare favorably with pre-war records. It is estimated that the total production in 1919 amounted to 77,200,000 tons, a decrease as compared with 1916, the latest normal year, of only about 1,000,000 tons, and this, as previously stated, was negligible as it was more than made up in the supplies carried over by consumers from the previous winter.

The annual production of anthracite since the beginning of the present century has been as follows:

Year	Gross Tons	Year	Gross Tons
1901	60,242,560	1911	80,771,488
1902	36,940,710	1912	75,322,855
1903	66,613,454	1913	81,718,680
1904	65,318,490	1914	81,090,631
1905	69,339,152	1915	79,459,876
1906	63,645,010	1916	78,195,083
1907	76,432,421	1917	88,939,811
1908	74,347,102	1918	88,237,575
1909	72,374,249	1919	77,200,000*
1910	75,433,246		

*Partly estimated.

Wankie Coal Field of Rhodesia

At a meeting of the Midland Junior Mining Engineers, held at Sheffield University on Monday, Major B. Lightfoot gave a paper upon the "Wankie Coal Field of Rhodesia," in the course of which he showed that the coal was not of the same age as English coal, but was deposited whilst the Permain and Triassic rocks were being formed. The coal was only formed in the deepest hollows—in big lakes in these hollows—and later all was covered up by the forest sandstones. The floor consisted chiefly of granite and schist, in which were found all the gold mines.

The haulage was so great that Wankie was the only developed coalfield, and this had 212 miles haulage to Bulawayo. The mine was still the only coal producer in Rhodesia. The coal was of an excellent quality, and had a high calorific value, being superior to any Transvaal coal, equal to the best Natal coal, and, but for its high percentage of ash, would be equal to Welsh coal. Taking the average of 21 analyses, the following was shown: Fixed carbon, 66.13 per cent; volatile matter, 20.38 per cent; moisture, 0.88 per cent; ash, 10.61 per cent; sulphur, 2.00 per cent. Calorific value, 13.23 lbs. of water evaporated.

As the reserves of coal in the area were far ahead of present requirements, no attempt had been made at the colliery to make a definite estimate of them. A. R. Thompson (general manager at the colliery) estimated that the coal extended through a low-lying area between the mine and the Dekka River, a tract roughly 25 miles in extent. He deducted losses in working, and allowed 4,000,000 tons of coal per sq.mi. so that there would be 100,000,000 tons in this area alone.

H. B. Maude gave 201,200,000 tons as the reserve in the area. It was estimated that coal was to be found throughout an area of 150 sq.mi. without the limits of the field being reached in a north-easterly direction. This would raise the estimate, adopting Mr. Thompson's view for the tonnage per sq.mi., to 600,000,000 tons. In view of the immense reserve of coal still existing at Wankie, it was not likely that any attempt would be made to prove the possibility of a cancealed coalfield, but if ever such an attempt were made the structures brought out by the mapping of the Wankie coal field should be borne in mind in selecting sites for boreholes.—*The Iron and Coal Trades Review.*

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[1] An exception to this should be noted in regard to pea coal, which dragged throughout the entire year. The supply of steam sizes was constantly in excess of demand even during the six weeks of idleness among the bituminous miners. The territory that consumes the larger part of the anthracite production was not seriously affected by the strike in the bituminous fields.

Anthracite in New England in 1919

By G. G. Wolkins
Boston, Mass.

USUAL plans for distribution were set awry during 1919. The unfortunate experiment with the Reading barges at Port Reading and the two protracted wage controversies cost New England heavily, both in increased charges and in diminished receipts. Retailers were kept on the ragged edge of supply until almost the very end of December, and probably there never was a year when the ultimate consumer was so eager to buy early and heavily. During the period beginning Sept. 1 the all-rail deliveries were much heavier than the year previous and did much to allay anxiety. After April there was a sustained insistent demand for domestic sizes, which kept up until Dec. 15.

The year began with a daily average of 330 cars all-rail, most requirements comfortably supplied, and confidence everywhere that 1919 would prove an easy season. Allotments made by the fuel authorities were soon withdrawn, restrictions were off, and distribution was once again left to trade channels. The generally mild winter made demand uncertain and more than once there were cold snaps that caught several of these timid buyers without adequate stocks, but by February all anxiety was ended and the market was abundantly supplied.

APPROXIMATE COST OF READING COAL ALONGSIDE BOSTON DURING 1919

White Ash	Jan. 1	Apr. 15	Sept. 1	Dec. 31
Broken...	$10.01	$9.17	$9.67	$9.94
Egg	9.61	9.02	9.52	9.79
Stove....	9.86	9.27	9.77	10.04
Chestnut	9.96	9.37	9.87	10.14
Pea	8.31	8.43	8.79	9.05

The "independent" shippers, in particular, found the going hard. Through two years of a steady demand they had taken in many instances the limit of price for both coal and freight, and now that there was a surplus of broken, egg, and pea sizes, their efforts to move them were unavailing. The retailers were relieved that they were no longer dependent upon these sources.

The last eight days of January saw the movement jumping to 511 cars all-rail, and there was a correspondingly improved volume by water. Over-shipments were frequent; orders that buyers had forgotten to cancel were shipped to the limit, and demand even for the range sizes eased up notably, not only in Philadelphia and New York but in this territory as well. January retail deliveries were about one-third normal and orders melted away like snow in July. It was clear by Feb. 10 that the bottom had dropped out, for the house trade was off 50 per cent; "the last third" of fuel regulation fame was a myth, and continued mild weather along with the psychology of the situation induced Boston dealers to reduce prices.

ANTHRACITE MOVEMENT ALL-RAIL THROUGH NEW ENGLAND GATEWAYS

	1918 No. of Cars	1919 No. of Cars
January..		
February.		
March		
April		10,609
May		10,517
June		9,208
July		10,756
August...	18,364	11,013
September	16,283	11,864
October..	13,688	14,320
November	11,158	12,885
December	11,595	14,046
Average No. of cars monthly, Aug. 1–Dec. 31, or in gross tons..........	14,217	12,825
45 gross tons to a car	639,768 g.–	577,125 g.+

A campaign of newspaper advertising on the part of operators doubtless did much to start retail buying in the spring. The object was to lay a foundation for monthly advances beginning May 1, and more or less discussion was occasioned. The publicity given parts of Dr. Garfield's farewell address was particularly the subject of comment, and there was a strong feeling that too much reliance had been placed upon cost estimates submitted by small operators who had not been able to sell coal in competition. In other words, there seemed a disposition to lift prices so that any operator could mine at a profit, whether his particular output was necessary or not. All this, however, was at a time when there was plenty of "free" coal. Two months later, when the demand was certain to be acute and the advance had materialized there was less comment. The cry was—"Get coal forward."

RELATIVE COST, BITUMINOUS, RAIL VS. RAIL-WATER-AND-RAIL

	All-Rail [illegible] [illegible]	Rail-Water-Rail [illegible]
[illegible]	$2 [illegible]	$2 [illegible]
[illegible]	[illegible]	[illegible]
[illegible]	4.12	
[illegible]		2 [illegible]
Steamer rate, Norfolk-Boston		[illegible]
[illegible]		[illegible]
[illegible]		[illegible]
[illegible]	168	[illegible]
[illegible]		[illegible]
[illegible]		.01
[illegible]		[illegible]
Tax on rail freight		.03
Total	$7.592	[illegible]

Through February and March when a considerable tonnage might have been taken on by retailers with good storage facilities the attitude of the Railroad Administration with respect to barge freights had a discouraging effect. On Dec. 28, 1918, at a time when in the open market freights had receded because of surplus bottoms the Government representatives advanced rates to points east of Newburyport from New York on railroad-owned transportation 30c., making the new rate to Portland $2.10. The "open" rate to Boston was $1.25 to $1.35. The result was that the railroad-owned barges swung at anchor and were not used at all except for emergencies. In consequence collieries were shut down for from three to four days a week, when, had a different policy been followed, some of the con-

RECEIPTS OF ANTHRACITE COAL BY RAIL AT BOSTON

	1918	1919
January	33,453	22,516
February...	23,188	16,483
March	42,526	11,622
April	23,256	16,103
May	20,482	26,017
June..	15,527	33,994
July.....	33,420	23,861
August	28,581	14,628
September...	26,259	17,918
October	29,348	24,845
November	17,630	26,933
December..............................	20,740	22,561
Total	314,410	257,481

TOTAL

1917.	217,408	1915	192,442
1916.....................	292,599	1914.....................	192,426

BITUMINOUS MOVEMENT ALL-RAIL THROUGH NEW ENGLAND GATEWAYS

	Number of Cars. 1918	Number of Cars. 1919
January		
February		
March		
April	13,886	7,665
May		8,737
June		9,989
July		11,997
August	16,045	11,243
September	12,461	15,690
October	9,640	15,415
November	8,582	5,657
December	6,999	3,882
Average for 5 months, Aug. 1 Dec. 31	10,745	10,377
Output, gross tons, av. 45 gross tons to a car	483,525 gross tons	499,965 gross tons

gestion which followed later in the season might easily have been avoided. This was another comment on Government operation.

On April 5, just at a time when the trade was beginning to despair of an equitable decision, the producing companies forced a reduction in the Boston rate from \$1.80 to \$1.25; the Portland rate, from \$2.10 to \$1.35, and the Providence rate, to \$1.15 from \$1.75. The effect was immediate; orders poured in, although water shipments started very slowly. The mines were once more on full time, but with the heavy movement all-rail it took a fortnight to get supplies running in volume to the piers. In addition, April deliveries were far behind normal, thereby imposing a handicap on shipments later in the season.

Another long-awaited move was made on May 1 when the Reading fleet resumed operation from Philadelphia, and the trade now had good reason to feel that at last things were in shape for an effective and equitable distribution. The whole area using anthracite, however, made insistent demand at the same time and instead of making the customary heavy spring shipments East, the pressure on producers was so strong that they could only spread the output in such a way as would meet with least criticism. Shipments noticeably slowed up in New England as there was a shortage of the egg size for which there is the strongest spring demand.

An ominous feature of the early spring trade was the summary announcement that 750,000 tons of locomotive fuel would have to be carried in the same Reading barges so much relied upon for the movement of anthracite. Had the order from Washington been carried out there would have been a howl from this whole section. At the time there were eighty to ninety Shipping Board steamers lying idle, and these could just as well have been used then for carrying railroad fuel, as they were later on. Reading barges were cheaper, and in part as a result of this policy the public dependent upon this fleet for anthracite was obliged to pay the Shipping Board rate on steamers in order to get the domestic sizes in sufficient volume.

Demand continued unabated through summer and fall. Applications filed in the cities were beyond all precedent. Thanks to ample stocks carried over, there were dealers who delivered in April one-fifth to one-sixth of their normal tonnage for the year, and yet most rehandlers at water points got during the same month barely 5 per cent of their yearly requirements. Smaller New York shippers, growing restive under excessive car service and delays at the loading piers were naturally inclined to favor the all-rail route and more than a few retail dealers with expensive wharf properties suffered from this situation and saw only too frequently barges carrying "independent" coal.

In July the situation grew even more tense. Premiums were advanced from \$1.00 to \$1.25, and later still they climbed to \$1.75, but the output let down generally around the holiday, and it was usual for bottoms to wait from ten days to two weeks for cargo. Reading barges scheduled to load anthracite were frequently turned over to bituminous shippers, and dealers began to take pea coal, in almost a state of desperation.

The propaganda of bituminous operators also had its bearing, for to the public eye coal is coal, and in display advertisements the word "bituminous" left out, gave the widespread impression that cars and men were idle because of lack of orders for anthracite.

In August there came a new blow because the Railroad Administration could not see the way clear to pay marine workers the same scale that the Shipping Board had agreed to pay in July. The result was a full 30-day suspension of the movement of railroad-owned barges. Two tows got away on Aug. 5 from Philadelphia, but they were the only sailings for a full month. It was well the public at the time did not realize how small were stocks at this end. At length, on Sept. 3, a settlement was made, on the Shipping Board basis, as might have been foreseen, and for a month fleet movement proceeded with reasonable smoothness. At the end of September a dispute over wages of marine engineers again paralyzed railroad-owned transportation, this time for sixty days. The difference was adjusted late in November, and during the balance of the year the barges moved with a certain regularity.

RECEIPTS OF GROSS TONS OF ANTHRACITE COAL BY SEA AT BOSTON

	Philadelphia		New York		Total	
	1918	1919	1918	1919	1918	1919
January	10,122	2,702	20,600	77,787	30,722	80,489
February	21,754		24,082	39,889	45,836	39,889
March	68,966		39,349	20,820	108,315	20,820
April	34,132	4,923	66,923	50,704	101,055	55,627
May	41,111	26,668	99,860	96,370	140,971	123,038
June	28,644	29,760	104,290	81,938	132,934	111,698
July	31,934	42,894	101,943	74,238	133,877	117,132
August	46,411	5,973	79,776	80,752	126,187	86,725
September	4,825	29,479	106,064	84,036	110,889	113,515
October	5,569	10,413	81,502	66,964	87,071	77,377
November	2,448	6,525	72,829	94,495	75,277	101,020
December	5,200	28,085*	63,833	71,423*	69,033	99,508*
Total	301,116	187,422	861,051	839,416	1,162,167	1,026,838

* Not complete.

TOTAL

	Philadelphia	New York	Total
1917	473,853	914,806	1,388,660
1916	524,220	956,676	1,480,896
1915	548,689	960,331	1,509,960
1914	624,798	1,094,241	1,719,099
1913	582,183	1,094,128	1,676,311
1912	579,778	1,054,378	1,554,156

For the most part, buyers were unresponsive in 1919 to steam sizes. Buckwheat moved more easily than either rice or barley, and not even drastic cuts in prices of the latter could induce any comprehensive sales until December, when the bituminous wage trouble took an acute turn. The flurry lasted but a week, however, although some considerable tonnage of pea was moved as well as junior sizes.

It is a matter of satisfaction that the cost of anthracite is relatively so little higher than at the close of 1918. Shippers with established connections enjoyed a favorable year, and in spite of all the public was finally served. Coal enough cannot be mined in a single month to provide everybody with a year's supply. If in 1920 we can be permitted the use of facilities we already have the problem of distribution will be reasonably simple. The trade looks forward to March 1 with a certain wistfulness, for it is realized that under private management there will be less experimenting and more regard for service.

Trade Conditions in New England in 1919

By G. G. Wolkins

Boston, Mass.

THE SURFEIT with which New England was favored in war-time was easily the controlling factor in 1919. The trade was for the most part unhampered by the close supervision that characterized the year previous; but even with embargoes, marine strikes, and finally a widespread suspension of mining there was no active demand that lasted more than a fortnight. Reserves were ample. The re-birth of the Fuel Administration on Oct. 30 had little effect in New England, except for a momentary scare that had no real basis in fact.

Until the slightly accelerated buying in July the market dragged heavily, chiefly because of the glut forced upon us in the fall of 1918, and at no time during the 12 months was New England without at least a full 75 to 90 days' supply. During most of the year stocks averaged 40 to 60 days more. There was only the wholesale and needless withholding of deliveries during November-December to give the trade even the remote promise of a sustained active market. When cars were eventually released it was realized another 60 days would elapse before any current demand could be developed.

All-Rail Movement Heavily Increased

The really outstanding feature was the heavily increased movement all-rail, followed necessarily by diminished tonnages coastwise. It worked havoc with the unpractised figuring of those outside the trade who aspired to be masters of distribution, but by the trade it was readily understood as the logical result of one or two simple factors. The Port of Providence, R. I., alone showed in eight months water receipts diminished by 800,000 tons. Half of this is accounted for by the increased fuel supply that the New Haven R.R. took all-rail for the region formerly served from Providence, allowance being made for decreased consumption.

Fuel oil in 1919 displaced approximately 200,000 tons of 1918 coal in the vicinity of Providence, and a like tonnage is surely accounted for by shifts of commercial coal to the all-rail route. So it was throughout Tidewater New England, although oil distribution was centred within certain areas, and all-rail deliveries were general. There were the ships, a great surplus of them, and Shipping Board rates were reduced early in the year, but all-rail delivery was still much cheaper! industries that had bought water coal uniformly for a generation were led in 1919 to buy all-rail exclusively. Hence there was a big increase through the five gateways, an aggregate tonnage never equalled in normal years.

Bituminous Trade Was Slow

Speaking broadly, the seaboard bituminous trade was slow and apathetic the whole season. Early, the weight of opinion was all against buying fuel that would not be required for several months, and there was too great anxiety on the part of steam-users to get clear of coal then on their dumps to warrant purchases until the market was more nearly established. Not only did the railroads cease buying, but actual consumption was materially less because of very much reduced traffic. Mild weather and the curtailment in manufacturing of all kinds also had their combined effect. The Government price began to be shaded for medium grades, but as the season advanced it grew increasingly clear there would be much more discrimination than had been the case since the first upward swing nearly four years ago. By the end of January it was evident sacrifices would gladly be made by many operators to get orders for current shipment. The possibility of labor tie-ups and light output were used as arguments, but the trade was as unresponsive as at any time in its history.

Railroad management, in particular, began to outline a distinct change of policy with regard to fuel purchase. Several long-term contracts were allowed to lapse and this was especially true of coal coming by water. In view of conditions this attitude could occasion no surprise. No responsible buyer could at that time obligate himself on marine freights that had been established during the height of war and in the midst of a great shortage of shipping. One road, using 250,000 tons a year, reported a 6-months' reserve, and in a measure this was true of practically all the New England lines. It was not until late March that there were any significant developments. Bids to furnish one of the railroads for a stated tonnage for April ranged from $1.60 per net ton on Fairmont to $1.85 on coal from the Greensburg district. These prices were so much lower than quotations in the open market that they were bound to react unfavorably on commercial buyers. It had a peculiarly depressing effect because consumers in this territory are usually slow to realize the difference between the spot market and offerings for deferred or season delivery.

Toward the end of February it was seen that operators were themselves following a close-hauled policy. Those who produce high-grade coal were holding up to the one-time Government figure, even though they were only putting out one-fourth or one-fifth of their usual tonnage. To that extent, the all-rail situation grew slightly firmer during the spring and foreshadowed the better demand that developed late in June. Otherwise, the market just kept mulling on with light traffic and minimum consumption in almost every direction. Movement all-rail and by water was in very small volume and the trade grew reconciled to a meagre business.

At the very moment when New England industries were bringing pressure to bear on the Shipping Board the announcement was made, on March 6, that all rates were withdrawn and that individual ship-owners were free to make their own rates in the open market, and this went far to restore confidence.

There began to be an interest in quotations that had not been manifest since the summer of 1917, but naturally this renewal of inquiry was almost wholly confined to coal by the all-rail route. Coastwise freights, however, settled down quite rapidly. By March 15 it was admitted that $2 was all the traffic would bear, and at $2 the Shipping Board rate remained, Hampton Roads to Boston, the remainder of the year.

Large Contracts in April

It was clear by April 1 that the number of contracts already placed was large, and the aggregate tonnage considerable, but it was equally clear that most of them were for less than 10,000 tons and that with few exceptions they called for grades that have come to be regarded as specialties. Nothing else would account for the prices consumers agreed to pay. And it was also true that by far the greater number of these contract arrangements had been made in the same channels as in other years. Service during 1917 and 1918 was often a consideration in favoring the customary sources of supply, but there still remained a very large tonnage to be placed among heavy consumers whose ample stocks allowed them to wait 60 to 90 days more to test the market. The ensuing period, distinctly weaker in tone, justified this attitude, although the quality grades persisted on a relatively firm level.

Buyers now realized the heavy differential applying against rail-and-water deliveries to inland points. At industrial centres like Fitchburg, Mass., where reliance had once been placed on water coal via Providence or Boston, there was now a freight rate inland from Boston of $1.40, besides largely increased charges at the rehandling wharves. It was a foregone conclusion that Hampton Roads coals would have no chance whatever to meet all-rail competition at such points, or even at Lawrence, Mass., where the rate from Boston is $1.05.

Much "Free" Coal Available in 1919

Notwithstanding early predictions, there was much more "free" coal available during 1919 than is usually the case. Because of the uncertain prospect, operators had refrained from making contracts in anticipation of an active market and for that reason there were fewer contracts on file. In other words, output by September had caught up with the demand, and at least until cold weather it was clear there would be no spurt to buying in this territory. Through September and October production was way beyond expectation and had it not been for the strike prospect Nov. 1 there would have been great difficulty placing coal.

By Oct. 15 the wage discussion had induced a pronounced lift in prices for shipment all-rail. The more conservative operators were disinclined to ask much if anything over the yearly contract basis on the ground that "profiteering" would not put them in a favorable light with mine workers who were agitating increased pay. The market here was much restricted, and yet prices on certain grades advanced sharply. Sales were rumored at $4 and up, on ordinary grades, but there was no support to this and when prices were again fixed on Oct. 30 there was no real change in the New England market. The fact was that buyers here were getting their coal on a basis that approximated the fixed price and notwithstanding the heavy curtailment because of the strike no special anxiety was observed.

During November and December the steam trade practically marked time. The few applications made for emergency supplies were from small consumers who were beginning to worry over the possible loss of coal they had in transit, and the only visible panic was among gentlemen who were suddenly called from other pursuits to refunction as fuel supervisors.

So effective was railroad control of distribution during November and December that there were actually three days, Dec. 1, 12, and 13, when not a solitary car of bituminous reached the New England gateways. For several days at a time not a cargo loaded for New England at any of the Atlantic ports. The tie-up was complete, while coal was rushed to the Central States to make up for deficient production there. The average receipts for the whole of December all-rail were 129 cars, but there was no distress. Eight thousand cars were held by the railroad authorities, either in transit or at destination.

Fine Hopes for 1920

For 1920 the trade attitude is hopeful. Export business remains alluring; wage increases and greater railroad income are foreshadowed, the possibilities of the large amount of shipping built or acquired by the Government are freely discussed, but the consensus is that coal factors will continue doing business as usual. The coming year is hailed with satisfaction by all those interested since it is believed that all signs point to an extremely active season in industry and consequently in the coal trade.

New York Coal Trade in 1919

By Robert W. Morris

New York City

THE anthracite trade passed through the year 1919 satisfactorily, although in the majority of the twelve months there was a heavy demand for the domestic coals and not sufficient supplies to meet it. This heavy demand was due in part to an educational campaign inaugurated by the trade itself to induce consumers to put in their winter fuel early and "avoid the rush" during the fall and winter. The public saw an opportunity to save money by having its winter supply of coal stored away as early as possible, thereby saving 10c per month on each ton of coal.

The first three months of the year were inactive, for there was very little buying, the dealers having carried over from the closing months of the previous year good-sized stocks of coal. The business transacted in January was in direct contrast with that of the previous January when the shortage was acute and the weather extremely cold. Instead of a rush of orders and an urgent demand for deliveries, the trade was easy and many orders already placed for so-called "independent" product were cancelled. It was hard to move supplies and boats loaded with stove and chestnut were hard to dispose of during the first month of the year.

DUMPERS OF THE CENTRAL R.R. OF NEW JERSEY
New Coal Pier at Jersey City—Capacity 6,000,000 Tons Annually

Gradually the war-time restrictions of the Fuel Administration were removed and it was hoped that when the ban would be lifted on Feb. 1 trade would pick up. But even when the rules were withdrawn there was no response, and the market was not stimulated. Cancellation of orders continued and the supply of steam sizes became so large that it was necessary to make concessions to move them.

With stocks of all sizes on hand and no desire on the part of the public to buy except for actual needs mining was reduced to about half time, which program was generally followed until the end of March. A comparatively few weeks later both producers and shippers had sufficient orders booked to take their supply for several weeks ahead and some middle houses began to refuse new orders. Instead of the lull that usually prevailed in the summer months the entire trade was kept busy by the demand made upon it. There was a constant call for egg, stove and chestnut coals and at times the retail dealers had scarcely enough of the commodity in their yards to keep their employees engaged. Early in the fall it was felt that all danger of a coal shortage had passed, as the situation had become easier and the demand had slackened. Wholesale houses reported their orders pretty well in hand and the retailers were catching up with the call for the various sizes. Independent coal which since early in the coal year had been quoted at 75c. higher than the regular company circular, and in some instances higher than that, was now beginning to feel the effects of the situation, and buyers were not inclined to pay more than 50c and sometimes less. The situation in September was much the same as it was in the corresponding month of the pre-

THAWING SHED OF THE CENTRAL R.R. OF NEW JERSEY, NEW COAL PIER NO. 18 AT JERSEY CITY

vious year, for as a result of the heavy summer business, there was comparatively no new business. In October chestnut coal was becoming scarcer because of the heavy demand made upon the peddler trade, which usually consists of one- and two-ton lots, and for the first time in months some middle houses had to scurry around to secure sufficient tonnage of this size to meet the demands made upon it. But it was not until the latter part of November and the first part of December that the trade again felt the necessity of larger shipments to meet the increased demand. This was due in most part to a brief spell of cold weather which eclipsed, for that time of the year, temperature records for New York City.

BITUMINOUS

The year 1919 was one of unrest and uncertainty for the bituminous trade here. It opened with the Fuel Administration in control and its prices prevailing, but the situation was such that these prices were hardly obtainable unless the coal offered for sale was of the highest grade. There was a lack of demand and the mines were being operated on a reduced schedule.

This harbor was in the throes of a marine strike which continued to be a menace to the trade until early fall. Consumers bought carefully during the first month of the year because of the reports that the government would relinquish its supervision of the industry, and that they would then see a drop in prices.

On Feb. 1 the Fuel Administration did withdraw its supervision and there was a better feeling in the market. Supplies were low on account of the holiday season which had recently passed and the slow movement of coal from the mines. Inducements to buy failed to create a market, but after a few weeks had passed manufacturers who had drawn heavily upon their reserve stocks while waiting for the Fuel Administration to pass out of existence, came into the market, thus causing a gradual improvement. Meantime shipments from the mines had become steadier and because of slow buying here and along the line, the local piers became congested with coal. There were many loaded boats hereabouts, but with operators standing firm behind their quotations and buyers just as firm in holding out for bargains, their number was not reduced as quickly as was desired.

Conditions improved considerably in March and embargoes which had been placed on many individual shippers were removed. It was then expected that inasmuch as the Fuel Administration, in addition to withdrawing its maximum price list, had removed all restrictions as to shipment and delivery of coal, and had also given the operators the privilege of withdrawing from the Tidewater Coal Exchange, that many would resign from that organization, and that the producers would dispose of their coals separately. But such was not the case, as an exceedingly small number of operators withdrew from the Exchange.

Deliveries in the near-by waterways were again interrupted in March by a renewed strike of the boatmen and the situation became such that the government saw that fuel was delivered to public utility corporations if needed. In one instance the city was in danger of being without transportation facilities, as the supply of coal had become so low. Harbor deliveries did not improve until well into the next month, when the private boat owners made a settlement with their employees. This was followed a few days later by a complete settlement and operations in the harbor became normal within a few days.

Early in April inquiries for coal showed an improvement and consumers began to look around for contracts prices for the following year, but the operators were not anxious about tying up too large a portion of their output, and care was used in signing up. In May there was a slight reduction in quotations for tidewater shipments, especially for the poorer grades of coal, but the operators appeared to stand firm in maintaining prices for the better grades.

With another truce in the harbor situation and the belief that the difficulties had been permanently settled there was a flurry of demand in August and some heavy supplies were laid away. Production also increased and there was an urgent call for Pennsylvania coals in Canada. It was about this time of the year that the mine workers began to display their restlessness and rumors were current that they might stop work unless an increase in wages and other concessions desired were forthcoming.

Demand soon slowed down while production improved and again there was more than enough coal here to meet all requirements. Supplies in storage were such that buyers discriminated as to the grades to be furnished them and they would take nothing but the best available. Then came the strike of the steel workers, but which did not affect the local situation to any great extent. Buying again picked up when the Fuel Administration again resumed control of the industry on Oct. 30 in anticipation of the beginning of the coal strike. The work of distributing the coal was undertaken by the Railroad Administration, who remained in charge of this work until the men were ordered back to work.

In the latter part of December supplies at the docks were low; deliveries were bad and shippers complained bitterly of the slowness of receipts. The harbor was filled with empty boats, some of which had been waiting at the loading piers for two weeks. Prices were maintained at the government maximum and it was said that some producers were refusing orders because of the

NEW YORK COAL AND COKE EXPORTS IN 1919

	Anthracite				Bituminous				Coke			
	1918		1919		1918		1919		1918		1919	
	Weight Tons	Value Dollars	Weight Tons	Value Dollars	Weight Tons	Value Dollars	Weight Tons	Value Dollars	Weight Tons	Value Dollars	Weight Tons	Value Dollars
January	490	4,223	10,367	84,275	530	3,435	3,168	25,108	1,599	19,582	570	16,091
February	1,184	8,177	615	6,190	2,157	19,348	3,561	36,581	44	1,253	1,586	22,608
March	2,607	20,050	904	9,350	4,508	27,190	140	1,732	956	14,481	390	5,582
April	7,107	49,785	1,695	13,368	3,081	21,304	1,001	6,328	633	16,757	468	7,711
May	4,444	30,158	3,601	29,402	8,117	58,118	540	4,517	2,153	30,868	626	11,184
June	6,761	43,991	10,482	88,292	6,807	50,751	25	250	1,605	20,562	2,614	42,814
July	9,340	62,824	4,983	40,990	7,440	52,402	2,847	17,721	117	3,220	283	6,870
August	10,460	72,264	4,703	40,871	10,149	72,612	1,626	11,900	333	9,032	300	4,664
September	13,602	96,204	6,249	56,325	3,449	25,444	6,742	38,929	106	3,294	200	5,167
October	11,656	80,688	6,929	62,226	1,045	7,884	3,959	27,240	203	3,996	5,265	39,143
November	9,182	71,233	15,585	148,636	221	2,205	2,077	14,813	494	14,214	1,585	19,353
December	4,614	44,490			1,213	8,676			2,694	36,854		....
Total	82,447	584,087	66,113	579,925	48,717	349,369	25,686	185,119	10,937	174,114	13,887	181,187

lack of miners to produce the coal and the bad car-supply. It was predicted, however, that with the miners returning to work in larger numbers soon after the New Year the situation would soon become normal.

During the first eleven months of 1919 there were exported through the port of New York to foreign countries 66,113 tons of anthracite coal; 25,686 tons of bituminous, and 13,887 tons of coke. This is a decrease from the shipments of anthracite and bituminous in 1918, but an increase in coke shipments. The average cost per ton for anthracite exported in 1919 shows an increase of $1.75 over the previous year; of 3c for bituminous, during the same years, but a decrease in the average cost of coke of $2.88.

COAL DUMPINGS AT NEW YORK IN 1919

	Anthracite (Tons)		Bituminous (Tons)	
	1918	1919	1918	1919
January	24,064	23,756	19,277	21,749
February	22,876	15,137	17,268	25,668
March	31,224	6,439	23,810	11,516
April	28,548	19,448	23,084	20,708
May	29,835	26,138	28,104	25,271
June	30,695	23,970	30,240	23,773
July	32,228	25,542	31,155	24,555
August	32,417	26,978	30,157	25,480
September	28,119	22,433	30,328	23,367
October	27,190	24,886	28,503	24,571
November	21,834	23,331	25,479	16,679
December	26,261	22,660	25,169	13,829
Total	335,291	260,718	312,574	257,166

Wholesale Coal Trade Association of New York

By Charles S. Allen

New York City

THE matter of oil competition interested the members of the Wholesale Coal Trade Association and the trade generally during the past year, and it has been found that many concerns have gone over to the use of oil without a careful and proper consideration of the change. This association was asked, by a committee formed to look after this subject, to take over this branch of work and wherever it has been able to find an opportunity to place the facts with respect to the use of coal before the contemplating user of oil, generally the result has been that the consumer has decided to stick to coal. Our first step was to engage a combustion engineer, who is the head of the engineering department of one of the great universities in the East. He has taken over this matter for us and will go to the bottom of the whole subject and give us his report.

Coal Exchange Bureau Eased Situation

The throwing upon the market of large quantities of coal early in the year following the general breakdown of business was largely mitigated in this locality by the Coal Exchange Bureau maintained by the association which enabled its members to buy and sell among themselves with a greater freedom than had ever been known before in the trade.

The action of the association in obtaining from the Railroad Administration a suspension of the payment of demurrage charges, up to and including May 31 of last year aggregating upward of half a million dollars, as a result of the harbor strike that existed for a few days in January, and then from March 4 to April 21, relieved the trade of an immense burden. Complaint was filed with the Interstate Commerce Commission as to the reasonableness of the charges, and in July a hearing in the matter was held in this city, the presentation of the testimony and evidence occupying nine days. It is expected that the tentative report of the examiner who heard the testimony will be ready shortly. Following this, under the rules of the commission, the parties to the complaint, if they desire, have the privilege of filing exceptions to the report and making oral argument before a division of the commission, after which the commission's final decision will be handed down.

Hines Dons Garfield's Discarded Mantle

Much confusion and additional work has been thrust upon our members by the resumption of the functions of the Fuel Administration, especially as they have been carried out by its delegated authority, the Railroad Administration, and hundreds of thousands of dollars are now tied up in coal which had been taken by the latter, which the members have found it impossible to locate or to collect for, when they have been so fortunate as to locate it. I am of the opinion that if the coal trade had been permitted to function in a normal way during the last two months of the past year, much of the hardship which was suffered by the public would have been entirely obviated.

It is my belief that the coal trade as a whole is distinctly opposed to anything that even savors of profiteering. I think the tendency among dealers is always to treat their customers in the most considerate manner and my personal view in speaking on this ubject—and I am only expressing my personal view—is that what is said of the people generally is true of the coal trade specifically, and that the people are best governed which are least governed.

British Labor and Coal Prices

With reference to a statement made by the secretary of the Miners' Federation of Great Britain that "Miners started cutting the coal at $0.60 per ton and the consumer paid $12.50 for it," a correspondent of the *Daily Telepraph* quotes the following official figures, showing how the London retail price of $11.88 per ton is made up: (a) Pit price—labor, $5.29½; timber and stores $0.86½; other costs, $0.40; royalties, $0.15; owners' profits, $0.31 total, $7.02; (b) railway rate, $1.52; (c) wagon hire, $0.36; (d) distribution charges—loaders' wages, $0.42 carmen's wages, $0.44; other cartage charges, $0.62; loss on small coal, etc., $0.14; sacks, $.10; railway siding rents, demurrage, etc., $0.02; salaries and establishment charges, $0.84; profits, $0.40; total, $2.98. These separate items total $11.88.

The figures given by the President of the Board of Trade, i.e., $1,406,250,000, as the cost of raising 192,000,000 tons of coal in the year ended July 16, 1920, were accounted for as follows: Labor, $1,051,250,000; timber and stores, $172,500,000; other costs, $65,000,000; royalties, $30,000,000; owners' profits, $62,500,000; compensation to owners for working mines which would not otherwise be worked, $15,000,000; cost of Coal Mines Department, $5,000,000; margin for emergencies, $5,000,000. From these figures the cost of 192,000,000 tons of coal at the mines amounts to $1,406,250,000 as noted; the cost per ton of coal would be $7.32. The authority for these figures is Trade Commissioner Henry F. Grady, of London, Eng., in *Commerce Reports*.

Philadelphia Coal Trade in 1919

By Correspondent

THE first "after the war" year in this district was epoch making in many respects. In the first place the winter from the beginning of January was one of the mildest known here for fifty years and as a result the coal business was very quiet all during the season. Of course many consumers had been heavily stocked during the previous summer, but in the ordinary current business, the anthracite trade was far below expectations.

With the continuance of mild weather into February the Fuel Administration finally relinquished all regulations on anthracite coal, and the first effect of this was a reduction in retail prices, which then ran about as follows: Egg, $10.30; stove, $10.55; nut, $10.65, and pea, $9.05. Due to the lack of demand from the retail trade the independents were obliged to remove their differential of 75c. a ton, but even then they had the utmost difficulty to market their production. As a matter of fact many of the mines in the region suspended operations at this time, there being as many as 17 collieries closed in a single week. A striking feature of the trade was the manner in which the pea coal business had slipped away from the retail trade. Heavy stocks of this size were carried, but the demand was extremely light, a large proportion of the former pea trade having shifted to stove and nut. At this time there were many rumors as to what the spring wholesale prices would be, there being a general feeling that there would not be the usual 50c. reduction.

March Price Schedule Continues Till May

The price rumors which had started in February culminated in actuality early in March, for on the thirteenth of that month there was issued a circular by the largest producer, dated March 10, stating that the present winter circular would continue in effect until May 1.

April opened with only a light demand for fuel, some seeming to consider that the price investigation by the state had led the people to believe that lower prices would prevail. A "Buy Early" campaign was started by the retail trade in May and the dealers used heavy space in the newspapers urging the consumers to lay in their winter fuel during the summer. Whether the flood of orders which followed was due to the campaign or to a sudden realization on the part of the public that it was wise to buy in the face of the rising prices each month, it is a fact that the dealers were soon swamped with orders. On the part of the producers they found it most difficult to meet the calls of the retailers on them for egg, stove and nut, although pea was still very quiet.

In June there was a tendency toward quietness in retail ordering, although no dealer was in need of business, as most of them then had more orders on their books than they could fill for the next three or four months, most of which had been taken at a fixed price. Some of them began to realize that they had made a mistake in doing this, especially those handling a fair proportion of independent coal.

In July most of the independent shippers advanced their prices 15c. above company circular, but even at these prices they were shipping only a limited tonnage of the prepared sizes to this market. At this time the demand from outside markets, which during the war had suffered from lack of fuel, began so strong that heavy shipments were made in that direction at even greater advances in prices. All through August the demand for egg, stove and nut continued on the part of the retailers, and most of the larger companies were alloting shipments on the basis of the past year's experience, to the disgust of most dealers who maintained that this system made no allowance for natural increase in business.

Buying Good in September

September opened with a cool spell, which immediately made people think more actively than ever of their coal piles. In this month the wholesale prices also reached their maximum. The individuals also took occasion at this time to increase their margin over the company prices, their differentials ranging from 25c. for the lowest up to 75c. It seemed more than likely that it was only the matter of a month until all independents would be asking the 75c. margin on all sizes except pea. There was not the least sign of decrease of activity in the trade during October, with the dealers' yards still bare of egg, stove and nut. They had now reached the point where they would not book further orders with the consumers at a fixed price, as they were not at all certain what they would have to pay for the fuel at the mines.

The outstanding feature of the November trade was the picking up in the demand for pea by the retail consumers, especially in the latter part of the month, coincident with the arrival of some cool weather. Yet the real demand continued to be for stove and nut, and only to a lesser degree for egg. This month there was a decided call for all the steam sizes, due to the strike in the bituminous region which began on Nov. 1.

December was a real winter month in the trade and early in the month with cold weather the dealers began to move heavy quantities of pea. With the coming of the new year all interests were beginning to wonder if another slump in the coal trade similar to last year during the winter months was not about due. The only thing to offset such a prediction was that so far in the month of December we had had more winter than during the entire season last year and that the consumption of coal was very heavy, which it was believed would be reflected in better ordering later in the season when consumers' stocks began to run down.

Light Bituminous Demand in January

The year just closing is far from being a banner one for the soft coal interests. The season opened with only a light demand for fuel, for with the ending of the war in the previous November all the big consumers were loaded sky-high with fuel and buying fell off very materially. There was a strong demand for the better grades and shippers of this kind of fuel found little difficulty in making a market, but the lower grades were plentiful and coal was sold as low as $2.85.

With February the price regulation was removed by the fuel authorities, but the demand was far from strong. Most producers endeavored to procure the Government price of $2.95 for their output, maintaining that to take less would be to do business at a loss and they would fare better by closing down. There was at this time considerable interest being manifested in export business.

March still found the demand quiet, the real buying being confined to the best coals. There was more interest shown in contracts and some business was taken at this time at figures running from $2.95 to $3.50, although the operators were only willing to take a very limited tonnage.

The demand for fuel continued light through April and the producers of medium grade coals found it most difficult to find a market. This month many shippers sent in bids to the railroad administration covering their fuel requirements, but all tenders were rejected as being too high.

May displayed little change in the general situation, there being little tendency on the part of the consumer to stock fuel beyond their current needs, as they all had heavy stocks on the ground from the previous season. There was, however, an increase in the amount of contracting done, and some concerns began to make agreements for railway fuel.

Late in June there was a decided tendency on the part of consumers to take in coal, although this was confined chiefly to the best grades and the vendors of the ordinary fuels were still finding it hard going to move their production, sales being made as low as $1.80 for pool fuel. The big users in particular began to display interest and the month closed with a strong trend to better conditions.

PRODUCTION IN JULY INCREASED 50 PER CENT

In July the operators were able to get their production up to about 50 per cent of maximum and the more active movement begun in the previous month displayed increased strength. On this account the shipping houses showed less tendency than ever to enter into contracts. On the spot market the high grade coals were running from $3.05 to $3.25, while ordinary fuel was bringing in the market from $2.60 to $2.80.

There was a distinct upward movement of prices in August, averaging about 20c. all around, all of which was due to a car shortage which began to develop in all regions. Buyers seemed quite anxious to get in additional supplies and all prices were closely approaching the $3 mark, with quite a few beyond.

Good business was maintained in Sept. it being estimated that production was close to 70 per cent of maximum and this could have been increased if there had been sufficient cars to meet the demand. Later in the month an embargo was placed at tide and this threw a considerable volume of coal into the spot market, which had a tendency to depress prices.

With the tide embargo still on with the coming of October there was plenty of coal to be had for rail delivery and despite the threatened strike of the miners on Nov. 1 the local consumers refused to show any anxiety over the situation. With the arrival of the end of the month, however, the consumer woke up, until prices had moved up to $3.50 and $4, and finally shippers refused to accept any business at all.

With the coming of the strike on Nov. 1 there was little coal to be had and most of the output was applied on contract business. Nevertheless this market was supplied quite well with fuel, especially the larger plants, who had stocked up during the summer. Conditions became so bad in other districts that the Fuel Administration was revived, its affairs being administered by the railroad officials, and coal was only allotted to the industries in accordance with the priorities established during the war. The old Government prices were also in effect, which for Pennsylvania coal was $2.95 plus 15c. for commission when sold through brokerage houses.

The strike ended on Dec. 10, but this market had been so well taken care of that there was far from an extraordinary demand for coal. Later in the month, however, it became more difficult to procure fuel. At this time the trade stands in a most unsatisfactory condition and enters the new year with much uncertainty as to its ability to make the production of coal a profitable business. When the strike settlement was made with the miners, the Government stated that there was to be no increase to the consumer and the producers are still wondering where they will "get off."

Coal Industry's Part

George Otis Smith, in an address before the American Mining Congress, said: The advantages of regular employment accrue alike to labor and capital; it is the year's earnings that really count, whether it is the dollar or the man whose service we thus measure. Now, if we study the country's soft-coal business as a whole, we find a gratifying improvement during the war period in the average number of days of employment—from 195 days in 1914 to the top record of 249 days for 1918. But these averages for the country unfortunately include low figures for certain states, and usually for the same states year after year, a relation that deserves this comment: wherever the working year is shortest there dissatisfaction with the conditions of labor is keenest,—in other words where coal mines have not enough market to keep them running a long working year, there we find labor unrest.

Of course the relationship is not simple; cause and effect are mixed in this coincidence of short years, labor unrest and union strength, and it must be noted that mine owners as well as mine workers suffer from every interruption to the full opportunity for earning that comes only with continuous operation. The underlying cause of bad conditions in the coal industry is the seasonal fluctuation in demand, which has resulted in the country being overequipped with coal mines and coal miners.

For three months this last spring (1919) the coal mines of the country were operated, on an average, for only about 24 hours a week. From coast to coast the reason for lost time was "no market," something beyond the control of either operator or mine worker. Here, then, is the greatest branch of our mining industry vitally affected by a wirespread malady, the remedy for which lies with the public alone. Arbitration-dictation, legislation cannot cure such deep-seated trouble. Laws cannot make coal mines operate when there is no outlet for their product, but education of the consuming public may accomplish much in bettering the conditions of demand, and we as consumers will do well to remember that the price of coal must be varied accordingly.

Baltimore Trade in the Year 1919

By Staff Correspondent

A PERIOD of wide differences as to demand, supply and prices, of unusual disturbances occurred during the past year, caused by labor troubles and government control which was by no means altogether bad, as there was much healthy trading, especially on export from this port. The first months of the year were marked by exceeding dullness following the shutting down or curtailment of numerous war plants in this territory; the midseason witnessed a revival both as to demand and price, with record loadings being recorded on foreign delivery dumpings, and the end of the season saw the business both in and out of a great miners' strike and government control.

The months of January and February were dull in the bituminous trade. The light demand following the first days of reconstruction after the Armistice was such that prices dropped below the government maximum in nearly all cases. Take the state of the market at the outset of February as an example—three-quarter-sized Fairmont coal had a government price of $2.75 and went begging on the general market at $2.40 f.o.b. mines. Freeport was likewise some 35c. below government figures, and the government priced $2.95 Pennsylvania coals could be had at $2.75. At this time the anthracite trade showed little activity, as it was then believed that spring would bring a break from the existing wholesale scale and consequently in retail prices.

In March and April the soft coal market dragged and was without added strength. The retail hard coal trade fixed its schedule to conform with the new wholesale prices which were to remain in the old wartime margin of profit. It was planned not to make monthly advances of 10c., but to jump to 25c. on July 1, and 25c. toward fall to cover the 50c. over-season wholesale move.

Operators Swamped With Orders

May saw a continuation of the flat bituminous market, but the hard coal men received a record breaking line of early orders and complained much that they could not get through enough coal from mines to meet this. Other seasons had seen as high as 75,000 to 85,000 tons of hard coal received, but the receipts fell to less than 45,000 tons last May. In this month the export of soft coal began to pick up to a small degree. June brought a big spurt in the export business and one order alone was in the market for 3,000,000 tons for Italy, but with no takers. Prices began to stiffen in the domestic market as well.

The soft coal market grew tighter and tighter in July and prices for good coals mounted to $3 and better, while the export movement reached more than 230,000 tons for the month. The retail hard coal price advance of 25c. in July was quietly received.

Three dollars and a half per ton of coal at the mines came with August, and local plants began to hustle to get in stores of coal before it went higher. The export movement mounted to 248,000 tons for the month. Another advance of 25c. per ton in retail hard coal prices to offset the growing charges for premiums on independent coals, often ranging around 75c. per ton, raised little protest in public circles.

The jam of coal at this port in September as a result of an export trade that the piers could not handle promptly, and the rush to local plants of all-rail coals caused a series of embargoes. In this month sales of the best coals were recorded as high as $3.75 and $4 per ton and exports jumped to more than 326,000 tons. Anthracite dealers recorded still another price advance to take care of the last part of the wholesale over-summer rise.

The month of October was the last of the boom period, a vast quantity of coal having moved at good prices, and the exports from Baltimore reaching the remarkable figure of 460,000 tons. The story of the strike period starting the last of October; the ban on exports; the government seizures of coal which even to this writing have never been adjusted in payment to mines or shippers; the final adjustment after the coal trade had been badly upset, and the eleventh hour order of the Railroad Administration allowing a resumption of exports under permits on a 50 per cent basis of the October movement, are too fresh in mind to need review.

The total exports for the year of cargo coal from Baltimore—a ten-month period ending Oct. 31—showed 1,722,839 tons loaded here. This meant that the export movement, had it not been interrupted by the strike, would have vastly surpassed the banner year of 1915, when a total of 1,901,466 tons was loaded for foreign delivery from this port.

With government control about over, with the export business on the point of renewal, and with the business of Baltimore booming, the coal trade here is looking forward to a very prosperous 1920, unless the government fails to find an adequate solution to the labor troubles now being threshed out in Washington. The fact that a number of plants have substituted oil burners for coal because of the uncertainty of coal supply and the mounting prices is offset by the fact that industry here is demanding more fuel.

Buffalo Coal Trade in 1919

By John W. Chamberlain
Buffalo, N. Y.

THE Buffalo coal trade has had a very trying year, as has been the case throughout the entire country, but 1920 promises well, as all labor troubles will soon be overcome.

Since the Government gave up control of the trade the jobber has continued on the small margin allowed and had made a moderate amount of money as a rule until the miners' strike in November, which practically put a stop to the business. He had not been idle in the meantime and if he has sold little coal during the last two months of the year it was because he had so impressed his views to the consumer. There was of course profit in this business, but it ought to have been much more, for without the advice, not to say the orders of the jobbers, the consumer would have neglected buying and would have been without a supply when the strike began.

The anthracite trade has been continued much as usual. The shortage in the city trade has been much of the same character as in recent seasons, but the effort to obtain coal faster than it was provided has not been quite so determined as in some seasons. Last winter was so mild that a prediction of another winter of the same sort, quite commonly made by the weather sharps, no doubt held up buying considerably. As soon as the lakes closed the companies began to furnish coal as fast as it could be handled and in some cases a premium of $3 a ton has been paid.

The most disconcerting part of the anthracite trade was from the reports that the mining was millions of tons below the average, so the consumer reasoned that somebody was sure to get left. Still the anthracite shipper has always maintained that there was coal enough and it is now being proved that he was right.

The lake trade has been well taken care of, as the shipment of 4,150,118 tons from here to the upper lakes shows, for it is much above the average of the past two seasons. The shipment in 1918 was 3,594,803 tons and in 1917 it was 4,237,904 tons. The anthracite shipped by water now practically all goes to Lake Superior and Lake Michigan ports. It is said to have been taken by dealers or consumers about as fast as it arrived there, but if some of them do not have coal left over it will not come up to general calculations. The natural gas supply in Buffalo, which used to supply about as many private consumers as did anthracite, has so run down that coal is again the rule, except for small fires, in grates and kitchens.

LUCERNE MINE, LUCERNEMINES, INDIANA COUNTY, ILL.

Where 500 men are employed producing about 1,000 tons a day. Much of the coal is sent to Buffalo

Milwaukee Coal Trade in 1919

BY HERMAN BLEYER

Milwaukee, Wis.

THE passing of the year 1919 aroused no regret in Milwaukee coal circles, as it had been a period of worry and anxiety from start to finish, in fact, it is acknowledged to have been the worst season in twenty years, not excepting the harrowing war-time experience. Business was very dull at the beginning of the year, because of mild weather conditions, but later on an unusual demand developed which dealers found hard to satisfy and at the same time keep pace with the requirements of existing contracts, an unusual number of manufacturing establishments and apartment buildings having made early contracts covering their fuel needs. Strikes in various parts of the country contributed to the uncertainties of the business, and at the close of the season the great miners' strike and the re-establishment of the Fuel Administration put the finishing touch to the potpourri of trials and tribulations of the coal man.

A large portion of Milwaukee's fuel supply was taken over by the government and shipped to different points for railway uses. In this way some small dealers lost supplies for which they had been waiting for months. There was never a comfortable supply of cars at any time during the year, and naturally when periods of rush developed, the situation in this respect became acute and this seriously hampered the outward flow of coal to interior points. Anthracite was subjected to the usual advance of 10c. per month during the summer months and there were two or three small advances in bituminous grades, but taking it as a whole the public seemed well satisfied with the figures maintained.

The movement of coal by lake was steady and satisfactory. The tonnage of anthracite shipped was the largest Milwaukee has received since 1915. Receipts of soft coal, however, fell short of last year's record. Five hundred cargoes of coal in all entered the port during the season of navigation. The shortage in the volume of bituminous coal received was made up by the tonnage carried over from the previous year. With reasonably normal weather conditions there should be a sufficient supply of coal on hand in Milwaukee to tide consumers over until the opening of navigation in 1920.

Navigation is now closed. One cargo of nearly 10,000 tons of anthracite is still enroute and will not reach here until spring, the steamer having been compelled to winter in the Straits of Mackinac. The rush of large carriers to swell Milwaukee's coal supply on account of the drafts made upon it by the government, brought a large number of heavy carriers to the port at the close of the season.

RECEIPTS OF COAL AT MILWAUKEE DURING THE YEAR 1919

Month	Cargo Vessels		Car-Ferry		Total Anthracite and Bituminous	Rail		Grand Total Incl. Lake and Rail
	Anthracite Tons	Bituminous Tons	Anthracite Tons	Bituminous Tons	Bituminous Tons	Anthracite Tons	Bituminous Tons	Tons
January	.		12,830	15,204	28,034	42	58,848	86,924
February			10,930	13,280	24,210	105	46,852	71,167
March			9,303	4,741	14,044		47,730	61,774
April	59,535	92,652	12,521	12,619	177,327		40,729	218,056
May	102,498	440,018	8,016	11,010	561,542	....	40,176	601,718
June	101,539	615,882	13,755	24,896	756,072	613	43,132	799,817
July	133,128	455,374	5,222	19,227	612,951	1,382	41,659	655,992
August	147,036	363,986	2,753	23,031	536,806	45	37,259	574,110
September	122,096	394,611			516,707	....	43,158	559,865
October	91,587	357,851	2,796	34,921	487,155	41	50,792	537,988
November	127,007	176,678	4,104	22,913	330,702		42,107	372,809
December	81,326	114,484	*8,654	*15,733	220,197	*100	*40,000	260,297
Total, 1919	965,752	3,011,536	90,884	197,575	4,265,747	2,328	532,442	4,800,517
Total, 1918	839,092	3,446,061	61,109	113,054	4,459,316	1,245	727,606	5,188,167
Increase	127,760		29,775	84,521	....	1,183		....
Decrease	....	434,525			193,569		195,164	387,650

* Estimate.

Middle-West Coal Trade in 1919

By Haven A. Requa
Chicago, Ill.

FOR the coal man, the year 1919 certainly had its ups and downs. And one operator suggests that a proper title of an article on trade conditions in the Middle West, during the past year, ought to be "Bumping the Bumps and Shooting the Shoots, or the Harrowing Adventures of the Coal Industry." As a matter of fact, the suggestion of our operator friend is good, because a study of the market for the last yearly period shows that it was very erratic. The demand was practically never normal, either there being no demand at all, or more orders booked than the operator could handle. The year was a disappointment to the trade because it was expected that 1919 would prove a banner year for the entire coal industry.

When one glances over the events which took place in 1919, it is found that the year automatically divides itself into three periods, each consisting of about four months. Each period has one or two outstanding features, which in themselves have proved of great importance to the industry in this part of the country.

The first period was from January to the last of April. In order to get a comprehensive idea as to what took place during this period, it is necessary to review the last few months of 1918, when the demand for coal dropped like a plummet, chiefly on account of the signing of the Armistice, and on account of the fact that nearly all of the retail coal dealers, as well as the various industries in the country had substantial supplies of coal on hand. After the armistice was signed in November, war contracts were cancelled right and left, thus releasing practically millions of tons, a market for which had to be found elsewhere. The country could not absorb this suddenly released tonnage, and as a natural result the market broke. The retail dealers, in the meantime, had their hands in the game, but played an unconscious part. Owing to the efforts of the Fuel Administration a tremendously large tonnage of domestic coal had been sold and shipped during the summer months, consequently every householder and every dealer had a comfortable supply on hand when the armistice was signed. Added to this the winter proved remarkably mild.

When January 1919 came around, there was practically no activity in the coal market because, as I have said, the public had plenty of coal on hand. Soon some of the operators, with weak selling organizations, began disposing of their coal at prices below those fixed by the Fuel Administration, so very soon the market on both steam and the domestic coals was completely demoralized. About the middle of February, when conditions were at their worst, more confusion was added to the situation by the withdrawal of nearly all of the rules and regulations of the Fuel Administration. This withdrawal, of what practically amounted to Government control of the industry, was the cause of much comment, as the general opinion appeared to be that the Government ought to have used its great influence at this time to help the operators maintain Government prices, if for no other reason, on account of the splendid work and co-operation on the part of

MINE 9 OF THE MADISON COAL CORPORATION AT DEWMAINE, WILLIAMSON COUNTY, ILL.

the operators and mine workers during the war. The mine workers suffered just as much as the operators by being thrown out of work on account of the lack of demand. As a matter of fact, the operators have very little reason to look upon the present Fuel Administration at Washington, except with suspicion.

To return to the market conditions during the remaining part of the first period, it was found that after February, until the end of April, conditions in the coal market were lamentable, as prices steadily went downward until coal was selling in some cases as much as $1 below the Government prices. Many mines closed, and many mine workers were thrown out of work because there was either too much coal in the country, or because the public was not interested.

WHEN EVERYONE WAITED FOR COAL ORDERS

The next period, from May 1 until the end of August, is particularly remembered because of the general stagnation of the coal market, during the earlier part of the period; the gradual recovery of the market during the latter part of July and August; and chiefly, and finally remembered, on account of the efforts of the United States Railroad Administration, to beat down prices in order to buy its contract coal cheap. This last item referred to is what finally destroyed what little confidence the operators and jobbers had left.

A rough analysis of the situation appears to disclose the fact that the railroads, under Government ownership, were running seriously behind in their finances, and something had to be done. By purchasing cheap coal for the railroads, the authorities of the administration saw an opportunity to recover their losses and perhaps save their political reputations. In order to demoralize the coal market, these gentlemen at Washington determined not to buy their fuel at the prices set by the Government, which every one conceded perfectly fair, but deliberately kept their roads out of the contract market just as long as they dared. The coal market, deprived of its largest and perhaps most important customer, went completely to pieces, and eventually the railroads were enabled to purchase their contract coal at prices considerably below the old Government figures.

By their inconsiderate treatment of the coal operators, the authorities at Washington lost a great opportunity to gain the confidence of all the industries in this country. Instead of stepping in, earlier in the year, and buying coal at fair prices—these prices set by Government agencies—and therefore saving the coal industry from serious losses, these gentlemen sat back and did not buy for their railroads until they dared delay no longer. Besides causing severe losses to the operators, this action on the part of the Railroad Administration was responsible for much dissatisfaction which arose among the miners who were thrown out of work, when the mines had to remain idle.

In July there was some slight improvement in the coal market, although mostly on the prepared sizes for the domestic trade. Steam sizes were still very inactive, either because the industry had not adjusted itself to new conditions, or because there was still a great supply of storage coal in the country. August proved to be a better month and developed a good strong demand for domestic coal, with a fair demand for steam sizes. The period, however, from May 1 until the end of August was perhaps the hardest and most trying of the year.

LA SALLE COUNTY CARBON COAL CO., LA SALLE COUNTY, ILL.

The third and last period embraces from Sept. 1 to the end of the year. Starting in September, there was a healthy and vigorous market, that grew in strength every week. This condition was brought about by two reasons; the first, that buying is always heavy in the fall, and the second, that practically all storage coal held by the various industries had been consumed. In October, rumors were prevalent, all relative to unrest and dissatisfaction among the miners. These rumors spread about, and brought on a regular stampede of nervous and excited purchasing agents who were at that late date doing all possible to prevail upon the operators and jobbers to accept additional orders.

THE TARDY CONSUMER NOW BESIEGES THE MINES

The public, that is, the householder who had apparently forgotten the stern lessons taught by the fuel famine of 1917, had not bought very heavily from the retail dealers during the summer. As soon as trouble with the miners was threatened this class of consumer made frantic demands on the retailers, who in turn besieged both operator and jobber in attempting to place extra orders. Soon practically every mine in this part of the country had booked far more business than it could take care of. To add to the situation, it now developed that there was a decided car shortage. New cars had not been built fast enough to replace old and worn-out equipment, and lucky was the coal field anywhere in the United States, that could boast of an 85 per cent car supply for any length of time. A great many mines in the East, had but 50 or 60 per cent car supply for practically months at a time.

On Nov. 1 the strike came, a deliberate attempt on the part of the United Mine Workers to hold up the American public. At first the Government took a stern attitude, and showed the miners that the Government meant business. Dr. Garfield was recalled, and left his duties at Williams College to return to his old post at Washington. Dr. Garfield has always had the respect of the coal industry, and his return to Washington was looked upon with favor. Within a short time however, the coal industry knew that something was up at Washington. It appeared that Secretary of Labor Wilson had made an attempt, which luckily proved futile, to settle the strike on a basis satisfactory to the labor element only. It is said that Secretary Wilson was deeply disappointed over the failure of his plans, as some think he had political ideas in mind, whereby the labor vote would have come in very handy. However, this is mere heresay. Later on, Mr. William McAdoo succeeded in getting some free publicity by injecting himself into the situation. In a modest and retiring manner, Mr. McAdoo, although a private citizen, presumed upon his relationship and old official position, by intruding on the various agencies at Washington at work on a settlement of the strike. Mr. McAdoo claimed, it is said, that a 2,000 per cent profit was made by some operators. While his contention was misleading, it did a great deal of harm, as it stirred up the United Mine Workers, and made them more set than ever in their demands on the operators.

Dr. Garfield, in the meantime, had decided that the mine workers were entitled to a 14 per cent increase, which the miners refused. Toward the middle of December, Messrs. Palmer and Tumulty, acting in the President's name, we understand, made a temporary peace with the miners. This arrangement was contrary to the plans laid out by Dr. Garfield, so that gentleman resigned, and returned to Williamstown, leaving the final settlement of the strike in the hands of certain astute politicians at our capitol.

When the men went back to work, toward the middle of December, it was discovered that nearly all of the producers and jobbers in the Middle West had enough orders on file to operate their mines for some time. Naturally, those coming into the market to buy had trouble in placing their orders. It is no exaggeration to say that it is almost impossible to buy, at this time, coal from any of our better known mines either in Illinois or Indiana. However, as time goes on, this condition will change, as certain mines will run out of orders on certain sizes, and will have to take on additional business. It is believed that operators and jobbers will be in a position to take on more business at least by the middle or latter part of January. Coal producers are looking forward to a busy season from now until late in the spring. Labor is still unsettled, and many large coal consumers are endeavoring to accumulate a surplus. In addition the mines will have to work full time for a long while to make up for the tonnage lost during the strike.

Predictions for 1920 are uniformly optimistic. Practically every operator and distributor in the Middle West has the greatest confidence in the future. It is generally said that the labor question, so far as the miners are concerned, will have to be settled on some sort of a permanent basis, but it is believed that this can be done, and will be done soon. On account of the tremendous activities in all sorts of manufacturing, and the increasing demand for American coal for export, it is predicted that there will be business enough to keep the mines of the country mining pretty steadily. The year 1920 looms up bright, and unless some of the best brains of the country are mistaken, it will prove one of the best years the coal industry has ever experienced.

Connellsville and the Byproduct Coke Industries in 1919

By B. E. V. Luty.
Pittsburgh, Pa.

THE BYPRODUCT coke industry now rests on its oars. There was little done in 1919 by way of the new construction of ovens, beyond the completion of various plants, the erection of which had been started during the war, and scarcely any new plants were projected. The reason for the halt is simply that labor is very scarce and the cost of building is extremely high. In one quarter the estimate is made that byproduct plants in batteries of 50 to 100 ovens would now cost about $45,000 per oven. Even at that they would probably pay for themselves, but prospective builders probably figure also that waiting may pay just as well or better, by saving part of the cost.

The byproduct coke industry has fully justified itself. Ovens are operated more economically than a few years ago, producing much more gas per ton of coal carbonized and somewhat more of the various byproducts, while year by year there is a greater latitude in the choice of coal. Byproduct coke, particularly of late, has made excellent records in the blast furnace, which, as a rule, produces more pig iron per day, and with less coke per ton. This is due not so much to the coke being better, piece by piece than beehive coke, than to its being more regular.

According to the Geological Survey reports it was in the week ended Oct. 19, 1918, that the production of byproduct coke for the first time exceeded the contemporaneous production of beehive coke in the United States, but that was rather an empty honor, since the circumstance was due to a decline in the beehive output. Unfortunately it became necessary for the Geological Survey to discontinue its weekly reports of byproduct coke production before the end of January, 1919, through some of the byproduct coke producers refusing longer to co-operate, but the weekly report of beehive coke production was still continued. When the final figures of the coke production in 1919 are issued they will doubtless show heavier production of byproduct than of beehive coke, but 1919 does not furnish the test of a calendar year of full demand for coke. Under the stimulus of a full demand the beehive ovens might come close to their record, which was the 35,464,224 net tons produced in 1916, while it is very doubtful whether the existing byproduct ovens can produce as much as 3,000,000 tons a month. Their output in 1919 was probably about 2,500,000 tons a month in the good months, and much less in the poorer months, particularly April, May and June, when blast furnace and steel plant operations were light from lack of orders, and October and November, when the iron and steel strike was a limiting factor.

In 1919 the Connellsville region again found that the byproduct coking industry was not marked to deprive it of all profitable business. It is true the production of Connellsville coke was much less than in 1918, not much over 10,000,000 tons, and thus not much above the average of 20 years ago, but the coal business of the Connelsville region was very satisfactory. The region profits not only by the quality of its coal for coking purposes, a quality that is recognized by byproduct coke producers, but also by the thickness of the vein and the relative ease with which the coal is mined.

The wage scale from Nov. 10, 1917, to Dec. 1, 1919, was based on $2.29 per 100 bu. for pick mining and loading room and rib coal. As a bushel is 76 lbs., making about 26 1-3 bu. to the short ton, the rate was only a trifle over 60c. per ton. The new scale, $2.66, is equal to 70c. Rates under the two scales for loading machine coal, $1.65 and $1.88, are equal respectively to 43½c and 49½c.

OPERATORS INCREASE THEIR LOADING FACILITIES

Year by year Connellsville coke operators increase their facilities for loading coal, until at the end of 1919 there were relatively few operations of any size, or with any amount of coal still in the ground, that were not fairly well equipped to load coal for rail shipment. In 1919 the prices obtained for coal were moderately satisfactory to Connellsville operators, and distinctly more so to Pittsburgh district operators.

The largest byproduct coke plant in the world, the Clairton plant, near Pittsburgh, of the United States Steel Corporation, depends practically altogether upon Connellsville coal, the operation contemplating, in the long run, water shipment exclusively. On account of the many operations in the Connellsville region controlled by the Steel Corporation it was feasible to select operations to supply Clairton, that could ship by water. Late in 1919, 128 additional byproduct ovens were completed at Clairton, making a total of 768 in the plant, arranged in 12 batteries of 64 ovens each. The next plant in size is the 700-oven plant at Gary, Ind. The total number of byproduct ovens in the United States is between 10,000 and 11,000, the actual capacity per oven varying considerably.

The year 1919 opened with Connellsville coke at Government limits, $6 for furnace and $7 for selected 72 hour foundry, per ton at ovens. Just after the middle of the month annnouncement was made that Government price control would be relinquished at the end of the month, and prices began to drop within a few days. Most of the consumptive requirements were under contract. The contracts having been made during the war. The majority of the contracts provided that in the event of there being no Government price there should be a monthly adjustment of price between buyer and seller, these adjustments being made month by month, much in accordance with the spot market as developed from time to time by open trading. A few contracts were made at "last Government price" which proved disadvantageous to the buyers. In some cases the operators having such contracts made what were technically voluntary price concessions, but were in substance caused by knowledge that if the concessions were not made the furnaces would not operate and thus would not be obligated to take coke at all.

The spot furnace coke market declined steadily after the middle of January until April, when $3.50 was reached in some cases. Then the market stiffened slowly and somewhat irregularly until by July 1 it stood at about $4. Thereafter it advanced slowly for four months and then rapidly in November and the fore part of December, until just before the reinstatement of Government prices on Dec. 8 when some coke sold at $10 to $12 a ton.

The major portion of the contract furnace coke tonnage ran out June 30, and fresh contracts were made for the second half of the year on various terms. The flat price contracts were generally at $4.25 to $4.50, while sliding scale contracts were largely at 6¼ to 1, against basic pig iron at valley furnaces. With the $25.75 price that ruled throughout the first four months of the half-year this made a settlement price of $4.12 for the coke. For November and December settlements were much higher as pig iron was advancing.

In November there was much contracting for the first half or all of 1919, and some ratio contracts, similar in form to those just mentioned, were made at 5½ to 1, while a few were made at 5 to 1. Flat price sales were made at $5, $5.50 and $6, the average of these contracts being much nearer $6 than $5. The advance in spot coke occasioned by the coal strike curtailing supplies to byproduct ovens discouraged further contracting, and the imposition of Government price limits put a complete stop to negotiations, leaving a considerable volume of consumption for 1920 uncovered.

Railroads' Largest Customer

The Director of the U. S. Geological Survey, George Otis Smith, says: "As the railroads' largest customer, the coal mining industry is largely concerned in the solution of the transportation problem now so prominently before the American public. It is plain that adequate service and low rates mean much to the health if not to the very life of our industry, yet even as large buyers of transportation we should not seek preferential rates at the expense of the rest of the public, any more than as sellers of fuel we should be willing to let the Railroad Administration procure its supplies from our mines at prices so related to bare cost that the public must make up the difference. You coal operators know too well how that style of shoe pinches to wish the same kind of narrow policy on the reorganized railroad system. We must allow freight rates to be determined by facts of transportation cost, rather than by what we claim to be the exigencies of our own business.

"Even a legislature cannot impose rates, however they may seem calculated to serve public interest; that would deny to the railroad the reasonable reward necessary for its financial and physical upkeep. The Supreme Court has ruled that a State law can not force a railroad to haul coal at a loss on the supposition that the profits in the wheat traffic will recoup the carrier. So it is that in a spirit of fairness the mining industry ought to help in the adjustment of rates on a basis adequate to revive healthy conditions on our railroads.

"In its relation to the mining industry the Government needs to be fair, whether the relation is that of mineral landlord or of business investigator or of tax collector or of purchaser of fuel. Disregard of established equities, ill-advised charges of bad faith, threats of commandeering, or offers of confiscatory terms are no longer warranted in these days when the Government's necessities are no greater than those of other consumers."

Pittsburgh Coal Trade in 1919

By B. E. V. Luty
Pittsburgh, Pa.

THE PITTSBURGH district coal market entered and closed the year 1919 with Government price limits in force, while from Feb. 1 to Oct. 31 there was a free market. During that period there were interesting developments.

After the signing of the armistice the tenseness of the market wore off, and by the beginning of 1919 prices were not uniformly at the limits allowed by the Government control. The demand was very limited, as consumption decreased after the cessation of hostilities and there was much less disposition on the part of consumers to carry stocks. The situation was helped somewhat by light production during the holidays, the men celebrating freely, while many mines were closed for the period.

During the first two or three weeks of January off-grades of coal were being sold in the market at less than Government limits, which for the Pittsburgh district were $2.10 for slack, $2.35 for mine-run and $2.60 for screened, with a 15c. brokerage allowance in some cases, while many sales of good coal were being made with a brokerage allowance, the dealer selling to the consumer at the regular price, not charging him any brokerage. Many wagon mines were closed while of those operating few were able to secure the extra prices allowed. Gas coal, however, was in relatively scant supply and commanded the limit prices.

Government Price Control Discontinued

About Jan. 15 the Fuel Administration announced that price control of coal, as well as the zoning system, would be discontinued at the end of the month. When the time arrived an incident occurred which was forgotten in most quarters in a week or two, some operators announcing the following schedule of prices: Slack, $2.35; mine-run, $2.50; ¾-in., $2.60; 1¼-in., $2.75, per net ton at mine, Pittsburgh district. The actual market developed was on the basis of an asking price of $2.35 for mine-run, with concessions according to the quality of the coal and the urgency of the seller's position. Odd lots of coal loaded went as at low as $2. On the other hand consumers of gas coal who had had extremely trying experiences during the war were disposed to pay prices asked and get under cover, so that a fair tonnage of ¾-in. gas coal was contracted for at $2.60 for the coal year, to April 1, 1920.

During February, March and April the coal market dragged and the market had a basis of strength but the basis was not visible. Consumers of coal were imbued with the idea that was very general throughout the country as to commodity prices as a whole, that since the war was over all prices would decline, and decline sharply. Apart from the mental attitude of buyers there was the physical fact that there were large stocks of coal in consumers' hands and the further fact that consumption was decreasing, domestic consumption falling with the progress of the season, while the steel mills, the most important group of customers of the Pittsburgh coal disrict, were operating at lower and lower rates. The steel mills were operating at between 85 and 90 per cent of capacity at the beginning of the year, but by the middle of May they were down to approximately a 50 per cent rate.

During this period of extreme apathy on the part of buyers the Pittsburgh district coal operators were sustained in their price views by knowledge of their production costs, which were much higher than generally believed by consumers, and by the belief that under the Government control of prices they had not been given as large a margin as several other districts, hence if other districts sold coal at much below the former Government limits that did not necessarily constitute a reason for the Pittsburgh district doing so.

Pennsylvania R.R. Closes Large Contract

About May 1 an event occurred that put a new aspect on the situation and strengthened the operators' hand. It was announced that the Pennsylvania R.R. had closed a contract with the Pittsburgh Coal Co. for 1,200 tons of coal a day to April 1, 1920, at $2.35 for mine-run. The Industrial Board of the Department of Commerce had been endeavoring to bring the Railroad Administration to the point of contracting for railroad fuel at stabilized prices, but having failed to accomplish anything in its first effort, than to secure an acceptance of its steel prices, the attempt was abandoned. The individual roads bought at various prices and for various periods, the shorter periods involving the lower prices, and some Pan Handle coal went to railroads for short periods at less than $2.

By reason of railroad buying, and other important causes, the coal market situation improved in May, definitely rounding the turn. Lake shipments began, though definite prices were not set. The steel industry began to revive and of course took more coal when it was looking forward to heavier operations than when its operations were decreasing. Buyers generally began to observe that after all prices of commodities on the whole were no longer declining and hence they looked with more favor upon coal.

Operators Expectations Not Realized

The coal operators were convinced that trying times were likely in the winter, and they did not believe the railroads would be able to handle abnormal quantities of coal, as there had been few additions to their rolling stock, which had suffered during the war. They considered it extremely probable that the miners would demand large wage advances when the agreement ran out, as it would upon the declaration of peace. They did not expect what eventually did occur, a demand for wage advances and changed working conditions when the agreement which was to run to the declaration of peace, or to April 1, 1920, was still in force, but neither did they expect the declaration of peace to be postponed so long by the failure of the Senate to act on the Peace Treaty.

The operators were therefore very conservative in the making of contracts for execution during the remainder of the coal year, a common policy being to sell on contract about half the normal output. By the end of June most of the operators had withdrawn from the contract market, and several prominent interests then advanced their circular prices from $2.35 to $2.50, mine-run basis.

Early in the year productions in the Pittsburgh district had been at only about 30 per cent, but with the beginning of lake shipments operations increased and by mid year the district was operating at 60 to 65 per cent of capacity. At this time consumers, particularly the steel industry, began to heed the repeated warnings of the coal producers, and started accumulating stocks, though on quite a moderate scale. When the steel strike started Sept. 22 some of the mills were forced to stop receiving coal, but those able to unload continued to take coal just the same, and thus the steel industry was moderately well stocked when the mining suspension began on Nov. 1.

From midyear to the reimposition of Government price limits the coal market increased in strength. The change was particularly marked in slack, which in the first couple months of lake shipments, with the attendant increase in output, the sales were made at even less than $1.50.

The coal mining settlement, by the acceptance on Dec. 10 of President Wilson's proposals by the miners' representatives at Indianapolis, was followed by a quick return to work of the miners in the Pittsburgh district, but within a few days car shortages developed. The advent of real winter weather was practically coincident with the mining settlement, thus slowing down railroad operations somewhat, while many cars belonging to the service of the Pittsburgh district had gone far afield. To the extent of about 21,000 cars, according to investigations made by Pittsburgh district operators, loaded with coal in western Pennsylvania, Ohio and West Virginia districts had gone to Chicago and points beyond, some as far as Salt Lake City. The railroads were prompt and efficient in moving the loaded cars to destination as soon as the husbanding of coal supplies became unnecessary, but even at the end of the year the Pittsburgh district was still short of the number of coal cars usually in the service.

The situation left for the new year was that no consumers had any stocks of coal, when normally they still have some winter stocks left, and a great many were definitely short of coal and unable to operate as fully as conditions in other respects would warrant. With the steel industry oversold and with practically all coal consuming industries desirous of operating to their fullest extent, the outlook for a heavy coal demand was never better. Nineteen twenty is being looked forward to with great interest.

Detroit Coal Market in 1919

By Staff Correspondent

EMERGING from war-time restrictions into a protracted interval of stagnation, only to be brought again under governmental regulation after a few weeks of improving activity, the coal business in Detroit, in the year just passed, has been full of disappointments and discouragements for wholesalers and jobbers and conducive to anxiety and apprehension on the part of consumers.

Business Poor in Earlier Months

Through the earlier months the wholesalers and jobbers paid office rent, and filled the role of observers rather than of active participants in the business from which they derive this rent money. Under the active functioning of fuel administrators, federal, state and municipal, and their antipathy to coal brokers, little remained for the wholesalers and jobbers but to sit helplessly, though interestedly, and observe the progress made by the various authorities in handling business not as the jobbers were accustomed to.

Under the operation of the federal zoning system, they saw the local market being overwhelmed with a flood of low grade coal from districts that ordinarily are called on to contribute little to its supply. They saw the high grade stock that had constituted the market's chief reliance diverted to eastern centers and the export trade. They saw their customers in the retail trade and among the consumers of steam coal, responding patriotically to the urging of the Fuel Administration, and buying heavily of the inferior stock in the effort to make certain that they would not be left wholly unsupplied.

When the Fuel Administrators ceased functioning, the jobbers devolved the task of restoring the market, but progress was slow. For weeks following the lifting of the zoning regulations and removal of federal price restrictions, the market remained in a state of languor. The storage yards of retail dealers were crowded with an unsaleable miscellany, in which coal of inferior grade and in sizes better adapted to steam plant use than for consumption in household heating equipment, predominated. Steam plants were overstocked with low grade coal and received without enthusiasm the information that it was again possible to bring into Detroit the high grade stock from West Virginia and other mines that had long been withheld.

The retailers started the new coal year with capital tied up in coal, their customers having protested against receiving it because of the little yard space for its accommodation. The domestic buyers, deprived of anthracite, which in the case of many was the only fuel with which they were familiar, were supercritical as to substitutes. Many of the consumers of steam coal overstocked with the inferior coal were unwilling to place orders for the higher quality coal until they could clear their yards of stocks which presented the menace of internal combustion and produced unsatisfactory results in boiler rooms.

Government Settlements Complicate Situation

With this basis for stagnation in the retail and steam coal trade, the situation was complicated by the dilatory policy of the federal government in negotiating settlements of cancelled war contracts and in making payments for government equipment and supplies. For some weeks large industrial plants were hindered in efforts to revert to peacetime production by the loss of working capital tied up in government machinery, material and manufactured goods, and by the delay of the government in removing mechanical equipment which filled the space required for the machinery of peace production. The unsettled industrial condition was reflected in curtailed operation or suspension of factory production with consequent reduction in coal consumption. This cut down buying requirements of steam-coal users purchasing in the open market and protracted the interval necessary for other steam plants to work out the low-grade coal in their reserves.

Meantime prices held at approximately the maximum fixed under the Fuel Administration, with small consignments coming chiefly to the retail dealers from the mining districts that supplied the city before the war. The market dullness continued through the spring and early summer. Retail dealers endeavored without success to effect some arrangement under which the municipal government would take over their unsatisfactory stocks.

ACTIVE BUYING IN LATE SUMMER

In the late summer and early fall a more active buying movement set in. The buying, however, was irregular and reflected the general theory among consumers that lower prices would be obtainable later in the season. The tendency to hold back orders received encouragement from time to time from statements issued from semi-authentic sources in Washington. The belief among steam-coal users that the price of coal would revert to prewar prices, which was supported also by the refusal of the Railroad Administration to close contracts at the current prices, was an influence tending to encourage disregard of the reiterated warnings of the imminence of labor difficulties in the bituminous mining regions. The threats of strike action apparently were regarded as part of a well prepared plot between operators and mine workers to maintain war-time prices.

COAL CONTINUED TO COME AFTER STRIKE BEGAN

There was a certain amount of buying in progress, however, and when the strike actually materialized on Nov. 1, the preparations of jobbers and wholesalers had been so well worked out that coal continued coming into Detroit in quantity sufficient for steam and domestic requirements for two or three weeks.

Following the reinstatement of Fuel Administration prices, the Railroad Administration representing the Fuel Administration, seized all coal on cars, the Regional Committee finding the Detroit supply so satisfactory that a liberal policy of distribution to original consignees was adopted. Detroit consumers ultimately were made to feel the pinch of supply in other western markets by diversion of an increasing proportion of the coal sent to Detroit to provide for the needs of the railroads or of consumers in other cities. With the city confronting an actual shortage because its coal was being sent elsewhere, very drastic restrictive regulations were put in operation to conserve light, power and coal supply.

POOR CAR DISTRIBUTION DECREASES SUPPLY

Termination of the strike came before any actual serious hardship had been experienced, beyond that attending the suspension of operation by numerous industrial plants and the reduced production of others. It brought a slight improvement in volume of shipments into Detroit. The movement has not yet regained the level that was maintained previous to the strike, though jobbers and wholesalers look for a more liberal supply soon. In resuming shipments, however, operators are giving first attention to the fulfillment of contract obligations, with the result that free coal is not plentiful in the Detroit market.

Prices on the contract coal in most cases are said to show an increase of 25 or 30c. over the maximum set by the government, this advance being an absorption of the increase in wages granted to the mine workers. The change in contract price is permissible under terms of most of the contracts which provide for adjustment of selling price to meet changes in mine-wage scales.

CONTRACT CONSUMERS ARE NOT SUPPLIED

Owing to the present condition of supply the consumers who are not protected by contract find it necessary to do considerable searching to provide for their requirements, though the prices at which they are privileged to buy do not embody the increase applying to contracts.

Throughout the year the anthracite situation has been unsatisfactory, and the supply irregular. During the earlier months of the coal year the prediction frequently was made that a freer movement would follow the closing of the lake navigation. This so far has failed to materialize. Supplies in retailers' yards have not been large and would not last long should extremely low temperatures for several days stimulate a strong buying demand. While it is believed that a large distribution to consumers was effected during the summer, despite the slow shipments, a considerable volume of renewal orders may reasonably be expected in the near future.

Reinforced Concrete Headframe To Be Erected at a Scotch Colliery

The first ferro-concrete headframe in Scotland is now in course of erection at the Lochore Colliery of the Fife Coal Co., Limited. As the shaft is being sunk on the lower portion of the property, the superstructure had to be carried to a considerable height so as to bring the landing into line with the general level of the colliery. The shaft will be sunk 20 ft. in diameter in the clear. The foundation for the shaft headframe is in the form of a reinforced concrete raft 41 ft. sq. x 4 ft. thick, and carried out from the back of this for a distance of 70 ft. are two underground beams 5 ft. x 3 ft., which terminate and are connected with a solid concrete foundation slab, from which the batter posts spring and run right up to the top platform at sheave level. On the top c the concrete raft referred to there is a super-foundation 30 ft. sq. x 7 ft. deep. The ground will eventually be filled up to approximately this level, the shaft being of course, carried through this super-foundation, upon which the four main columns surrounding the shaft are set, being monolithically connected to the foundation. These columns, tied at intervals with cross beams and angle braces, are carried right up to the sheave platform.

The decking level is 26 ft. above the present ground level, and is roofed over at a height of 14 ft. The structure will be walled for the first half of its height with steel mesh, cement-covered inside and outside to form a wall 2 in. thick, and the upper half will be glazed.

The headframe is 90 ft. 3 in. high from the ground level to the center of the sheaves, whilst the overall height from the foundation level to the top of the standard is 126 ft. 3 in. The top is surrounded by a concrete platform 30 ft. x 16 ft., thus providing ample space for carrying out any work at the gears, etc.—*The Iron and Coal Trades Review.*

Cleveland Coal Trade in 1919

By Edwin C. Boehringer
Cleveland, Ohio

COAL history in the Cleveland district for the past year may be written in terms of stockpiles—the extent of them at the beginning and the lack of them at the end of the year. Probably no twelve months in the industry's local history have been so packed with precedents overturned, demand reaching such extreme ranges, and trade conditions generally upset. The year in Cleveland ended as turbulent as it was placid in beginning.

January's coming found demand for steam and domestic sizes of bituminous coal at the low ebb that followed the signing of the armistice. Ohio mine-run and slack were quoted at $2.35, f.o.b. mine, and prepared sizes at $2.60, but practically none was moving. By far the greater portion of industry in Cleveland is allied with iron and steel, and huge stockpiles laid down in the summer and fall of 1918 remained as mute witnesses to the record-breaking consumption expected during the winter.

Steam coal users, face to face with decreased operations and abnormal stocks, withdrew completely from the market. Domestic consumption was cut probably 60 per cent by the mild weather. Consequently, the termination of government control on Feb. 1 had only the effect of precipitating a slump in prices. Steam coal sales in the five months from January to May were the lowest on record and prices acted accordingly. From February to the middle of April prices gravitated cellarward, and as low as $1.88 finally was done by the federal Railroad Administration on mine-run. Good-sized sales of slack, too, were made at about this level in the Cleveland district.

May saw steam-coal consumers in Cleveland besieged by operators to buy. Warning after warning that prices would increase and supplies be restricted later in the summer were heaped upon users, but with little effect other than to halt the downward trend of prices. From the middle of April to about July 1 prices remained stationary, and indications that a revival in buying was imminent caused them to multiply. Operators also took heed as July 1 neared, and were much less anxious to tie up their output on long-time contracts. The recovery at this time was more pronounced in mine-run than in slack.

PART OF 5,000-TON COAL RESERVE OF CLEVELAND ELECTRIC ILLUMINATING CO. AT ITS EAST 72D ST. PLANT

COAL STOCKPILE OF THE LAKE-FRONT IRON & STEEL PLANTS AT CLEVELAND

The beginning of the last half of the year was plainly marked. Trade conditions took a decided turn for the better and order books grew fatter. Practically no coal buying having been done in the preceding six months, the bottoms of stockpiles began to be visible. Recognition of the fact that coal prices were mounting slowly, but surely, and that delay could bring only decreased supplies appears to have been almost simultaneous. The result was that early in July several of the largest steam-coal users in the Cleveland district contracted. When the smaller users learned of this they too began contracting, but as usual they were just too late. They paid from 10 to 25c. a ton more for their delay.

From July to the beginning of the strike, on Nov. 1, the trend of prices and demand for steam coal was consistently upward. From January, when No. 8 mine-run was quoted at $2.35, at the mine, to steam-coal consumers in Cleveland, the quotation fell as low as $1.90, or thereabouts, in mid-April, had risen to about $2.15 by late July, and in September and October, when the strike loomed up a certainty, reached the high mark of $2.75@$2.85 for the year. Buying of steam coal became feverish in September and continued so as long as any was to be had. But so low had most stockpiles been allowed to become that steam-coal users in Cleveland, on an average, entered the strike with no more than a month's supply on the ground.

No real effects from the strike were felt in Cleveland until late November. Restoration of the government maximums of $2.35 for mine-run and slack, and $2.60 for prepared sizes, meant little or nothing, in view of the almost complete disappearance of receipts. In normal times Cleveland proper receives about 2000 cars of bituminous a day—barring that consigned to the lake trade; about Dec. 1 receipts dropped to 50 cars a day, and sometimes fewer. Dec. 18 saw the arrival of five cars from the Ohio No. 8 field—the first coal to be received in Cleveland that was mined following the ending of the strike. On Dec. 22 the local fuel committee relinquished its hold on all receipts and except for price and trade, conditions became normal. Restrictions as to heating and lighting were in effect less than ten days in Cleveland.

Domestic demand for bituminous coal was practically nil as 1919 dawned. Cellars were well-stocked in the fall of 1918, and the extremely mild winter enabled them to survive into the spring with supplies not more than half consumed, in many instances. In the spring, anthracite and Pocahontas again became available, and domestic demand for these two grades became the greatest in the history of the local retail trade. Retail dealers, as a result, did a winter business all summer long in these sizes, and domestic consumers of coal entered the strike period prepared for a siege of several months, using only smokeless grades.

DECEMBER PRICES HIGHER THAN IN JANUARY

Anthracite wound up the year priced little higher than at the start. In February egg was bringing $11.25, delivered in Cleveland; in July it could be had for $10.85; in September for $11.65, and in December for $11.75. Chestnut, which ended the year with a local spread of $12@$12.20, could be had for $12 in September; $11.65 in July; $11.15 in May, and $11.55 in February. Forked Pocahontas was quoted at the close of the year at $10@$10.50, where in July it could be had for $9.50, and in May for $9. No. 8 slack was quoted at $4.95, delivered Cleveland, in March; $4.75 in April; $4.70 in May, June and July; $4.90 in August; $5.10 in October and later $5.10@$5.50 when government prices were restored. On No. 8 mine-run, delivered Cleveland, the retail price was $4.95 in March; $4.85 in April; $4.70 in May; $4.80 in June; $4.90 in July; $5.10 in August; $5.20 in September, and $5.75 @$5.90 when the strike broke in November.

Opening of navigation on the Great Lakes in March saw dock piles of coal at upper lake ports almost the largest, if not the largest, in the history of the lake trade. This coal was a mixture of Indiana, Illinois, Ohio and Pennsylvania coal, partially afire. Forced by the zoning system to forego their supplies from Ohio, Pennsylvania and West Virginia in the 1918 season, the upper lake coal trade came back stronger than ever for fuel from these states. The lake trade thus boomed from the day the first lake freighter was able to get through the ice. In the week of June 7, the Lake Erie docks set a new high record for loading when they dumped 1,122,322 net tons of cargo bituminous coal and 46,007 tons of vessel fuel, a grand total of 1,168,329 tons. By July 1 the 1919 season was a good 1,500,000 tons ahead of the 1918 season to that date.

RECEIPTS OF COAL AT THE HEAD OF THE GREAT LAKES

	1918		1919	
	Anthracite	Bituminous	Anthracite	Bituminous
Northwestern Fuel Co...	443,100	1,352,800	447,400	829,400
Berwind Fuel Co........	....	819,000	....	557,400
Pittsburgh Coal Co......	338,900	1,320,500	254,100	1,217,100
Superior Coal & Dock....	20,500	115,500	....	....
Reeves Coal & Dock.....	....	....	24,900	93,500
Boston Coal & Dock....	31,000	224,700	49,900	175,700
Carnegie Dock & Fuel...	110,300	1,127,100	158,300	747,500
Hanna Coal Co.........	127,500	497,500	138,300	292,100
Island-Creek Coal Co....	....	328,800	8,100	153,100
Clarkson Coal Co........	12,000	318,800	44,500	256,400
Northern Coal & Dock Co.	48,100	478,200	87,400	280,800
Zenith Furnace Co.......	....	457,600	.....	414,600
Philadelphia & Reading...	147,500	195,800	183,900	170,500
Steel Corporation........	....	1,306,500	....	939,500
Reiss Coal Co...........	140,400	601,500	109,200	317,000
Pittsburgh & Ashland....	6,600	166,600	....	101,300
Lehigh Valley...........	183,700	....	120,200	....
Great Lakes Coal Co.....	....	280,000	6,200	310,000
Totals...	1,609,600	9,590,900	1,632,400	6,855,900

Shipments to the head of the Great Lakes in July and August continued at a record pace. The middle of September, however, saw the 1919 season practically ended three months in advance of normal seasons. Early in September handlers at the upper lake coal docks struck, and were out more than a month. In the meantime, sailors on the lake fleets became restless and there was considerable talk of a sympathetic strike to tie up downbound iron ore cargoes and aid the striking iron and steel workers. By the time these troubles were ameliorated, and vessels that had been temporarily tied up were put back in the lake ore and coal trade, the coal strike broke. Where on July 1 lake shipments of bituminous were ahead of 1918 shipments by 1,500,000 tons, the end of navigation—the middle of December—found the 1919 season about 6,000,000 tons behind 1918. The loss from July 1 to Dec. 15 in the 1919 season was some 7,500,000 tons as compared with 1918.

The total movement of bituminous coal on the Great Lakes in the season of 1919 was 22,743,000 net tons. In 1918 the movement was 28,153,317 tons. The average for the ten years ending with 1919 was 23,500,000 tons, thus relegating 1919 to slightly below the average. In net tons including the Great Lakes trade in bituminous (cargo coal) has been as follows:

Year	Tons	Year	Tons
1919	21,713,341	1914	22,995,000
1918	28,153,317	1913	28,328,683
1917	26,828,759	1912	23,335,000
1916	24,369,000	1911	21,782,685
1915	22,420,000	1910	22,838,700

One feature of the 1919 season on the Great Lakes was the demand for slack. More slack was handled by car dumpers at the Lake Erie ports than for many a season. Another feature was the reduction of lake freight rates, making the 1919 ones about on the same level with 1917. The 1918 rate of 48c. a net ton on bituminous from Lake Erie to Duluth was reduced to 42½c.; the rate from Lake Erie to Lake Michigan ports was cut from 55c. to 47½c. In December the rate both to the west bank of Lake Michigan and to Duluth-Superior soared to $1.25 a net ton.

Casting aside the differences between the operators and the mine workers—problems which are national and not local—the outlook for 1920 is most bright.

Columbus Coal Trade in 1919

BY J. W. LEHMAN
Columbus, Ohio

THE YEAR 1919 was a peculiar one in the coal trade in the Buckeye State. Early in the year there was government regulation of prices and distribution and the same thing occurred toward the closing days. But during the nine months ending Nov. 1 there was unrestricted operation and distribution, which allowed the market to take the course which was the natural result of the law of demand and supply.

TIPPLE OF THE POMEROY PLANT OF THE ESSEX COAL CO., OF COLUMBUS, OHIO

On the whole the year was not as prosperous for either the operator or the jobber as it might have been, although some showed fair profits, especially where they operated low-cost mines. Jobbers generally were not as prosperous because of the reduced volume of business. On the other hand the retailer was generally prosperous because of the better margins now obtainable since cost has been ascertained and dealers are inclined to do business with a proper margin.

33,687,000 TONS PRODUCED IN OHIO

One of the chief features of the year was a reduction in the output in Ohio as compared with previous years. Stimulated by war activities production in Ohio during the years 1916, 1917 and 1918 ranged higher than at any previous times and the closest estimates made for the year 1919 show a marked falling off from the high figures of 1917 and 1918. A careful estimate of the production in 1919 made by W. D. McKinney, secretary of the Southern Ohio Coal Exchange, shows that about 33,687,000 tons were produced in the State. As compared with 1918, when a total of 47,894,236 tons were produced, there is a falling off of approximately 14,000,000 tons.

Production figures for some previous years in contrast with those of 1919 show that 1912, 1913, 1916, 1917 and 1918 exceeded the year just closed in production.

In 1912 there was a total of 34,444,291 tons produced; in 1913, 36,285,468 tons; in 1914, 18,736,407 tons; in 1915, 22,627,046 tons; in 1916, 34,526,552 tons; in 1917, 41,677,986 tons, and in 1918, 47,849,236 tons.

In arriving at the estimate for the 1919 production the Southern Ohio Coal Exchange gives the following figures: Total production for commercial purposes from the first of the year to Nov. 1, 14,389,504 tons; production for railroad fuel during the same period, 4,359,787 tons and lake coal produced during the same period, 6,188,612 tons. This makes a total of 24,937,903 tons, which does not include non-revenue producing railroad fuel, which means coal used by railroads on which the mines are located. Last year there was approximately 9,000,000 tons of this class of coal and an estimate of the tonnage required for 1919 is 7,500,000 tons, making a total of 32,379,903 tons. To this tonnage must be added the number of tons produced since the settlement of the strike, about Dec. 14, which is estimated at 1,250,000 tons, making a grand total of about 33,687,903 tons. When the figures are finally tabulated this will not be very far from the real total.

Production figures in the southern Ohio field by months will show in a general way the trend of production during the year. With a capacity of approximately 2,000,000 tons monthly in the district the following production figures are given: January, 1,685,608 tons; February, 1,282,412; March, 1,434,107 tons; April, 1,602,850 tons; May, 2,602,920 tons; June, 2,917,316 tons; July, 3,039,094 tons; August, 3,085,136 tons; September 3,310,718 tons; October, 3,977,742 tons; November, nothing; December, 1,250,000 tons (estimated). These figures do not include non-revenue producing railroad fuel.

A study of the production in the southern Ohio field, which is a fair index of production in other parts of the state, shows that the smallest output was in February and March. This was slightly increased in April but did not show up with large gains until in May, when the railroad fuel contracts which had been hanging fire for some time were closed, and the operators started to extend their operations. In June and July there was a steady increase with the peak coming in October just prior to the suspension.

CAR AND LABOR SHORTAGE AFFECTS PRODUCTION

Car shortage and labor shortage had their effects on production during the year. The factor "no market" was also the principal cause for the heavy reduction in production. Looking over the chart of the fall in output due to the lack of market we find that the output started to decrease almost immediately after the signing of the armistice in November, 1918, and went up rapidly until the peak was reached on Jan. 25, 1919, when there was a reduction of 275,000 tons a week, due to lack of demand. Then the line started to drop slowly, with several reactions until April 26 when a heavier demand appeared and it reached normal lines toward the latter part of the year. In other words, during the latter part of September and the whole of October the market readily absorbed all the coal that could be produced in Ohio mines.

The car shortage made its first appearance July 19, and on Aug. 30 reached a point where the output in the southern Ohio field was reduced by 110,000 tons weekly. During the months of September and October the car shortage was not pronounced, as the railroad authorities made especial efforts to handle the larger production of coal.

Price fluctuations during the year are very interesting when studied in connection with production, car shortage and the approach of the time for the strike of the United Mine Workers. In January the federal prices prevailed in all districts and as a result there were no price fluctuations other than some selling under the government prices because of lack of demand. This was not general however, and, generally speaking, government prices ruled during the month.

MONTHLY PRICES COMPARED

In February, when the government regulation of the industry was removed, the first prices to be governed by the law of supply and demand since the time the Fuel Administration took charge in the latter part of 1917 prevailed. The average price paid in the Hocking Valley field, in which is included Jackson, Pomeroy and Crooksville, was $2.85 for prepared sizes; $2.53 for mine-run and $1.98 for screenings. About the same levels prevailed during March, when lump averaged $2.83, mine-run $2.56 and screenings $1.87. In April there was a rather marked reduction, due to lack of demand when prepared sizes sold at $2.72; mine-run at $2.27, and screenings at $1.62. The month of May saw practically no improvement and in fact a still further decline in some grades. Prepared sizes sold at $2.70; mine-run at $2.20 and screenings at $1.30. In June prices on some grades were still further reduced to $2.57 for prepared sizes; $2.11 for mine-run and $1.37 for screenings.

In July the average prices were: Prepared sizes, $2.75; mine-run, $2.10 and screenings, $1.59. August showed some recovery when the average quotations were $2.80 for prepared sizes; $2.07 for mine-run and $1.58 for screenings. In September prices still further recovered to $3.20 for prepared sizes; $2.40 for mine-run and $1.65 for screenings. One of the features at this time was the weakness in screenings which was due to a heavy production of prepared sizes and lack of demand from steam plants for storage screenings. In October prices showed a boost to $3.30 for prepared sizes; $2.50 for mine-run and $2 for screenings. During the last days of October, when it was seen that a suspension was inevitable, prices took a boost until $4.50 was paid for lump, $3.75 for mine-run and $3.50 for screenings. In a few instances even higher prices were paid.

When the strike was in force the Fuel Administration was again established and federal regulated prices were enforced. These in every instance were the same as prevailed during the first month of the year.

COAL CARS SCATTERED IN OCTOBER

With the coming of the federal regulations on the distribution of coal at the end of October, coal cars were scattered from one end of the country to the other and the result was an acute car shortage at the close of the year. This condition is expected to maintain for some time and will hamper production during the early part of the New Year.

Outside of the big strike of Nov. 1, there was not a great deal of loss in production caused by small strikes, although there was about the usual quota of such shutdowns. Many causes entered into these shut-downs, among which were some local grievances, funerals of employes or in their families or disputes over scales.

Stripping operations showed up remarkably well during the year. Early in the strike arrangements were made with the employees of many of the stripping operations to continue at work, and thus some production was possible. Several additional large stripping operations were put into commission during the year and more will be developed at a later date.

General development of mines during the year was not as active as in some previous years, due largely to lack of demand. Some large deals in coal lands were reported and in some casese these deals will mean future development in drift and shaft mines. But on the whole development was not on as large a scale as during the war years.

PRINCIPAL CHANGE IN NORTHERN OHIO

One of the principal changes in the coal demand in central and northern Ohio territory which took place recently is the partial failure of the natural gas supply which has placed a heavier burden on coal. The cold winter has showed up the lessening gas supply and many householders have changed from natural gas to coal as a fuel. This means a still further demand for coal for domestic purposes.

As soon as the commission which is now in session decides to order an increase in prices, and settles the labor question, the operators, having the co-operation of the miners, will endeavor to make 1920 a banner year. Operators in this region are of the opinion that the work of the commission will be of no avail.

St. Louis Coal Trade in 1919

By E. J. Wallace

St. Louis, Mo.

As 1918 came to an end, as a matter of fact within a week after that eventful Nov. 11 when warfare ended for America, mines in the Illinois fields began to shut down and those mines were the forerunners of many others that "blew over" for many months of idleness. While peace brought joy to millions, it brought poverty to thousands of homes in the Midwest fields and a breaking up of perfect conditions from an operating viewpoint.

In the St. Louis territory, with its vast recent undertakings in munition and other government supply plants, the sudden let-up hit the steam trade hard. As 1919 came in inventories unearthed huge storage supplies that in some cases carried the fuel supplies for those plants up into the following May. Contracts made for government work were cancelled and all over the Middle West the steam market was at low ebb.

With the information that the Fuel Administration would soon lift its rulings, came a demand from dealers and operators alike that the zone restrictions be maintained in the West until spring, on account of the huge storage supplies, and certain other trade relations that had been formed. In St. Louis alone it was estimated that the retail dealers had upwards of 80,000 tons of coal in storage and then there was close to 150,000 tons of steam coal in storage piles, many of which were on fire.

AUTOMATIC CONVEYOR LOADERS ARE USED LOCALLY

Weather records showed the mildest winter on record, the winter of 1877-1878 was a mild one, but nothing compared to 1918-1919. Each week end brought hopes of a colder week to come—a prayer always for seasonable weather from retailer and operator alike, but the weeks slid into months and soon April came in with springtime. This brought no retail demand, and working hand in hand with no steam call, dismay was rampant from the miner down to the coal wagon driver.

Much discontent was evident in the Standard field and a little later on it spread to the Mt. Olive field. This smoldering fire was the flame that was to break out in the Illinois fields five or six months later, and not entirely without cause, through Governmental failure to see far enough into the future of the operating problems and causes therefrom. With plenty of Carterville coal available, as well as some from Mt. Olive, there was no work in the greater part of the Standard field. Prices were cut, but coal would not move. And cars were plentiful except in the Carterville field.

Either government control of railroads or deliberate incompetency in those operating them for the government was one of the primary causes for the unfavorable coal conditions in the West. Railroad storage supplies were used; contract mines were idle for months, and following this, in the later spring and summer months no storage coal was put away. Rank ignorance or maliciousness seemed to dominate the railroad fuel problems and the Government pretended to help the operator by advising the public to store coal when the railroads under government control would not store any unless they could get a little now and then for less than cost of production.

STEAM SHOVELS AT WORK OUTSIDE ST. LOUIS

As January ended, demand eased up on Carterville and Mt. Olive. Here and there was a slight cut to move no-bills. The Baltimore & Ohio, Louisville & Nashville and Missouri Pacific R.R. began to get back to normal, with no cars and poor service on such coal as the operators could find a market for. Then the terminal at St. Louis began to fall down and February saw conditions most depressing.

An effort was made at this time to create selling agencies for all of the mines on each road so as to divide up the tonnage saleable among all of the mines. This fizzled out for many reasons, but chiefly through lack of confidence in the sponsors and in each other.

Anthracite egg began to move in, which brought grief to the dealer who had Arkansas and coke in storage. Every dealer now began to work off his storage supplies and the public generally called for new coal, to add to the trouble. Retail prices began slipping on Standard and Mt. Olive coal at this time and the retailer threw away the profit that the Government said he should have.

Approaching April 1 a surplus of coal began piling up in Franklin County, but the prices held from Williamson County worked better and sold cheaper, and the Mt. Olive and Standard coals were absolutely a drug. The mines had a hard time getting over two days a week, with over one-half of them idle all of the time or next to it.

REACTION OF STEAM SIZES OCCURED IN JULY

As June came in there developed a reaction on the Carterville steam sizes from Franklin County and many mines had thousands of tons stored nearby. There was a general picking up of domestic sizes from this field in June, all moving to the Northwest. Car supply generally was good and at the end of the first half of the year found the railroad situation in fairly good shape, except that little railroad coal was going into storage.

The industrial situation at this time was very bad in the Mississippi Valley and steam coal unbilled was the cause of many mines remaining idle. At this time the shortage of domestic sizes caused a slight flurry in the price, but not for long, in the Standard field. The high-grade demand, however, was different. It assumed such headway that many operators on July 1 could not promise definitely a shipping date on domestic sizes, although they were in some instances idle on account of no-billed steam coal.

Prices prevailing at time of shipment of orders were not filled unless they netted the shipper a minimum of $3.25 and as high as $3.60. The buyer predicated his purchase on the price at time of sale, but he was a party to a contract order with equity only on the side of the Franklin County shipper, and this coal will suffer in the future as a result of the unfair attitude of a group of operators in that field.

Railroad tonnage for northern and western roads showed some improvement in July and toward the end of the month the car shortage increased. Mines in the Carterville field that were idle since the Armistice were reopened, but there was a shortage of men. This soon became prevalent throughout Illinois as other mines long since idle tried to resume.

It developed at this time that on account of the uncertainty of work and the unsatisfactory wage scale, thousands of foreign miners were going back to Europe. Native miners were leaving for the harvest fields and seeking employment elsewhere. Several went East to nonunion fields. There was an outburst of dissatisfaction over the fact that the operator was charging more every month for his coal but the miner was not getting any part of this increase.

Mines that produced 3,000 tons per day in the Carterville field were down to 1,500 tons, and this falling tonnage soon became serious for St. Louis, and the southern territory could get but little Carterville coal. No orders for the future were taken, and dealers were trying to swing the trade to Mt. Olive or Standard coal. Anthracite was unobtainable and there was no smokeless coal in sight. This caused good working time in the Mt. Olive district for domestic coal, a big tonnage of which began to move West.

The Standard field began to come into its own, so that on Aug. the general situation had almost reversed itself in a month's time, except on steam sizes, which were the cause of much worry in order to get them out of the way for domestic business.

The country call for domestic came in now and was never filled as far as high grade coal was concerned. It took several months—up to Oct. 30—to take care of the Mt. Olive and Standard business that piled up in August and some of it remained unfilled to the end of the year.

LOCAL TRUCKS LOADING AT HUGE COKE PILE

On Aug. 1 the retail price of soft coal advanced 25c. because of the 10c. per month increase in Carterville, and the bettering of conditions in the other fields. The pot of discontent among the miners began to boil over in the Standard field. Miners around Belleville who had worked one or two days a week for many months, because of no business, and others who were idle for the same reason for many months, found places in the mines but car supply now gave them not over two days a week, with no better prospects in sight. This income did not cover the cost of the barest necessities of life and it did not take long for this propaganda to spread. The real primary cause of the trouble was that on July 5 many miners laid off as a protest in the Mooney case. When they were fined a day's pay this was the straw, figuratively speaking, that broke the camel's back. By Aug. 10 nearly every mine in the Standard field was idle except those on the Mobile & Ohio R.R. and those at the south of Coulterville. It spread to the Mt. Olive field and mines would work for a day or two. These miners openly defied their state officers and asked them to resign.

With all these troubles there was plenty of coal in St. Louis. Business in other lines was bad; there was no steam demand and the public lagged along in the domestic sizes. When Sept. arrived many of the miners returned to work for a day or two, and went out again when the strike leaders lost their places in the mine. Threats were made against those who worked and this finally ended in the authorities taking a vigorous stand for law and order.

Miners reported for work at many places on days when there were no cars. When there was equipment the whole outfit would forget to report and thus there was a systematic method of striking apparently within their own law. Railroads were desperately in need of fuel and they were taking everything in sight, and with cars scarce, there was almost no commercial coal to offer. Toward the end of the month the striking miners had all returned to the same old two and three days a week and oftentimes not that. There were no eastern coals coming West. And anthracite was uncommon after June and July.

ST. LOUIS COKE PILES SAVED MIDDLE WEST

The coke piles at St. Louis saved the Middle West during the strike period. The byproduct tonnage was close to 75,000 tons, and there were about 35,000 to 40,000 tons of gashouse coke, which kept the steam plants of St. Louis and east St. Louis going, as well as many outside places. The product was shipped out by day and night crews, and at the time the strike was settled in December there was no gashouse coke left. Orders on hand for byproduct covered the available tonnage remaining. Fortunately the 1,700 tons of gas coal required for the gas plants kept coming in daily from the East.

The fuel conservation rules were lax and brought no public relief. They did, however, cause much open rebellion and public condemnation. With the aid of a few practical coal men the Regional Committee began to get results and West Virginia smokeless coal came in at the proper time and was distributed where it would accomplish most.

Coming from the railroads, no one knew what kind of coal they were going to get, nor the cost of it. At the end of the year they had no idea what they were to pay for coal received in November and which they sold, in many cases, at low prices. The railroads played safe by laying it on as heavy as they could. Many small places got no coal because a car would cost more delivered than the local coal man was worth. Way-bill information was as "Greek to a Mexican" when sought for from the railroad. This one glaring instance of governmental supervision incompetency was manifested here, and as a result many dealers were obliged to charge exceedingly high prices.

Nearly all the eastern coal coming West was the high-priced contract quality. Up to the end little, if any, government priced coal moved West which made the price so high that poor people could not buy it. The weather continued mild throughout all of this period up to about Dec. 15, and even after that there was no real cold weather; just cold enough to keep business going.

SITUATION BECAME ACUTE IN DECEMBER

Toward the middle of December the local coke supply began to get short and the situation became acute. Many plants put in oil, and lucky it was for the future of the coal man, for these oil burners were all pulled out before the first of the year, and coal went in again. The cost of oil was about two or three times as great as coal in most cases.

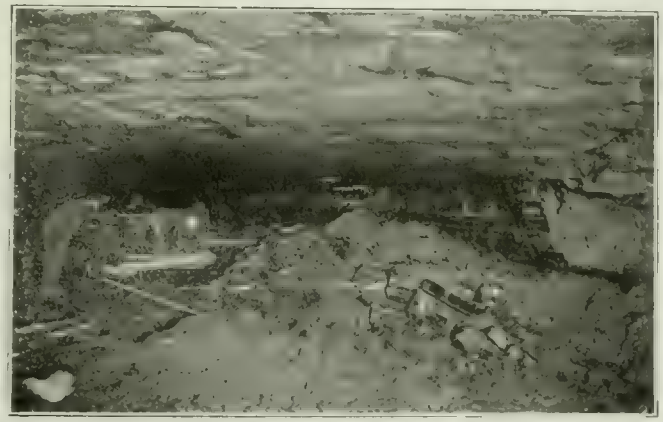
Work was resumed when the strike was called off, but the tonnage was small, growing steadily until it became close to normal at the end of the month in all fields. Many miners had drifted away, disgusted with their calling. For the first time anthracite steam sizes were coming into St. Louis for factories, but other sizes were scarce. In the Standard and Mt. Olive fields the Fuel Administration prices of last winter were in effect.

Louisville Coal Trade in 1919

BY A. W. WILLIAMS
Louisville, Ky.

THE CLOSE of the 1919 season in the coal trade finds the industry in what is said to be the most disordered condition of the war period. Conditions throughout the year have been far from satisfactory as a whole, and the outlook for 1920 is much of a gamble at the present time. Many operators are of the opinion that 1920 and 1921 represent the real reconstruction period even more than that of 1919.

In the early part of 1919 many industrial concerns were winding up the war orders. Others secured considerable domestic business that had fallen behind during the war period. With domestic demands upon various industries slackening in 1920 there may be a reduced demand for coal. One leading operator calls attention to the fact that there has been an abnormal domestic demand since the early part of the war, and an increased export demand due to conditions in Europe. However Europe will shortly start producing much more coal, which will relieve export demand somewhat, while shipping is depending more and more on fuel oil, with the result that some operators feel that the coal industry may become an even greater domestic proposition than it was before the war. There are some operators who feel that there will be an overproduction of coal if conditions return to normal. It is pointed out that if prices at the mines are regulated by federal control, along with wage control, overproduction will be impossible for a long time to come, as many of the small operators and wagon mines will be unable to operate profitably.

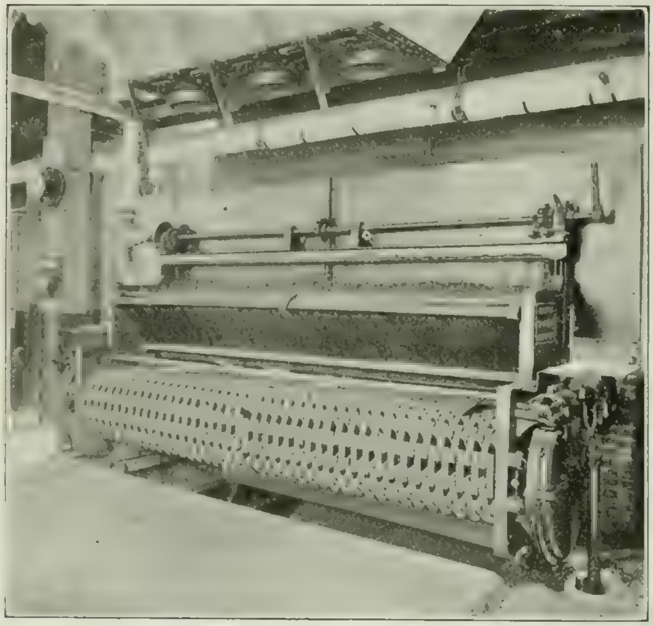


SEAM FALLS AS FAST AS COAL IS CUT

Some of the smaller mining companies are now in the hands of receivers, and comparatively few companies had a really good year in 1919. The big companies with adequate machinery and equipment for fast mining of better seams of coal will be able to operate profitably probably even under existing conditions. Before the war coal salesmen were numerous, while for the past three years they have been scarce. It is believed that with good labor and car supplies it will require six to eight months to place normal stocks of coal throughout the country, and make up for the time lost during the strike. After that there is a possibility of mines being short of business, which will probably result in overproduction and price cutting.

Louisville retailers as a whole report that their records for the year show that they did not make as much money as they did under federal control in 1918. This was due largely to an effort made to stock the domestic consumer in the summer months. Unlike conditions in 1918 coal was plentiful, and all retailers were able to secure supplies. Between competition for stocking business and price cutting on coal brought in by river, prices remained low during the stocking season. Then the mines began advancing prices sharply, and retailers did not keep up with the advances, due to the fact that a few had good stocks of river coal, or cheaply purchased coal, and held prices down. This resulted in much domestic stocking at very nearly cost, and a big reduction in profits for the retail trade as a whole.

The jobbers did not have an especially good year either for when coal was plentiful they had plenty offered, but could not sell it. In the spring they were offered block coal, and later in the year when block was in demand they could only secure the steam sizes. In the late fall when the strike became apparent the demand became heavy, and they were unable to secure any coal, as the operators could sell their production direct, and this condition has continued.



ONE OF THREE LARGE STOKERS AT PLANT OF STANDARD OIL CO. AT LOUISVILLE

Western Kentucky operators came closer to observing federal prices during the year than operators in other sections. For several months their prices remained at their schedules, even after regulations were lifted on Feb. 1. However, eastern Kentucky, Tennessee and West Virginia as well as Indiana cut prices to such an extent that western Kentucky had to finally meet the reductions, and at one time fine screenings were selling down around 60c. a ton in spot shipments. When block prices advanced western Kentucky did not go so very much over the war time price. Eastern Kentucky advanced block prices to a $4 per ton maximum in some sections of the Harlan field, while in other sections operators asked and got $5.00 to $5.50 per ton.

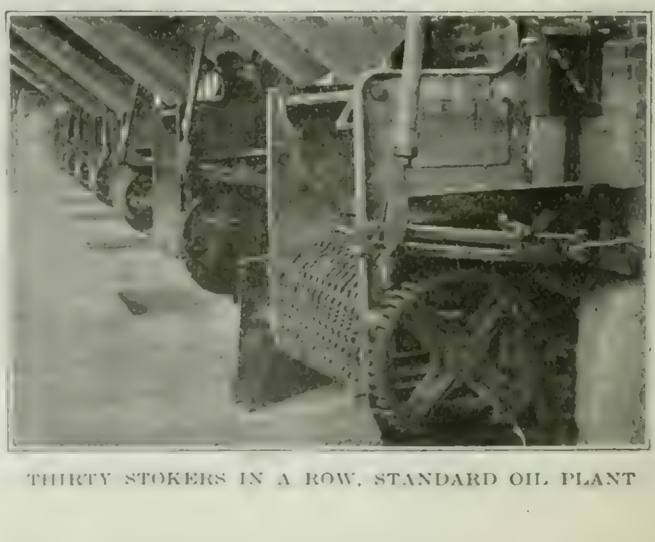
With the return of railroads to private control on March 1, it is believed that traffic conditions will probably be a little worse for a time, but gradually show improvement. Large car building companies claim that there will be one of the biggest car building movements in many years when railroads do finally return to private control, as the railroads realize that they are shy on equipment, and must have it.

Prospects for 1920 are very uncertain. If the balance of the winter is as mild as the first part domestic stocks will carry through nicely, and at most there can not be more than sixty days of bad weather in the year. This will result in very little early spring demand. Industrial demand should continue good for some months, especially in view of the fact that many industrial buyers fear further strike troubles and are anxious to secure adequate supplies.

River shipping didn't turn out as well during the year as had been expected. The West Kentucky Coal Co., had some trouble over low stages in the Ohio River, and shipments by water from Sturgis were not as heavy as had been expected. The Pittsburgh Coal Co., shipped rather steadily to Cincinnati and Louisville during the year, but tonnage was off, as there were no available supplies, and there was a lack of demand as long as coal could be moved by rail. Cincinnati with better combined rail and water rates into Indiana and Illinois will probably handle more river tonnage next year. A deal is pending whereby the Island Coal people may take over a large portion of the Pittsburgh Coal Company's river operations, and develop them again to something like the former size. The River and Rail Coal Co., Louisville, is planning to develop a big barging business on Hazard coal to Madison, Ind., and Ohio river points if it can secure freight rates from the Hazard field to Beattyville, Ky., where coal would be chuted to barges, and be towed via the Kentucky and Ohio Rivers. The amount of coal in tons moved by river to Cincinnati and Louisville during the year was as follows:

	— Cincinnati —		— Louisville —	
	1919	1918	1919	1918
January	11,613	none	1,080	none
February	41,775	6,164	430	none
March	50,868	15,709	9,462	2,800
April	59,821	31,336	1,600	7,594
May	27,502	116,851	1,260	12,855
June	39,906	190,647	17,046	5,251
July	66,110	791,532	3,210	40,357
August	42,387	64,707	4,586	975
September	197,565	69,463	1,839	5,231
October	No report	65,590	4,823	4,530
November	No report	42,098	4,112	569
Total	....	1,439,497	49,448	80,162

Western Kentucky during the year managed to secure much more favorable coal traffic rates into various sections, and has been fought "tooth and toenail" by mines on other sections, as reduced rates enabled the west Kentucky operators to go into districts with low-priced coal, in which they had been unable to operate. Eastern Kentucky operators have received better rates to southeastern and the gulf shipping points, which have aided in securing export and bunker business.



THIRTY STOKERS IN A ROW, STANDARD OIL PLANT

The Hazard field which has been one of the youngest and fastest growing in the state is handicapped by a shortage of railroad facilities. The Louisville & Nashville R.R. into that section, known as the Eastern Kentucky division has only one outlet, that being westbound and can only handle about 450 cars of coal a day, whereas the capacity of the mines is around 765 cars, leaving the railroad capacity the controlling factor. In 1913 Perry County was producing but 25,000 tons annually, while that county alone had produced 2,120,000 tons in 1918. The Louisville & Nashville R.R. has not developed the division to meet requirements, not having sufficient sidings, or trackage heavy enough for the larger trains and locomotives.

CARS OF COAL SHIPPED FROM MINES ON LOUISVILLE & NASHVILLE R.R.

	1919	1918	1917
January	35,864	36,632	38,326
February	29,705	37,254	34,950
March	32,069	37,750	38,908
April	30,619	39,345	33,520
May	33,930	42,288	36,867
June	34,288	40,775	36,765
July	37,211	43,706	36,283
August	†32,232	†42,230	30,885
September	†39,494	†41,992	26,653
October	†45,348	†38,737	38,448
November	†20,715	†37,017	40,291

† "50-ton car" basis

Large consumers of coal are much interested in development of better methods for reduction of consumption, and the various trades associations today are employing experts to aid in improvement of plants. The accompanying photos show two interesting types of such installations.

In an illustration in the far column of the opposite page is shown one of three 500-hp. automatic stoker boilers, equipped with Illinois stokers, at the power plant of the Standard Oil Refinery at Louisville. Coal for these boilers is loaded to overhead magazines with an electrically operated shovel supplied by the Alfred Box Co., of Philadelphia. Ashes are automatically dropped from ash pits to empty gondola cars by air valves to sliding doors in the bottom of the ash hoppers, the cars coming in under the plant. The boiler room in this plant is on the second floor, some thirty feet above the ground level, which makes it more convenient to remove the residue of ashes automatically.

The other illustration shows 30 stokers in a row, also in the Standard Oil Refinery, at the same place. Some are, however, extremely indistinct, as the battery is so long that they fade away in the distance.

Byproduct Coke Ovens in 1919

BY C. J. RAMSBURG
Pittsburgh, Pa.

THERE were a total of 1,138 ovens added to those in operation Jan. 1, 1919. This makes a total of 10,519, or an increase of approximately 11 per cent, and since the new type of oven has a greater carbonizing capacity per unit than the general average, the increase in coking capacity amounts to practically 14 per cent. It will thus be seen that the past year has been a good one from the standpoint of conservation in coke making and the increased production of byproducts. A list of ovens now in operation is as follows:

KOPPERS OVENS

Owner or Operator	No.
Dominion Iron & Steel Co., Sydney, N. S.	120
Providence Gas Co., Providence, R. I.	40
Jones & Laughlin Steel Co., Pittsburgh, Pa.	240
Rainey-Wood Coke Co., Swedeland, Pa.	110
Carnegie Steel Co., Clairton, Pa.	128
Tennessee Coal, Iron & R.R. Co., Birmingham, Ala.	72
Total	710

SEMET-SOLVAY OVENS

Owner or Operator	No.
Ford Motor Co., Detroit, Mich.	120
Mark Manufacturing Co., Indiana Harbor, Ind.	120
Lackawanna Steel Co., Buffalo, N. Y.	60
Total	300

OTHER TYPES OF OVENS

Owner or Operator	No.
Wisconsin Steel Co., South Chicago, Ill.	88
Citizens Gas Co., Indianapolis, Ind.	40
Total	128

The following plants are in course of construction and should go into operation during 1920:

KOPPERS OVENS

Owner or Operator	No.
Jones & Laughlin Steel Co., Pittsburgh, Pa.	60
Bethlehem Steel Co., Sparrows Point, Md.	180
Donner Union Coke Corporation, Buffalo, N. Y.	150
Birmingham Coke & By-Products Co., Birmingham, Ala.	50
Domestic Coke Corporation, Fairmont, W. Va.	60
Pittsburgh Crucible Steel Co., Midland, Pa.	100
Total	600

SEMET-SOLVAY OVENS

Owner or Operator	No.
loss-Sheffield Steel & Iron Co., Birmingham, Ala.	120

It is evident that the coming year will see a falling off in ovens going into operation. This doubtless arises from the high cost of construction. It is, however, becoming evident and undeniable that the cost of construction has come to stay for a long period. The saving to be effected has adjusted itself to the times, so that the return on the investment is as sure in 1920 as it was in 1913. The past year has seen one encouraging development, in that, the use of straight high volatile coals in coke making has been proved a success and that a decreased cost of coke per ton of iron produced, is to be a consequent fact.

The high prices for food products, particularly those whose production is greatly enhanced by the use of fixed nitrogen, makes the demand for sulphate of ammonia an active one, and insures a good price for this product.

The increased use of creosote oil for the preservation of high priced timber, the demand for pitch in building construction and the increasing use of tar felt, have made a marked increase in the demand for tar and tar products. In addition to these demands, the use of tar products in road construction is assuming enormous proportions. Practically every state in the Union is engaged in a good roads campaign and the excellent binder from coke oven tars will be used on a large number of the contemplated highways. Coupled with the demand there is a relatively decreased supply of tar because the steel industry has come to realize that one of the best fuels available for use in the open-hearth process is coke-oven tar and little of this material made available by recent coke-oven construction is coming onto the market at this time.

Benzol, toluol, and solvent naptha are being sought in larger quantities daily by the dye manufacturer, the pharmaceutical product producer and by those industries requiring the use of high grade solvents; for example, rubber, paint and varnish makers. At the close of the war it was expected that motor fuel would be the ultimate destination of the major portion of the benzol-plant products, but there is reason to believe that while benzol mixtures with gasoline produce a fuel much superior in generally satisfactory motor operation than straight-gasoline products, the immediate future will see decreasing proportions going into this fuel and greater proportions into chemical trade channels.

The following products can be secured in daily operation in the modern byproduct coke plant producing 1000 tons of coke per day, or a two-blast furnace coke supply plant.

Benzol	3,000 gal.
Toluol	750 gal.
Solvent naphtha	550 gal.
Coal tar	16,000 gal.
Sulphate of ammonia	18 tons
Surplus gas for sale or use	9,000,000 cu.ft.

The value of these products to-day on conservative contract basis amounts to over $3.50 per ton of coke, and since each modern oven produces at least 4,000 tons of coke per annum, this means a return per oven in byproducts, of $14,000 yearly. Of course, this is not a net return, since plant investment and operating expenses must be deducted therefrom. It may be safely said, however, that never in the history of byproduct coke production has the outlook for favorable return even at the high construction costs at present obtaining, been better than on this the opening of the third decade of the twentieth century, and never has conservation been more important than in the closing days of 1919.

The need for conservation is becoming more generally recognized and the losses resulting from turning coal into coke without saving byproducts are beginning to be fully recognized, and this is increasing the interest in the byproduct oven.

Geological Survey Production Estimates

THE accompanying graph shows how 1919 output failed at all times to reach the level of the output of 1918 except during a week or two when the production was increased in 1919 by the prospect of a strike and decreased in 1918 by the probability of peace. Overlooking the strike period, the low point in 1919 was in the week ending April 5, the bathodic period of the year being between Feb. 8 and April 26. The biggest tonnage was recorded for the week ending Oct. 25, when the strike was approaching and every mine worker was hustling to lay by for the long layoff.

The largest output per week in 1919 came within a few thousands of tons of the maximum in 1918. But there were no such periods of sustained output as in that earlier year when patriotism and a desire to win the war made the work of mining not so much a labor as an act of devotion. The peaks of production in coal mining should certainly be ironed out if a way can be found of accomplishing this most desirable of results.

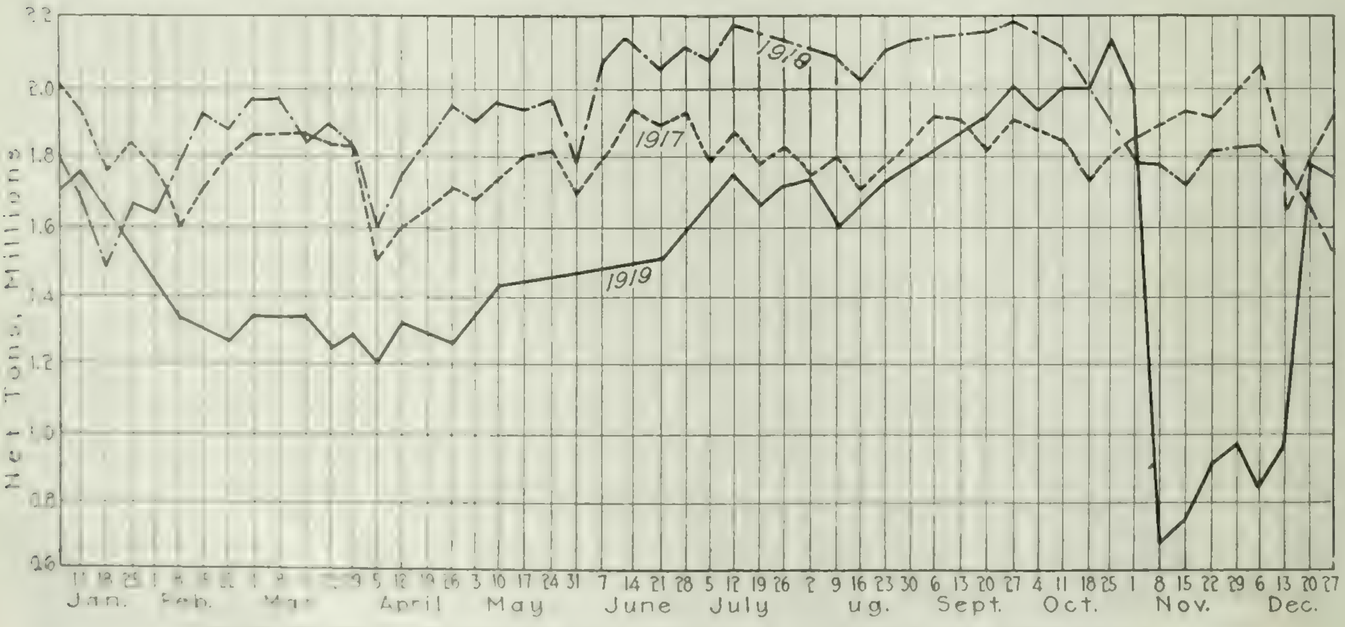
ANNUAL PRODUCTION OF THE UNITED STATES, 1913 1919
(Net tons)

Year	Pennsylvania Anthracite	Bituminous	Total
1913	91,525,000	478,435,000	569,960,000
1914	90,821,000	422,704,000	513,525,000
1915	88,995,000	422,624,000	531,619,000
1916	87,578,000	502,520,000	590,098,000
1917	99,612,000	551,790,000	651,402,000
1918	98,826,000	579,386,000	678,212,000
1919*	86,200,000	458,063,000	544,263,000

*Estimated.

MONTHLY PRODUCTION OF BITUMINOUS COAL, 1918-1919
(Net tons)

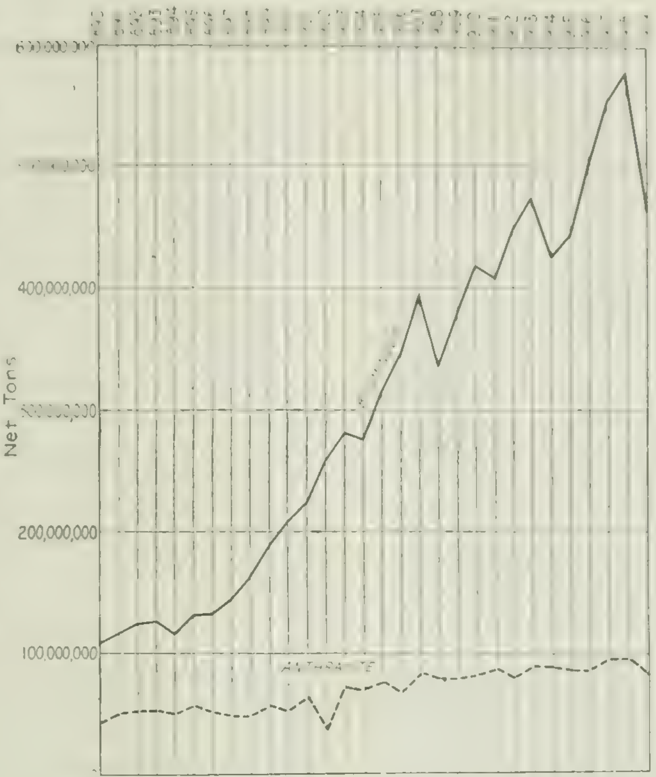
Month	1918	1919
January	42,227,000	41,487,000
February	43,777,000	31,566,000
March	48,113,000	33,719,000
April	46,041,000	32,164,000
May	50,443,000	37,547,000
June	51,138,000	37,054,000
July	54,971,000	42,698,000
August	55,114,000	42,883,000
September	51,183,000	47,402,000
October	52,300,000	56,243,000
November	43,895,000	18,688,000
December	40,184,000	36,612,000
Total	579,386,000	458,063,000



GRAPH SHOWING BITUMINOUS-COAL PRODUCTION BY WEEKS FOR THREE YEARS

Reports on Activities in Coal-Mining Fields

Made Mostly by Mine Inspectors



GRAPH SHOWING COAL PRODUCTION SINCE 1890

This, like all the issues of *Coal Age*, derives its importance from the generous assistance of the coal industry. The editors desire to express to the large number of their collaborators their keen sense of the courtesies extended and the labors thus incurred. The work was often performed under great difficulties, not the least being the closing of the affairs of the year just past. Some articles by men of leadership and authority in the various fields have been crowded out by lack of space and will appear in a later issue. Notable among these is one on the Alabama industry by Erskine Ramsay, and one by A. C. Watts on the Utah industry. To all the leaders of national thought and action whose work has found place in our columns in the past year let us give our most hearty thanks. It is their duty, as it is their pleasure, to make use of this medium for the enlightenment of the coal-mining public. The chart herewith shows what a slump occurred in the coal business in 1919. After some years of steady progress from 1914 to the end of 1918 production suddenly decreased. It is probable that 1920 will be as active as any in the past, as stocks are low and business unusually active. To phrase the matter in other words, the year 1918 has combined with the year 1920, just enterend, to steal production from 1919. The failure in 1919 will be assurance of success in the year that follows. True it was warm in the winter of the early part of 1919 and that affected the result, but 1920's opening shows low temperatures and high consumption with their usual promise to the coal industry. The variation in the coal production seems to be growing more marked than in early years. Can it be it possible that this is the result largely of extended and wide-spread strikes in the coal and other industries?

Summary of Production

The production of coal by states in short tons as reported to *Coal Age* by mine inspectors and others is shown in the following table:

Alabama	15,750,000
Alaska	70,000
Colorado	10,307,214
Idaho	5,000
Illinois	45,693,293
Indiana	25,053,064
Iowa	7,000,000
Kansas	6,000,000
Kentucky	30,000,000
Missouri	5,000,000
Michigan	1,000,000
Montana	4,381,840
North Dakota	783,694
New Mexico	3,272,129
Ohio	35,000,000
Oklahoma	3,941,391
Pennsylvania (anthracite)	85,570,469
Pennsylvania (bituminous)	141,596,625
South Dakota	10,000
Tennessee	5,000,000
Texas	1,653,000
Utah	4,568,128
Virginia	7,500,000
West Virginia	84.803.918
Wyoming	7,882,682
Total	532,138,529

The estimates, as is natural, do not precisely total with those of the U. S. Geological Survey but they give an indication of the relative importance of the states as productive units. The loss of tonnage has been much greater in some than in others. The mines producing higher-class coals being relatively more active than the others.

Alabama

By H. B. McLaurine
Birmingham, Ala.

The coal production of Alabama for the year 1919, from present estimates, will total about 16,000,000 tons. This is a decrease of approximately 3,500,000 short tons as compared with 1918. The decrease is attributed to a number of causes, viz: Shortage of labor early in the year due to men being still in the army; lack of cars; strike and the failure of miners to promptly return to work after the strike was called off.

Many improvements have been made during the year at different plants, notwithstanding the increased cost of material and labor.

The fatalities are on about the same basis as 1918, and taking into account the loss of 22 lives by the explosion of gas at the Majestic Mine, April 29, the showing made is considered very good.

The development of the Warrior River proposition has recently assumed definite shape. The Port of Birmingham Company has been organized on a basis of $200,000 capital stock, paid in, and adequate facilities are being completed at Birmingport (Short Creek) and Mobile, Ala. It is the purpose of this company to issue warehouse receipts on coal in carload and barge lots, as well as other classes of merchandise, which receipts can be used as collateral at banks and provide means for the operation expenses should there be any lack of market. Of course the larger mines on the Warrior will build their own tipples on the river and load at the mine.

Now that the wage dispute with the miners is in process of settlement it is expected that the production for 1920 will show a substantial increase as compared with 1917 and 1918, which were our banner years.

Alaska

BY SUMNER S. SMITH
Alaskan Engineering Commission, Seattle, Wash.

THE output of coal in Alaska probably approximated 70,000 short tons for the year 1919. This is divided about as follows: Matanuska field 44,000; Cook inlet, 3,500; Nenana, 20,000 and scattered 2,500 tons. In the Matanuska field 38,000 tons were produced from the Eska mine, 4,000 from the Chickaloon mine and 2,000 from several scattered prospects in the lower end of the field. The Eska and Chickaloon mines both produced bituminous coals, the latter being of a considerably higher grade than the former. The balance was lignite.

The Bering River Coal Co. and the Alaska Petroleum & Coal Co., both situated in the Bering River coal field continued development work on their properties in the Bering River field.

Colorado

BY A. R. TIBBITS
Office of the State Mine Inspector, Denver, Colo.

THE coal production of Colorado in 1919 was 10,307,214 tons, showing a decrease of 2,350,841 tons as compared with that of 1918. Immediately after the armistice was signed, the tonnage dropped to what would have been considered normal before the war. The year began with the production steadily falling off until June when the monthly output was as low as 785,000 tons. From then on it began to rise again until in October it exceeded a million tons.

The slump in the market closed most of the numerous small mines, which the press for greater production in order to win the war, had opened in the southern field, and which were able to help materially in supplying the local trade. These did not resume operations in 1919. Nearly all these mines were wagon developments and none of them new openings.

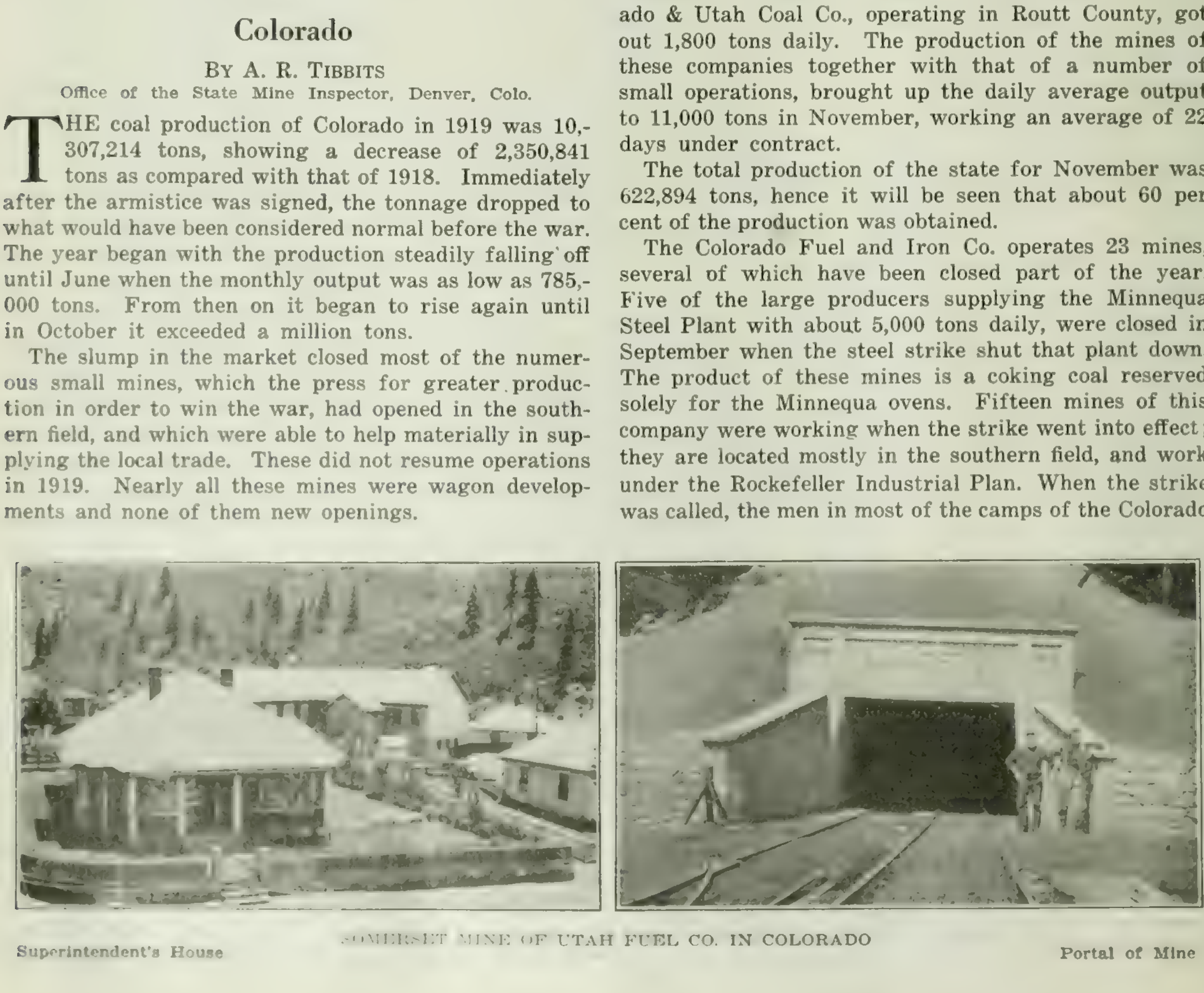
In the summer months it became evident that little coal was being bought for storage for the winter. The public was duly warned to lay in winter supplies, but little heed was given thereto, the consumer, no doubt, hoping that the selling price of coal would go down. The fall trade soon made it clear that a coal shortage prevailed, the dealers were swamped with orders for fuel they could deliver at best only in part. When the strike went into effect, it was further discovered that the coal reserves in Colorado were small, even the railroad having stored only sufficient coal to meet the needs of the railroad service for not to exceed six weeks. Nor had the surrounding states, depending chiefly on Colorado for their fuel shown any greater foresight. To add to the distress of the situation, an unusually early and severe winter set in, causing much suffering in the adjoining territory as also at points in Colorado.

Colorado has been the locus of many labor troubles in the past, and the advent of the recent coal strike was viewed with much apprehension. A complete tie-up was feared. However, the edict of the United Mine Workers of America ordering the closing of all coal mines in all other states exempted from the general walkout those mines operating under contract with this organization in Colorado. Therefore, from the start of the strike, a daily output of 11,000 tons was assured for distribution.

The Victor-American Fuel Co., operating mines in Fremont, Huerfano, Las Animas and Routt counties, maintained a daily production of 5,000 tons; the Colorado & Utah Coal Co., operating in Routt County, got out 1,800 tons daily. The production of the mines of these companies together with that of a number of small operations, brought up the daily average output to 11,000 tons in November, working an average of 22 days under contract.

The total production of the state for November was 622,894 tons, hence it will be seen that about 60 per cent of the production was obtained.

The Colorado Fuel and Iron Co. operates 23 mines, several of which have been closed part of the year. Five of the large producers supplying the Minnequa Steel Plant with about 5,000 tons daily, were closed in September when the steel strike shut that plant down. The product of these mines is a coking coal reserved solely for the Minnequa ovens. Fifteen mines of this company were working when the strike went into effect; they are located mostly in the southern field, and work under the Rockefeller Industrial Plan. When the strike was called, the men in most of the camps of the Colorado



Superintendent's House

SOMERSET MINE OF UTAH FUEL CO. IN COLORADO

Portal of Mine

Fuel and Iron Co. voted by large majorities to remain at work. Many of those who did quit, soon returned to the mines when they saw that there would be no hostilities and that sufficient protection was assured in case of an outbreak, of which there was at no time serious danger. Consequently by the middle of November the production of the mines of the Colorado Fuel and Iron Co. had climbed from 5,000 tons a day to 15,000 tons, or to about 80 per cent of normal.

To the 60 per cent output of coal mined during the strike, the Utah Fuel Co., operating the Somerset mine in Gunnison County, contributed a daily average of 1,000 tons and worked 25 days. This company is so fortunate as to be able to record that it did not lose a single man or working day by the strike. The camp of this company is laid out on a picturesque mountain site, close to some hot springs, the water of which is conducted to a swimming pool and bath-houses for the use of the employees. The company has done everything available to make the standard of living at this camp conform to the best American ideal, supplying the camp with a good school, playgrounds, church, club house, well built tenant houses furnished with water for both domestic and irrigation purposes. In addition, the mine itself is one of the best equipped and most up to date in the state.

PRODUCTION OF COLORADO BY COUNTIES FOR 1919

(Showing increase or decrease, 1918-1919)

Counties	Total Tons Produced	Increase	Decrease
Boulder	1,135,702		195,479
Delta	85,772		9,098
El Paso	301,495		8,427
Fremont	839,989		36,879
Garfield	18,916		55,088
Gunnison	476,290		175,705
Huerfano	1,955,011		665,374
Jackson	51,683		32,821
Jefferson	139,011	13,201	
La Plata	115,341		25,699
Las Animas	3,279,753		1,169,428
Mesa	100,591		119,778
Moffat	1,580	1,032	
Montezuma	1,426		501
Montrose	437		583
Ouray	77		564
Pitkin	8,593		21,961
Rio Blanco	5,620	822	
Routt	1,149,196	186,505	
Weld	640,731		35,016
Total	10,307,214		

Decrease, 1919 .... 2,350,841 tons

Average number of men employed in and about the mines, 12,500.

At the mines of Boulder and Weld counties in the northern field, where only lignite is produced, the strike was more effective. While few of the mines in this district are working under contract, at least none of the large mines of which the Rocky Mountain Fuel Co. operates ten, and the National Fuel Co. two, the organization has here a stronger following than anywhere else in the state. Despite this fact, however, Boulder was able to produce 42 per cent of its normal output and Weld County 31 per cent. In Routt County, all the mines with the exception of those of one large company, operate under contract. In November this county produced 88,628 tons against 117,602 tons in October.

In summing up the effects the strike had on the coal production in Colorado, it can be safely said that it cost the industry about 42 per cent of what would have been the normal output had there been no strike. Another factor hampering the tonnage was a car shortage, cars being moved very slowly, thus congesting traffic and causing many mines to lie idle waiting for empties.

While Colorado produced almost enough coal for home consumption, the urgent needs of other parts of the country necessitated shipping it out of the state, and in common with other regions, Colorado suffered the riged curtailment of fuel and light enforced elsewhere.

The strike has also shown that the labor situation in Colorado is better than in former years. Labor has less of a grievance. There is no doubt, that the Rockefeller Industrial Plan has been the means of materially improving the situation. All the coal camps of the Colorado Fuel and Iron Co. working under this plan, show a decided uplift in the standard of living and a better understanding has been created between the employees and the mine officials. The fact that so many of the employees working under this plan refused to go out on strike, shows that it has vital merit. The conclusion is that better living conditions and a sincere effort towards fair and just treatment of the workmen have done much towards conciliation.

Idaho

By R. N. Bell

State Mine Inspector, Boise, Idaho

THE coal resources of Idaho are more conspicuous for their absence than for their presence. The rugged mountain topography which prevails over a large portion of this state is largely accompanied by crystalline metal-bearing formations and lava flows, and while our mine production ranks second among the states of the Union in its yield of lead and a close second in its yield of silver values, the bulk of our quite important coal requirements, running into several millions of tons a year, have previously all been imported from the adjoining states of Wyoming and Utah and our total coal production of 5,000 tons for 1919 is the record output so far.

Near the eastern border of Idaho a small area of the cretaceous coal-bearing formations of Wyoming extend over the Idaho state line. Within this area some promising coal prospects have been discovered recently. Only one of these, however—the property of the Idaho Coal Mines Co.—has so far been developed to a commercial stage.

War Held Up Progress of Idaho Coal Mine

This enterprise has been held up throughout the greater part of the year because of financial difficulties brought about by the termination of the war. Recently, however, these financial troubles have been adjusted but the enterprise was further interrupted by the jockeying tactics of the railway administration and the local railway authorities, in their tardiness in completing a railway spur to these interesting coal deposits which are situated 10 miles west of Driggs, the county seat of Teton County.

A railway spur had been under construction to the mines with the track laid for 7 mi., the grade finished to the mine and material on hand for the completion of the track. Because of the disastrous coal famine pressure was brought to bear by the Governor and other state authorities, and the work of laying the remaining three miles of steel has recently been undertaken and should be completed to the mine shortly.

These deposits are situated in a foothill country at an elevation of 7,000 ft. above sea level and consist of a series of steeply pitching parallel beds of high grade bituminous coal carrying the following general average analysis, according to numerous tests by state and Federal authorities.

	Per Cent
Moisture	3.60
Volatile matter	41.50
Fixed carbon	52.20
Ash	2.30
Sulphur	.40

There are nine parallel beds in the series with intervening spaces taken up with hard sandstone and shale formations varying from 100 to 500 ft. thick. These beds themselves vary in thickness from 30 in. to 12 ft. of clean coal. They have been proven by careful survey and surface cross course prospecting to be persistent for two miles. The principal development has been performed on one 5-ft. and one 10-ft. bed. The 5-ft. bed has been opened by a crosscut tunnel at the 100 ft. level and entries driven along its course for 3,000 ft.

IDAHO HAS A GOOD MINE IN OPERATION

From this shallow development 30,000 tons of coal has been produced and sold to local wagon-haul market. An incline shaft 500 ft. deep has been extended down on the bed in the center of this shallow development and a new entry with systematic accompanying air courses opened for 1,000 ft. in length, driven at that level, from which 10,000 tons of coal has been broken down and is now ready to be drawn through the chutes and hoisted to the surface as soon as the railroad track is completed and shipping facilities thus afforded.

This development is well equipped with hoisting apparatus, Sirocco fan air compressor and punching machines, and good tipple facilities. It is situated half a mile from the end of the railroad track to which point the coal will have to be delivered temporarily in sleds.

On the 10-ft. bed, which is cut by a narrow gulch, adit entries have been driven 500 ft. in each direction to a face depth of 200 ft., and a considerable supply of coal has been extracted for shipment. At the railway terminal a drainage and ventilation tunnel 7 x 8 ft. has been started and is already in 600 ft. This long crosscut will be driven 6,000 ft. and is designed to cut the whole series of coal beds at depths on their dip varying from 500 to 900 ft. This should greatly facilitate their exploitation and subsequent operation. A complete plant of machinery is already on the ground for driving this tunnel and for the railway bunkers and tipple equipment that will be quickly put in shape for a daily capacity of 1,000 tons.

The engineering estimates of the resources of this property down to this tunnel level are conservatively placed at ten million tons. The steep pitch of these beds (about 50 deg.) has resulted in considerable slip movement on the coal and in mining considerable slack is produced. The coal, however, has exceptional steaming qualities and with good roof and careful mining a substantial proportion of lump coal can be produced.

This property is immediately adjacent to the most extensive agricultural region of Idaho and to the rapidly expanding sugar beet industry which is an extensive user of slack coal and since the other sources of supply are fully 250 miles distant, this property will enjoy an extensive home market and a decided railway freight advantage. Its fuller development should afford a profitable and desirable coal mining enterprise for Idaho.

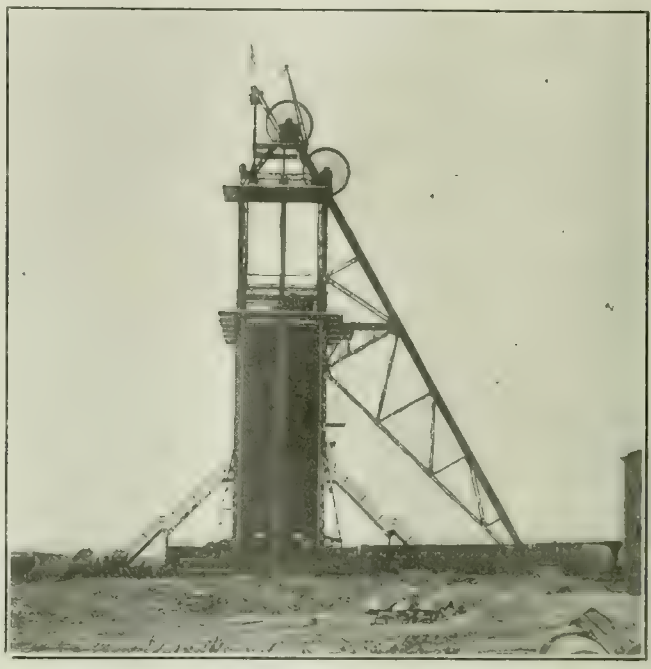
Illinois

BY JOSEPH C. THOMPSON

Director Department of Mines and Minerals, Springfield, Ill.

During the calendar year 1919 several factors entered into and influenced the production of coal in Illinois in an adverse manner. Among these was the coal strike in the bituminous field which practically shut down all shipping mines for a period of six weeks.

It is estimated that the production from shipping mines would have been 57,993,293 tons with 1,300,000 tons additional from local mines had there been no strike. The loss attributable to the strike amounted to 8½ million tons during November and 5 million tons during December. Thus the total loss in output as a result of the strike is estimated as being 13½ million tons, while the actual output will be about 45,693,293 tons.



TIPPLE, SUPERIOR COAL CO., GILLESPIE, ILL.

During the year Illinois was extremely fortunate in not having any serious accidents to reduce the output much below normal. Fortunately also the mines were started up after the strike, and in spite of the fact that this resumption took place at the most dangerous period of the year no accidents of a serious nature have occurred at any of the mines of the state. Furthermore it is not anticipated that any such will occur now because normal working conditions have been resumed and the roads are thoroughly sprinkled and kept moist in spite of cold weather.

Indiana

BY CAIRY LITTLEJOHN

State Mine Inspector, Indianapolis, Ind.

THE coal mining industry of Indiana for the fiscal year ending Sept. 30, 1919, did not assume such proportions as in the preceding year owing, no doubt, to the unsettled condition of the country following the signing of the armistice.

Consumers of coal thought, as they with reason had a right to think, that wartime prices for fuel would recede from the high figures set by the fuel administration. Those engaged in the production of war material required some time to rearrange their plants for the production of peacetime commodities. The anticipated fall in prices did not materialize; but, on the contrary the prices of nearly everything necessary to the maintenance of a family took an upward swing and this fact created universal dissatisfaction among those whose wages had been fixed at a stipulated price by the government.

This dissatisfaction manifested itself in numerous minor strikes, most of which were unauthorized by the officials of the labor organizations to which the men belonged. The mining industry was affected along with others. The dissatisfaction resulting from the continuation of what is called the Washington agreement between the operators and miners culminated in the nation-wide strike which became effective Nov. 1, 1919.

As to the merits of either side of the controversies between the operators, the miners and the general public I have no desire to express an opinion. It is believed, however, that the general strike will have been of incalculable value to the general public if we profit by the experience gained during this controversy. It should awaken the people of the country as never before to the importance of the coal-mining industry, affecting as it does, every phase of our industrial life. From the experience just passed through there should come some fruitful and well-needed legislation governing industrial disputes.

The total production of coal in Indiana during the year was: block coal 339,247 short tons; bituminous. 24,713,817 short tons. The number of mines in operation employing ten or more men was 222. The number of men employed was: outside day and monthly men 3,121, inside day and monthly men 7,824, machine runners and helpers 1,362, loaders 7,654, pick men 10,051.

The distribution of coal was as follows: To Indiana 13,305,940 tons, other states 8,319,806 tons. The total number of days worked was 33,593, total number of days idle 22,040½. The causes for the loss of time and the number of days lost were: On account of no orders 15,193, no cars 2,952, strikes 639, funerals 87, other causes 3,169½.

During the year there were 75 fatal accidents at the mines employing ten or more men and 4 fatalities at mines employing less than ten men. There were 344 serious accidents, 1,316 minor accidents reported to the Inspection Department.

The causes of the fatal accidents were divided as follows: Falls of coal 2, falls of slate and rock 35, mine cars and motors 19, explosions, powder, windy shots and gas 12, miscellaneous 7.

Iowa

By L. E. Stamm

Secretary, Iowa Mine Inspectors, Des Moines, Iowa

CONDITIONS in the Iowa coal industry were not as satisfactory in 1919 in many respects as in preceding years. The coal business of the State was rather unstable most of the time. Conditions generally in this State during the latter part of each year influence and affect the coal business for the first few months of the next year. This was notably so during the latter part of 1918. The stocking of domestic coal was urged early in that year, on account of the war and other conditions affecting the production and transportation of fuel. The result was that in nearly every town and city of the State large stocks of coal were laid in early.

Had the weather been normal perhaps the large stocking of fuel would not have affected the industry, but a warm period about the first of the year caused a falling off in the demand for coal, so that in January, 1919, just at the time when the mines should have been the busiest, they were only working part time. This caused a big decline in production for that month. February and March were much better but their production was not sufficient to offset the January loss.

All during the summer of 1919 the mines doing a railroad business, that is, selling their output for railroad use, were working but a few days each week as the roads had persistently refused to enter into contracts for railroad coal at the prices asked by the Iowa coal operators, and were only taking necessary fuel at the old contract price.

August and September were usually good months for the Iowa coal mines since at this time the demand is largely for shipment for domestic use. Dealers in all the cities and towns at that time begin to order coal, and the mines are kept busy with no loss in time. October proved a still better month so far as production was concerned as it was generally understood that in case the miners did not get an increased wage at the conferences being held between the miners and operators in the east, that the mines would close down on Nov. 1 until some adjustment in wages was made.

Strike Laid Mines Idle Six Months

The wage conference proved unproductive for the miners and all the mines in Iowa, with the exception of a few small local operations employing nonunion miners, were closed on the last day of October. The mines did not resume operations until Dec. 12 and then with only a part of their employees, so that it was not until Dec. 15 that full operations were in swing. This suspension of the Iowa mines for a month and a half occurring at a time when these operations are busiest will materially affect the production for the year 1919.

The last half of December saw every mine in Iowa running at full speed, but the output for the year will no doubt be materially lessened because of the month and a half lost while the miners strike was on. The mine inspectors' office collects the returns for the year from the operators sending out the blanks for that purpose on Jan. 1 and it is usually about the last of the month before the full returns are in, so that any estimate made at this time covering the 1919 production all things considered would be hard to make accurately. I believe, however, that the production for the year will fall off a million and perhaps a million and a half tons from that of previous years. This would make the 1919 production about 7,000,000 tons.

Iowa produces annually around 8 million tons of coal. About 240 mines are in operation in the State and approximately 15,000 miners are given employment in and around the mines. Coal is now produced in 22 counties in the State, but perhaps some four or five counties produce the greater part of the tonnage. Formerly as many as 18,000 men were employed annually in and around the mines, but in 1917 many of these men were called into service in the army and navy, others went to other fields, and in 1919 after the armistice was signed many foreigners working in the mines returned to Europe so that the number of men working in the mines has been reduced somewhat in recent years. The introduction of mining machines however, has kept the production at about the same number of tons annually.

In 1918 the coal mines of Iowa produced 8,219,133 tons of coal, and gave employment to 14,563 men. A number of new mines that will be large producers have recently been opened in different coal producing counties. In Marion County the Greater Mammoth Vein Coal Co. has opened a new mine near Pershing which bids fair to become the largest producer in the county. Other new developments have been made in this county and recently the production of the county has increased wonderfully.

In Lucas County the Iowa-Nebraska Coal Co. has recently opened a large field and this with the extensions of the Iowa Central Coal Co., will largely increase the production of Lucas County for the coming year. In Dallas County the Norwood-White Coal Co. has opened a new field near Moran and will develop one of the largest mines in the state. Another big company is also considering the opening of a big mine in this county. In Polk County a number of new mines have been developed in the past year. These for the present are engaged in supplying the large local dmand for coal in Des Moines and vicinity. Monroe, the largest coal producing county in the state, will also see some new development this coming year. With all of this activity the year 1920 should be a good one in the Iowa coal industry, barring of course unforseen and uncertain difficulties such as labor troubles.

Labor troubles scarcely deserve attention in Iowa, as they are few. Some difficulty arises occasionally as to the interpretation of the terms of the agreement between the miners and operators and mining operations at the mines where misunderstandings occur are suspended until the slight differences are adjusted, but these difficulties are so infrequent as to be hardly worth mentioning, and are scarcely to be classed as labor troubles. If no further labor troubles occur in the central competitive coal field we look for a good year in coal production in this state for 1920.

Kansas

By James Sherwood

State Mine Inspector, Pittsburg, Kan.

THE Kansas coal field is located principally in Crawford and Cherokee Counties in the extreme southeastern portion of the state. Pittsburg is the center of this coal field. The population of Crawford County is about 62,000, while Cherokee County has a population of about 35,000. Nearly 10,000 miners are employed in this field in Kansas. During the years of 1917 and 1918 about 7,250,000 tons of coal were produced each year. However, during the year 1919 the production will be decreased materially by reason of strikes.

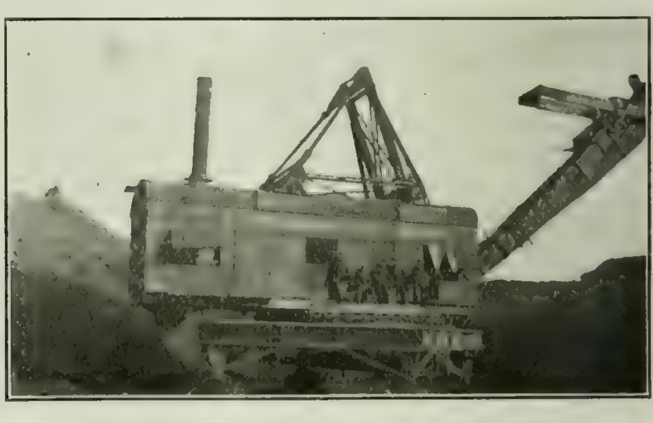
The mines of the Central Coal & Coke Co., as well as its lessees were idle about two weeks in the spring on account of a strike. They resumed operations for a short time, the employees being again called out July 16, 1919, by the district officials of the United Mines Workers. They were only recently preparing to start operations again and it is estimated that a total output of over 500,000 tons was lost on account of this strike.

The Domestic Fuel Co.'s employees have also been on strike since July 16, 1919, and it is estimated that approximately 40,000 tons were lost on account of this strike. It is calculated that the miners lost approximately $1,500,000 in wages on account of these strikes and that their organization paid strike benefits in an aggregate of approximately $215,000.

The mine workers paid no strike benefits for the two weeks shut down in the spring at the Central Mines nor did they pay benefits for the first 30 days of the strike called on July 16. The strike at these mines affected approximately 1,600 men. These strikes drifted along through the year until the general strike was called on Nov. 1, 1919.

When the general strike was called, Governor Allen foresaw the suffering that would occur during the winter from a shortage of coal and immediately began a campaign to bring the miners and operators together by agreement. Failing in this, he threw the coal mines into the hands of receivers through proceedings in the state supreme court, and C. D. Sample, Mayor of Fort Scott, and Ben S. Gaitskill, an attorney of Girard, Kan., were appointed as receivers.

Governor Allen then made a tour through the coal fields of southeastern Kansas, speaking directly to the miners in the camps and urging them to return to work, upon the basis obtaining Oct. 31, 1919, prior to the general strike, contingent upon a wage contract to be made by the receivers the same as would be agreed upon at the conference then being held in Washington, with the guarantee that if an agreement was not reached in Washington before Jan. 1, 1920, that he and the receivers would make a contract with the miners in this district based upon the investigation to be made by him and the receivers during the interim betwen then and Jan. 1, 1920, in any event the contract to be retro-active from the day they returned to work and guaranteeing an increase.



STRIPPING SHOVEL AT CHICOPEE, KAN.

The miners did not return to work at the time specified by the Governor, and he accordingly issued a call for volunteers and ordered troops to the fields. Volunteers from all walks of life, including business and professoinal men, college students and ex-service men responded in large numbers. About 1,000 volunteers were shipped to the coal fields and placed at work in the large strip pit mines in this field, of which there are about 30. Here under the direction of the receivers, they mined coal to alleviate the shortage.

The volunteers began work about the first of December and produced approximately 6,500 tons of coal. The work of the receivers was greatly hampered by the run-down condition of the machinery at these strip-pit mines and the inclement weather during the time the volunteers were in the field. Extremely cold and stormy weather met them at every turn.

On Dec. 15, the union miners in Kansas for the most part returned to work under the agreement recommended by President Wilson and concurred in by the mine workers. However, the mines of the Central Coal & Coke Co. and its lessees still remained idle as well as those of the Domestic Fuel Co., under the original order of the district officials of the United Mine Workers. As the records show, Mr. Howat was called before Judge Anderson and agreed to start these mines to work at once, and the local officials of the Mine Workers have now agreed to and ordered the men back to work, and the mines were to start hoisting coal Dec. 30, 1919.

The maximum production was obtained during the years 1917 and 1918 in Kansas, but this will be reduced this year by over a million tons, mostly on account of the strikes. It is believed that the production will not exceed six million tons this year.

Conditions are rapidly returning to normal, however, and it is hoped that steady employment for the miners and a maximum production of coal will be the result of the combined efforts of the mine workers and operators in Kansas in 1920.

Under the supervision of James Sherwood who was appointed State Mine Inspector June 1, 1919, to succeed Fred Green, much has been done for the health and safety of the miners. Monthly bulletins have been issued relating to the principal details of the most serious accidents and offering a method for the prevention of similar mishaps. These bulletins are mailed to both the operators and miners. The organization of safety committees at each mine has been attempted and this work was fairly under way when the strike was called. This has practically "killed" this effort and it will have to be renewed from the beginning.

First aid and mine rescue work has also been strongly advocated and taught in Kansas, and the southern field is making rapid strides toward the front in these respects. A first aid team representing Kansas was sent to the national contest in Pittsburgh, Pa., last fall and made a creditable showing. The coal companies are also advancing rapidly along these lines, and the Western Coal & Mining Co. has established the first company-owned mine rescue station in Kansas. This is equipped with Gibbs mine rescue apparatus and the necessary supplies for such a station.

Up to and including Dec. 29, 26 fatalities and two deaths from natural causes occurred in the Kansas mines. These were attributed to the following causes:

Falling down shaft	1	Runaway car at steam shovel tipple	1
Death in mine from natural causes	2	Falling over pit car	1
Explosions from shots	3	Object falling down shaft	1
Falls of rock	15	Fumes from gasoline engine	2
Burned by gas	1	Machinery at steam shovel mine	1

By months, the fatalities in the mines were as follows:

January	5	July	3
February	2	August	2
March	3	September	2
April	3	October	2
May	3	November	2
June	2	December	1

Kentucky

By C. J. Norwood

State Mine Inspector, Lexington, Ky.

OUTPUT returns for the State of Kentucky for the year 1919 are at present so ragged and fragmentary as to render any accurate estimate of tonnage produced out of the question. Indications, however, point to a material decrease in production as compared to that of 1918 which exceeded 31½ million tons.

The actual net decrease will quite possibly be less than some people have assumed, since the output of some new companies has in large measure made up for the losses recorded by some older firms, while some of the established producers have practically maintained their previously established records. A rough guess would place the 1919 output, therefore, at approximately 30 million tons or thereabout.

A slump occurred at a number of mines in the spring and was attributed to an unusually reduced or depressed market. The general strike occurring on Nov. 1, involving as it did 20,000 to 25,000 miners, adversely affected production even in some unorganized territory until early December, while complaints of car shortage were numerous during the latter month as they were in numerous other states.

Despite unsettled conditions the development of new territory and the expansion of operations projected or begun in 1918 was pursued vigorously during the year just closed. This was especially the case in Harlan, Letcher, Perry and Pike Counties. A conspicuous example of this policy or practice is afforded by the mines of the U. S. Coal & Coke Co., at Lynch in Harlan County. This company increased its output over that of 1918 by nearly 600,000 tons in the eleven months ending Dec. 1, 1919.

The general outlook upon the future taken in mining circles is cheerful, provided no adverse state legislation is enacted. There are disturbing rumors of a contemplated hard drive to unionize all Eastern-field mines regardless of all wage or other considerations, thus disregarding even the wishes of the workmen involved in the territory to be unionized.

During the past year there have been no large mine accidents or disasters and no serious mine fires have occurred.

Michigan

By M. D. Kirby

Chief Clerk, Department of Labor, Lansing, Mich.

MICHIGAN mines each year yield approximately 1,500,000 tons of coal, practically all of which is mined in the Saginaw Valley and its environs. A single mine outside of this immediate district, operated by the B. S. K. Coal Co. of Albion, mines about 100 tons daily.

The St. Charles mine of the Robert Gage Coal Co. is the largest producing mine in Michigan, turning out about 1,250 tons a day.

The following mines have been abandoned during the past year: Robert Gage Coal Mine No. 6; Wolverine Coal Mine No. 3; both of Bay County; the What Cheer Coal Co. No. 2, located in Genesee County; the Robert Gage Coal Co. No. 2 and No. 9, and the Chappel & Fordney Mine No. 2 of Saginaw County and the Liberty Coal Corporation of Shiawassee County.

CONSOLIDATED YEARLY REPORT OF THE COAL MINES OF MICHIGAN
DEC. 1, 1918 TO NOV. 30, 1919

Number of Mines Operating	Months	Men Employed	Average Hours Worked per Day	Average Days Worked per Month	Average Daily Wages (Dollars)	Aggregate Monthly Wages (Dollars(	Mines Using Powder	Powder Used (Kegs)	Pick-Mined Coal Produced (Tons)	Machine-Mined Coal Produced (Tons)	Total Cost of Output (Dollars)	Average Cost per Ton (Dollars)
	1918											
22	December	2,553	8	16.0	6.82	280,818.87	18	1,130	10,313	99,022	418,596.12	3.83
	1919											
20	January	2,434	8	18.4	6.13	274,662.90	18	1,112	5,662	102,492	375,890.28	3.48
14	February	2,047	8	15.8	6.49	210,519.22	13	833	3,087	79,183	299,035.29	3.64
13	March	2,003	8	15.0	6.31	189,929.89	12	760	4,532	74,265	271,790.72	3.45
6	April	602	8	21.6	5.86	76,415.88	5	305	2,571	27,397	108,052.66	3.61
12	May	1,556	8	9.7	6.28	94,590.69	10	330	2,530	30,660	153,569.69	4.63
11	June	1,590	8	17.4	6.51	175,284.40	10	638	3,022	68,227	249,622.46	3.50
12	July	1,828	8	20.8	6.11	232,721.54	11	1,012	7,741	93,665	314,284.53	3.10
14	August	1,817	8	22.0	6.25	249,813.65	13	1,005	7,284	101,098	334,949.60	3.09
16	September	2,011	8	21.1	6.37	270,277.84	15	1,090	9,862	104,075	369,111.73	3.24
16	October	2,050	8	25.1	5.93	305,399.40	15	1,208	8,483	125,989	424,987.10	3.16
3	November	39	8	10.8	5.32	2,240.98	2	10	203	240	3,156.55	7.12
	Aggregate					2,362,675.26	..	9,413	65,290	906,313	3,323,046.73	.....
	Average		8	18.3	6 29		..	....	......	....	....	3.42

Missouri

By Geo. Hill

Chief Mine Inspector, Bevier, Mo.

There was never a time in the history of mining in Missouri when such unfavorable conditions prevailed as during the year 1919. It seems there was a general unrest among all concerned in the production of coal. The tonnage has fallen short of past records during the year one-half million tons while I estimate that the total output will not exceed 5,000,000 tons.

The Central Coal & Coke Co. mines have been on strike the latter part of the year. These mines are the largest producers in the state, Mine No. 24 of this company being the heaviest single producer at the present time, the output being approximately 1,000 tons per day. This company sunk Mine No. 68 this year about three miles southeast of Bevier, Mo., on 1,000 acres of good coal, the thickness of the bed being about 5 ft. This mine which is being opened on the panel system eventually should be the largest producer in the state and hoist 2,000 tons per day.

During the general strike which occurred on Nov. 1, the state institutions were suffering for the want of coal, and it became necessary for the Governor of Missouri to take over the strip mines in Barton County and work them with volunteer labor and I expect that if the strike had not been settled one week after taking over the mines Missouri by this means would have been producing considerable coal.

In the strip mines of Barton County the coal bed is overlaid with about 20 ft. of surface which is easily removed with large steam shovels. These mines produce annually about half a million tons. With labor troubles and a shortage of railroad cars in the early part of the year the industry in Missouri has operated under conditions unfavorable to both miner and operator.

Montana

By G. W. Griffin

Chief Coal Inspector, Helena, Mont.

Taking the year reported as a whole it shows that the coal business in Montana was poor. After the signing of the armistice the coal business suddenly dropped off, and some mines shut down altogether, while others worked from ½ to ¾ time. A few did somewhat better, but all mines were affected adversely by the halting of industrial activity.

The following figures are for the fiscal year ending June 30, 1919, for the coal mines in Montana:

Number of mines reporting	39
Machine operators employed	171
Loaders employed	[illegible]
Miners employed	1,550
Inside day men employed	1,201
Outside day men employed	709
Total men employed	4,434
Tons of coal produced	4,381,840
Tons produced per life lost	234,422
Number of men employed per fatal accident	261
Number of men killed per 1000 men employed	3[illegible]
Number of kegs of powder used	71,106
Tons of coal mined by machines	2,286,758
Tons of coal mined by hand	2,095,082
Value	$9,179,301.51
Number of lives lost	17

The first half of the year, that is to say from June to the eleventh of November, 1918, when the armistice was signed, business was extremely good and all concerned were doing their best to increase production. The miners as a whole nobly responded to the call of President Wilson for more coal.

During the past year we have had several visits of the United States First Aid car, and much good has resulted from these efforts. While this is true, yet I am sorry to say that interest in first aid work has been allowed to wane in many coal camps.

I think that this can be explained, in part at least by the fact that a tremendous effort was exerted to increase production in all the mines during the war, while war conditions in general so occupied the minds of the people engaged in mining that they thought of little else than their daily tasks.

Now that the war is ended all are hoping that there will be a determined effort made on the part of both the mine owners and the miners to push first aid work, for there can be no question but that much good has been accomplished by this means, and doubtless many lives have been saved both directly, and indirectly, where this subject has been followed up with persistence and good judgment.

In Montana, as in all other states, there are altogether too many accidents occurring from day to day and we have become so accustomed to them that there is great danger of our regarding them as a necessary part of the business. This ought not to be so, and it must not be so, for upon analyzing our mine accidents we are forced to the conclusion that many of them could have been prevented by the exercise of greater care on the part of the victims and the injured men, while in some cases greater care should have been exercised by mine officials in the performance of their important duties.

New Mexico

By J. E. Sheridan
State Inspector of Mines, Silver City, N. M.

COMPARING the production of the coal mines during the past year, amounting to 3,272,129 tons,with the production of the preceding year or 4,037,726 tons, there is shown a decrease of 765,597, or more than three-quarters of a million tons. Upon perusal of the statistics and comparison of production by counties in the report of this office for the preceding year, it will be seen that the decrease in production of the state is fully accounted for by the decreased production of Colfax County. The record here shows a production of 3,058,639 tons in 1918, as against 2,290,258 tons in the past year, or a decrease of 767,258 tons.

Seeking now for cause of the decreased production in this county, we find that in the preceding year, 1,126,935 tons were sent to the coke ovens, and in the year just past 555,218 tons went to the coke ovens. This is a decrease of 571,717 tons and largely accounts for the falling off in production of the state.

It is thus evident, that the stagnation at the copper mines lessened the demand for coke, at the smelters both in Arizona and at El Paso, Texas. The balance of the decrease for Colfax County was the lack of orders for coal for railroad use during the months of March, April and May, when there was almost a cessation of freight traffic at times. Later on when demand for coal increased there was a scarcity of miners.

The prospects for the coal-mining industry for coming years is bright, as there is certain to be increased demand for the fuel from local markets as the present sparsely-settled states of Arizona, Texas and New Mexico, become more densely populated. There will also be increased demand for coal at the metal mines and smelters of Mexico.

Cannot Keep Mining Copper Without Market

But for the immediate future, the coming year especially, there is room for much speculation as to the prosperity of the coal industry. At present the output of the copper mines of the country is accumulating in the hands of the copper-mining companies, there being no active market for the metal. How long this lack of demand will continue is problematical; but how long the copper companies can finance the mining, smelting, refining and storing of the metal is more readily opined. The consensus of opinion is that if some relief is not afforded, through the marketing of copper at least to keep pace with production, there will be a further decrease in production of copper, and a correspondingly lessened demand for coke.

It is not at all probable that there will be lack of demand for coal, from the railroads, for engine fuel, unless disturbed industrial conditions among the employes should hamper the operation of these carriers. The copper-mining industry and the railroads are the two principal consumers of coal-mine products, which it is necessary to consider before production.

Now must be considered the problem of production. The first and most serious consideration is the scarcity of miners to dig the coal. In the early part of the last decade the majority of coal miners in New Mexico were natives of the Slavish states of central and southern Europe with an admixture of Austrians, Italians and men from northern Russia. For various reasons many men of these nationalities have drifted away from the coal mines, and have been replaced by Spanish-speaking natives of Old and New Mexico.

While the average Mexican has not the robust physique of the European, yet he can be trained to be an efficient miner. And while these men will not produce as much coal from a given number of working places, yet the mines are now opened to such an extent that there are more working places than there are miners to work them. The Mexican is less turbulent by nature than the European, and unless outside influences dominate the coal camps, he will continue at work during periods of industrial unrest elsewhere and will not voluntarily initiate a sympathetic strike.

There are therefore the three factors named, exerting an influence on mining conditions—the market for the product, the miner to dig the coal, and his probable willingness to remain constantly at his work. These together influence the coal industry for good or evil in New Mexico. The fundamental factors of prosperity for the future in the coal industry are present, viz.: the vast resources of fuel, and the constancy of the market for the coal produced, at all seasons. Any abnormal conditions as to industrial unrest or lack of demand for coal from the copper mines, or from the railroads, can be of only temporary duration. Eventual continuous prosperity for the coal industry in New Mexico is thus assured.

North Dakota

By John Hanwell
State Mine Inspector, Bismarck, N. D.

THE production of coal in North Dakota for the year ending Oct. 31, 1919, was slightly larger than for the year 1918, the increase being approximately 63,961 tons. In the 19 coal-producing counties of this state there were 783,694 tons of coal produced from 155 mines by an average of 1,391 men employed in and around them. There were three fatal and 19 non-fatal accidents during the year 1919. An average of 261,231⅓ tons per fatal accident and 41,246 tons per non-fatal accident.

The mining industry in this state is practically in its infancy and offers an immense field. Its progress in the past was stunted by lack of railroads and excessive freight rates as well as other things that have been eliminated. Mining is a profitable business and offers excellent opportunity for investment. It is apparent that mining will be an important business in this state in the near future. It will also be a benefit to the people of this and neighboring commonwealths through immense savings in the cost of fuel. It has been stated by the officials of some of the mines that they could ship their entire production to the Twin Cities and Minnesota but local demand prevents them from doing this.

I am writing this because of my familiarity with the coal situation and I am interested in the development of good mines. We need them to supply the demand for fuel: to give employment to large numbers of men; to increase the wealth of our country; to do our duty as patriotic citizens and develop the natural resources of our state, and to develop a local industry and business, that will keep profits at home which are now to a large extent being sent away to distant regions and benefiting outside capital as well as the labor employed to produce the fuel consumed within the confines of North Dakota.

Ohio

By Jerome Watson

Chief Deputy and Safety Commission of Mines, Columbus, Ohio

THE maximum which was reached in the coal production of Ohio for the year 1918, when the production amounted to 47,849,236 tons, was largely responsible for the great decline in the coal industry during the year just past. The beginning of 1919 found the coal markets still over-crowded—a result of the greatly increased war production. This necessarily closed a large proportion of the small mines, some permanently, others only temporarily, while the large shipping mines worked intermittently during the early part of the year, except those in eastern Ohio.

Eastern Ohio mines probably had something near a normal year as compared with 1918. Most of the Lake trade supply is shipped from this district—Lake shipments amounting to 6,188,612 tons during 1919.

All indications point to a decrease in production for the year 1919 as compared with the previous year of, at least, 26 or 27 per cent, bringing the tonnage down around the 35,000,000 mark, or perhaps lower. This, however, should the tonnage reach such a figure, is a fair record for normal times, the greatest tonnage for any one year in Ohio, prior to the war period, being 36,285,468 tons for the year 1913.

In anticipation of the miners' strike, last October, witnessed the greatest single month's production in the history of Ohio. Six full weeks' time was lost by the strike. Although the 14 per cent increase in wages became effective Dec. 1, there were but few men such as pumpers, engineers, etc., at work to profit thereby, until the strike order was rescinded Dec. 12.

The car supply was almost entirely adequate until August, when a shortage became felt, the supply for August being probably not more than 50 per cent, and for September not more than 75 per cent. By that time the cars had become widely distributed and were not returned. Perhaps another factor in the car situation was the strike of the railroad shopmen early in August, which interfered with the repairing of cars.

There was no noticeable labor shortage, and, in fact, with the exception of the six weeks' strike, apparently no reason for idleness except the lack of market for coal. The exceptional effort to produce coal during October took its almost inevitable toll of fatalities. Forty-three lives were lost in the mines of Ohio during this one month, the majority of the accidents evidently being the result of too great hurry with its contingent carelessness.

Twenty of these 43 lives were lost in the greatest mine disaster Ohio has ever experienced. This was in the nature of a fire which occurred on Oct. 29 at the Amsterdam mine, located at Amsterdam, Jefferson county, and owned by the Youghiogheny & Ohio Coal Co. of Cleveland. The fire is supposed to have been caused by an overheated bearing on an electric fan located inside the mine 800 ft. from bottom of the shaft. Twenty men trapped back of the fire were overcome by carbon monoxide and fumes before they could be rescued.

The number of fatal accidents in proportion to the tonnage produced will run considerably higher than in 1918, a contributing factor being the unusual number of accidents in which two or more persons were killed. In addition to the Amsterdam fire, there was a gas explosion in a Belmont county mine during February which cost the lives of two men; during October a charge of dynamite was accidentally fired in a Jefferson county mine, killing two men. Also during October, three men met death in a Perry county mine as a result of a fall of roof which struck a man-trip in which they were riding.

Oklahoma

By Edward Boyle

Chief Mine Inspector, McAlester, Okla.

THE following is a report of the coal production for the State of Oklahoma for the fiscal year ended June 30, 1919.

The tonnage produced for the past year by grades was as follows:

Lump, tons	656,895
Nut, tons	131,713
Pea and slack, tons	368,799
Run-of-mine, tons	2,783,984
Total tons	3,941,391
The total production in 1918 was	4,489,064
The total production in 1919 was	3,941,391
Decrease in 1919, tons	547,673

The following table shows the gain and loss in the different grades of coal as set forth:

	1918	1919		
Lump	633,688	656,895	23,207	gain
Nut	180,035	131,713	48,322	loss
Slack	468,841	368,799	100,042	loss
Run-of-mine	3,206,500	2,783,984	422,516	loss
showing a total decrease of			547,673	tons

The principal output was produced in the following counties: Coal, Latimer, LeFlore, Pittsburg and Okmulgee. However, a small portion was produced in Tulsa and Wagoner Counties. Pittsburg County alone produced a net tonnage of 1,370,610 tons, this being the largest coal field in the State of Oklahoma.

To produce the foregoing tonnage required the equipment of 150 mines, employing a total of 7,946 men, inside and outside combined. With an average of 7,946 men employed in the coal fields there were 43 fatal accidents during the year, which was a slight increase over the fatalities for the fiscal year ended June 30, 1918.

An average of 170 days for the year was worked and this divided by the 52 weeks of the year shows that each man worked an average of only three and one-half (3½) working days per week.

CLASSIFICATION OF EMPLOYEES

Miners	3,529
Inside men	1,981
Outside men	2,436
Total	7,946

The average number of working days was reduced in the past fiscal year to 170 against an average of 189 for the previous fiscal year, making a loss of 19 days per man.

The number of fatal accidents per ton produced was necessarily increased on account of the fatal explosion at Rock Island No. 5 Mine, Alderson, on June 30, 1919.

TOTAL NUMBER AND CAUSES OF FATAL ACCIDENTS

Windy shots	3
Falls of rock	14
Trip wrecks	2
Burned by gas	3
Run-away trips	2
Falls of slate	1
Improper shots	3
Explosions	15
Total	43

NUMBER OF TONS PRODUCED FOR EACH FATAL ACCIDENT

Windy shots	1,131,797
Falls of rock	281,527
Trip wrecks	1,970,695
Burned by gas	1,313,797
Run-away trips	1,970,695
Falls of slate	3,941,391
Improper shots	1,313,797
Explosions........	262,759

In obtaining the number of tons of coal produced to each keg of black powder it is necessary to reduce the amount of other explosives and dynamite to equivalent kegs of 25 lb. each, one pound of other explosives being considered as equal to 2 lb. of black powder, while one pound of dynamite was reckoned as equivalent to 2½ lb. of black powder. Therefore, allowing 26½ tons per keg would give the average tonnage per keg produced.

This report shows 7,946 men working produced an average of 495 tons per man for the fiscal year ended June 30, 1919. Placing this tonnage at the average rate of $1.01 per ton would make the earning capacity of each miner for the year $499.95 and adding to this the average yardage at 78c together with other dead work would make an average earning capacity, or approximate total earning of $883.05 per man. From this must be subtracted expenditures for explosives, etc.

The grand total of all the explosives used during the year after reduction to black powder amounted to 149,570 kegs. At an average cost of $2 per keg this would represent a total sum of $299,140, the average cost per man being approximately $37.68. Deducting this from his total earnings would leave a balance of $845.37 for the fiscal year. This reduced to a monthly average would be $70.44 per month. This approximation of cost does not include the miners' expenses for fuse, blacksmithing, oil, blasting paper, etc.

Pennsylvania

By Frank Hall

Department of Mines, Harrisburg, Pa.

The year just closed has been characterized by much uncertainty because of labor conditions. The strike in the bituminous field was a highly disastrous one, not only to the mine workers and operators, but particularly to the public. The rather makeshift agreement finally entered into by the Federal Government and the coal interests will not be a preventive of further agitation tending in a similar direction.

Some time, however, it is to be hoped that the Government will be wise enough to appoint a proper commission to act with the operators and miners in keeping the great and essential coal industry reasonably active, so that the public may always have sufficient fuel, the miners fair wages and the operators reasonable profits.

During the present winter months trade will no doubt be active and the industries of the country will be amply supplied with fuel. Nor need any discomfort be apprehended in the households from lack of coal.

The present outstanding feature of the industry is the high wages paid generally to mine employees, and it is doubtful if any material reduction will be made in the future. The increased cost of production, together with the high cost of mining materials and equipment, means necessarily that the price of coal will never again reach the low levels of past years.

The production and accidents during 1918 and 1919 by districts are shown in the accompanying tables:

ANTHRACITE

District	Production Net Tons		Fatal Accidents	
	1918	1919	1918	1919
1	3,424,691	2,440,729	16	21
2	3,981,568	3,110,400	18	22
3	3,704,654	3,808,000	17	15
4	2,751,896	1,974,989	20	14
5	3,846,215	2,757,400	30	22
6	4,134,103	3,958,532	20	20
7	3,250,831	2,808,992	18	18
8	5,051,086	4,495,550	27	21
9	3,406,199	2,800,000	29	13
10	3,515,972	3,016,687	28	22
11	4,101,674	3,535,878	12	116
12	4,325,051	3,920,000	20	20
13	4,853,811	4,368,000	35	28
14	4,733,313	4,610,000	39	25
15	5,265,483	5,040,000	21	16
16	3,455,551	3,329,000	22	18
17	5,256,002	4,249,000	25	26
18	4,160,314	3,511,000	16	18
19	2,928,966	2,330,000	17	16
20	3,828,516	3,144,000	17	26
21	4,880,897	3,374,000	24	27
22	5,299,395	3,852,000	24	25
23	3,121,895	2,600,000	26	19
24	3,336,113	3,016,312	15	23
25	2,831,588	2,520,000	20	22
Totals........	99,445,694	85,570,469	556	613

BITUMINOUS

District	Production		Fatal Accidents	
	1918	1919	1918	1919
1	6,094,636	4,000,000	16	9
2	6,484,742	6,000,000	14	14
3	4,572,959	2,000,000	11	5
4	4,401,857	4,100,000	12	2
5	7,011,189	5,824,400	20	22
6	5,352,158	4,200,000	17	10
7	6,446,507	5,195,000	21	14
8	5,156,832	3,500,000	7	3
9	7,189,948	6,150,000	12	12
10	4,224,584	3,500,000	9	11
11	6,880,298	3,500,000	12	15
12	5,414,803	3,700,000	23	7
13	3,689,449	3,000,000	9	5
14	4,877,480	4,000,000	16	8
15	5,903,241	5,000,000	10	9
16	8,867,477	8,500,000	36	39
17	5,401,047	4,000,000	15	6
18	5,541,004	4,000,000	18	11
19	5,874,682	6,000,000	20	12
20	5,029,477	4,400,000	16	22
21	7,660,627	5,678,000	25	15
22	4,474,126	4,250,000	9	6
23	7,831,192	7,300,000	18	16
24	6,078,487	5,325,425	17	19
25	6,191,735	4,643,800	17	12
26	5,627,701	5,000,000	24	10
27	5,838,972	4,500,000	14	21
28	5,273,526	3,450,000	10	10
29	6,611,624	5,380,000	26	24
30	7,205,534	5,500,000	20	24
Totals........	177,217,194	141,596,625	494	393

In Pennsylvania during 1919 the estimated production of anthracite for the year was 85,570,469 net tons, and of bituminous 141,596,625 net tons, making a total of 227,167,094 net tons. The number of fatal accidents in the anthracite region was 613, and in the bituminous region 393, or a total for the entire state of 1006.

South Dakota

By O. Ellerman

State Mine Inspector, Lead, S. D.

The coal mines of South Dakota continued a normal production during 1919 and approximately 10,000 tons of lignite were mined. This has been the average output for the past several years and despite the demand for fuel, no increase was made during the past season. The mines situated some distance from railroad connections produced only such amounts as could be consumed locally. There will be no increased productions from these properties until railroads are built through the fields, making possible shipment to market. At present there are no indications that the transportation question will be settled by the extension of railroads into the coal areas and we cannot look for a marked increase within the next few years.

The Robbins and Lindt mines in Dewey County are within a few miles of the railroad and made normal productions during the past year. The shortage of labor was directly responsible for the small yield, which did not meet the demand for this fuel. Both of the above mines were purchased by the South Dakota Fuel & Coal Products Co. of Watertown, but the mines were operated, under lease, by individuals. In addition to these properties the company also purchased adjoining coal lands and now owns 800 acres in the Isabel and Firesteel districts.

It is probable that operations will be undertaken on a large scale during this coming year, with steam shovels utilized for stripping and mining. The overburden has a depth of 20 ft. and the coal bed will average 7 ft., at the two main producing mines. The fuel is a good grade of lignite, containing from 6,000 to 9,000 B.t.u. and an average of 20 per cent of moisture. The Robbins mine produced 1,500 tons, most of which was shipped to points along the railroad, while the production from the Lindt mine was less. The remainder of the annual state yield was taken from mines in Harding, Perkins and Corson counties and used locally as fuel for domestic purposes.

Tennessee

By A. W. Evans

Chief Mine Inspector, Nashville, Tenn.

THE annual production of coal in Tennessee for the year 1919 will closely approximate 5,000,000 tons. The production of coal was materially reduced by the strike, in the bituminous coal field, covering a period of 45 days.

The production of coal up to Dec. 1 was approximately 4,000,000 tons. The loss in tonnage to the state due to the strike will closely approximate 700,000 tons. On Dec. 15 the mines were running 100 per cent full; on that date, all of the miners returned to work.

The largest producing mine in the state is the operation at Fonde, Ky., owned and operated by the Clearfield Coal and Coke Co. The camp and post office is situated in Kentucky, but the mine is in Tennessee, and comes under the supervision of the mining department of that state. The next largest operation is the mine at Whitwell, Tenn., owned and operated by the Tennessee Coal, Iron and R. R. Co. The respective tonnage from these operations are 20,000 and 18,000 monthly.

During the year, several coal companies, commenced the development of new properties, and as these operations will be producing coal during the early part of 1920, it is safe too predict, that the annual production for the ensuing year will prove the largest in the history of the state.

The Buffalo Coal Co. is developing a lease of 1,200 acres on New River in Anderson County on the Tennessee R. R. This lease carries 500 acres of the Dean seam, averaging 6 ft. 9 in. in thickness, and this is the bed being exploited. The incline 2,800 ft. in length is graded, both lower and upper tipple are in course of erection, 9 four-room dwellings have been completed, and the steel rails for incline and spur tracks, as well as the drum, and rope are on the ground. This mine will have an ultimate output of 1,000 tons, and will be one of the state's large producers.

The Pruden Coal and Coke Co. of Pruden, Tenn., is building a new plant, which will be known as the Valley Creek operation. This is situated in Clairbourne County, on the Southern R. R., 2 mi. south of the old plant at Pruden. This operation is on the Mingo seam, and the company expects to mine an average of 1,000 tons daily. This plant will be modern in every respect.

Texas

By Bruce Gentry

State Inspector of Mines, Rockdale, Tex.

THE production of coal and lignite (brown coal) in Texas for the year 1919 Jan. 1 to Dec. 31) were approximately:

Bituminous, 700,000; sub-bituminous, 31,000; cannel, 62,000; and lignite, 860,000. The total was 1,653,000 short tons.

The total number of mines in operation during the year was 54 divided as follows: Bituminous, 13; sub-bituminous, 2; cannel, 2; and lignite, 37.

The bituminous mines gave employment to about 3,500 men while the lignite mines employed 2,500 men. The year 1919 saw the opening of new mines, and the abandoning of five.

The deposits of bituminous coal are located in the northcentral part of the state, only one seam underlying most of this region. This bed of coal ranges from 18 to 48 in. in thickness, the depth below the surface being from 100 to 600 ft. The mines operated in this district are worked on the longwall plan, with the exception of two which are worked room-and-pillar. These mines use electric haulage, overhead trolley and storage batteries. Little machine mining is done, most of the coal being undercut by hand, and small shots used to break it down. Practically the entire output of the bituminous mines is used by the railroads. These mines are all operated by organized miners, being located in District 21.

TIPPLE, J. HOUSTON-LEON COAL CO., CROCKETT, TEX.

The sub-bituminous mines are located in the southwestern part of the state on the Rio Grande, and the field is small in extent. There is here only one bed which averages about 48 in. in thickness and carries a number of partings. In this field is operated the only washery in Texas. These mines are worked on the room-and-pillar plan. Mule haulage is employed. This coal is used principally in electric lighting plants and for domestic purposes.

The cannel mines are also located in the southwestern part of the state, lying about 100 miles to the south of the sub-bituminous field, being situated on the Rio Grande also. Here two seams are mined, each bed averaging about 18 in. in thickness. Bed 1 is about 100 ft. below the surface, while bed 2 lies 100 ft. deeper. Gasoline motor haulage is used, and the mines are worked on room-and-pillar plan, electric machines being utilized to undercut the coal. The output of cannel coal is consumed by railroads, irrigation pumping plants, etc.

The lignite mines extend from one corner of the state to the other, beginning in the northeastern part and stretching in a southwesterly direction across the state. In this field there are many many beds, those being worked running from 48 to 150 in. in thickness. All of these mines are worked room-and-pillar plan. Most of the coal is pick-mined. Gasoline, rope and mule haulage are used. These mines are operated open shop. The output of the lignite mines is consumed largely by the street-railways, electric power plants, cotton-oil-mills, gins, for domestic purposes, etc. Especially has the lignite found favor as a domestic fuel this year because of the shortage of the other coals.

Texas was affected by the recent coal strike, the bituminous output being entirely suspended for the duration of the strike. The lignite mines, however, continued their production and materially relieved the situation. Some of the mines were able to increase their output, thus furnishing additional fuel at a time when it was sorely needed. The train service (freight and passenger) suffered some, but not so severely as in some other states, because many of the roads of Texas operate oil-burning engines exclusively. The present outlook is that several roads formerly burning coal will now change their fuel and burn oil in the future. During the period of the strike many of the miners left the mining centers, going to the farms, where they found work picking cotton and doing other farm labor.

The mining industry is a safe one as is proven by the small number of accidents each year. None of the mines are deep and none are gaseous. During the year 1919 there were only one or two fatal accidents in all the mines.

The outlook for the coming year seems to be that the mines will be quite busy, and it is doubtful whether there will be any slack work, the duration of the strike having been so long that it will tax the mines to produce enough coal to make up the tonnage lost.

Utah

BY C. A. ALLEN
Chief Mine Inspector, Salt Lake City, Utah

AFTER the signing of the armistice the production of coal in Utah showed a marked falling off. Throughout the remainder of the winter the production was not much greater than for the similar months of 1917, while in April and May the market was extremely sluggish, causing the production to fall below that of 1917. However, June and July, which are, ordinarily, slack months, commenced to show an improvement. The fairly steady market in the summer and early fall months greatly helped the Utah mines, and the production was further increased in October and November. In November practically all the other coal-producing states were suffering from the general strike, whereas Utah was producing all she could with the men available. The estimate for December is based on the production for the first half, which showed an increase over the same period of November. The mines were, however, suffering from a shortage of cars, which, taken with the fact that the Christmas holidays occur during this month, will probably make the production for December little larger than that for November.

During the year just closed there was but one mine to start production—the Kinney Coal Co. at Scofield, Utah. Three other companies, however, started surveying for the opening of new properties. They were: The Utah Coal & Coke Co., which has already done some work toward opening a mine near Sunnyside; the Mutual Fuel Co., which is planning to open a mine near Rains, and another company which, under the management of Arthur Gibson, plans to open a block of coal land just south of Standardville.

UTAH COAL PRODUCTION IN 1919

Month	Production (Tons)	Month	Production (Tons)
January	387,948	September	407,152
February	318,781	October	470,649
March	322,027	November	467,473
April	247,342	December	472,000*
May	297,228	Miscellaneous small mines	16,000*
June	349,055		
July	386,211		
August	426,262	Total	4,568,128

*Estimated.

The outlook for 1920 is good, because of the fact that there is an increasing demand for Utah coal at Pacific Coast points. The production is also expected to be larger in 1920 because some of the mines that only did preliminary work during the past season are expected to be in the producing class before the end of the new year.

It is also reported that the Milner interests, which own a large block of coking coal land, have secured capital for the establishment of steel works in Salt Lake Valley, the iron ore to be brought from southern Utah and the coal for the coke to be mined on their property in Carbon County.

Everything considered, the coal industry of the state can anticipate an excellent year in 1920.

Virginia

BY A. G. LUCAS AND F. E. MAXEY
Mine Inspectors, Richmond, Va.

THE output of the coal mines of Virginia for the year 1919 will fall far below that of 1918 according to the best information obtainable. While no figures are at this writing available, yet it is believed that the shortage will not be less than 25 per cent and may be considerably more as compared with the output for 1918. This would make the 1919 output about 7,500,000 tons. This reduced production resulted principally from two causes.

During the early part of the year there was a lack of orders which resulted in the operation of the mines for only from one to three days per week. This continued during January, February, March and part of April. From April to the latter part of July and again from the latter part of October to about the end of November the operators report a shortage of cars. During the latter periods the mines were in operation from three to five days a week.

Coal production in Virginia has steadily increased since the inception of the industry in this state. The output for 1880 was 38,463 long tons. The increase since that date has been fairly uniform, reaching its highest point in 1917 with a total of 10,396,625 tons; in that year Virginia ranked the ninth state in the production of coal.

The four largest coal producing companies operating in this state in the order of their output are the Stonega Coal & Coke Co., the Clinchfield Coal Corporation, the Pocahontas Fuel Co., and the Virginia Iron, Coal & Coke Co. The Stonega Coal & Coke Co. is the largest producer of coal and coke in Virginia and its Roda Mine produces more coal than any other operation in the state.

The recent strike only affected the mines in Lee County. About 1,000 men were out on strike for about six or seven weeks. About one-third of these men have left the state, one-third moved to other camps within the state and the majority of the remainder have returned to work in the Lee County district.

The strike was conducted in an orderly manner with absolutely no disturbance by the miners. Some shooting around the mines was reported several times but on investigation no evidence was found that the miners were in any way implicated in the rumored disturbance. The Baldwin guards were called out on one occasion to quell a riot and on investigation it was found that the alleged disturbance was caused by some boys shooting fire crackers. Only one death resulted as the outcome of the strike. This was that of a Baldwin-Felts guard accidentally shot. His gun fell to the ground and was thus discharged shooting him in the leg severing an artery.

The prospects for the coming year appear at this time to be bright. There is every reason to believe that with more settled conditions and the impetus given industry, following the declaration of peace, that production in this state will go forward with greater rapidity than ever before.

Washington

By James Bagley

State Mine Inspector, Seattle, Wash.

Reports for the first eleven months of 1919 indicate that the coal production for the State of Washington for the year 1919 will be about 3,100,000 tons, showing a decrease of over 900,000 tons as compared with 1918. Part of this decrease was due to the strike which closed the Washington mines from Nov. 1 to Dec. 17. The miners were ordered to return to work on the latter date but only part of the mines then resumed operations as the miners in the Roslyn-Cle Elum field, which produces about half the tonnage of the state, refused to return to the mines until their district officials visited the field and urged them to do so. They resumed work on Dec. 22.

Most of the Washington mines resumed work under protest as the operators claim they cannot absorb the 14 per cent increase in wages without increasing the price of coal. They also contend that any increase in the price of coal will place them at a serious disadvantage in competing for business with California fuel oil as well as fuel from Utah and British Columbia where coal can be mined at much less cost, because of the more favorable mining conditions and the fact that the miners are not organized.

Only one new mine of any importance, the Bellingham Mine in Whatcom County, operated by the Bellingham Coal Mines Co., was opened during the past year. This mine is shipping about 300 tons per day and will considerably increase its output during the year 1920.

Eighteen fatal accidents had occurred up to Dec. 24 as against 32 for the previous year.

A campaign of education will be started early in the present year in an effort to reduce accidents in the coal mines of this state. A merit rating system has been adopted by the State Industrial Insurance Commission whereby the careful operator will be given credit for his efforts in preventing accidents while the operator who does not take the same interest in safety will be penalized. Educational standards have been adopted for coal mines that, if carried out in the right spirit, will get all employed in mines interested in safety for in that way only can accidents be prevented.

West Virginia

By W. J. Heatherman

Chief of Department of Mines, Charleston, W. Va.

The period covered by the year just closed, has been the most unusual one in the history of the coal industry of West Virginia. In the latter half of the calendar year of 1918 the signing of the armistice paralyzed the coal industry, which in turn was reflected in all other lines of industry and commerce, and as the unemployment lengthened over into the year 1919, unmistakable signs of unrest began to appear; nor, did the return to normal production in the month of May, allay the signs of unrest.

Local disagreements at many of the mines, brought on local strikes throughout the organized sections of the state, and caused a considerable curtailment of production, for which there are no figures. Shortage of railroad equipment to the mines, has been the largest retarding factor in the production of coal, and will easily account for the 40 per cent loss of tonnage in the production.

CONSOLIDATION COAL CO., NO. 25 MINE

Rescue stations, have been established at Wheeling, Fairmont, Elkins, Welch, Logan, Mount Hope and Charleston, in charge of Robert Lilly, late mine-foreman in charge of U. S. Mine-Rescue Car 8. Mr. Lilly, is training rescue teams at each of the stations, and great interest is being taken by the best young workmen at the respective vicinities where stations have been established. The operating companies are generously assisting in this new feature of the department work in this state.

During the year past, County Mining Institutes, have been organized at the solicitation of the district inspectors under the direction of the chief of the department, for the purpose of educating foremen, firebosses and assistant foremen, and any mine employee in their respective duties, in order to obtain a better knowledge of the mine laws and the responsibilities and legal duties under the law. It is believed, that through the educational work of these institutes, better enforcement of the law can be had, and that it will lead to a more definite fixing of responsibility upon the mind and person of each mine-employee.

In this period of willful violation of law by irresponsible radicalism, and social and industrial revolutionary ferment, no better subject than respect for, and willing compliance with, the requirements of the law, can engage the public mind at this time. Educational work will bring about the elimination of black powder, and relegate the squib and "short fuse" to oblivion, replacing them by permissible explosives with shot-firers, detonators and electric batteries; and will thereby eliminate a prolific source of serious and minor accidents.

A legislative amendment to the mine law should be passed requiring superintendents to have certificates of competency, take oath to perform their duties according to law, and give bond for the faithful performance of duty.

The coal mines as now developed in the state are capable of producing 125,000,000 tons annually without any estimate for new development now actually begun, and in contemplation, pending completion of organization and assembling of machinery and materials. Statistics for the fiscal year ended June 30, 1919, and comparison with the preceding year follow.

	1918	1919	Increase	Decrease
Production coal (tons)	90,766,637	84,803,918	...	5,962,719
Production coke (tons)	2,843,597	1,866,372	...	977,225
Men inside	71,253	71,958	705	......
Men outside	18,365	16,930	...	1,435
Coke workers	2,514	2,142	...	372
Coal used in the production of coal	4,935,382	2,921,339	...	2,014,043
Fatal accidents inside	352	332	...	20
Fatal accidents outside	52	45	...	7
Tonnage, per fatal accident inside,	257,860	255,765	...	2,095

Wyoming, District 1

By Robert T. Sneddon

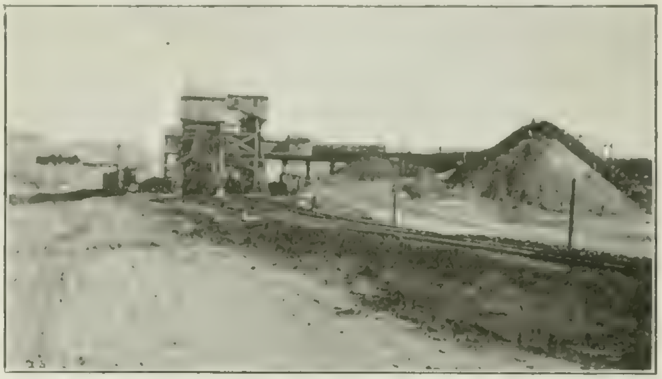
State Coal Mine Inspector, District No. 1, Diamondville, Wyo.

THE coal production in District No. 1, State of Wyoming, for the year ended Sept. 30, 1919, amounted to 5,232,682 tons, a decrease of over 1,000,000 tons as compared with the production for the previous twelve months.

The decrease in production is attributable to labor shortage during the busy season and a poor demand for coal during the spring and summer months. Slow time began to manifest itself in February and continued until the end of July. In some of our largest producing mines during that period the average time worked was four days per week, while a number of the small producers were shut down entirely. A good feeling seems to exist between the operators and the men, as all grievances have been amicably settled without resorting to extreme measures during the period covered by this report.

Twenty-six fatal and 144 non-fatal accidents have been recorded, compared with thirty fatal and 190 non-fatal accidents for the previous year. Fifty-eight per cent of the accidents were due to falls of roof. Four thousand, six hundred and sixty-three men were employed in and around the mines, making the ratio of fatal accidents per 1,000 men employed 5.57, and the ratio per 1,000 men employed for non-fatal accidents, 30.9.

During the past year electricity was utilized to a large extent, displacing steam for hoisting, pumping and haulage. The old frame buildings are being discarded and fireproof structures composed of cement, brick, etc., are being erected over fans, hoisting engines, power units and the like. The necessity of establishing bath houses at the mines has been taken up by some of the up-to-date coal companies and good, substantial bath houses have been installed, and it is only a question of time when others will follow their example. Good housing accommodations for workmen is receiving close attention by the coal operators. The old shacks are being supplanted by modern dwelling houses; recreation and amusement halls are being built for the health and entertainment of the workmen.



RELIANCE MINE OF THE UNION PACIFIC COAL CO.

Wyoming, District 2

By R. V. Hotchkiss

State Coal Mine Inspector, Sheridan, Wyo.

THE production for District 2 will fall far short of that for 1918, because there was no market for coal during the first nine months, and the strike cut into the production during the last two months of the year. It would be safe to say therefore that the production will be half a million tons short of that of last year, making it about 2,650,000 tons. We will not know the exact amount until the operators turn in their annual reports. The law was changed at the last session of the Legislature, and reports from Jan. 1 to Dec. 31 of each year are now required instead of closing Sept. 30. As the operators do not make any monthly reports, it makes it difficult to give any accurate figures on production or distribution at the present time. The railroads use a large percentage of the coal produced in District 2.

The high cost of living has been a bone of contention with the laboring man, especially the coal miner. He looked for an adjustment to take place, but as yet things are much unsettled from the miner's point of view. Companies that had kept their organization intact for a period of years found themselves badly disorganized after the strike and it is only within the last week that the production has got back to normal. With the present rate of production it makes one wonder why there is ever a coal shortage. The nine mines in Sheridan County recently produced 13,200 tons, the largest day's run, and the largest run on record. This does not include the wagon mines of which there are quite a few, some of them producing up to 100 tons a day.

At the present time there is strong talk of the Peabody Coal Co. taking over the Sheridan County mines and operating them as one company. One wonders what effect this consolidation would have as the miners only work from one to three days a week in the summer months. No doubt it would mean the closing down of some of the mines during the warm weather, allowing possibly half of the mines to work the year round, and the rest of them work during the winter months. Every one is hoping for the best, and if a consolidation of the companies will bring steadier work to the miners in Sheridan County no one will welcome it more than the men who have remained in the field and heard the whistle blow from one to three days a week, from six to eight months in the year.

Saskatchewan

By E. Pierce
Mine Inspector, Roche Percee, Sask.

The output of the Saskatchewan mines in 1919 surpassed that of last year, the shipping mines not being able to fill all the orders received during the months of October and November. This great demand arose from the practical exhaustion of all stocks held by local dealers at the commencement of the winter season, such stocks being small because of the Alberta coal strike last summer, and the winter setting in early and almost causing a famine. Production may be roughly estimated as somewhat exceeding 250,000 tons during the year just passed.

There were no labor troubles other than a scarcity of experienced miners to augment the difficulty of the operators in meeting the great demand for coal. Owing to the insistent demand and high prices offered a considerable number of cars were loaded at Estevan Station loading platform, most of the coal being hauled by sleigh and teams three and four miles, from the small mines in the valley south of the above town.

No new operations were opened in 1919, and out of 51 mines in this province only eight are shipping coal direct from the tipple in car lots, six mines are hauling by teams to the loading platforms at the railway stations, the other 47 being located a considerable distance from the railways, and supplying the needs of the farmers in the southwest portion of the province.

The most up-to-date mine is that of the Western Dominion Collieries, Ltd., at Taylorton, under the management of Andrew A. Miller. This is a shaft mine with self-dumping cages, shaker screens, electric haulage motors underground, and electric coal-cutting machines; the method of working is entry and room and the seam is 9 ft. in thickness. The output is approximately 13,000 tons per month.

One fatal and four non-fatal accidents occurred during the year.

The total coal requirements for Saskatchewan in 1918 were 1,510,000 tons. This does not include railways, nor large consumers, such as power plants in towns and cities. Taking into consideration the above demand the future of this lignite field is decidedly promising, chiefly on account of its location in proximity to the large cities of Moose Jaw and Regina, as well as other large towns.

In order to secure a more equitable distribution, during the entire year, of the lignite coal of Saskatchewan, and at the same time permit of the working of the mines during the summer months, an agreement was made between the Dominion Government and the governments of Saskatchewan and Manitoba; and a board called the Saskatchewan Lignite Utilization Board was appointed to determine the possibility of briquetting carbonized lignite. Indications point toward the establishment of a commercial plant to demonstrate the practicability of such a process. Should the result be satisfactory, it will not only provide a suitable fuel for the farmers, one that can be stored during the summer months (in place of imported coal), but will cause a great development of the coal-mining industry of Saskatchewan, and set at rest all fears of a fuel shortage in this province.

The plant for carbonizing lignite for the manufacture of briquets, is being erected by the board of Bienfait, Saskatchewan, the expected output being 30,000 tons per year. This will be distributed as widely as possible, so that the briquets may be demonstrated throughout a wide area.

The board has made much progress on both processes and plant and expects to be producing briquets commercially before the close of 1920.

British Columbia

By George Wilkinson
Chief Inspector of Mines, Victoria, B. C.

It is estimated that the gross production of coal was 2,504,423 long tons, or 2,804,953 short tons, of which 147,205 long tons were made into coke, leaving the net production at 2,357,218 long tons. These figures show a decrease as compared with 1918, or 68,388 tons gross and an increase of 65,150 tons net. The quantity of coke made was about 98,598 tons, which is a decrease of about 92,060 tons, as compared with 1918. For purposes of comparison the following table is shown:

Gross tons of 2240 Lb.	1919	1918	1917	1916	1915	1914
Coal	2,504,423	2,572,811	2,398,715	2,485,580	1,972,580	2,166,428
Less made into coke	147,205	280,743	248,740	401,487	361,551	355,461
Coal, net	2,357,218	2,292,068	2,149,975	2,084,093	1,611,129	1,810,967
Coke made	98,598	190,656	159,905	267,725	245,871	234,577

In these figures for 1919 the output for the month of December has had to be estimated, consequently the final figures may vary from the above slightly.

Summarizing the Provincial production of coal, the following table shows the estimated output for 1919:

	Long tons
Vancouver island collieries	1,690,724
Nicola and Similkameen collieries	152,731
Crowsnest district collieries	659,408
Telkwa collieries	1,560
Total quantity coal mined	2,504,423
Less that made into coke	147,205
Net quantity of coal produced	2,357,218

In addition to the above net production of coal, there was manufactured the coke production shown in the following table:

	Long tons
Vancouver island collieries	43,517
Nicola and Similkameen collieries	0
Crowsnest district collieries	55,081
Total	98,598

As will be seen by the above figures, the net coal production this year is expected to be some 65,150 tons (2240 lb.) more than it was in 1918. The production of coke in 1919 was about 98,598 long tons, which is 92,060 tons less than that of the preceding year, a decrease of about 48 per cent.

The coal mines of the Province have had a fairly good year; interruptions to production were as follows: A strike at Fernie closed the mines during June, July and August, but work was started again the beginning of September. During the months of May, June and July the mines on Vancouver Island worked on slack time, losing probably 160,000 tons.

The Vancouver Island Collieries made a gross output of about 1,690,724 long tons of coal, or 24,142 tons more than in 1918.

Western Fuel Co. mined this past year about 641,171 tons of coal, a decrease from the previous year's output of 90,751 tons.

ACTIVITIES OF BRITISH COLUMBIA MINES

The Nanaimo Colliery, in the City of Nanaimo, is entered by No. 1 or Esplanade shaft, which is connected by underground workings with a shaft on Protection Island, and also on Newcastle Island. The workings are at a depth of from 600 to 1,200 ft. and are quite extensive, including a large submarine area. On the north side both the Douglas and Newcastle seams are operated; on the south side only the Douglas or Upper bed is worked. This property has been in operation since 1881, and is still the largest producing coal mine in the Province.

The Reserve Colliery is situated about five miles from Nanaimo; the Douglas seam is reached through two shafts 950 ft. in depth. This property became a producer in 1914; development has been retarded owing to faulted and much-disturbed condition of the coal bed.

The Harewood Mine, which has been closed down for a number of years, was reopened during 1917, and at the present time is producing about 1,000 tons daily.

The Wakesiah shafts, which were sunk during 1918 on the Five-acre Lots, are now producing 200 tons daily.

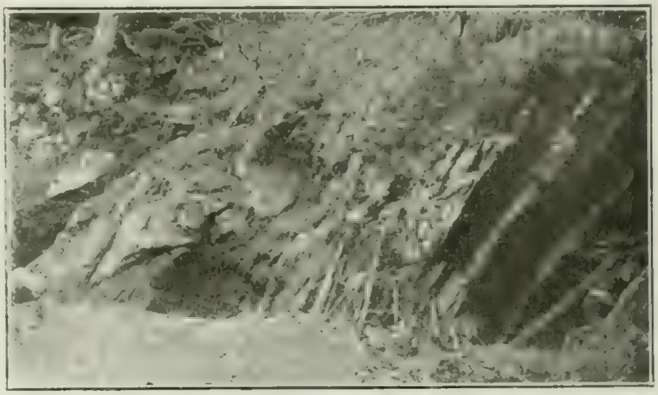
The Canadian Collieries (Dunsmuir) Ltd., operates two collieries—the Comox Colliery, situated at Cumberland, 70 miles north of Nanaimo, and Wellington-Extension Colliery at Extension, 6 mi. southwest of Nanaimo. The mines of the Comox Colliery are situated around Cumberland and are connected by a standard-gage railway with the seaboard at Union Bay, where are situated the loading place, a coal washery and a battery of 200 coke-ovens. The mines operated during the year were Nos. 4 and 7 slopes and No. 5 shaft. No. 6 shaft, however, has not been producing coal during the year. The estimated gross output of coal for this colliery during the year is 549,513 long tons, an increase of 11,151 tons over 1918.

The mines of the Wellington-Extension Colliery are situated around Extension, and are connected by a standard-gage railway with tidewater, and the Extension & Nanaimo Ry. at Ladysmith, where a coal-washery, bunkers, and loading-piers are situated. Three mines were operated during the year. Nos. 1, 2 and 3, entered by a tunnel 5,000 ft. in length. The output for the year was about 224,498, or practically the same as that produced in 1918.

The new slope known as No. 5 mine is being developed at South Wellington, from which the output for the year was about 86,118 tons, an increase of 57,331 over 1918. Pacific Coast Coal Mines, Ltd., operated the Morden mine throughout the year. This mine is situated about 6 mi. south of Nanaimo and produced about 64,147 tons during 1918, this being a decrease of 18,482 from the 1918 production. The Suquash Colliery, situated on the northeastern coast of Vancouver Island and owned by this company, was not in operation during the year. British Columbia Coal Mining Co.'s output for the past year was about 36,739 tons, or an increase of 32,029 tons over 1918 production.

The operation of the Nanoose Collieries, Ltd., is situated at Nanoose Bay, about 10 mi. north of Nanaimo, the workings being in the Old Wellington Seam. The output for this colliery during the past year was 20,803 tons, a decrease of 9,633 tons from that of the previous year.

The new colliery, or No. 1 of the Granby Co. at Cassidy Siding, produced about 67,735 tons of coal during the year. This was an increase of 50,110 tons over the 1918 production.



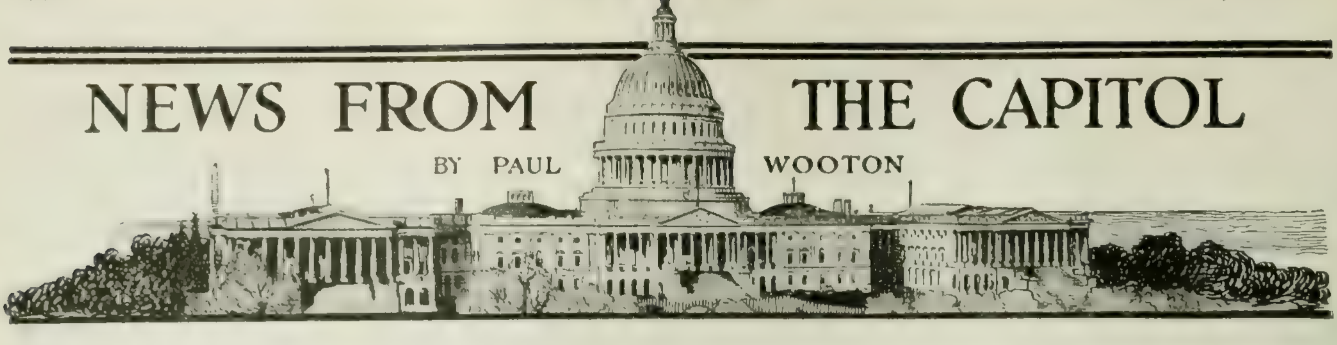
THREE COAL VEINS OF ANTHRACITE
Beds located in British Columbia near Lake Kathlyn are 30 ft. thick

The Nicola-Similkameen coalfields produced in 1919 about 152,731 tons, this being a decrease from the previous year of 21,542 tons. In the Nicola District four companies produced coal during 1919, viz.: the Middlesboro Collieries, Ltd., the Fleming Coal Co., the Merritt Collieries and the Coalmont Collieries. The Middlesboro Colliery produced about 81,589 tons during the year, this being a decrease of 19,411 tons from the previous year. The mines in operation were Nos. 4, 4 East, 7 and 8.

The Fleming Coal Co. operated the Coal Hill mine during the year. The production for this colliery was about 37,127 tons, an increase over the previous year of 6,127 tons. At Princeton, the Princeton Coal & Land Co. produced about 22,966 tons, showing a decrease of 15,712 tons from the previous year. The Coalmont Collieries produced 10,012 tons, and the Merritt Collieries 1,037 tons.

There were only two companies producing in the East Kootenay Coalfield during 1918—the Crow's Nest Pass Coal Co., and the Corbin Coal & Coke Co., with its colliery at Corbin.

Late in the fall of 1919 production on a small scale was started by the Telkwa Collieries. The colliery is situated 4½ miles from Telkwa, a town on the Grand Trunk Pacific Ry. About 1,560 tons was mined and shipped to Prince Rupert, and a continued production is expected. This was an increase of 1,060 tons over the production of 1918.



NEWS FROM THE CAPITOL

BY PAUL WOOTON

Operators Demand Intent of Coal Commission

"Before we enter into the arbitration we should know definitely what it is we are submitting. I believe, in accordance with the rule, that in submitting any questions to arbitration both parties should know definitely what it is they are submitting." The foregoing sums up the position of the mine operators as expressed by Thomas T. Brewster, chairman of the Scale Committee of the bituminous operators of the Central Competitive Field at the initial hearing before the President's Coal Commission.

Henry M. Robinson, the chairman of the commission, put practically identical questions to Mr. Lewis and to Mr. Brewster. His question was as follows: "I would like to ask for the commission if you can speak for the United Mine Workers in this: Are they here to assist in this investigation and are they willing to submit to the award which the commission finally will make?" To this inquiry Mr. Lewis replied: "I am advised that the United Mine Workers are here to assist the Coal Commission in every proper and practical way in order to arrive at their conclusions and to co-operate in every manner. We submit our interests to the commission without reservations and shall abide by the judgment of the commission."

When the same question was put to Mr. Brewster, he stated that before answering he was instructed to submit a statement in writing. The statement set forth that the operators had been unable to determine the exact scope and character of the contemplated arbitration, in respect to some matters of vital importance to the public. The statement brought out further that the operators are anxious to settle the present controversy, to prevent the recurrence of strikes and to prevent the suspension of the supply of necessary coal to meet the needs of the country.

"We hope," said the operators' statement, "to be able to advise the commission promptly of our ability to co-operate with it in arriving at such a result. In order, however, that we may be in a position to comply intelligently with the request of the commission for a statement of the operators' position, we respectfully ask that we be advised as to the following matters." Then followed the list of questions which caused an extended colloquy between Mr. Brewster and Chairman Robinson. The questions were worded as follows:

First: Is it the intention of the commission to investigate and act upon matters in the central competitive fields only.

Second: Will the award of the commission be final and constitute a contract, binding upon both parties?

Third: Will the commission in its award provide a method by which the contract entered into may be enforced?

Fourth: Will the commission investigate and act upon matters brought before it by either party, including the check-off system now in effect?

Fifth: Will the commission fix the basic principles upon which evidence is to be submitted, particularly with regard to wages?

Sixth: Does the commission understand that it has the authority, should the facts warrant such findings, to adjust wages, either by awards or between parties?

Seventh: Does the commission consider practicable to make a retroactive award, either as to wages or selling price of coal?

Eighth: Will the commission immediately determine the cost of coal during the year 1919, and the present cost based upon the 14 per cent advance granted the miners, to determine fair selling prices, to be effective at once, having in mind the fair and reasonable profit provided by law?

Ninth: Will the commission's awards as to the selling price of their coal be made to expire simultaneously with the expiration of the Lever Law?

Tenth: Will the commission provide in its award for the introduction of modern devices, which may serve to reduce the cost of coal, and consequently the cost to the public?

Immediately upon hearing the questions Chairman Robinson asked if the answering of the questions is a condition as to whether or not they will submit to the final award of the commission. While Mr. Brewster did not make direct answer he practically answered in the affirmative when he said: "I think that we would like to have as full answers as the commission can give consistently without embarrassment."

The secretarial organization of the commission is to be as follows: Herbert M. Shenton, Executive Secretary; Samuel A. Taylor, Technical Advisor; Mr. King, Counsel; Charles O'Neill, Percy Tetlow, and E. A. Goldenweiser, Secretaries; K. C. Adams, Director of Information, and Mrs. Mary Burke East, Official Stenographer.

Elaborate Statistics Being Prepared By C. E. Lesher

The most elaborate statistics ever collected by any industry with regard to the earnings of labor are being compiled by the National Coal Association. The earnings of 100,000 miners for the first ten months, in all the bituminous coal fields, are being tabulated in a manner so as to disclose many new facts with regard to amounts being paid by coal operators on wage account.

C. E. Lesher, who recently took over the statistical activities of the National Coal Association, has perfected his organization and is preparing to gather such statistics as are not being collected by the government. While the general statistical program being planned by the National Coal Association will have to be deferred somewhat due to the immediate necessity of getting up special information, it is the intention to work up figures which will give clearer insight into the general working of the coal industry than ever before has been possible. In addition to compiling data showing what labor earns and how, figures also are being gathered at the present time on the subject of actual investment in the coal industry and the cost of production this year, which has been a lean one, as compared with the fat year of 1918.

Mr. Lesher's chief assistant in the statistical department of the National Coal Association is Adreon Futterer, who was connected with the statistical division of the Fuel Administration during the two years of its existence.

War Department Experiments with Colloidal Fuel

The War Department makes the following announcement in connection with its experiments with colloidal fuel:

The General Supplies Branch is conducting tests on colloidal fuel, which is a mixture of finely ground coal suspended in fuel oil. In the liquid form it can be used in any oil-burning furnace. This fuel is heavier than water and can thus be sealed against combustion and evaporation. As it will not mix with water, it can be stored in this manner for an indefinite period without deterioration. There is no danger of spontaneous combustion on exposure to air and sunlight. This fuel may be reduced to brick form for use in field kitchens and tent stoves.

Hampton Roads Coal Rates Advance

An advance of 75c. per ton in the coal rates from Hampton Roads and Baltimore to Boston and other New England ports became effective Jan. 10 in accordance with a ruling by the Shipping Board. The increase, Shipping Board officials declare, simply takes care of the increased cost of operation and will not permit any profit for the vessels in this trade. For some time it is explained that vessels in the New England coal trade have been operated at a loss.

Commission's Work Will Be of Little Value

With the opening of the hearing before the President's Coal Commission operators very generally seem to be of the opinion that the chances greatly favor conclusions which will be adverse to the operators and to the public. It is the belief of many that the Commission's ruling will settle nothing and be of no permanent value.

The miners are going before the President's Commission with their representatives entirely in agreement and with full knowledge to the smallest detail as to what they want. On the other hand the operators' representatives are widely apart as to the stand that should be taken and it will be very difficult for their representatives to give even an approximation of what they want the decision to be. The operators' position is being compared to that of the Allies before they unified their command. Labor, on the contrary, has all the advantages of a unified command.

An opinion not held alone by coal operators is that the President's Commission is not of sufficient weight to impress the country. Nearly everyone who has given the matter any thought seems to be of the opinion that the only hope for anything permanent from the Commission's work would be its enlargement. There is no particular demand for the additional members to be coal men but it is thought that they should be men nationally recognized. As a matter of fact the President's Commission is attacking a problem of the same proportions as that which presented itself to the Industrial Conference. No three men it is held could begin to get anywhere with such a problem in the time limit specified.

It also is pointed out that there is no man on the commission who will be able to even approximate Judge Gary's great classic which so impressed the nation in summing up the conclusions of the Roosevelt Coal Commission. It is not believed that the report of the present commission will get a national hearing and that the results of its findings are bound to be a compromise rather than arbitration based on findings of fact.

It is very evidently the policy of the miners to split the operators still further and operators themselves acknowledge that they have no chance of impressing the commission unless they get together.

On Jan. 13, the operators agreed to accept whatever construction might be put on the words empowering the commission to make an award which would "serve as a basis upon which a new wage agreement can be made" and to waive the demand that answer be given to the ten questions submitted.

Operators Ordered to Submit Monthly Reports

Under the powers conferred upon it by law and in consideration of a special appropriation made by Congress to investigate the cost of living, and to inquire into costs in basic industries the Federal Trade Commission is advising coal operators that they are required to report monthly costs of production, and other information according to a prescribed form.

These reports must be submitted for each month of 1920 and must be mailed not later than the twentieth day of the month following the month for which the report is made. In addition a balance sheet as of the close of business Dec. 31, 1919, or as of the close of the coal companies last fiscal year, must be submitted. A separate cost report is required when mines operated by the same company are located in separate districts. A separate cost report may be filed for each mine as the operator chooses.

Every effort has been made by the Federal Trade Commission to simplify the balance sheet and cost report. The cost report contains 135 entries as compared with 410 entries on the cost report prepared by the National Coal Association. Every effort has been made to make this cost report the last word in such accounting, and it is believed that some compensation will be had for the trouble of making it out in that the operator will be better off by keeping close track of each report in detail of his costs.

The balance sheet, only one of which is to be submitted during the year, contains fifty entries of which eight are totals. The instructions which are being sent out with the cost report blanks contain over 3,500 words and are intended to be so clear that no difficulties will be experienced in filling them out.

Alaskan Coal Lands Now Available

The Senate on Jan. 5 passed a bill permitting agricultural entries on coal lands in Alaska. All patents granted, however, must contain a reservation to the United States of all coal, oil or gas in the land so patented, together with the right to prospect for, mine, and remove those articles.

It also provides that any person qualified to acquire coal, oil or gas deposits, or the right to mine and remove the coal, or to drill for and remove the oil or gas, shall have the right at all times to enter upon the lands.

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A Year of Experience

WHEN a year passes without much addition to national wealth and prosperity we can write into the balance sheet, when the auditors are not looking, the words "To Experience." But who knows whether the experience is really worth all that is paid for it? If it were all made use of to its utmost farthing doubtless it would be worth many times the value we would have to charge against it when it is all we have to square a bad balance.

Unfortunately experience does not seem to be bought in large quantity no matter how high the price paid; for the nations that have lived longer than we have, like India and China, Great Britain and France, not to mention others in between, and that have had the most extensive experience, do not seem to have gained a large degree of wisdom by the passage of years or even of centuries.

India has tied itself up in the red tape of caste, which is doubtless a scheme that was put into operation largely for the laudable purpose of providing enough trained workers in every class of operation. China has hampered itself by tongs, by a multiplicity of officials and by ancient practices for which there no longer exists any adequate excuse. Great Britain and France are suffering from the restrictions put upon labor by unions and on the employing class by social practices. They all have their multicolored tape in which they wrap and swathe themselves, and every time they fall they tie a few more knots, instead of undoing what has been tied, while the new snarl only insures that they will fall again or at least find their progress thereafter appreciably hampered.

We are doing the same thing. Every time the nation falters as it did during the war we put some new pieces of harness on it so that, if our judgment is correct, it will never falter again, but the new piece of equipment acts as a check rein and lessens the nation's ability to haul its load. Most of these checks seem admirable enough in their way and well calculated to relieve the difficulties existing.

With a sigh of relief we gave up the inefficiencies and antagonisms of private railroad management. Many of us thought that the railroads would do better under Government management than they have done. They had everything their own way. There was no competition. They could overload the coaches and herd people at their pleasure; they could lay off trains; they could reduce accommodation by dropping dining, club and observation cars and other accommodations. They could have regular shipping days for less-than-car-load-lot shippers. They could pool cars and put the traffic over direct and easy-grade lines.

But nationalization has proved all to no purpose. Government management has only completed what Government regulation commenced. Expectation was that when the coal strike was ended the coal cars would be mobilized in squadrons ready for a big coal output. The car shortage was, however, larger than ever. Apparently no good judgment was shown in the handling of transportation facilities, or else, to save expenditure for the moment, the necessary number of freight trains was not run.

There is little or no complaint, however, not such a tempest as there would have been if the railroads had still been individually owned and hampered by Federal regulation and had failed in an equal degree. In fact the condition of being enamored of our chains seems as common here as in Europe and the Far East. We hanker over much for Federal regulation of industry though it has never helped any nation. It nearly ruined the Byzantine Empire. It, with a love of luxury, was the cause of the fall of Rome. It has crippled the railroad industry already. It may yet have the same effect on coal production if we will not learn from experience.

Surely after several years of repression of transportation, coal and sugar prices we are learning that such repression does not pay. The coal prices during the war were for most of the time not oppressively low, so production did not suffer for any length of time. But transportation and sugar production have been hopelessly inadequate. One wonders what kind of help we could have been to our allies, what kind of fight we could have waged in France, if we had controlled our iron and steel interests as excessively as we have our railroads.

Now we are to have a "standard return." The pay for service is to be a percentage, not based on the value of the service rendered, or on the economy with which the service is performed, but solely on the capital invested and the cost of rendering the service. The cost-plus system under a new name is to be perpetuated. If the investment was illjudged, if the service is uneconomically rendered, it is to make no difference, the reward is to be the same in any case.

The standard return looks much like the standard wage that the unions have somewhat generally forced on industry. "All the traffic will bear" was never without its merits. Sometimes the traffic would bear only a small burden that did not pay the interest on the investment; sometimes it would carry readily a large service charge; but the charge in any event was made proportionate to the service whereas it has relation now only to the cost of the work performed. There is no incentive to use judgment or economy in rendering the service. The company that cuts the cost will be rewarded by having the rate cut also.

In 1920 we can do no better work than to give the railroads a fair measure of freedom and the right to charge profitable rates. Why should the users of the railroads be allowed to profiteer at pleasure, while the railroad that hauls the material thus sold at profiteering prices is kept strictly to a cost-plus level?

If the material carried is a luxury, then the carriage of it is an element of the luxury trade and by no means a necessity. If a sealskin coat or a billiard table is not a public utility surely the transportation of it is not a public service to be performed at or below cost. Every luxury industry is trying to claim that everything that is necessary to the luxury trades is a necessity. Nothing can be more fallacious. If the essential industries are to be serfs to the basal needs of the people, it does not follow that the luxury trades have a right also to hold them in villenage.

Meeting Industrial Limitations

SUCCESSFUL business men are well aware that it pays to find what any given market wants and then either to comply with its needs, change those needs or withdraw from the market. It is necessary therefore to know just what any particular market is trying to secure, whether it can be satisfactorily diverted to accepting something else, better or worse, and whether the necessary demands are likely to be so drastic as to make compliance too burdensome or actually impossible.

Operators need therefore to know where and how their coal is used and why. They are apt to say that their problem is production, not consumption, but unless they understand the needs of the consumer they are apt to go far wrong. As a matter of fact the coal industry has not held conferences enough with manufacturers of fuel-using machinery and consumers of coal. If it had, doubtless there would be more slack burned and more coal replaced by electric energy generated at or near the mines.

The man who knows only his product and not its use is not a successful seller of his output, He must understand just what the purchaser really needs, and then between them they must decide how operation and consumption can best be dovetailed together.

Many a small purchaser of coal does not have the knowledge of consumption or the time to acquire a knowledge. A suggestion from a man who has made a study of coal may enable him to rectify his methods so as to get results with the coal supplied him or to take a grade that is better suited to the mutual needs of the seller and buyer. The operator or his selling aides, having a large interest at stake, may well make such studies and thus increase their sales.

Our Industrial Unrest

THERE are two kinds of industrial uneasiness, one which results from distress and hunger and another which is the outcome of excessive prosperity and agitation. It is this latter form of industrial unrest with which we are confronted today. The cry that is raised is not one of despair but of desire. So much has been sought and obtained that there exists in the minds of those who do not save, a desire for still better conditions, to be derived not from their own efforts but from union activity or a reconstruction of society more or less drastic.

That part of capital that is fixed in dollars has lost out in the increase in prices and it is only natural to suppose that labor and the stockholders have profited. The condition will not continue. It is quite likely that the bondholder will demand and receive more consideration hereafter and his demands may be a cause of higher living costs. Just now he is getting a low percentage of depreciated dollars for the full-value advances he made before the war. Soon he will come into the market with depreciated coin and demand a high percentage on his money, for every evidence is in favor of the belief that the interest rate on bonds is rapidly rising.

The advantage to labor that now exists will be wiped out when that time comes. But every evidence seems to show that prosperity is as dangerous as adversity and that safety lies rather between penury and riches; so perhaps the outcome will not be so unfortunate as might be feared.

New Capitalists

FULLY determined to lower, if possible, the cost of living, the Brotherhood of Maintenance of Way Employees and Railway Shop Laborers has purchased a knitting and underwear plant, located at Ypsilanti, Mich., a glove factory, making canvas gloves, at Williamstown, Mich., and a tubing factory, operating at Watertown, N. Y.

This is an excellent departure. Nothing is more promising than this commingling of labor unionism with capitalism. Several questions spring to mind. What will happen if the knitting and underwear makers, the canvas-glove workers and the "tubers"—pardon the word—demand higher wages from the brotherhood? Will the members of the employing union be satisfied when their employees conspire against them and even strike to get more than the present scale of wages? And if the increase is granted will the loss be met by economies in operation or by an increase in price after the abhorred capitalistic manner?

The brotherhood has now put itself in the other fellow's place. Will it see things as the employer sees them, and, so seeing, will its demands be tempered by good judgment? Let us hope its members will not demand as employees more than they are willing to grant in their corporate capacity as an employer of their fellow workmen.

Perhaps fairness in the demands of the brotherhood will be the outcome of the experiment. And yet, there is no certainty that the result will be what we expect. Even capitalists fail to learn to do to others as they would be done by. For instance, many manufacturers of America have been leaders in the persecution of the railroads. Transportation companies would not be having so hard a time today if capital, including that of the coal industry, had been ready to see the problem of other as it views its own and arrive at its judgments accordingly.

Then there are the electric-power companies, for example, seeking to throttle the coal business by questioning the right of bituminous-coal operators to meet the increase in wages by a raise in price of 25c. a ton. Thus the public utilities fight among themselves and seek to be spared the natural rise in price that follows an advance in wages.

It is not fair to assert that labor is alone in being unfair, suspicious and self-seeking, for capital has like faults. No one can therefore be surprised if the Brotherhood mentioned should take an inconsistent attitude, holding down its employees while demanding freedom of action for itself.

The new capitalism may, and probably will, be like the old, not overconscientious of the rights of others or overconscious of its own shortcomings, but yet quite ready to assert and compel what it regards as its own rights. The brotherhood firmly believes that it is being wronged by the present prices; it will try the effect of the ownership of all, or at least some, of the mills that are now supplying its members. If it finds that it has guessed wrong, then every card holder of the union will find his belief in the arguments he has advanced shaken to the foundation and thereafter the brotherhood may be more tolerant of capitalism and less confident of the union. It has been noted in the cotton-spinning counties of Great Britain where co-operative stores are many that since their establishment there has been less disposition to indulge in strikes.

What Happened in 1919

January

Jan. 1—The U. S. Fuel Administration removes all limitations on the duration of contracts for coal and coke made under order of Dec 25, 1917, with amendment of July 26, 1918—U. S. War Department commences to handle its own coal requirements without reference to Fuel Administration.

Jan. 2—The U. S. Fuel Administration announces that it has induced the carbon-black manufacturers of Grantsville, W. Va., to cease using the natural gas of West Virginia for that purpose but to operate in Wyoming and Louisiana where gas cannot be otherwise utilized. This will save 15,000,000 cu.ft. of gas and 5,000 gal of gasoline per day—John E. Williams, Federal fuel administrator for the State of Illinois, dies at his home in Streator, Ill.

Jan. 4—General March states that 6,000 anthracite coal miners have been ordered released by the army [XV, 151]—Frank E Harkness is made Solicitor of United States Fuel Administration.

Jan. 5—George H. Cushing, since 1907 editor of the "Black Diamond," becomes managing director of the American Wholesale Coal Association—Practically all restrictions upon the sale and shipment of bituminous coal for bunkering purposes at points north of Cape Hatteras removed by order of U. S. Fuel Administration.

Jan. 7—Director of Railroads makes report to President in which he declares that the zoning law greatly helped the railroads in meeting the demands of the nation for transportation [XV, 150]—House of Representatives passes lignite bill, providing funds to determine the commercial practicability of using lignite in producing fuel oil, gasoline substitutes, ammonia, tar, solid fuels and gas for power and other purposes [XV, 191].

Jan. 8—George R. Sheldon, treasurer Republican National Committee and director of the Union Colliery Co., is seriously injured at Dowell, Ill., by being crushed between a trip and the coal rib. Dies Jan. 14.

Jan. 9—Strike of 16,000 marine workers ties up more than 1,000 boats in New York Harbor, causing railroad embargo.

Jan. 10—All fuel conservation provisions of Fuel Administration withdrawn, except those relating to waste of natural gas by free consumers or by inefficient appliances or through carelessness [XV, 165.]—Restrictions on domestic and foreign shipments of egg and pea size of anthracite removed, though chestnut and stove continue to be restricted [XV, 165].

Jan. 14—The Cleveland & Western Coal Co. is fined $1,000, to be paid to the Red Cross, for disposing of coal shipped to the McKinney Steel Co. for byproduct coke oven use. When the steel company said it had no need for the coal, the coal company sold to local consumers in violation of the zoning order—Explosion of gas at No. 9 mine of Pennsylvania Coal Co. seriously burns three men [XV, 209].

Jan. 15—Southport Miners' Federation demands that British Government demobilize all miners in army and requires that corporations give them an increase in wage of 30 per cent [XV, 210].

Jan. 17—Fuel Administration announces that on Feb. 1 all district representatives would cease to function except for the purpose of preparing records of the work done to Jan 31 [XV, 191]—Orders of May 16 and July 16, 1918, are suspended by Fuel Administration. These orders prohibited selling, shipping, delivering or distributing smokeless coal received at Lake Michigan or Lake Superior docks except for making illuminating gas, byproduct coke or coal briquets or other purposes designated by Fuel Administration—Coke and all coal, except Pennsylvania anthracite, is relieved of price restrictions and zoning rules. Filing of contracts with Fuel Administration is no longer required [XV, 191].

Jan. 20—Mine fire prevents six men from escaping from Mt. Braddock mine of the W. J. Rainey Co., Mt. Braddock, Fayette County, Pennsylvania. Two men lose lives in rescue work. The six men are ultimately rescued on Jan. 24 [XV, 252, 272].

Jan. 21—Harrold B. Harris appointed Custodian of Records, Fuel Administration [XV, 237]—Cage in Hammond colliery shaft near Shenandoah frees itself of the guides and tears timbers loose so that they fall to the shaft bottom [XV, 252]—No. 5 breaker, of Hudson Coal Co., destroyed by fire [XV, 252].

Jan. 22—Fuel Administration decrees that all orders for the requisition of coal and coke are cancelled and annulled from Jan. 31 onward [XV, 236]—Fuel Administration announces that the Bureau of Labor, which works under the Fuel Administration, will continue its existence till the close of the war [XV, 238]—Employees of Yorkshire, England, mines, numbering some 150,000 men, go on strike for an extra 20-min. lunch time [XV, 239].

Jan. 23—Convention of miners in Winding Gulf field meets at Beckley, W. Va., to discuss a new wage scale which, as decided on by the convention shall give 12c. per ton more to miners and $1.50 to $1.75 per day to day workers [XV, 239].

Jan. 24—George E. Howes is appointed historian of Fuel Administration.

Jan. 28—Shipping rates from the United States to the United Kingdom, Havre, Bordeaux, Antwerp, Rotterdam, Marseilles, Cette, Genoa, Naples, Colombo, Calcutta, Rangoon and Madras reduced by British Ministry of Shipping roughly two-thirds—The ratification of the Prohibition Amendment to the United States Constitution is announced by the Secretary of State.

Jan. 29—War Trade Board announces that the government of Great Britain will on March 1 prohibit the importation of specified classes of manufactured goods from the United States—Mine workers open co-operative store in Shenandoah [XV, 284]—Three miners are killed by the explosion of a pocket of gas at Goodyear Mine, Smoky Run, in Clearfield County, Pennsylvania [XV, 295].

Jan. 31—Treasury Department and Department of Interior reassume control of the supply of their coal requirements without reference to Fuel Administration — Orders of requisition for coal and coke are annulled—Maximum prices for anthracite suspended, also all other coal and coke regulations but three [XV, 282].

[The bracketed figures in the text refer to [illegible] reference to the pages indicated.]

February

Feb. 1—Mine Workers' representatives meet presidents and secretaries of New River Association and Winding Gulf Operators' Association at Charleston, W. Va., who refuse to discuss a new scale, regarding demand as in violation of contract [XV, 370]—Maximum prices on anthracite and all the coal and coke regulations, except three, are suspended [XV, 282]—Allison O. Smith, special umpire of Fuel Administration, makes several decisions for New River and Winding Gulf fields [XV, 411].

Feb. 3—Florence and Sydney mines of Nova Scotia Steel & Coal Co. closed down owing to alleged interference of Dominion Iron and Steel Co. with its workings [XV, 339, 456].

Feb. 7—White mines of H. C. Frick Coke Co. are abandoned [XV, 382]—River tipple and trestle of Hecla Coal & Coke Co., Isabella, Fayette County, Pa., destroyed by fire [XV, 382].

Feb. 10—Store of Federal Coal Co. at Cary, Ky., burned down [XV, 382]

Feb. 11—Alicia mine of W. H. Brown, with 400 coke ovens, all located just above Brownsville, closed down indefinitely [XV, 382]—Coal price regulation in Canada ends [XV, 422.]

Feb. 14—Southern Appalachian Coal Operators' Association meets at Louisville, Ky. [XV, 397, 398]—Mine workers of West Virginia parade at Charleston, in protest against "Red flag bill" [XV, 457].

Feb. 17—American Institute of Mining Engineers meets at New York City, adjourning Feb. 20 and changing its name to American Institute of Mining and Metallurgical Engineers [XV, 237, 448, 449].

Feb. 20—Mr. Deitrich, representative from Allegheny County, Pennsylvania, introduces bill providing that where injury arises from failure of employer to obey safety requirements no consideration shall be allowed to affect liability of employer [XV, 498].

Feb. 21—Frank Farrington advocates 6-hour day, 5-day week, as cure for shortage of demand for coal [XV, 499]—Fire breaks out in the South Wilkes-Barre No. 5 colliery of Lehigh and Wilkes-Barre Coal Co., and is walled in on Feb. 23 [XV, 469].

Feb. 23—Sir Guy Spencer Calthrop, controller of British Coal mines, dies of influenza [XV, 471].

Feb. 24—The Amalgamated Mine Workers of Nova Scotia sign contract providing for 8-hour day with no suspension for meal [XV, 499].

Feb. 25—V. Everit Macy announces that the National War Labor Board awards the marine workers of New York an 8-hour day, 6-day week and a week's holiday a year, the short day to be paid for at the same rate as the long day. No retroactive provisions or increase in wage incorporated in decision.

Feb. 27—Meeting of New York State Coal Merchants' Association—Wood tipple at Kellar-Klondyke mine near Clinton, Ill., is blown down by explosion [XV, 510].

Feb. 28—William C. Redfield announces formation of Industrial Board of Department of Commerce to stabilize prices at a lower and "equitable" level.

March

March 3—Senator Vardaman declares that high prices of anthracite during the war were the outcome of monopoly, and that royalties in the anthracite region are too high [XV, 451, 496, 497]—Governors of states and mayors of cities meet in conference at the White House, Washington, D. C., with members of the Cabinet and others. They discuss means of reviving business.

March 4—About 16,000 harbor workers in New York Harbor go on strike against Macy award of 12-hours' pay for 8 hours of labor and other concessions. They demand an increase of 30 per cent in the wage rate also—A. L. Dickenson, financial advisor to the Coal Controller of Great Britain, announces that for the first 8 months of 1918 the profit on mining in that country averaged 86c. per ton on coal having an average cost of $6.05, which is 14.2 per cent profit per ton. This is over three times average profit in five years ending 1913, when the profit was 24.3c. per ton and the price at the pithead $2.13. Some companies in 1918 were making $1.46 per ton—S. D. Warriner makes reply to the March 3 statements of Senator Vardaman [XV, 494].

March 5—Governors and Mayors' conference adjourns sine die after recommending Government activity in railroad construction, the ascertainment by Government of fair prices for staples, opposing price fixing, urging further reductions in freight rates for building materials, opposing reductions in wages till prices fall, recommending inquiries into wastes of natural resources, and recommending that the controllers of natural resources who withhold them for speculative profit or visionary future development be compelled to release them.

March 11—Charles P. Neill gives decision in favor of the cranemen, engineers and firemen engaged in steam-shovel work at the Jeddo stripping of G. B. Markle Co. [XV, 541].

March 13—Governor W. C. Sproul of Pennsylvania announces that he has asked Attorney-General W. I. Shaffer what powers are vested in the State Government to inquire into the rise in the cost of anthracite [XV, 553].

March 18—Policy Committee of United Mine Workers of America advocates 6-hour day, 5-day week, substantial increase on tonnage, daywork, yardage and deadwork prices with Government ownership [XV, 541, 583].

March 19—Fuel Administration urges the buying and stocking of coal to avert coal famine next winter [XV, 579]—Dr. H. A. Garfield desires the National Coal Association to submit in a referendum to all its members a plan of governmental co-operation [XV, 580]—Thirteen United Mine Workers' leaders are indicted for being parties to a shooting at the mines of the E. E. White Coal Co. in November, 1917, the Raleigh, W. Va., grand jury returning a true bill [XV, 630].

March 20—Sankey Commission makes interim report on the wage question in Great Britain advocating more wages, shorter time, regulated prices and Government to stand some of the losses in production [XV, 585].

March 25—Conferences between Industrial Board of Department of Commerce and the National Coal Association for the stabilization of price open at Washington, D. C.—Bill introduced into Pennsylvania House of Representatives providing for a 1 per cent tax on all coal produced in the state [XV, 642].

March 26—Conference between National Coal Association and Industrial Board to provide stabilized prices for coal [XV, 625].

March 27—Conference for stabilization of coal prices ends, the National Coal Association declaring that the U. S. Railroad Administration is not willing to agree to buy coal at the price to be named but desires to get coal below cost at the expense of the smaller consumer.

March 31—Explosion at the Aguilar mine of the Empire Coal Co., in Las Animas, Col. Twelve men are entombed [XV, 686].

April

April 1—Frank J. Hayes, president of the United Mine Workers of America, visits the White House and announces that his purpose is to call on President Wilson in Paris and urge his co-operation in the securing of increased sales of American coal in Europe.

April 2—Director General Hines of the Railroad Administration refuses to pay "stabilized" prices for rail. Southern pine lumber manufacturers refuse to "stabilize" their prices.

April 4—Governor Sproul of Pennsylvania declares increase in anthracite prices is justified, attacking, however, railroad rate inequalities and retail delivery charges. He also urges public fuel markets.

April 8—The air shaft at the Harry E. colliery of the Forty Fort Coal Co. is destroyed by fire, endangering the lives of 50 men underground—The washery of the Red Ash Coal Co. is burned. Its value was about $100,000 [XV, 774].

April 9—President John Brophy, of Central Pennsylvania District 2 of the United Mine Workers of America, protests against the terms of the anti-sedition bill [XV, 836].

April 11—J. L. Lewis, acting president of the United Mine Workers, declares that the miners' organization will take drastic action unless Director-General Hines changes his policy in regard to making coal contracts [XV, 773].

April 12—The National Retail Coal Merchants' Association meets at the Fort Pitt Hotel in Pittsburgh, Pa., and resolves to seek representation in Government schemes of distribution during reconstruction period and to encourage early buying of coal [XV, 773].

April 13—The workers of the Clinton, Ind., coal field show their approval of the attitude of the executive board of District 11 which protested against a cut in the price of coal to W. D. Hines [XV, 762]—The Victory Loan drive begins at 12 o'clock midnight.

April 15—Director-General Walker D. Hines instructs the individual railroads that they must give all information as to tonnage in coal contracts to the mine workers' officials in Pittsburgh district.

April 16—The Miners' Federation of Great Britain and Ireland meets in conference and approves by a large majority the report of the Sankey Commission [XV, 762]—All of the mines of the Central Coal & Coke Co., at Pittsburg, Kan., are idle, the 1,200 miners not reporting for work following the strike order of the district president [XV, 762].

April 17—Back wages under the Sankey award, approximately $25,000,000, are paid out by operators in Great Britain, by order of the Coal Controler, to virtually all of 900,000 workers in the mines of the United Kingdom. The back wages represents an advance of about 25c per shift worked for employees under 16 and 50c. per shift for employees over 16, applied from Jan. 9 to April 17.

April 18—The strike of the coal workers in Kansas, Arkansas and Oklahoma fields is extended by Alexander Howat, president of District 14, into Missouri. About 6,000 men are now involved [XV, 823].

April 19—The New York Harbor strike, in its eighth week, is settled under an agreement reached at a meeting presided over by Mayor Hylan, by which the men return to work on a permanent 10- and 12-hr. day basis leaving the increase in wages to be settled by a committee of four representatives of the boat owners and four representatives of the strikers.

April 20—Dr. H. A. Garfield threatens to revoke provision of agreement of November, 1917, unless Howat orders striking miners of the Central Coal & Coke Co. to return to work [XV, 762].

April 22—Representatives of anthracite and bituminous coal producers of Pennsylvania enter protest against any increase in workingmen's compensation at the second conference on the suggested amendments held at the state capitol. Representatives of the miners support the amendment [XV, 835]. The resignation of the members of the Industrial Board, George N. Peek, chairman, is accepted. This action followed the failure of the conference arranged by the board between the representatives of the steel industry and those of the Railroad Administration.

April 23—President Wheelwright, of the National Coal Association, appoints a foreign trade committee of seven members to consider the formation of an export association under the Webb-Pomerene law for the coal industry. T. V. Farrell, of the Pocahontas Fuel Co., is chairman of the committee.

April 25—The child-labor provisions of the new revenue bill become effective and will tend to stop the employment of boys under 16 years of age in or about mines in any capacity. Violation of this law will subject the employer's business to a tax of 10 per cent.

April 26—The strike of the 6,000 mine workers of the Central Coal & Coke Co. is settled on the agreement that the mining machines and loaders start simultaneously [XV, 917].

April 29—A gas explosion in the Regal mine of the Majestic Coal Co., of Alabama, results in the death of 21 employees [XV, 885].

May

May 2—The U. S. Circuit Court of Appeals hands down a conditional affirmation of the judgment rendered by the District Court in the case of the Coronado County Mining Co., of Sebastain County, Ark. vs. the United Mine Workers of America [XV, 873]—Charles D. Neill hands down a decision under which 200 contract miners of the Lehigh & Wilkes-Barre Coal Co. will receive back pay for work done since 1917. The point at issue was payment for the removal of rock in the robbing of pillars [XV, 916].

May 3—A disastrous accident occurs at the mine of Old Ben Coal Corporation, at Buckner, Ill. As several men are being hoisted out of the mine on a cage, one is killed and three others are injured [XV, 930]—The Western Coal Operators' Association of Canada meets and discusses the position of the coal industry in regard to the labor question [XV, 1093].

May 5—Charles P. Neill rules that contract miners who are taken off their regular work for an emergency job, shall be paid the rate called for in their scale if the pay for the other job is less [XV, 916]—A cage containing ten miners drops 1100 ft. at the Maple Hill shaft of the Philadelphia & Reading Coal & Iron Co., resulting in the death of one miner and the serious injury of the nine other men, two of whom may die [XV, 885].

May 7—A new workmen's compensation bill is introduced at the Pennsylvania legislature by Senator Smith [XV, 929]—The peace treaty and the constitution of the league of nations (one document), framed by the peace conference at Paris, is handed to the German plenipotentiaries.

May 8—An open market for steel products is created, when representatives of the Railroad Administration and members of the general committee of the American Iron and Steel Institute fail to agree on minimum stabilization prices—Charles P. Neill rules that mine workers cannot be expected to be reinstated in their jobs if the operators can show that they were discharged for incompetency, in dismissing the complaint of H. C. Singley against the Evans Colliery Co., of Beaver Meadow, Pa.

May 9—The resignation of the Industrial Board, George N. Peek, chairman, is accepted by Secretary Redfield. Upon retiring the board releases all industries from its findings.

May 10—Attorney General Mitchell Palmer makes public an opinion to the effect that the Redfield plan for stabilizing prices in industry violates the anti-trust laws; he declares price fixing illegal. Any modification of statutes upholding a non-competitive policy must come from Congress.

May 16—The Northeast Kentucky Coal Association holds a special meeting at Ashland, Ky. Income tax statements and freight rates are discussed [XXV, 1018].

May 20—Congress opens at Washington, D. C., and President Wilson's message is read to the two houses.

May 22-24—The National Coal Association holds its annual meeting at Chicago in the Congress Hotel. The convention elects officers for the ensuing year [XV, 1,000].

May 26—The Caldwell Bill, proposing a loan of the Government's surplus machine tools to various technical institutions in the U. S., is introduced in the U. S. House of Representatives [XV, 1,090].

May 27—The Ohio Valley Coal Operators' Association secures an order from the Interstate Commerce Commission directing the railroads to make marked reductions in rates on coal from western Kentucky [XV, 1,063]—John P. Reese, vice president and general manager of the Chicago & Northwestern coal properties, dies at his home in St. Louis, Mo. [XV, 1,065].

May 28—A committee of senators of the Pennsylvania Legislature confer with anthracite coal operators in regard to the mine-cave question [XV, 1,063].

May 29—It is recorded that all mine workers are out in District 18 (eastern British Columbia and Alberta) as a result of a disagreement about wages [XV, 1,052]—The Shipping Board holds a meeting of representatives of producers, exporters and brokers, at which the export situation is discussed [XV, 1,060].

May 29-30—The first meeting of the Coal Mining Electricians' and Mechanics' Institute is held at Charlestown, W. Va. [XV, 1,076].

June

June 2—The final report of the Canadian Fuel Controller is presented to the Canadian House of Commons [XV, 1,184] Senator Davis introduces a bill in the Pennsylvania Senate relative to mine-cave conditions in the anthracite field [XV, 1,101].

June 3—The Second Pan-American Conference begins a 4-day session at Washington, D. C., with delegates from North and South America in attendance — The Pittsburgh Coal Producers' Association holds an important meeting at Pittsburgh discussing the present and future coal situation [XV, 1,102].

June 3 to 4—The West Virginia Coal Mining Institute holds its twentieth semi-annual meeting in Huntington, W. Va., at Hotel Frederick. Papers are read and discussed [XV, 1,018].

June 4—The Pennsylvania Senate passes the McConnell bill relating to insurance [XV, 1,101].

June 4 to 5—The Western branch of the Canadian Mining Institute holds a meeting at Nanaimo, B. C. [XVI, 66].

June 5—An ignition of powder takes place on a man trip in the Baltimore tunnel of the Hudson Coal Co., at Wilkes-Barre, Pa.; 92 men lose their lives as a result [XV, 1,076].

June 10—The annual meeting of the West Virginia Coal Association is held at Huntington, W. Va., when officers are elected and the question of a continuation of Government [illegible] of the coal industry is discussed [XV, 1,183].

June 11—The employees of Vesta No. [illegible] of the Jones & Laughlin company return to work after a strike of eight weeks [XV, 1,173].

June 15—A [illegible] session of past and present [illegible] of the United Mine Workers of America is held at Atlantic City, N. J. [XV, 1,172]

June 16—After a strike of one week the Norfolk & Western Ry. motive-power employees return to work [XV, 1,173]—A strike of the Federation of Miners of France takes place, involving all the mine workers of that country, on a question of working time [XV, 1,132].

June 17—The Flynn anti-sedition bill is defeated in the Pennsylvania House of Representatives [XV, 1,183].

June 18—The Coal-mine superintendents of Peoria, Fulton and Tazewell counties, Illinois, meet at Canton, perfect an organization and elect officers [XVI, 36].

June 23—The American Federation of Labor meeting at Atlantic City declares itself in favor of a universal 44-hour week [XV, 1,172].

June 23-24—A conference of prominent educators is held in Washington, D. C.; the economic and business training of engineers being discussed [XVI, 65].

June 23-25—The coroner's jury sits at Wilkes-Barre, Pa., on the Baltimore tunnel disaster of the Hudson Coal Co. It refuses to fix the blame for the accident [XVI, 55-58].

June 25—Bills are introduced in each house of Congress proposing that the Federal Department of the Interior become the Department of Public Works [XVI, 17].

June 26—Jerome Watson, Chief Deputy and Safety Commissioner of Mines of the state of Ohio, sends a communication to the operators and miners of that commonwealth relative to the conveying of explosives into mines [XVI, 78]—A meeting of the executive board of the three anthracite districts of the United Mine Workers is held at Wilkes-Barre, Pa., to decide on details of the next tridistrict convention [XVI, 25]

June 26-28—The U. M. W. conferences started at Atlantic City commence anew at Charleston, W. Va. [XVI, 64].

June 27—The sedition bill is finally put through the Pennsylvania Legislature and signed by the governor. The bill amending the workmen's compensation law is also signed [XVI, 35]—Joint conferences of operators and mine workers are held in the Alabama district [XVI, 64].

June 28—The signing of the peace treaty takes place in Paris.

June 30—The Fuel Administration passes out of existence [XVI, 21]—An explosion occurs in the No. 15 mine of the Rock Island Coal Mining Co., at Alderson, Okla., with disastrous consequences [XVI, 79].

July

July 1—W. A. Hurst, of Williamson, W. Va., dies [XVI, 127]—W. G. Sharp, president of U. S. Smelting, Refining and Mining Co., dies in Boston, Mass. [XVI, 232]—Amendments to the Coal Mines Regulation Act, of Canada, come into effect. They have to do with the examination of coal mine officials and miners [XVI, 78].

July 5—Employees (3,000) in the Belleville mining district of Illinois, near St. Louis, Mo., go on strike [XVI, 284]

July 7—Three men are killed and seven others seriously injured by fall of rock and earth at O'Neill mine of Pittsburgh Coal Co., near Fayette City, Pa. [XVI, 125].

July 7—Rocky Mountain Institute meets at Salt Lake City, Utah. Papers are read and discussed and mines visited [XVI, 196].

July 8—The surface plant of the Hafer Washed Coal Co., at Carterville, Ill., is destroyed by fire [XVI, 126].

July 9—The board of directors of the National Coal Association hold a meeting in Kansas City, at which important questions are discussed [XVI, 124]—Six men are killed and ten others are seriously injured in explosion at colliery of Lehigh Coal & Navigation Co., Lansford, Pa. [XVI, 125]

July 8-11—The tenth annual meeting of the Mine Inspectors' Institute of America is held at Indianapolis, Ind. [XVI, 144].

July 14—The agreements entered into with the War Trade Board by parties in the United States in connection with sale or delivery of coal, coke and oils, are cancelled [XVI, 155].

July 15—The Leggetts Creek colliery of the Hudson Coal Co., Scranton, Pa., is purchased by syndicate of Boston and Cleveland capitalists [XVI, 170].

July 17—Some 2,500 miners strike at the mines of the Central Coal & Coke Co., in Missouri and Kansas [XVI, 200].

July 18—The Commissioner of Internal Revenue announces that $1,500,000 will be returned to exporters of coal [XVI, 154]—An explosion of gas at the Carswell mine of the Houston Collieries Co., near Welch, W. Va., causes the death of six men [XVI, 191]—An investigation to determine whether the steady advance in the price of coal since the signing of the armistice is due to economic causes or to profiteering, is proposed in a resolution introduced in the Senate by Senator Frelinghuysen, of New Jersey.

July 21—The increase of six shillings ($1.50) per ton on price of coal in Great Britain comes into effect [XVI, 158]—Announcement is made of the retirement of F. J. Hayes from the presidency of the United Mine Workers [XVI, 243].

July 22—The operators and mine workers of the New River, W. Va., field hold a conference at Charleston [XVI, 200]—The Attorney General of Pennsylvania hands down an important "boundary pillar" decision [XVI, 209].

July 24—Governor Sproul, of Pennsylvania approves the amendments to the Workmen's Compensation Insurance acts [XVI, 209]—Senator Lenroot introduces a bill in the U. S. Senate to provide for the leasing of coal deposits owned by this country outside of Alaska [XVI, 240]—Senator Lenroot introduces a bill in the Senate at Washington to provide for the disposal of non-metalliferous mineral deposits owned by the United States separate from the surface of the lands wherein they lie, and for other purposes [XVI, 240].

July 25—The Oklahoma Coal Producers' Association holds a special session at McAlester, Okla., to discuss fuel oil competition [XVI, 253]—The strike of the miners of Great Britain (with the exception of the Yorkshire men) ends [XVI, 199]—District 1, of the United Mine Workers of America, holds an important meeting at Scranton, Pa. [XVI, 243].

August

Aug. 1—A wage increase is announced in the Pocahontas field of West Virginia [XVI, 284]—The 8-hour day goes into effect in the Pocahontas field [XVI, 284]—The operators of the Tug River field meet in Bluefield, W. Va., and adjust their scale of wages to that of Pocahontas field [XVI, 284].

Aug. 4—President Kenney finishes conference with operators at Buckhannon and Adrian, W. Va., a new contract being signed by all but one company [XVI, 284].

Aug. 6—After this date production of coal is entirely suspended at mines on Chesapeake & Ohio R.R. pending settlement of shopmen strike on the railroad [XVI, 293].

Aug. 7—An explosion occurs at the Weirwood mine of the New River & Pocahontas Consolidated Coal Co., in Fayette County, W. Va., in which seven men are killed [XVI, 294].

Aug. 8—The policy committee of the United Mine Workers reports it has prepared recommendations to be presented to the convention of the union in Cleveland, Ohio, in September [XVI, 283].

Aug. 12—The U. S. War Labor Board

meets at New York City and formally ends its existence—The Yorkshire Miners' Council of England recommends a return to work, which is accepted by all but the men in the West Yorkshire section [XVI, 331] —Mine cave in West Scranton buries boy causing his death. Public action is taken in the matter [XVI, 340].

Aug. 13—Convention of United Mine Workers' District 12, is held at Belleville, Ill. [XVI, 331]—The Yorkshire miners in England vote to return to work. These 200,000 miners held out after the majority of the mine employees of Great Britain had returned to work on July 25.

Aug. 14-15—Shopmen of C. & O. return to work making it possible for mines to resume operation [XVI, 341]—Walker D. Hines sends letter to Vice President Marshall touching on congressional inquiry into coal situation [XVI, 267]—The Williamson, or Thacker, W. Va., non-union field decides to advance wages and shorten hours to eight per day [XVI, 372].

Aug. 18—An explosion occurs in the Oakview mine of the Oakdale Coal Co., in Colorado, in which 18 men are killed [XVI, 385]—The C. & O. moves empties to mines in its territory following resumption of work by shopmen [XVI, 383].

Aug. 19—Districts 1, 7 and 9, United Mine Workers, meet at Wilkes-Barre, Pa. [XVI, 372].

Aug. 20—Committee of Guyan, W. Va., operators appeals to manager of Eastern Car Pool for better car supply [XVI, 383].

Aug. 21—Employees at Plymouth district of Hudson Coal Co., Pennsylvania anthracite field, go on strike [XVI, 414]—The operators' association of the Williamson, W. Va., field meet to discuss wage situation [XVI, 455].

Aug. 22—The scale committee makes its report to the convention of United Mine Workers' Districts 1, 7 and 9, at Wilkes-Barre, Pa. [XVI, 412].

Aug. 25—President Wilson issues statement referring to threatened strike of railway shopmen [XVI, 431].

Aug. 26—Director General of Railroads Walker D. Hines issues statement (supplementing his statement of Aug. 14) concerning the coal-car supply [XVI, 443]—J. D. A. Morrow gives important testimony before Senate committee conducting inquiry into the coal situation [XVI, 366]—Walter Nesbit, of Illinois United Mine workers, issues ultimatum to striking locals to return to work or be expelled [XVI, 414].

Aug. 30—Fire destroys surface plant of Springside mine of Smith-Lohr Coal Mining Co., Pana, Ill. [XVI, 468].

September

Sept. 1—International mine-rescue and first-aid contest takes place at Nanaimo, B. C., under the auspices of the Vancouver Island Mine Safety Association [XVI, 577]—Employees of Canadian Western Fuel Co. receive an advance of 25c. a day [XVI, 467].

Sept. 3—H. Y. Saint, head of the export coal department of the Shipping Board, appears before the Senate Committee investigating the coal situation [XVI, 451].

Sept. 5—William C. Redfield, Secretary of Commerce, hands in his resignation to President Wilson. Follows failure of Industrial Board (organized by Redfield) to stabilize prices—Grievance Committee of Powderly, No. 1, and Jermyn collieries, at Carbondale, Pa., meet with Hudson Coal Co. officials without securing concessions, and order general suspension at all mines of the company [XVI, 455].

Sept. 6—Miners at larger operations on Kanawha & Michigan R.R., on Kanawha River, W. Va., start an invasion of Guyan Valley. Miners from other nearby points start for points in Boone and Logan counties Action taken by Governor Cornwall of West Virginia [XVI, 455, 456].

Sept. 8—Most of miners who marched to points in Guyan Valley, W. Va., back to work [XVI, 456]—Governor Cornwall issues a statement relative to further disorders of recent Guyan Valley raid order [XVI, 498] —Some 20,000 men of 30 mining plants of Hudson Coal Co., in Lackawanna and Wyoming Valley, Pa., go out on strike [XVI, 455]—An order is issued to start strike of mine workers of Delaware, Lackawanna & Western R.R. Co., Coal Department, to take effect on Sept. 9 [XVI, 498].

Sept. 9—Convention of United Mine Workers of America meets in Cleveland, Ohio, to formulate a wage scale [XVI, 454]—John Mitchell dies at the Post-Graduate Hospital in New York City [XVI, 491]—The Twenty-seventh Consecutive and Fourth Biennial Convention of United Mine Workers of America, meets in Cleveland, Ohio [XVI, 496-7].

Sept. 10—Senate Investigating Committee considers export coal situation [XVI, 492-3].

Sept. 11—The locals of men employed by the Hudson Coal Co. vote to go back to work on Sept. 13 [XVI, 498].

Sept. 12—The committee on Railroad Relations of the National Coal Association and representatives of the U. S. Railroad Administration held a session at White Sulphur Springs, W. Va. [XVI, 552].

Sept. 15—The mine workers of the Hudson Coal Co. return to work [XVI, 539].

Sept. 17—The Delaware, Lackawanna & Western mine workers return to work [XVI, 539].

Sept. 22—Investigation starts relative to conditions in Guyan field in W. Va.; also raid of Boone County by mine workers [XVI, 539]—The American Institute of Mining and Metallurgical Engineers meets at the Congress Hotel in Chicago, Ill. [XVI, 606]—Arthur H. Storrs dies at Pelham Manor, N. Y. His home was at Scranton, Pa. [XVI, 696].

Sept. 25—The Chicago meeting of the American Institute of Mining and Metallurgical Engineer concludes its sessions [XVI, 609].

Sept. 29—The Pittsburgh station building of the Bureau of Mines is dedicated formally at Pittsburgh, Pa. Many notables present—Anthracite operators grant the demands of their miners to pay war-scale wages until Mar. 31, 1920. This action eliminates the probability of a general strike in the anthracite fields on Nov. 1 [XVI, 611].

Sept. 30—The preliminary mine-rescue contests of the national first-aid and mine-rescue meet is held in Pittsburgh, Pa., in conjunction with dedication of the Bureau of Mines building [XVI, 614].

October

Oct. 1—The finals of mine-rescue competition of the national first-aid and mine-rescue meet is held in Pittsburgh, Pa., in conjunction with dedication of the Bureau of Mines buildings [XVI, 615].

Oct. 1 to 4—The Eighth Annual Safety Congress of the National Safety Council is held at Hotel Statler, Cleveland, Ohio [XVI, 618 to 623].

Oct. 10—The operatives of the Central Competitive district meet (at Hotel Bellevue-Stratford, in Philadelphia, Pa.) with the officials appointed by the United Mine Workers of America, in a wage conference [XVI, 657].

Oct. 12—The wage conference of the Central Competitive district and officials of the United Mine Workers of America, at Philadelphia, adjourn without having come to any agreement [XVI, 657]

Oct. 15—An order is issued to members of the United Mine Workers of America, in the bituminous regions of the United States, to cease work at midnight of Oct. 31, 1919 [XVI, 657] Secretary of Labor W. B. Wilson summons John L. Lewis, acting president of U. M. W., and Thomas T. Brewster, spokesman of the bituminous coal operators, to meet him on Oct. 17 [XVI, 657].

Oct. 17—A conference is held at Washington, D. C., between W. B. Wilson, Secretary of Labor, John L. Lewis, acting president of U. M. W., Thomas T. Brewster, representing the coal operators of the Central Competitive district. A meeting is called for Oct. 21, 1919, to debate the issue in question [XVI, 690].

Oct. 21-25—Operators meet mine workers in conference at Washington, D. C., as agreed at the Oct. 17 conference [XVI, 690 to 691].

Oct. 24—From 3,000 to 5,000 miners meet at Charleston, W. Va., and discuss invasion of Guyan field. Governor Cornwall wires acting president John L. Lewis, of the United Mine Workers, in regard to invasion—The last Government effort to avert the coal strike fails. Even an appeal from President Wilson to the operators and miners in conference at Washington, brings no results.

Oct. 25—President Wilson issues statement saying a coal strike would be considered a grave moral and legal wrong against the Government and that the law will be enforced. The President requests that the strike order be recalled—Numerous strikes are on in District 11 of the United Mine Workers of America. This includes most of Indiana's coal fields.

Oct. 28—William Beury, a prominent coal operator of southern West Virginia, dies at his home in Philadelphia, Pa. [XVI, 764].

Oct. 29—Fire starts in mine No. 2 of the Youghiogheny & Ohio Coal Co., at Amsterdam, Ohio. As a result, 20 men lose their lives; thousands of dollars are lost [XVI, 792]—A conference of the International Executive Board, Scale Committee and district presidents of the United Mine Workers of America takes place in Indianapolis, Ind., to consider the strike situation, especially President Wilson's request that the strike order be recalled. District presidents and Scale Committee leave for their homes to direct the strike.

Oct. 30—The Executive Board of the United Mine Workers of America continues in session at Indianapolis, Ind.

Oct. 31—The executive committee of the Central Competitive field meets in conference at Cleveland, Ohio, to take action on the nation-wide strike scheduled for midnight. The conference then adjourns—Troops are secretly moved to strategic points in coal states to be affected by strike order at midnight—Federal Judge A. B. Anderson issues a temporary restraining order to prevent union officials from issuing instructions to union members relative to the strike or paying strike benefits from union funds. This order is issued at request of special assistant U. S. Attorney General A. B. Ames.

November

Nov. 1—Union mine workers in the bituminous coal regions of the United States go out on strike starting at midnight of Oct. 31-Nov. 1 Non-union mines working at top speed throughout the country. According to state the situation is as follows: Pennsylvania, three-fifths working; West Virginia, over one-half working; Virginia, working; Kentucky, under half working; Ohio.

Indiana and Illinois, all mines close; Tennessee, not working; Alabama, mainly working; mines in Southwest close down (except New Mexico); Colorado, indefinite; Utah, working; Washington mines close down—Director General Hines, of the Railroad Administration, issues war-time priorities order for coal shipment.

Nov. 2—Pennsylvania State Federation of Labor holds a meeting in Pittsburgh and authorizes its executive council to call a state-wide strike to enforce a change in the policy and laws of the state.

Nov. 5—President Wilson authorizes Dr. H. A. Garfield, Fuel Administrator, to regulate the price, distribution, production, sales, shipment, apportionment and storage of all coal, including anthracite and coke

Nov. 9—The Executive Council of the American Federation of Labor pledges to the United Mine Workers, the full support of its members in the bituminous coal strike. Comment on this action is made in address by Charles Piez [XVI, 882]

Nov. 10—The officials and executive board of the United Mine Workers of America meet at Indianapolis, to take action as to whether they would comply with the order of Federal Judge A. B. Anderson to call off the coal strike

Nov. 11—Thomas T. Brewster, chairman of the Executive Committee of the bituminous coal operators of the Central Competitive field, asks John L. Lewis, acting president of U. M. W., and its wage scale committee, to meet the scale committee of the operators at Washington, D. C., on Nov. 17, to negotiate a contract—The general committee of the United Mine Workers of America, meeting in Indianapolis, decides at an early hour this morning, to comply with the mandate of the court to withdraw the strike order. This order is mailed to the various locals throughout the country before 6 P.M. today as per the order of the court—A conference proposed by T. T. Brewster is declined by the United Mine Workers who accept an invitation of Secretary of Labor Wilson to meet the bituminous operators of the country at Washington, D. C., on Nov. 14.

Nov. 13—The State of North Dakota operates the lignite mines of the state. Operators and miners from all districts report to Governor Frazier.

Nov. 14—Secretary of Labor William B. Wilson, representing the Federal Government, opens the conference of operators and miners at Washington, D. C. He submits a definite plan.

Nov. 15—Operators and miners in conference at Washington reach an agreement to negotiate a new wage contract through scale committees of the Central Competitive field.

Nov. 17—Judge W. L. Menssle of the district court, at Bismarck, N. D., hears petition for injunction commanding State of North Dakota to refrain from operating plant of Washburn Lignite Coal Co. at Wilton—The State of Kansas takes over all its coal mines under a receivership plan. The receivership is based on the state's right to protect its citizens. Under the court's order, the receivers will have full charge of production, sales and distribution of coal from the Kansas [illegible] to last until Friday, Nov. 21 [XVI, 797]

[illegible]

Nov. 21—At operators' [illegible] miners reject 20 per cent wage-in- [illegible]

propose 40 per cent increase instead of 60 and drop 30-hour week demand. Operators reject miners' new demands and withdraw their 20 per cent increase offer.

Nov. 22—The State of North Dakota surrenders control of the Washburn Lignite Coal Co.'s mines at Wilton, as per order of N. D. Supreme Court.

Nov. 22—Secretary of Labor W. B. Wilson makes public his offer of 27.12c. a ton increase in mining rates; an increase of $1.58 in day's wages; an increase in yard and dead work of 31.61 per cent. The operators reject this offer and the miners accept it. The offer was submitted on Nov. 19.

Nov. 24—Former Secretary William G. McAdoo, of the Treasury, wires Fuel Administrator Garfield to let operators stand increase in miners' wages, as operators made profits as high as 2,000 per cent during 1917, as shown by income tax returns. Also that earnings of 100 to 300 per cent on capital stock were not uncommon.

Nov. 25—Two meetings are held by the Cabinet during the day, at which the coal situation is discussed; adjournment is taken until next day when the subject will be taken up again. Operators and miners meet and adjourn to await outcome of Cabinet meeting.

Nov. 26—Tipple of the Washburn Lignite Coal Co., at Wilton, N. D., burns to the ground [XVI, 905]—Henry D. Merrill, pioneer coal operator and iron manufacturer dies at the home of his daughter in Birmingham, Ala., at 85 years of age [XVI, 906].

Nov. 27—Dr. H. A. Garfield proposes 14 per cent increase in miners' wages without increase in price of coal; operators accept terms and miners reject them. Garfield offer is backed by the Government. Negotiations between operators and miners at Washington, come to an end.

Nov. 28—A committee of coal operators at Washington, D. C., notifies operators to post notice of increase in wages as ordered by the Government [XVI, 857].

Nov. 30—Governors of Illinois, Indiana, Iowa, Missouri, Oklahoma, Tennessee and Kansas meet in Chicago and agree on state and Federal action in regard to coal situation.

December

Dec. 1—The semi-annual meeting of the West Virginia Coal Mining Institute is held at Huntington, W. Va. Two days are given to the reading and discussion of papers, business and election of officers [XVI, 826]—Production of coal in the strip mines of Pittsburg, Kan., begins. Volunteer workers are protected by troops. Letter of J. D. A. Morrow to Secretary of the Treasury Carter Glass, relative to profits of coal operators in 1917, is made public [XVI, 892]—Concerted action by governors of six central western states is postponed for one week and conference agrees to meet again in St. Louis. Plan of governors is stated to include pooling of coal mined by nation.

Dec. 2—H. C. Frick dies at his home in New York City at the age of 70 years [XVI, 835].

Dec. 3—Information charging criminal contempt of court is filed by the Federal Government, before Judge A. B. Anderson in the U. S. District Court at Indianapolis, Ind., against [illegible] international and district officers of the United Mine Workers of America. Violation of Judge Anderson's anti-strike injunction is charged.

Dec. 3 and 4—The annual session of the Coal Mining Institute of America is held at Pittsburgh, Pa. Papers are read and discussed, a banquet is held and officers elected [XVI, 839].

Dec. 5—Governor James M. Cox, of Ohio, holds conference at Columbus, at which operators and miners make statements regarding the coal-strike situation. The governor makes an effort to have mines reopened. He proposes 25 per cent increase in wages.

Dec. 6—The Fuel Administration issues an order (effective Dec. 8) relative to prices of coke [XVI, 875].

Dec. 9—The general committee of the United Mine Workers of America meets at Indianapolis, Ind., to consider President Wilson's proposal for ending the coal strike. The plan is kept secret.

Dec. 10—The general committee of the United Mine Workers of America, in session at Indianapolis, votes to accept President Wilson's proposal for immediate return to work pending final settlement, of the controversy with operators, by a commission to be appointed by him. Telegrams are sent out to 4,000 locals of the union, by officials of U. M. W., instructing these men to return to work immediately on a basis of an increase of 14 per cent in wages.

Dec. 12—The operators of central Pennsylvania issue a statement protesting the manner of settling the coal strike [XVI, 935]—Joseph B. Dickson, a prominent anthracite coal operator, dies at the Post-Graduate Hospital, in New York City, following an operation [XVI, 947]—Dr. H. A. Garfield, Fuel Administrator, hands in his resignation to President Wilson.

Dec. 13—Dr. H. A. Garfield's resignation, as Fuel Administrator, is accepted by President Wilson. Dr. Garfield objects to terms of strike settlement; he objects to make up of board of arbitration and increase in price of coal, the latter of which is possible.

Dec. 20—President Wilson appoints commission of three to carry out the Government's plan to settle the soft coal strike. The following were named: Henry M. Robinson, Pasadena, Cal., representing the public; John P. White, representing the miners; Rembrant Peale, of Pennsylvania, for the operators.

Dec. 22—Alexander Howat, president of the Kansas district of the United Mine Workers of America, is remanded to jail by U. S. District Judge Anderson, of Indianapolis, charged with contempt of court in furthering the coal strike in Kansas.

Dec. 23—A statement from Phil H. Penna, spokesman for the operators of the Central Competitive field, notes that the attitude of the operators has not been changed since they agreed to a plan similar to President Wilson's scheme for settling the miner's wage controversy. The operators will abide by the decisions of the commission appointed by the President, but believe they should have been consulted before the plan was presented to the miners—Alexander Howat, president of the Kansas district of U. M. W., is released from jail and allowed to return to Kansas, on agreeing to call off the strike of miners in his district and to order the miners back to work.

Dec. 29—Coal operators from the Central Competitive field confer in Chicago, and declare they will assume no increase in miners' wages above the 14 per cent granted in the strike settlement, unless the commission should shoulder the responsibility of the increased price to the consumer. The commission appointed by the President to settle the controversy between the operators and the miners, meets in Washington and maps out program for its work; Henry M. Robinson is chairman. Hearings relative to wages and prices will be started on Jan. 12, in Washington.

CURRENT PRICES—MATERIALS & SUPPLIES

IRON AND STEEL

PIG IRON—Quotations compiled by the Matthew Addy Company as per Department of Commerce Committee Schedule.

	Current	One Month Ago
CINCINNATI		
No. 2 Southern	$39.10	$36.60
Northern Basic	38.20	31.05
Southern Ohio No. 2	40.80	31.55
NEW YORK, Tidewater delivery		
2X Virginia (silicon 2.25 to 2.75)	45.65	39.40
Southern No. 2 (silicon 2.25 to 2.75)	43.20	41.40
BIRMINGHAM		
No. 2 Foundry	35.50	33.00
PHILADELPHIA		
Eastern Pa.	42.50*	38.10*
Virginia No. 2	40.00*	39.10*
Basic	40.00†	34.60†
Grey Forge	39.50*	34.60*
CHICAGO		
No. 2 Foundry Local	40.00	36.25
No. 2 Foundry Southern	40.50	38.00
PITTSBURGH, including freight charge from the Valley		
No. 2 Foundry Valley	39.40	
Basic	36.40	34.40
Bessemer	37.40	35.40

* F. o. b. furnace. † Delivered.

STRUCTURAL MATERIAL—The following are the base prices, f.o.b. mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

	Mill	New York		St	Chi-
	Pittsburgh	Current	One Year Ago	Louis	cago
Beams, 3 to 15 in.	$2.45	$3.47	$4.27	$3.54	$3.47
Channels, 3 to 15 in.	2.45	3.47	4.27	3.54	3.47
Angles, 3 to 6 in., ¼ in. thick	2.45	3.47	4.27	3.54	3.47
Tees, 3 in. and larger	2.45	3.47	4.27	3.54	3.47
Plates	2.65	3.67	4.52	3.54	3.67

BAR IRON—Prices in cents per pound at cities named are as follows:

Pittsburgh	Cincinnati	St. Louis	Denver	Birmingham
2.75	3.50	3.44	4.30	3.75

NAILS—Prices per keg from warehouse in cities named:

	Mill Pittsburgh	St. Louis	Denver	Chicago	Birmingham	San Francisco	Dallas
Wire	$3.25	$3.90	$4.90	$3.90	$5.25	$5.25	$5.00
Cut	4.925	5.40	5.61	5.50	....	6.65	6.40

TRACK SUPPLIES—The following prices are base per 100 lb. f.o.b. Pittsburgh for carload lots, together with the warehouse prices at the places named:

	Pittsburgh	Chicago	St. Louis	San Francisco	Birmingham	Denver
Standard railroad spikes 9/16-in and larger	$3.35	$4.27	$4.44	$5.65	$4.50	$5.05
Track bolts	4.35	5.17	Prem.	6.65	6.00	6.05
Standard section angle bars	3.00	4.22	Prem.	4.60	....	4.40

COLD FINISHED STEEL—Warehouse prices are as follows:

	New York	Chicago	Cleveland	St. Louis
Round shafting or screw stock, per 100 lb. base	$5.00	$4.90	$4.75	$5.00
Flats, squares and hexagons, per 100 lb. base	5.50	5.40	.....	5.50

HORSE AND MULE SHOES—Warehouse prices per 100 lb. in cities named:

	Mill Pittsburgh	Cincinnati	Chicago	St. Louis	Denver	Birmingham
Straight	$5.75	$7.50	$6.50	$7.00	$8.15	$7.00
Assorted	5.85	7.50	6.50-7.00	7.25	8.40	7.25

Cincinnati—Horseshoe nails sell for $4.50 to $5 per 25-lb. box.

CAST-IRON PIPE—The following are prices per net ton for carload lots:

	New York						
	Current	One Month Ago	One Year Ago	Chicago	St. Louis	San Francisco	Dallas
4 in.	$65.30	$65.30	$70.70	$69.80	$61.00	$83.55	$70.30
6 in. and over	62.30	62.30	67.70	66.80	58.00	80.55	67.30

Gas pipe and 16-ft. lengths are $1 per ton extra.

STEEL RAILS—The following quotations are per ton f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5c. per 100 lb. is charged extra:

	Pittsburgh		Chicago	
	Current	One Year Ago	Current	One Year Ago
Standard Bessemer rails	$45.00	$55.00	$45.00	$65.00
Standard openhearth rails	47.00	57.00	47.00	67.00
Light rails, 8 to 10 lb.	2.58½*	3.13*	2.585*	3.13½*
Light rails, 12 to 14 lb.	2.54*	3.09*	2.54*	3.09*
Light rails, 25 to 45 lb.	2.45*	3.00*	2.45*	3.00*

* Per 100 lb.

OLD MATERIAL—The prices following are per gross ton paid to dealers and producers in New York. In Chicago and St. Louis the quotations are per net ton and cover delivery at the buyer's works including freight transfer charges.

	New York	Chicago	St. Louis
No. 1 railroad wrought	$28.00	$24.00	$23.00
Stove plate	21.00	27.00	27.00
No. 1 machinery cast	32.00	33.50	30.00
Machine shop turnings	15.00	10.50	13.00
Cast borings	17.00	12.50	11.50
Railroad malleable cast	23.00	25.00	23.00

COAL BIT STEEL—Warehouse price per pound is as follows:

New York	Cincinnati	Birmingham	St. Louis	Denver
$0.12	$0.16½	$0.18	$0.11	$0.18½

DRILL STEEL—Warehouse price per pound:

	New York	St. Louis	Birmingham	Denve
Solid	14c.	13c.	15c.	15c.
Hollow	17c.	....	.	22c.

PIPE—The following discounts are for carload lots f.o.b. Pittsburgh; basing card of Jan. 1, 1919 for steel pipe and for iron pipe:

Inches	Steel Black	Galvanized	Inches	Iron Black	Galvanized
BUTT WELD					
⅛, ¼ and ⅜	50½%	24%	¾ to 1½	30½%	23½%
½	54½%	40%			
¾ to 3	57½%	44%			
LAP WELD					
2	50½%	35%	2	32½%	18½%
2½ to 6	53½%	41%	2½ to 4	34½%	21½%
BUTT WELD, EXTRA STRONG PLAIN ENDS					
⅛, ¼ and ⅜	46½%	29%	¾ to 1½	39½%	24½%
½	51½%	39%			
¾ to 1½	55½%	43%			
LAP WELD, EXTRA STRONG PLAIN ENDS					
2	48½%	37%	2	33½%	20½%
2½ to 4	51½%	40%	2½ to 4	35½%	23½%
4½ to 6	50½%	39%	4½ to 6	34½%	22½%

Stocks discounts in cities named are as follows

	New York		Cleveland		Chicago	
	Black	Galvanized	Black	Galvanized	Black	Galvanized
¾ to 3 in. steel butt welded	47%	31%	43½%	34½%	57½%	44%
3½ to 3 in. steel lap welded	42%	27%	39½%	30½%	53½%	41%

Malleable fittings. Class B and C, from New York stock sell at list + 12½%. Cast iron, standard sizes, 10% off.

WIRE ROPE—Discounts from list price on regular grades of bright and galvanized are as follows:

	New York and St. Louis
Galvanized iron rigging	+12½%
Galvanized cast steel rigging	7½%
Bright plain rigging	35%
Bright cast steel	22½%
Bright iron and iron tiller	5%

STEEL SHEETS—The following are the prices in cents per pound from jobbers' warehouse at the cities named:

	Pittsburgh, Mill in Carloads	New York			Cleveland	Chicago
		Current	One Month Ago	One Year Ago	Current	Current
*No. 28 black	4.35-4.85	7.00-8.00	5.62	6.52	5.77	6.00
*No. 26 black	4.25-4.75	6.90-7.90	5.52	6.42	5.67	5.98
*Nos. 22 and 24 black	4.20-4.71	6.85-7.85	5.47	6.37	5.62	5.85
Nos. 18 and 20 black	4.15-4.65	6.80-7.80	5.42	6.32	5.57	5.80
No. 16 blue annealed	3.75-4.20	5.27	4.77	5.72	5.17	5.02
No. 14 blue annealed	3.65-4.10	5.17	4.67	5.62	5.07	4.92
No. 10 blue annealed	3.55-4.00	5.07-6.00	4.57	5.52	4.97	4.82
No. 28 galvanized	5.70-6.20	7.75-9.00	7.42	7.77	7.12	7.25
*No. 26 galvanized	5.40-5.90	7.45	7.12	7.47	6.82	6.95
No. 24 galvanized	5.25-5.75	7.30	6.97	7.32	6.57	6.52

* For painted corrugated sheets add 30c. per 100 lb. for 25 to 28 gages; 25c. for 19 to 24 gages; for galvanized corrugated sheets add 15c., all gages.

SHOP SUPPLIES

NUTS—From warehouse at the places named, on fair size orders, the following amount is deducted from list:

	New York	Cleveland		Chicago		St. Louis
	Current	Current	One Year Ago	Current	One Year Ago	Current
Hot pressed square	List	$1.00	$1.25	$1.45	$0.98	$2.25
Hot pressed hexagon	List	1.00	1.05	1.45	0.78	2.25
Cold punched square	List	1.00	.75	1.05	1.00	2.25
Cold punched hexagon	List	1.00	.75	1.05	1.00	2.25

Semi-finished nuts sell at the following discounts from list price:

	Current	One Year Ago
New York	70–5%	50–10%
Chicago	50%	50%
Cleveland	60 10%	50–10%
St. Louis	45%	....

MACHINE BOLTS—Warehouse discounts in the following cities:

	New York	Cleveland	Chicago	St. Louis
⅜ by 4 in. and smaller	30%	50%	35–5%	50–5%
Larger and longer up to 1 in. by 30 in.	20%	40%	25–5%	40–5%

WASHERS—From warehouses at the places named the following amount is deducted from list price:

For wrought-iron washers:
New York . . $1.50 Cleveland.........$3.75 Chicago..........$3.00

For cast-iron washers the base price per 100 lb. is as follows:
New York.........$7.00 Cleveland.........$3.75 Chicago..........$4.25

RIVETS—The following quotations are allowed for fair sized orders from warehouse:

	New York	Cleveland	Chicago
Steel 7/16 and smaller	40%	55% off	50%
Tinned	40%	55% off	50%

Boiler, ½, ¾, 1 in. diameter by 2 in. to 5 in. sell as follows per 100 lb.:
New York..$5.00 base Cleveland..$4.00 Chicago..$4.87 Pittsburgh..$4.72

Structural, same sizes:
New York..$5.10 Cleveland..$4.10 Chicago..$4.97 Pittsburgh..$4.82

CONSTRUCTION MATERIALS

LINSEED OIL—These prices are per gallon:

	New York Current	New York One Year Ago	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago
Raw, 5-bbl. lots	$1.80	$1.59	$2.05	$2.10	$1.93	$1.90
5-gal. cans	2.00	1.84	2.25	2.25	2.23	2.00

WHITE AND RED LEAD—Base price.

	Red Current Dry	Red Current In Oil	Red 1 Year Ago Dry	Red 1 Year Ago In Oil	White Current Dry and In Oil	White 1 Year Ago Dry and In Oil
100-lb. keg	14.50	15.50	14.00	14.50	14.50	14.00
25 and 50-lb. kegs	14.75	15.75	14.25	15.75	14.75	14.25
12½-lb. keg	15.00	16.00	14.50	15.00	15.00	14.50
5-lb. cans	16.00	17.50	.	....	16.50	16.00
1-lb. cans	17.00	18.50		.	17.50	17.00

500 lb. lots less 10% discount. 2000 lb. lots less 10–2½% discount.

COMMON BRICK—The prices per 1000 in cargo or carload lots are as follows:

Chicago	$12.00	Birmingham	$15.00
St. Louis, salmon	12.00	Denver (hard red)	16.00
Cincinnati	17.00		

PREPARED ROOFINGS—Standard grade rubbered surface, complete with nails and cement, costs per square as follows in New York, St. Louis, Chicago and San Francisco.

	1-Ply C.l.	1-Ply L.c.l.	2-Ply C.l.	2-Ply L.c.l.	3-Ply C.l.	3-Ply L.c.l.
No. 1 grade	$1.50	$1.75	$1.90	$2.15	$2.30	$2.55
No. 2 grade	1.35	1.60	1.70	1.95	2.05	2.30

Asbestos asphalt saturated felt (14 lb. per square) costs $5.00 per 100 lb.

Slate-surfaced roofing (red and green) in rolls of 108 sq.ft. costs $2.25 per roll in carload lots and $2.50 for smaller quantities.

Shingles, red and green slate finish cost $6.00 per square in carloads, $6.25 in smaller quantities, in Philadelphia.

ROOFING MATERIAL—Prices per ton f. o. b. New York and Chicago:

	Carload Lots N. Y.	Carload Lots Chicago	Less Than Carload Lots N. Y.	Less Than Carload Lots Chicago
Tarfelt (14 lb. per square of 100 sq.ft.)	$70.00	$70.00	$71.00	$71.00
Tar pitch (in 400-lb. bbl.)	21.00	18.00	22.00	19.00
Asphalt pitch (in barrels)	34.00	34.00	37.50	37.50
Asphalt felt	68.00	68.00	72.50	72.50

HOLLOW TILE—Price per block in carload lots for hollow building tile:

	4x12x12	8x12x12	12x12x12
St. Paul	$0.087	$0 135	$0.185
St. Louis	.10	.18½	.31
Seattle	.09	.175	.30
Los Angeles*	.082	.154	.236
New Orleans	.165	.22	.325
Pittsburgh	.065	.115	......
Chicago	.08	.144	......
Denver	.125	.18	.25
Cincinnati	.08705	.1623	.2416

*F. o. b. factory, 4, 8 and 10 inch.

LUMBER—Price of pine per M in carload lots:

	1-In. Rough 10 In. x 16 Ft.	2-In. T. and G. 10 In. x 16 Ft.	8 x 8 In. x 20 Ft.
St. Louis	$49.00	$45.00	$41.00
Birmingham	40 00	48.00	43.00
Denver	43.25	35.00	43.00
Cincinnati	55.00	50.00	47.50

EXPLOSIVES—Price per pound of dynamite in small lots and price per 25-lb. keg for black powder:

	Low Freezing 20%	Gelatin 40%	Gelatin 60%	Gelatin 80%	Black Powder
New York	......	$0.27	$0.29½	......	$2.20
Boston	$0.22½	.24½	.26½	$0.31	2.20
Kansas City	.18½	.22½	.25½	.29	2.25
New Orleans	.23½ (50%)	.22	.24		...
Seattle	.1675	.1925	.2125	.2775	2.10
Chicago	.18½	.20½	.25	.29½	2.15
St. Paul	.18¼	.22¼	.24¾		2.25
St. Louis	.18½	.22½	.23¾	.29½	1.80
Denver	.17¾	.21½	.24	.28¼	2.25
Los Angeles	.25	.30	.33	.27½	3.00

MISCELLANEOUS

GREASES—Prices are as follows in the following cities in cents per pound for barrel lots:

	Cincinnati	St. Louis	Birmingham	Denver
Cup	7–8	3.6-3.7	8½	13¾
Fiber or sponge	7	7.2	9	18
Transmission	9–10	13	8½	15
Axle	5	4½	4½	5½
Gear	5	6½	8½	8
Car journal	5	4.7	4½	15¾

BABBITT METAL—Warehouse prices in cents per pound:

	New York Current	New York One Year Ago	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago
Best grade	90.00	95.00	68.50	93.00	60.00	96.00
Commercial	50.00	50.00	17.25	23.00	13.00	25.00

HOSE—Following are prices of various classes of hose:

Fire

	50-Ft. Lengths
Underwriters' 2½-in.	75c. per ft.
Common, 2½-in.	40%

Air

	First Grade	Second Grade	Third Grade
¾-in. per ft.	$0.50	$0.33	$0.22

Steam—Discounts from list

First grade...... 30% Second grade..... 40% Third grade...... 45%

LEATHER BELTING—Present discounts from list in cities named:

	Medium Grade	Heavy Grade
St. Louis	40%	35%
Denver	35–5%	30%
Birmingham	35%	30%
Chicago	45%	40%
Cincinnati	30-5-2½%	40-2½%

RAWHIDE LACING—20% for cut; 45c. per sq.ft. for ordinary.

PACKING—Prices per pound:

Rubber and duck for low-pressure steam	$1.00
Asbestos for high-pressure steam	1.70
Duck and rubber for piston packing	1.00
Flax, regular	1.20
Flax, waterproofed	1.70
Compressed asbestos sheet	.90
Wire insertion asbestos sheet	1.50
Rubber sheet	.50
Rubber sheet, wire insertion	.70
Rubber sheet, duck insertion	.50
Rubber sheet, cloth insertion	.30
Asbestos packing, twisted or braided, and graphited, for valve stems and stuffing boxes	1.30
Asbestos wick, ½- and 1-lb. balls	.85

MANILA ROPE—For rope smaller than ⅜-in. the price is ½ to 2c. extra: while for quantities amounting to less than 600 ft. there is an extra charge of 1c. The number of feet per pound for the various sizes is as follows: ⅜-in., 8 ft.; ⅝-in., 6; ¾-in., 4½; 1 in., 3⅓; 1¼-in., 2 ft. 10 in.; 1½-in., 2 ft. 4 in. Following is price per pound for ⅜-in. and larger, in 1200-ft. coils:

Boston	$0.27½	Atlanta	$0.29½
New York	.26	Denver	.27½
St. Louis	.26½	Kansas City	.26½
Chicago	26½	New Orleans	.25½
St. Paul	.26	Seattle	.25
San Francisco	.24	Los Angeles	.28

PIPE AND BOILER COVERING—Below are discounts and part of standard lists:

PIPE COVERING Pipe Size	Standard List Per Lin.Ft.	BLOCKS AND SHEETS Thickness	Price per Sq.Ft.
1-in.	$0.27	½-in.	$0.27
2-in.	.36	1 -in.	.30
3-in.	.45	1½-in.	.45
4-in.	.60	2 -in.	.60
6-in.	.80	2½-in.	.75
8-in.	1.10	3 -in.	.90
10-in.	1.30	3½-in.	1.05

85% magnesia high pressure.................. List

For low-pressure heating and return lines: 4-ply.... 58% off; 3-ply.... 60% off; 2-ply.... 62% off

WIRING SUPPLIES—New York prices for tape and solder are as follows:

Friction tape, ½-lb. rolls	48c. per lb.
Rubber tape, ½-lb. rolls	60c. per lb.
Wire solder, 50-lb. spools	46c. per lb.
Soldering paste, 2-oz. cans	$1.20 per doz.

COPPER WIRE—Prices per 1000 ft. for rubber-covered wire in following cities:

	Denver Single Braid	Denver Double Braid	Denver Duplex	Birmingham Single Braid	
14	$14 50	$17 50	$35 00	$ 12 50	Solid
10	23 25	29.25	58 75	25.10	"
8	31 05	38 30	77.95	34 75	"
6	50 60	52 65	......	57.50	"
4	73 00	75.32	......	81.65	"
2	110 00	112.45	....	140 20	Stranded
1	143 90	146 15	....	190.90	"
0	181 25	181.25	......	231.33	"
00	......	......	......	281.83	"
000	......	......	......	343.22	"
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Pittsburg—23c. base; discount 50%; St. Louis—30c. base.

FREIGHT RATES—On finished steel products in the Pittsburgh district including plates, structural shapes, merchant steel, bars, pipe fittings, plain and galvanized wire nails, rivets, spikes, bolts, flat sheets (except planished), chains, etc. the following freight rates per 1000 lb. are effective:

Boston	$0 30	New Orleans	$0.38½
Buffalo	17	New York	.27
Chicago	.27	Philadelphia	.24½
Cincinnati	.23	St. Louis	24
Cleveland	.17	St. Paul	.49½
Denver	.99	Pacific Coast (all rail)	1.25*
Kansas City	.59		

Note—Add 3% transportation tax. Minimum carload, 80,000 lb.

DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

Electric Mine Haulage

Letter No. 1—Having had some experience of a similar nature, in respect to the action of electric mine locomotives, I was much interested in reading of the trouble experienced by Charles F. Sherman, as described in his inquiry, *Coal Age*, Nov. 27, p. 861. In that connection, kindly permit me to submit the following:

Mr. Sherman describes his difficulty by saying that the locomotive has a tendency to lift at the front end when hauling a loaded mine trip, causing the front wheels to spin and throwing the greater portion of the load on the rear motor, which becomes overheated. Unfortunately, he has omitted to state in what manner the motors are slung or suspended in the frame of the locomotive.

On small locomotives having a short wheelbase, the motors are usually slung outside of the wheels, the suspension bars being then attached to the two ends of the locomotive frame. When this is the case, it would seem that the action of both motors would be to lift the front end of the machine. I have tried to illustrate this in the accompanying sketch in which it appears that the locomotive is moving to the left and the head motor tends to climb on the gear fixed to the front axle. The motor thus exerts a lifting force R on the front end of the frame. At the same time, the rear motor, acting downward on the gear attached to the rear axle, exerts a downward pull R on the tail end of the frame, which also acts to lift the front end of the machine.

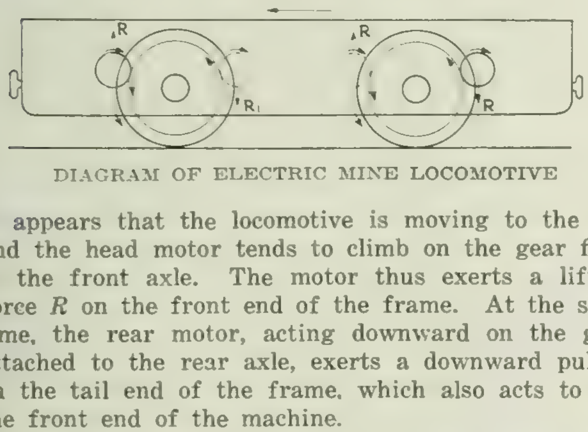


DIAGRAM OF ELECTRIC MINE LOCOMOTIVE

If my reasoning is correct it is clear that the combined action of the two motors when hung in the manner in which I have described, is to lift the front end of the locomotive frame and press down the rear end. That being the case, my opinion is that it would do no good to change the position of the drawbar, which should be at about the height of the locomotive axle above the rails to obtain the best results, assuming this is about the elevation of the drawbars of the mine cars.

My understanding is that the best practice in mine-locomotive building is to suspend the motors on the inside of the two locomotive axles, so that these conditions will be reversed. As shown in the figure by the dotted lines and arrows, the head motor then tends to work downward on the gear attached to the front axle and exerts a downward force R_1 on the locomotive frame, which acts within the wheelbase and exerts no tendency to tilt the locomotive either way. On the other hand, the rear motor tends to climb the gear attached to the rear axle and exerts a lifting force R_1 on the locomotive frame, which is counteracted to better advantage, however, by the relatively greater leverage of the weight of the machine, acting through its center of gravity. In this position of the motors, their action is practically neutralized as far as the lifting or tilting of the locomotive is concerned.

Trouble Due to Imperfect Connections

Allow me to call attention here to another trouble that is frequently experienced in the operation of an electric mine locomotive. In one instance in my own practice, observing that there was a tendency of the front wheels of the locomotive to spin, I made a careful examination, which disclosed the fact that the head motor was running on two fields only, instead of four. This caused the armature to revolve more rapidly than that of the other motor. As in Mr. Sherman's case, the effect was to throw the major portion of the work on the rear motor, especially when starting the trip. It was found that the two dead fields were grounded between the second and third fields, which were operating in series and short-circuited.

Taking everything into consideration, let me suggest to Mr. Sherman the making of a thorough examination of all the electrical connections, fields and armatures of each motor, to see that they are operating properly. If no trouble is found there, an effort should then be made to alter the suspension of the motors in the locomotive frame, if this is at all practicable. If not, I know of no better way of overcoming the difficulty he has mentioned than to weight the front end of the machine so as to prevent its lifting. With many others, I shall be glad to learn of the experience of motormen who have had similar troubles. ELECTRICIAN.

Johnstown, Penn.

Roller Bearings for Mine Cars

Letter No. 4—Since reading the several letters published in *Coal Age* and dealing with the subject of roller-bearing equipment, I have had some very interesting and profitable discussions, on this subject, with numerous friends who are connected both with the steel industry and coal companies in an engineering capacity. From them I have learned many facts and obtained much interesting information on the use of antifriction bearings, which may be said to be yet in their infancy.

In speaking thus, I do not mean that the present application of roller bearings is experimental; but rather, the field is so large that the possibilities of their use have hardly been realized. The fact is that it will take time to so perfect this type of bearing that its adoption will be universal. As with the aeroplane and other problems, development is slow; but the day will surely come when antifriction bearings will be universally employed

At the present time, the so-called "flexible, roller bearing" is used to a large extent around steel mills. The ingot cars of the Bethlehem Steel Co. are equipped with these bearings in its plants at South Bethlehem, Lebanon, and Sparrows Point. They are also used under charging cars, at the Youngstown plant of the Carnegie Steel Co., and under the ingot cars of the Illinois Steel Co., at Joliet, Ill. The same type of bearing is found on rolling-mill tables, caster beds, hot saws and in a very large number of machines in the shops. Indeed, when one takes the trouble to investigate the extent of their use, it is surprising to find the number of applications of roller bearings.

ROLLER BEARINGS AT MINES AND CAUSES OF THEIR SEEMING FAILURE TO SAVE POWER

Around the mines, roller bearings are used on storage-battery locomotives, and thousands of mine cars so equipped are giving satisfactory service. Regarding the division of opinion as to the merits of the wheel-hub and journal-box application, it seems to be the policy of the operators in the anthracite field to favor the journal box for use under their larger and heavier cars, while bituminous mine owners seem to prefer the wheel-hub installation. My observation shows, however, that the journal-box equipment is now invading the soft coal fields; and there is little doubt in my mind but that this discussion will interest large numbers of operators in all soft-coal regions.

While it is true that the saving in power claimed for roller-bearing equipment has not been realized in every instance, the failure seems to be due largely either to an improper installation of the bearing, or the use of a wrong kind of lubricant.

Since leaving the employ of a company that was one of the large soft-coal producers, I have learned that they have now invested heavily in the spiral type of roller-bearing equipment, after making an extended investigation of the matter. During my service with that concern, I was always impressed with their conservative methods and lack of experimentation.

Another large coal and coke operation, having a national reputation, purchased a small number of roller-bearing cars, in 1913, and as a result of the satisfactory service of this equipment they have now in use more than a thousand cars so equipped. The coal department of the largest steel corporation in this country has now in operation over 3000 cars equipped with the spiral-roller bearing.

When one reflects that the price of the roller-bearing car equipment is greater than that of plain-bearing cars, it is only logical to conclude that these companies have found the equipment a profitable investment, and that roller bearings for mine cars have come to stay, which is evidenced also by the growth of the industry.

Pittsburgh, Penn. LEWIS S. YOUNG.

Letter No. 5.—Referring to the letter of J. F. Fox. *Coal Age*, Nov. 13, p. 805, regarding the relative merits of roller bearings and plain bearings for use on mine cars, permit me to say that there has been so much written advocating the use and explaining the advantages of roller-bearing equipment that it is quite refreshing to learn that the plain bearing has a few advantages after all.

Assuming, as I do, that a large majority of the coal mines still have their mine cars equipped with plain bearings, it is strange that the alleged efficiency of roller-bearing equipment and their dependability to save power, lubricants, and repair costs, have not had the effect to convince the large majority of mine owners, who have yet failed to adopt the improved equipment.

To my mind, the greatest disadvantage of this improved type of bearing lies in the bearing itself. While the simpler types of roller bearings may be durable enough, their mechanism is intricate and costly; and since it is not claimed that they are indestructible when derailments, wrecks and smashups occur in the mine, the cost of replacing such equipment may prove one of the chief objections to its adoption. However, aside from the excessive cost of renewals, the cost of repairing such bearings is an important consideration.

From the fact that there has never been a means yet discovered for preventing wrecks and smashups in mines, it follows that the simple plain bearing, being strong, durable and generally unbreakable, will cost less to maintain. The plain bearing is more quickly repaired by the average mine blacksmith and car repairman than the most simple type of roller bearing. My opinion is that there is no guarantee of greater length of service of a roller bearing that would warrant the extra outlay and cost of maintenance, under the severe service to which mine cars are subject.

PRACTICAL CONSIDERATIONS MUST BE TAKEN INTO ACCOUNT IN CHOOSING A BEARING

Much has been claimed in the way of reduced lubricating cost for the improved type of bearing. Speaking honestly, I am willing to admit that if roller bearings on mine cars could not be broken, twisted, warped or strained in wrecks and derailments, and if the grease recommended for their lubrication would never gum, cake, or become gritty with dirt and dust, one could scarcely imagine a smoother, more economical or more efficient running gear for mine cars than is offered by that type of bearing. However, in mines with heavy grades where the need of saving power is greatest, there is always the possibility of wrecks and smashups that must greatly increase the cost of repairs and renewals if roller bearings are in use.

Allowing, for the sake of argument, that the greasing of roller bearings shows a saving over the oiling of plain bearings, it is hard to understand the claim of one writer that this saving amounts to 250 days in the year. Even assuming the truth of the slogan of advertisers that greasing is necessary only "once every six months," there could not result the saving in wages paid an oiler for 250 days, as the time devoted to cleaning these bearings and greasing them properly would make an item of cost that would offset much of this saving. It is probable that the cost of greasing roller-bearing equipment is considerably more than we are led to believe by these alleged claims.

Of course, I realize that a great many dollars may be saved in the greasing of roller bearings on mine cars, even if it is necessary to grease such bearings once every three months, or, say, every two months. But let me ask if the profit and loss account on the credit side of the ledger will show a net saving when the extra cost of renewals and repairs of these bearings is considered, bearing in mind the severe service to which the cars are subjected and the relatively greater durability of plain bearings.

Taking all things into consideration, there is every possibility of spending more money than we save, unless there are really ideal perfect conditions regarding haulage in the mine that would insure against derailment and wreckage of cars. I believe that the saving in power claimed would have to equal 50 per cent., in order to offset the increased cost of maintenance and show a net profit due to the adoption of such improved equipment.

While the saving in power by the use of roller bearings may not have been fully considered in my practice, I have often wondered if the claim of 40 or 50 per cent. of power saving has been scientifically demonstrated; and, if so, why this type of bearing is not more generally adopted by coal-mine operators; and, more particularly, by the railroads of the country, whose engineers have made a study of all feasible ideas for facilitating transportation and saving power. It goes without saying that power is a dominant factor in all classes of transportation.

If roller-bearing equipment for cars offers an actual saving of 50 per cent. or even 40, 30 or 20 per cent., it would mean that an engine able to pull 100 railroad cars on a level grade, would haul 150, 140, 130 or 120 of such cars equipped with roller bearings. Indeed, it would be difficult to imagine a system of transportation where such a tremendous saving of power would be more justified than in the great system of railroads in the United States. W. H. NOONE.

Thomas, W. Va.

Lawful Examination of a Mine

Letter No. 9—The discussion of this subject in *Coal Age* has been of the greatest interest, chiefly because it brings out the best ideas and experiences of men who have been in positions that enable them to give the matter thoughtful attention.

To say the least, the question of what is a "lawful examination" of a mine is complicated by reason of the widely varying conditions in the mine and the difference in the requirements of state mining laws. Everyone that is directly connected with a coal mine should be, and no doubt is, greatly interested and desirous of knowing what a proper and lawful examination of a mine requires.

The careful reading of the previous letters in this discussion leads one to believe that there is great necessity for a better system of mine examination, and the adoption of a standard rule or law covering certain general requirements in coal mines. Where there is not constant vigilance and watchcare to avoid the disasters that are occurring all too frequently, coal mining is certainly a dangerous occupation. It must be remembered that gas may accumulate in mines that, up to that time, have been considered free from gas.

It is the "model mine" that has often been the scene of death and destruction, because of a too great confidence in its supposed freedom from dangerous accumulations of gas or dust. On the event of these disasters, experts examine the mine to ascertain the cause; but frequently the actual though unrecognized cause is a lack of mine discipline or an assumed freedom from danger in the mine.

I mention this in order to remind men of experience who make these examinations and are well versed in the theoretical knowledge of gases, though their practical experience may be somewhat limited, that their opinions and conclusions should be carefully worked out on a common sense basis and expressed candidly without fear.

Experience teaches that there are many mines where notices of warning, danger signs and "safety first" placards are everywhere in evidence. Many of these mines are known as "free from gas" and considered safe. But, too late, we are reminded of the stubborn truth, by the ever-recurring disaster caused by the explosion of gas or dust, demanding a terrible toll of life.

DANGER ALWAYS PRESENT IN MINES AND CONSTANT SUPERVISION IS REQUIRED

The fact is, there is plenty of danger in all mines and the sooner we recognize this truth, the more rapid will be our progress in reducing accidents. Where so large a proportion of our mine workers are unable to read or understand the notices that are posted to insure their safety, more constant supervision and careful instruction is the great safeguard and remedy that is needed to make the mines safe today.

Speaking of what constitutes a lawful examination, let me say that to comply with the law when examining a mine is a very difficult matter, except in small mines. Each year mines are becoming larger, the workings extended, and the working places more scattered. In the view of many superintendents and mine managers (foremen) the examination of the mine is a mere form that is necessary in order to comply with the law, and they know that a strict compliance would require more examiners than are commonly employed.

This is certainly a grave mistake and a source of danger, as the men responsible for the safe operation of a mine must hurry through their work and slight many places where danger lurks. It may be economy in the view of the coal company operating the mine; but it is radically wrong in principle to start economizing by employing so small a number of mine examiners that the work must be slighted by them.

TIME OF MAKING THE EXAMINATION

In some states, the law requires that the mine shall be examined not more than three hours before the men enter for work. In many cases, it is even then a hurry job. In my own State of Illinois, the law allows eight hours as the time during which the examination must be made and, in that time, the examiner must visit all working places, airways, haulage roads, manways and especially old gobs and abandoned workings. He must also measure the air at the last open crosscut in each pair of entries, or in the last room of each air split or section.

Many of the mines provide a large inspection bulletin that the examiner must fill out by indicating each place as "safe" or "not safe." Taking all into consideration, I have no hesitation in saying that one of the greatest dangers in our mines is the lack of their proper examination, which is largely due to the law controlling that work and the fact that man is only human.

Too often, the examiner is taxed to overexertion, by having in charge too large a territory. It is common to hear men of sound judgment and common sense remark that no examiner can fully comply with the requirements of the law in making the examination of our large mines. In attempting to do so, the examiner would lose his place.

In mines where a nightshift is employed, doors are often set open and no proper air measurements can then be taken, which is another reason why the examination should be made when no one but the examiners is in the mine. Of course, this would require more examiners and increase the expense of the work; but to the man of experience it is the only safe method to adopt and will always be found more profitable in the end.

As one whose living is earned by work in the mine, let me say I believe it is the earnest hope of all mine workers that safer and more sanitary conditions will soon be established and maintained in the operation of coal mines. I hope to see the day when nothing will be taken for granted, and a true picture of the actual conditions of our mines be recorded without fear or favor. To this end, the discussion in *Coal Age* must prove a great help. Let it continue.

Staunton, Ill. W. M. CHAMBERS.

Origin of Coal

Letter No. 2.—The letter of Richard Bowen, *Coal Age*, Sept. 11, p. 460, referring to the theories of the origin of coal should be interesting to all students of mining, as no one can follow the occupation of mining coal without at least an elementary knowledge of its formation.

When faults or "pinchouts" are met in mines, those who have studied the subject will have an intelligent idea of what has happened in the past to produce that condition, and will know better how to proceed to find the coal on the other side of the fault, or whether the pinching out of the seam is the limit of the basin.

Many who are just beginning their study of the geology of coal will find it difficult to believe that seams of coal, as we find them today, are the remains of great impenetrable forests of former ages. However, as one continues to study, these difficulties vanish. The "*in situ*" and the "drift" theories are both generally explained in a coal-mining course of study. These theories give the student a datum line from which his conclusions are drawn.

MANY PRACTICAL DIFFICULTIES PRESENTED IN ADOPTING THE DRIFT THEORY

The drift theory of coal formation teaches that the coal deposits are the remains of vegetable matter, trees, shrubs and other growth that have drifted from the places where they grew and been deposited in large quantities in the basin where the coal beds were formed.

While it is comparatively easy to understand that our coal was formed from wood and other vegetable matter, there is difficulty in accepting, for general application, the theory that these trees and vegetable matter were drifted, from their original location, in such great abundance as to form the coal beds that we now find covering extended areas.

Other mineral deposits, such as salt, iron ore, copper, silver, gold and other metals were undoubtedly deposited in beds, fissures and veins from the waters that carried them in solution. But, in the case of trees and other vegetable matter, the material was not carried in solution, but theory assumes that this great bulk of coal-forming material was drifted to where it has been deposited and has later formed the coal seams as they exist today.

On the other hand, the *in situ* theory of coal formation is more acceptable and much more easily explained than the drift theory, as it assumes the successive growth and accumulation, from year to year, of the trees and vegetable matter in one place, thereby forming the great beds and seams that cover extended areas and which represent to the practical mind great forest regions.

It is not assumed that the coal deposits are the remains of a forest growth of 50 or even 100 years; but that the accumulation continued for ages in the area represented by the coal seams of today. Many of the trees grew to immense size; some had fallen, while others remained standing when the area was overflowed owing to changes in the elevation of the surface, as we are taught in geology. This explains why the trunks of trees are sometimes found in a horizontal and others in an upright position in a coal seam.

Again, the floor of our coal seams, which is generally clay or sandrock is suggestive of the nature of the soil on which the forest grew. It would seem that, to accept the drift theory, would be to expect a greater variety in the strata underlying coal seams, including even igneous rocks, which are never a part of the coal formations, whose sedimentary character tell of a different origin.

MANY OBSERVED GEOLOGICAL FACTS SUGGEST THE TRUTH OF THE IN SITU THEORY

In adopting the *in situ* theory of coal formation, it is not necessary to assume that the entire area was one great swamp. But, geology teaches that in those early ages the earth's surface was continually undergoing changes, portions being depressed and others elevated, so that there were successive inundations of large areas, which gave rise to the interstratification of clay seams, shales, limestones and sandrock with thin and thick beds of coal, these foreign materials being deposited from the overflowing waters.

Similar conditions of goelogical changes are in evidence today, in the millions of tons of sediment carried down the Mississippi River each year, and the great silt deposits in the regions of the Nile and Ganges rivers. In the present age of the earth, however, such changes are not taking place as rapidly as was formerly the case.

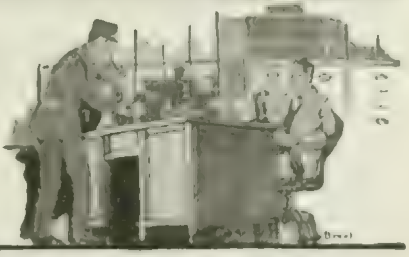
During the Carboniferous Period it is easy to believe that large portions of the earth were comparatively level, affording favorable conditions for the growth of extensive forests. Again, there were periods of violent disturbance that formed the mountain ranges and tilted and contorted many of the coal seams and, at times, produced the heat and pressure that changed much of the coal into anthracite. These disturbances broke up and separated many coal areas that were, perhaps, originally continuous but are now divided by mountain ranges.

The same disturbances gave rise to the steep pitches and inclinations in many coal regions; and coal seams are found outcropping high up on the mountain side. At the same time, much of the formations have been eroded by rivers and suface drainage, or worn away by glacial action and atmospheric agencies. The study of these agencies and their effects in the formation of coal is of deep interest and importance to the mining industry, especially to the men employed underground.

———, Ala. ROBERT MCCUNE.

INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD



Strength of Leather Belting

Kindly state what may be considered a safe working tension of a good leather belt, say 20 in. wide.

Pittsburgh, Penn. MINE MECHANIC.

Much will depend on the manner of lacing the two ends to form one continuous belt. Assuming, however, that the strength of the lacing is equal to that of the leather, the safe working stress of a good, well tanned oxhide belt $\frac{3}{16}$ in. thick can be taken as 55 lb. per inch of width. Such a belt 20 in. wide would be expected to carry a load of 20 × 55 = 1100 lb. The hair side of the belt should be run next to the pulley.

Electric Conductors and Coal Dust

The question was asked me a short time ago in regard to what effect, if any, the high-potential wires that conduct power to the working faces in our mine had on the mine air. This mine generates a considerable quantity of gas, though not enough to require the use of safety lamps, owing to the large quantity of air maintained in circulation.

Although I have read certain references, at different times, regarding the effect of electrical conductors on the mine air, I was unable to give a satisfactory answer to the question asked. It will be of interest to learn if there is any ground for apprehending danger when high potential wires are carried into a mine generating gas. FIREBOSS.

Pottsville, Penn.

Many ignitions of firedamp, which have taken place in coal mines and been followed by disastrous effects, have been traced to the use of electricity. Probably, the majority of these occurrences, however, have been the result of inadequate equipment. Either the installation has been made in a careless manner or by an incompetent person, or the sparking of the wires, blowing out of fuses, or some similar occurrence has resulted in the ignition of accumulated gas.

This, however, is not the only danger due to the presence of high-potential conductors when carried into mines generating gas and dust. As a result of experiment, it is claimed that when a cloud of coal dust, held in suspension in the air current of a mine, is projected against an electrical conductor of high potential there takes place a discharge of electricity yielding sparks several centimeters in length, depending on the potential of the current.

We are unable to say that these results have been confirmed in a manner to make them reliable. If this was the case, there would always exist the danger that a sudden fall of roof, which is liable to occur at any time, might raise a cloud of dust that would cause disaster in the presence of gas and such high-potential conductor. It is safe to say that when the mine air is charged with gas and dust, these constitute a grave danger, even in the absence of electrical conductors. There is little question, also, but that any form of live wire in such an atmosphere is an element of danger and should be avoided as not being permissible, in the best mining practice.

Normal Life of Mine-Car Axles

Much has been said, in past issues of *Coal Age*, regarding heat-treated axles for mine cars. The references, I believe, seem to indicate that the heat treatment greatly prolonged the life of the axles. Only recently, I read a highly interesting and instructive article on this treatment as applied to the axles of electric locomotives and cars on surface roads.

The article stated that the treatment was introduced for the purpose of making the axles stand an increased load without increasing the dimensions of the axles and produced satisfactory results in this respect. What is true in regard to the increasingly heavy tonnage on surface roads is likewise true in mine haulage, where the rapidly increasing demand for larger output requires the use of mine cars of greater capacity.

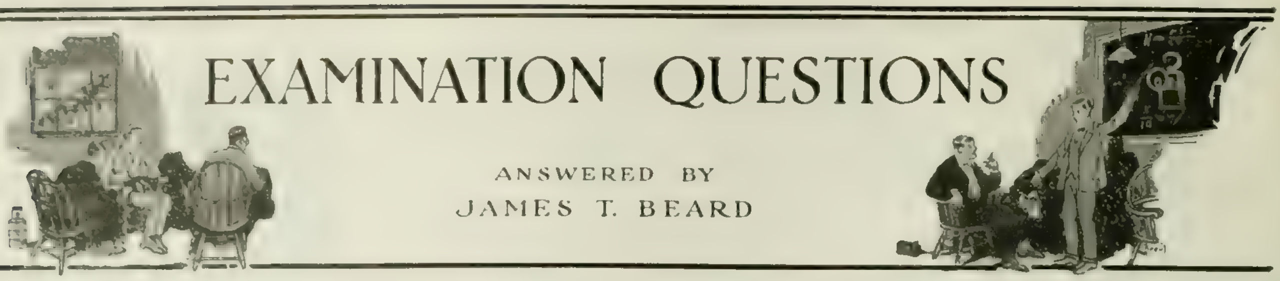
In connection with the suggested needed standardization of mine equipment, let me ask if it would not be of great interest to learn something regarding the average life of mine-car axles, used under different conditions. The description should state the style of bearing, kind of haulage, load on the axles, miles of haul and other details affecting the life of the axle, such as lubrication of the wheels, condition of track, etc.

It would seem that many of the mining engineers of our large coal companies should be able to give some interesting figures along this line and that this would give rise to a practical discussion of the subject that must prove valuable in reducing the cost of mine haulage. MECHANIC.

Pittsburgh, Penn.

Coal Age is pleased to receive the suggestion of this correspondent for submission to readers, hoping that it will have the careful attention it deserves. Undoubtedly, as mentioned by the correspondent, the normal life of mine-car axles will vary widely with the conditions under which they are used. At times, there will be failures from defects in material, but the endeavor should be made to eliminate such cases, as far as practicable.

It has been suggested, that the heat treatment of steel does not improve its nature with respect to resistance to bending, but hardens the surface and enables the metal to resist wear. Results in regard to this point will be welcomed and we hope for a good discussion by mechanics and engineers.



EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Mine Manager's Examination Springfield, Ill., Nov. 11, 12, 1919

(Selected Questions)

Ques.—Explain the conditions under which coal dust in a mine becomes dangerous as a source of explosion.

Ans.—The finely divided dust of a highly inflammable coal is always a menace to the safety of a mine, and particularly so when it is allowed to accumulate in such quantity as to be raised and held in suspension in the mine air. The danger is greater where the air contains even a small percentage of methane or where the coal is blasted, particularly if black powder is used or the coal blasted off the solid. Even if the coal is not highly inflammable, fine accumulated dust is dangerous under the conditions named. In order to reduce the liability to explosion in a mine generating gas and dust, or dust alone, in considerable quantity, the mine should be thoroughly examined for gas and no accumulations of gas or dust should be permitted at the working faces or on the roads and travelingways in the mine. All roads and travelingways should be thoroughly cleaned at regular intervals so as to prevent undue quantities of dust accumulating therein.

Ques.—How will a current of 100,000 cu.ft. of air per min., passing in the main air-course of a mine, divide between the following three splits: Split A, 6 x 6 ft., 2,000 ft. long; Split B, 6 x 6 ft., 4,000 ft. long; Split C, 6 x 6 ft., 6,000 ft. long. Find the quantity of air that will pass in each split, supposing the pressure on all the splits to be the same.

Ans.—These splits having the same cross-section and under the same unit pressure, the quantity of air passing in each will be in proportion to the square root of the length of the airway. Since the relative lengths of the splits are 2, 4, 6, the calculation is as follows:

$$A,\ \sqrt{2} = 1.414;\quad \frac{1.414}{5.764} \times 100{,}000 = 24.110 \textit{ cubic feet}$$

$$B,\ \sqrt{4} = 2.000;\quad \frac{2.000}{5.864} \times 100{,}000 = 34{,}110 \textit{ cubic feet}$$

$$C,\ \sqrt{6} = 2.450;\quad \frac{2.450}{5.864} \times 100{,}000 = 41{,}780 \textit{ cubic feet}$$

$$5.864 \qquad \textit{Total} \qquad 100{,}000 \textit{ cubic feet}$$

Ques.—What is meant by the term, "effective pressure" on an engine piston?

Ans.—In the cylinder of a steam engine, the steam is worked expansively, the valves shutting off the steam at a fraction of the stroke. Up to that point, the pressure on the piston is the full steam pressure; but during the remainder of the stroke the pressure decreases, the steam expanding to fill the increasing space behind the piston. Bearing these facts in mind, it is clear that the mean effective pressure is calculated on the assumption that the pressure on the piston is constant throughout the entire stroke, and the work performed is the same as when the steam is used expansively.

Ques.—An engine has a 5-ft. stroke and makes 30 r.p.m.; what is its piston speed in feet per minute?

Ans.—An engine makes two strokes during each revolution. At a speed of 30 r.p.m., the number of strokes per minute is 2 × 30 = 60. For a 5-ft. stroke, at this rate, the piston speed is 5 × 60 = 300 ft. per min.

Ques.—Supposing an entry 90 yd. long to be filled with marsh gas (CH_4) and air at the most explosive point. Also, suppose that the gas and air can be separated, what length of entry would each occupy?

Ans.—A mixture of marsh gas and air, at its most explosive point, contains 9.46 per cent. of gas. That is to say, in 100 vol. of the mixture, there are 9.46 vol. of gas and 100 — 9.46 = 90.54 vol. of air. Then, assuming the sectional area of the airway is constant throughout its length, the proportion of the length of entry each gas would occupy would be the same as their relative volumes. For example, in an entry 1,000 ft. long, the marsh gas would occupy a length of 0.0946 × 1,000 = 94.6 ft.; and the air would occupy a length of 1,000 × 0.9054 = 905.4 ft.

Ques.—A ventilating fan is 25 ft. in diameter and the port of entry is 10 ft. in diameter; what is the radial length of the blades?

Ans.—Assuming the lip or inner portion of each blade corresponds to the circumference of the port of entry of the fan, the radial length of the blades in this fan is $\frac{1}{2}$ (25 — 10) = 7.5 ft.

Ques.—If it is necessary to double the amount of air passing in a mine, how much should the pressure and power be increased, respectively?

Ans.—For the same mine or airway, the pressure varies as the square of the quantity of air in circulation. In order to double the quantity of air circulating in a mine or airway, therefore, the pressure must be increased to $2^2 = 4$ times the original pressure.

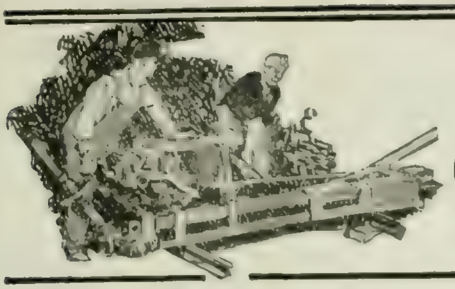
For the same mine or airway, the power producing circulation or the power on the air varies as the cube of the quantity of air in circulation. Therefore, to double the quantity of air passing in a mine or airway will require $2^3 = 8$ times the original power.

Ques.—The water gage is 1 in. and the volume of air in circulation, 50,000 cu.ft. per min., in a certain mine; what will be the volume of air if the water gage is increased to 1.6 in., owing to an increase of power?

Ans.—Assuming the conditions in the mine remain unchanged, the quantity of air increases as the square root of the pressure or water gage producing the circulation. In other words, the quantity ratio is equal to the square root of the pressure or water-gage ratio, and we write, in this case, calling the required volume of air x,

$$\frac{x}{50{,}000} = \sqrt{\frac{1.6}{1}} = \sqrt{1.6} = 1.265$$

$$x = 50{,}000 \times 1.265 = 63{,}250 \textit{ cu.ft. per min.}$$



COAL AND COKE NEWS

Hazleton, Pa.

Lease controversy closes three mines of the G. B. Markle Co. in the Lehigh anthracite field. Millions involved. Union Improvement Co., of Philadelphia, the land owners. Coal output reduced 3500 tons a day and 2000 men thrown out of work. Statements by both interests. Appraisers named to ascertain the value of the Markle improvements.

For the first time in more than twenty-five years, collieries of the G. B. Markle Co. are idle through causes other than strikes, holidays or breakdowns, says the *Public Ledger*, of Philadelphia. Leases with the Union Improvement Co., of Philadelphia, on the mining rights, involving the Highland No. 5, Jeddo No. 4 and Ebervale properties expired Dec. 31 and no agreement has been reached for their renewal. The dispute hinges on the amount of royalty to be paid on output. Two thousand men are idle and output is reduced 3500 tons a day.

The Markle company has operated the mines at Jeddo for 60 years and has millions of dollars invested in the plants, which comprise three of the six it controls. The mining rights of the other three are held outright by the Markle concern. The Markle collieries are said to have been worked more steadily than any in the Lehigh field and during the last 12 months sent 1,600,000 tons to market, 100,000 better than for any other similar period.

According to A. B. Jessup, vice president and general manager, the company has gone the limit on its offer of royalty, which is said to be close to forty cents a ton. It is claimed that this is above the average paid in the anthracite region.

The company in notices posted at the suspended mines announces it has put forth every effort to have the leases extended to the exhaustion of the coal, and that it has also offered to act as the agent of the Union Improvement Co. to mine the fuel, so that the employees can continue at work. The notices further say:

"These offers have been flatly refused by the Union Improvement Co., and G. B. Markle Co. cannot lawfully continue mining after Dec. 31, 1919."

J. E. Altmiller, of Hazleton, agent of the Union Improvement Co., denied the latter is responsible for the suspension. He said directors of the Union Improvement Co., whose headquarters are in the Lafayette Building, Philadelphia, would have accepted any fair offer. He announced that if negotiations with the Markle company eventually should fail the property would be operated by some one else, and that some lively bidding would be expected.

Before the property can pass into other hands certain conditions of the lease, involving millions of dollars, must be complied with. In that event a board of appraisers must set a value on the improvements underground and above the surface, placed there by the Markle company, which must be reimbursed. Officials of the company say they are unable to give any definite estimate as to these holdings, which represent an investment of millions. The breakers, engine and power houses, rail lines, locomotives and other equipment belong to the Markles, and the only equity not under their control is the right to take out the coal.

Appraisers have already been named to go over the value of the property. Frank Hemelright, of Scranton, one of the executives of the Temple Coal Co., was named by the Markle interests; R. V. Norris, of Wilkes-Barre, expert mining engineer, by the Union Improvement Co., and the two have selected W. W. Inglis, vice president of the Delaware, Lackawanna & Western R.R., Coal Department, as the third.

During the last six months the Markle company is said to have had a valuation made by experts of the Dodson Coal Co. whose report is about ready for submission.

One of the peculiar phases of the situation is that the G. B. Markle Co. controls a tunnel about four miles long that penetrates the mountain, to the Butler Valley, and drains the water from the Markle mines. This tunnel, costing more than $1,000,000, does away with the use of pumps and is owned by the Jeddo Tunnel Co. Were it to be closed the workings would be flooded within a few days. The tunnel is one of the big engineering feats in the anthracite field.

Among counsel representing the Markle interests in the negotiations are George Wharton Pepper, of Philadelphia; ex-Judge F. W. Wheaton, of Wilkes-Barre; Judge John P. Kelly, of Scranton, and Sanford Robinson, of New York.

Samuel J. Livingston, secretary of the Union Improvement Co., said that the collieries were shut down and he would probably issue a statement as to the claims of his company soon.

Charleston, W. Va.

The year 1919 ends well but cars scarce during first three days of 1920. Producers try to make up for previous losses. Embargo on eastern shipments lifted. Operators hope for good export business. Kanawha region hard hit by poor transportation. No prospect of early improvement. Acute car shortage in New River field. Operators incensed at commandeering of 60,000 tons of coal for railroad use.

While there was a decided upward trend to production in this part of the state supplied by the Chesapeake & Ohio R.R., such increases were due to loading during the first three days of the week ended Jan. 3, since during the last three days of the week there was a decided drop in the number of empties available. During the first half of the week, there was on an average about an 80 per cent supply. That was sustained until Thursday when there were not more than half enough cars for loading and the same was true as to Saturday.

While the year ended rather auspiciously, the same cannot be said of the beginning of 1920. There was, generally speaking, however, a quicker return to work on the part of miners than is usually the case. Not only were the usual number of miners on hand by the twenty-ninth but quite a large percentage worked throughout New Year's day, the railroads being somewhat unprepared for such a contingency, and, therefore, not having enough cars on hand. Motive power, generally speaking, has been such as to make it impossible to handle equipment as expeditiously as might be desired, and cold weather has also been a factor in handling coal loads and empties.

Producers were trying to recoup previous losses sustained during the strike and during the holidays especially in getting coal to contract customers, with whose orders they had fallen so far behind. Inasmuch as most companies are greatly in need of funds, it was also necessary to ship as large a tonnage as possible before the first of the month, in order to depend upon the usual sources of revenue, from which the operators had been cut off for so long a period.

There was of course in addition to the contract market, a steady demand for spot coal. It was toward export markets, however, that producers were looking, and, while unable to ship as much coal to tide for export following the lifting of the ban on such shipments as they would have liked to do, owing to the large amount of coal already on hand there, nevertheless it was a source of satisfaction to know that export shipments might be resumed on their former scale in the near future. The C. & O. was also moving more coal eastward than had been true in earlier weeks of December, an embargo as to eastern shipments having been lifted on the twenty-seventh.

Since the advent of the new year, up to and including Tuesday, Jan. 6, there had been a dearth of cars in the Kanawha region. During the three days previous to the beginning of the new year, however, production had shown much improvement over the previous week, the supply of cars averaging 80 per cent. On Thursday, Jan. 1, however, the total loadings on the entire C. & O. system only totaled [illegible] tons, the Kanawha region being affected in common with other districts. On both Friday and Saturday, Jan. 2 and 3, there was not more than a 55 per cent supply throughout the Kanawha district, and consequently many mines were either compelled to shut down, or else to work only part time.

While the fairly good car supply during the first three days of the week made it possible to ship more coal than during Christmas week, yet the wind-up of the first week of the new year was highly discouraging, especially in view of the fact that there was no prospect of much improvement for the next 60 days. The eastern movement of coal from the Kanawha region was heavier than has been the case in recent weeks, owing to the removal of a tidewater embargo. Some coal also was shipped to tidewater for export, but the volume was limited although vessels were plentiful about the first of the year. Kanawha coal men, insofar as was possible with a limited car supply, were seeking to make some headway in reaching schedule once again on contracts, finding at the same time a quite healthy demand for spot coal, despite the fact that the railroads had appeared to hoard an unnecessarily large amount during the strike.

Producers of the New River field were seriously handicapped, between Jan. 1 and Jan. 6, in shipping any coal owing to the acute car shortage. It has been worse than at any period of 1919, and, throughout the New River field during the period mentioned, the supply all told was not sufficient for more than two days loading. Between the end of the Christmas holidays and New Year's day, there were only three days in which it was possible to ship anything like the usual amount of coal. Of course during the week, which began on Dec. 29, New River producers began to export smokeless coal once again but not in particularly large quantities. Still, they believe that it will not take long to exhaust the present tonnage on hand at tidewater, when it will be possible to ship export coal in larger quantities, that being the most desirable business to have under present government prices.

New River and other operators are greatly incensed at the notice received from the Hampton Roads Committee, that 60,000 tons of high-volatile and smokeless coal would be commandeered, in the week between Jan. 5 and Jan. 10, for the Boston & Maine at Government prices, that meaning a loss of one dollar a ton or $60,000 to operators. More money from the railroads for diverted and confiscated coal is beginning to dribble into the New River region.

Bluefield, W. Va.

Production in smokeless fields larger in period following Christmas week. Car shortage develops. Outlook unfavorable for heavy smokeless shipments. Exports limited. Virginian car supply normal; C. & O. 60 per cent.; N. & W. transportation inadequate, motive power insufficient.

Greatly diversified conditions existed in the four smokeless fields of West Virginia during the period ended Jan. 3, two of the smokeless districts having a supply much improved over the Christmas week; another district having a full supply as far as one railroad was concerned, while the fourth district had an adequate supply during half of the week. Taking the smokeless territory as a whole, however, and including [illegible] the Williamson (high volatile) field, there was a much larger production than during the Christmas week, notwithstanding the fact that all miners had not returned from their Christmas vacation. However, there was a larger percentage of men at work on New Year's day than had generally been expected. Full complements of men were at work in only a comparatively small number of mines in the non-union smokeless fields [illegible] Jan. 7, [illegible] there was [illegible] idleness after the Christmas holidays had ended. Of course with more miners back at work such car shortages as existed became more patent.

While there had been no shortage of cars to speak of during the week ended the third in Norfolk & Western territory, one began to develop during the week beginning Jan. 5, with the result that a number of mines were shut down by Tuesday from that cause alone. Indeed the outlook for the week ended Jan. 10, for a large movement of smokeless coal, was extremely unfavorable. It had been hoped that beginning the fifth there would be a better export movement than had even been possible during the preceding week, but a car shortage and insufficient motive power blocked many side tracks with loads and retarded the movement and the placement of empties. Only certain sales agencies in various smokeless fields were permitted to make consignments of coal for foreign markets, although vessels have been plentiful, it is understood, so that the tonnage of export coal moving to the seaboard is still to some extent limited.

During the week ended Jan. 3, the Winding Gulf district was gradually regaining its normal producing strength, recovering from the holiday exodus of miners, who in large numbers left the field to celebrate the holidays. While the Winding Gulf district had a splendid car supply throughout the first three weeks of December and while the car supply on the Virginian during the week ended the third was almost normal, the supply on the C. & O. was only about 60 per cent of normal and Winding Gulf operators are extremely uneasy about the outlook for transportation facilities on the C. & O. during the next few weeks, as there is a vast accumulation of coal loads standing west of Huntington. It is stated that in many instances consumers in the West, who were anxious for coal during the strike, are now being supplied from the home mines and are unwilling to take coal from West Virginia, carrying as it does an extra freight rate from the Winding Gulf fields. It is feared that it will take some time to get the western accumulation worked off and the empties back into the various West Virginia fields.

Tug River totals jumped from 33,000 tons for Christmas week to 77,700 tons during the week ended the third, with 14,100 cars loaded on the fifth. Tug River operators were just beginning to preen themselves on the fact that after a light loading during the holidays, the field had restored production to normal, when another car shortage made its appearance in this territory on Jan. 6, forcing a number of mines to suspend operations, such a shortage being extremely unusual so early in the week. The outlook for the balance of the week was extremely unfavorable. Another factor in hampering the move of both loads and empties has been an insufficient motive power which has choked side tracks with loads and has of course interfered with the prompt handling of empties. Even export coal is not moving as freely as would be possible were restrictions out of the way and the car supply more favorable.

Production took a sharp turn upward during the week ended Jan. 3 in the Pocahontas region after the Christmas lull reaching a total of about 278,000 tons or approximately 150,000 tons more than had been produced during the week ended the twenty-seventh, there being little complaint of a car shortage. Such a shortage, however, began to rear its head about the sixth just at a time when operators were beginning to feel somewhat optimistic over the export outlook.

Huntington, W. Va.

Car supply about 50 per cent of normal first of the year. Some 30,000 tons of Logan coal commandeered for railroad use. A loss of $30,000 to the operators. Payments by railroads for confiscated and diverted coal exceedingly slow.

Production in the Guyan field was still under normal during the week ended Jan. 3, reaching a total of only 197,000 tons although that represented an increase of 73,000 tons over the output of Christmas week. Loadings would have been much larger but for the fact that once again an insufficient supply of cars made it impossible to operate mines to capacity, although during the last three days of the year production was almost normal. It was during the last half of the week, however, that production was affected by a car shortage, the supply during the period in question being little more than 50 per cent. Cars were equally scarce during the early part of the week beginning Jan. 5, so that not more than 25,000 tons a day was being loaded. Another factor in holding down production was a labor shortage on New Year's day though more men were at work than had really been expected.

A damper was put on the effort of some Logan operators, at least as to export coal, when on Jan. 6, word was received that the Hampton Roads Committee had directed that 30,000 tons of high volatile coal from the Logan field be commandeered and used as fuel for the Boston & Maine R.R.; the coal is to be paid for, not at export prices, though shipped to tidewater to be exported, but at Government prices, or in other words about one dollar a ton under the export price. Commandeering of the tonnage in question meant a loss of $30,000 to the operators. Some of the Logan operators indicated they would make an effort to prevent such commandeering as being unfair and unjust.

Movement of Logan coal to western points has been retarded somewhat by the large amount of loads at Russell, Ky., awaiting disposition and to the refusal of roads west of Cincinnati to accept shipments from the New River and Logan fields. Not only has the non-delivery of quite a large tonnage, confiscated or diverted or held for diversion during the strike, curtailed the number of empties available but it has augmented the large sums outstanding and due to shippers, and Logan operators still find it necessary to utilize trade acceptances in order to finance their business. Payments by railroads and by ultimate consignees have been exceedingly slow and much red tape has also delayed payments.

Large loadings during the last three days of 1919 were all that stood in the way of a very material decrease in the tonnage of coal handled by the Chesapeake & Ohio during the week ending the third. During that period the railroad company handled 12,127 cars of coal or 606,350 tons.

Fairmont, W. Va.

Car shortage limits production in northern West Virginia fields. Many Fairmont region mines idle first of the year. Embargo removed, exports picking up again. Much heralded payments for diverted coal proving Will-o'-the-Wisps.

While the supply of cars for the various fields in northern West Virginia was insufficient for full requirements of the mines during the week ended Jan. 3, there was about 80 per cent supply during all but two days of the week. The old year has ended and the new year ushered in, however, with a lower supply than obtained during any other part of the weekly working period. In the Fairmont region for instance there were not more than 600 or 700 cars available on the thirty-first as against about 1600 ordered, similar conditions prevailing elsewhere througnout the northern part of the state. Likewise on Jan. 1, while the supply was somewhat larger, it still lacked much of being sufficient to enable mines to work full time. The greatest number of mines shut down, however, was on Thursday when in the Fairmont region alone 64 mines were unable to operate because of an absence of cars and, during the remainder of the week, mines at scattered points were still marking time because of transportation disabilities.

While export markets afforded an outlet once again beginning Dec. 29, following the removal of the export embargo, shipments of that nature were not particularly large, in fact not as large as had been expected, due no doubt to the large tonnage at tidewater awaiting shipping facilities and also due to restrictions still existing. Still, it is stated that quite a large tonnage has recently been shipped to the West Indies and South America from northern West Virginia points.

Northern West Virginia operators are still living in hopes that they will soon begin to receive compensation for the large tonnage of coal diverted and confiscated while the strike was in effect. During the week ended the third some encouragement was derived from the fact that information was being furnished by delivering roads showing the final destination of some of the coal produced in northern West Virginia during the strike. The much heralded payments for diverted coal are proving to be something of the Will-o'-the-Wisp so far as northern West Virginia operators are concerned.

The number of cars ordered by various mines indicates quite a healthy demand, being much larger than usual. Production in the Fairmont region during December reached a total of 1,373,800 tons, other regions producing in like proportion. Operators are busy endeavoring to bring contract deliveries up to date and trying to take care of spot orders. Railroads were lighter buyers during the week ended the third than was the case in previous weeks.

Ashland, Ky.

Car supply good at end of 1919, but principal loss in production at beginning of new year. Miners get back to work promptly after holidays. In general embargoes removed on northeast Kentucky coal.

The excellent car supply prevailing during the last three days of 1919, enabled mines in the northeast Kentucky fields to increase production about 40,000 tons over the output for Christmas week. Taking the week as a whole there was a total output during the weekly working period ended Jan. 3, of 143,000 tons, that representing about 63 per cent of capacity. The largest source of loss was found in a car shortage of 41,000 tons, equivalent to 21 per cent of capacity. The labor shortage loss of 28,000 tons represented 13 per cent of capacity, there being a loss of only 7,000 tons or 3 per cent from mine disability.

The principal losses in production came after the end of the year or during the last three days of the week ended the third, when New Year's day and then extremely cold weather apparently exerted quite a potent effect on the movement of empties. This was especially true on the Chesapeake & Ohio since that road was able to furnish only about half enough cars to mines during the last half of the week, making an average car-shortage loss on that road for the week of 25 per cent and offsetting the good supply existing during the first three days of that period.

While the worst car shortages have usually been at Louisville & Nashville mines, yet the week ended the third, or rather the first part of that week, was an exception since all mines on the road in question were fully supplied until the end of the year, the car shortage on the L. & N. reaching only 12 per cent of capacity.

More work was done by the miners in northeast Kentucky during the holiday periods which wound up 1919, than during the holiday period a year ago, as shown by a greatly increased holiday production for 1919; for the two weeks in question the tonnage being 221,000 as compared with only 188,000 tons during the corresponding two weeks of 1918. Railroad officials were hardly prepared for the general resumption of work so soon after the holidays and it caught them, in a sense, unawares. Promptness of the miners in going back to work so soon was probably due to the general shortage of funds among them and also to the fact that Christmas beverages were harder to obtain.

One source of a car shortage is the large number of loads at Russell, Ky., a distributing point held, during the general shortage of coal, for distribution to points in the West, but since then unacceptable for that purpose with western mines in operation.

The market for northeast Kentucky coal was somewhat enlarged through the removal of embargoes on eastern shipments and on embargoes in general, and northeast Kentucky producers found a ready market for their product.

Victoria, B. C.

The fatal-accident record in British Columbia in 1919. Growing interest of miners in acquirement of knowledge. Efficiency of Mines Inspection Staff. Interesting statistics.

Only twelve fatal accidents occurred in the coal mines of British Columbia during 1919. This is a new record of quite a satisfactory character; never before in the history of coal mining in this province has it been equalled. In point of number of deaths it has been paralleled once in the last 21 years. This occurred in the year 1905, but it should be remembered in considering the statistics of that year, that then there were little more than half as many men employed in and around the mines as now is the case.

This announcement regarding the operation of the coal industry of the province was made on Jan. 7, 1920, by Hon. William Sloan, Minister of Mines. That he was gratified is scarcely an adequate expression of his sentiment. He trusted that with the growing interest being manifested by miners in the acquirement of knowledge of mine gases and their apparent greater appreciation of the importance of the safety-first principle, it would be possible to continue the contemplation of similar or even more satisfactory figures. Mr. Sloan also complimented George Wilkinson, Chief Inspector of Mines, on the evidence of the efficiency of the Mines Inspection Staff of the Provincial Bureau of Mines.

Of the 12 accidents referred to four were the result of falls of rock; four resulted from falls of coal; and an equal number occurred in the handling of mine cars and in haulage. The fatalities were divided among the collieries as follows:

Canadian Collieries, Ltd., Cumberland (all of whom were Orientals)	5
Canadian Collieries, Ltd., Extension	2
Canadian Western Fuel Co., Nanaimo, B.C.	4
Crow's Nest Pass Coal Co., Coal Creek	1
Total	12

The nationality of those killed was as follows: English, 2; Scotch, 2; Canadian, 1; Italian, 1; Austrian, 1 (naturalized British); Orientals, 5.

An estimate of the fatalities per 1,000 employees would put the percentage at approximately 2.2 as compared to the average of the past ten years of 5.095. This year's average, therefore, compares quite favorably with that of Great Britain and other European countries; this is worthy of special note when it is borne in mind that in the coal fields of the United Kingdom and of the Continent there are so many more miners actively engaged, and that it takes more than one serious accident to materially affect the general average at the end of a given period.

Only one fatality occurred in the mines of the Crow's Nest Pass district during 1919. This again is a record, if the eastern British Columbia field is considered apart from the rest of the province. It is the lowest mark since the first year of the field's development, over twenty years ago. Mr. Wilkinson notes, in his report, that the majority of these 12 fatal accidents could have been avoided had ordinary care been exercised.

PENNSYLVANIA

Anthracite

Scranton.—The miners of the Hyde Park colliery of the Delaware, Lackawanna & Western R.R. Co.'s Coal Department, have made a request that further mining in the surface seam of the colliery under the Washburn Street Cemetery be discontinued. The matter, it is said, has been brought to the attention of the lesser officials of the coal company, and the wishes of the men will be carried to the head of the corporation within a brief period. From what is learned, a great amount of coal has been removed from under the cemetery but by leaving the pillars that remain and filling in the voids the cemetery can be made safe. Should the mining be continued the graves probably will be disturbed and there will be a repetition of the conditions that have befallen other cemeteries in this city and valley as the result of the mining of coal. It is said the miners have protested against further operations under the cemetery that are liable to cause havoc and that some of them have openly refused to further mine coal in that area.

Well defined reports in mining circles, says a Scranton authority, are to the effect that the Hudson Coal Co. is about to dispose of a number of its collieries in the Scranton and Wilkes-Barre districts. The Dickson and the Manville collieries in this district are slated to be sold, it is stated, and report has it that the Laflin in the Wilkes-Barre district will be taken over by the Suffolk Coal Co., controlled by the Jermyn interests. This company recently started operating the Langcliffe colliery which it acquired from the Hudson company. It was stated that the Von Storch Collieries Co., which has taken over the Van Storch mine, is negotiating for both the Manville and the Dickson; but Warren Acker, one of the owners of the Von Storch, said that the purchase is not contemplated at this time. He intimated his company will wait until the new operation is definitely under way.

For some time the Manville was operated alternately by the Hudson company and the Delaware, Lackawanna and Western company; finally the former company purchased the Lackawanna interest. This appears to have been the motive of the Hudson company inasmuch as its sale could be more easily accomplished than when it was under the joint ownership.

ARKANSAS

Fort Smith—The State Mining Board here (Jan. 3) upheld Governor C. H. Brough in discharging Thomas H. Shaw, as State Mine Inspector. Mr. Shaw asked the local Circuit Court for an injunction restraining the board "from interfering with him in the discharge of his duties as State Mine Inspector." Hearings on the injunction requested by Mr. Shaw and for the continuance of the temporary order issued against him are set for an early date.

During the last week in December, Mr. Shaw has been refused admittance to a number of mines in this section. In one instance, 700 miners employed by the Central Coal & Coke Co., at Huntington, refused to enter the mines when they found (upon reporting for work) a notice posted by Mr. Shaw, as State Mine Inspector, declaring the mine closed. He posted the notice when refused admittance by the company officials, who claimed they had received orders from the governor not to admit Shaw as he no longer was State Mine Inspector. Governor Brough said that mine officials who had refused to allow Mr. Shaw to enter the mines, had acted under his instructions, and that appeals to the Supreme Court from rulings of justice courts, fining the mine officials, would be taken. According to a dispatch from Fort Smith, Mr. Shaw intends to close every mine in the state where officials refuse to recognize him as state inspector. He contends that Governor Brough did not have the legal grounds for his removal.

WASHINGTON

Colville—The Colville Valley Coal Co., at Valley, south of this place, has attained a depth of 475 ft. in its slope and expects to sink 200 ft. deeper, according to H. G. West, secretary-treasurer of the company. The seam is ten ft. thick at the bottom of the slope and is said to be clean coal. An entry was started at a depth of 450 ft. Owing to the condition of the road between the mine and the railroad loading point, transportation of coal to market is impracticable at present; efforts are being centered upon development work.

Foreign News

Lens, France.—According to estimates made by the manager of the Society of Mines at Lens, the mines, which were destroyed and flooded by the Germans, will be in shape for mining operations in five years. In ten years it is predicted that the production will reach the mark of 1913. At present pumps of 30,000 hp. are at work, and, it is said, they will have the mines dry in two and a half years. In 1913 these mines produced four million tons of coal, one-tenth of the French coal output.

Brussels, Belgium — It is reported that Belgium is contemplating a plan of centralizing the coal output and controlling its distribution in order to obviate the effects of the present crisis. According to this plan, groups would be organized in each province for every branch of industry. These groups would centralize the orders which would be forwarded to a special organization connected with the Ministry of Economic Affairs. This ministry would allocate coal among provincial groups in proportion to the quantity available, and these provincial groups would handle the distribution.

Sydney, N. S.—It is officially announced that as a result of the improved methods of mining by the Dominion Coal Co., in its Cape Breton workings, that the output for December amounts to 312,891 tons, as compared with 272,725 tons for December, 1918.

This represents a gain of nearly 15 per cent. President Workman states that January should show an even greater increase. The installation of turbine generators has proved completely successful. Electricity generated by the new equipment is being utilized on the company's shipping piers. The embargo on the shipment of coal to foreign ports having been lifted, a considerable export trade is anticipated.

Coming Meetings

Northern West Virginia Coal Operators' Association will hold its next meeting Feb. 10, 1920, at Fairmont, W. Va. Secretary, George T. Bell, Fairmont, W. Va.

American Institute of Mining and Metallurgical Engineers will hold its next meeting Feb. 16 to 19, in New York City. Secretary Bradley Stoughton, 29 West 39th St., New York City.

The Wholesale Coal Trade Association of New York will hold its next meeting Jan. 20, 1920, at the Whitehall Club, New York City. Secretary, Charles S. Allen, 1 Broadway, New York City.

The Rocky Mountain Coal Mining Institute will hold its winter meeting Jan. 20 to 22, 1920, at Denver, Colo., with headquarters at the Albany Hotel. Secretary, F. W. Whiteside, Denver, Colo.

The Material Handling Machinery Manufacturing Association will hold an open convention at the Waldorf Astoria Hotel, New York City, Jan. 29 and 30. Secretary, Z. W. Carter, 35 West 39th St., New York City.

Indiana Engineering Society will hold its annual meeting Jan. 23 and 24 at the Claypool Hotel, Indianapolis, Ind. Secretary Charles Brossman, 1503 Merchants Bank Building, Indianapolis, Ind.

Personals

H. H. Staggers, of Fairmont, is manager and coal purchasing agent for A. R. Hamilton & Co., coal jobbers of Pittsburgh, his territory includes West Virginia.

Arthur A. Allan, superintendent of the Adah mine of the Westmoreland-Fayette Coal & Coke Co., at Cheat Haven, Fayette County, Pa., has been promoted to the position of general superintendent of the company with headquarters at Fairmont, W. Va.

Hod Eller, the baseball pitcher, who was largely instrumental in winning the World's championship for the Cincinnati Reds, states that he has completed negotiations whereby he is to become part owner in a Danville (Ill.) coal mine and serve as assistant general manager of the concern.

A. A. Straub, Jay W. Johns and **T. J. Atkinson**, recently associated with the Superba Coal & Coke Co. as vice president and general manager, general coal sales manager and general coke sales manager, respectively, have organized the Straub-Atkinson Coal & Coke Co., beginning Jan. 1, 1920, with offices, Suite 351 Union Arcade Building, Pittsburgh, Pa.

Frederick Howarth, of Brownsville, Pa., superintendent of Alicia No. 2 mine of the Pittsburgh Steel Co., has resigned that position, effective Jan. 15, to enter upon the duties of superintendent of the Isabella mine and coke ovens of the Hillman Coal & Coke Co., at Hillcoke, Fayette County, Pa., succeeding David E. Parker. Mr. Howarth is a son of William E. Howarth, a district state mine inspector, of Brownsville, Pa.

W. P. Meiring has resigned as general superintendent of the Himler Coal Co. to open offices in Williamson, W. Va., as a consulting mining engineer; he purchased the business of the firm of Evans & Knight. Mr. Meiring was for six years with the Pond Creek Coal Co. as engineer, chief mine inspector and assistant general superintendent.

Obituary

C. E. Kunz, died at his apartments at the Elks Club in Albuquerque, N. M., on Jan. 2. Death is believed to have resulted from heart disease. He was president of the New States Coal Company.

William W. Ray, a coal operator, died at Terre Haute, Ind. recently. He was 60 years of age. He was a native of Cambridge City, Ind., and came to Terre Haute, in the early eighties. Later he engaged in the coal business; he was president of the Sanford Mining Co. and the Big Vein Mining Co. Mr. Ray is survived by a widow and two children.

John H. Reilly, superintendent of the Reilly-Callaghan coal mines, Georges Township, Fayette County, Pa., was killed in the mines he had charge of on Dec. 31, by being run down by a trip of cars in the mines. He was buried in Uniontown, Pa. He was a son of E. S. Reilly, of the Reilly-Peabody Fuel Co. and the American Connellsville Coal & Coke Co., of Pittsburgh, Pa.

John Cooper Thomas, a wealthy coal operator of Bramwell, W. Va., died on Jan. 6 at the age of 24 years. He was at his winter residence on Belle Isle, Miami, Fla. Mr. Thomas was an airman during the war. His father was a son-in-law of John Cooper, a pioneer operator of the Pocahontas field. The Cooper and Thomas interests controlled valuable coal properties in southern West Virginia.

Thomas Lilley, 72 years old, millionaire coal operator and farmer, died suddenly at his home in West Brownsville, Pa., Jan. 5, from apoplexy. Mr. Lilley was the founder and president of the Lilley Coal & Coke Co., and owned a large acreage of coal lands in Washington County, Pa. He laid the foundation for his fortune by cattle dealing and farming. In 1913 he established the Lilley Coal & Coke Co., which has an output of 2,500 tons daily.

Publications Received

Coal. Pennsylvania — Bituminous No. 1 Cost Report of the Federal Trade Commission. Illustrated; pp 103; 5⅝ x 9½ inches.

Preliminary Report on the Mineral Resorces of the United States in 1918. Department of the Interior. U. S. Geological Survey Unillustrated; 5¾ x 9⅛ inches.

Extinguishing and Preventing Oil and Gas Fires. By C. P. Bowie. Bulletin 170. Petroleum Technology 48. Department of the Interior, Bureau of Mines. Illustrated; pp. 50; 6 x 9 inches.

Prices of Coal and Coke. War Industries Board. W. I. B. Price. Bulletin 35 of the series—History of Prices During the War. Illustrated; pp. 115; 5⅝ x 9½ inches.

Notes on the Black Sand Deposits of Southern Oregon and Northern California. By R. R. Hornor. Technical Paper 196. Department of the Interior, Bureau of Mines Illustrated; pp 42; 6 x 9 inches.

Coke and Byproducts in 1916 and 1917. Department of the Interior, U. S. Geological Survey By C. E. Lesher and W. T. Thom, Jr. Published Sept. 19, 1919. Illustrated; pp. 1137-1202 (Mineral Resources of U. S. 1917—Part II); 5¾ x 9⅛ inches.

Coal Mine Fatalities in the United States in 1918. Compiled by Albert H. Fay. Department of the Interior, Bureau of Mines. Unillustrated; pp 61; 5¾ x 9⅛ inches. Also contains a list of explosives, lamps and motors tested prior to Jan. 31, 1919.

Asbestos. — Published by Secretarial Service, Bulletin Bldg., Philadelphia, Pa., Vol. 1, No. 3, Sept. 1919. This new publication—**Asbestos**—is published in the interest of the asbestos and magnesia industry; it is designed to be the mouthpiece of the industry which it represents. Illustrated; pp 28; 5 x 7½ inches.

Geology and Coal Resources of the Coal-Bearing Portion of Tazewell County, Virginia. By T. K. Hainesberger. Virginia Geological Survey, University of Virginia. Charlottesville, Va. Prepared in co-operation with the U. S. Geological Survey. Bulletin XIX. Illustrated; pp. 195; 7 x 10 inches.

Trade Catalogs

The Pyrograph. Davis-Bournonville Co., Jersey City, N. J. Bulletin. Pp 8; 8½ x 11 in.; illustrated. This boiler shop cutting machine is described and shown in operation.

Blawforms. Blaw-Knox Co. Pittsburgh, Pa. Booklet. Pp. 24; 6 x 9 in.; illustrated. Illustrates the applicability of this type of form for road, sidewalk, curb, and curb and gutter construction.

Rails. Walter A. Zelnicker Supply Co., St. Louis, Mo. Bulletin No. 266. Pp. 8; 3⅞ x 8½ in.; illustrated A folder announcing new and second-hand railway equipment and accessories.

Condensers, Pumps, Cooling Towers, Etc. Wheeler Condenser & Engineering Co., Carteret, N. J. Bulletin 112-B. Pp. 36; 8 x 10½ in.; illustrated. Complete description of the apparatus manufactured by the Wheeler company.

Nickel and Its Products. The International Nickel Co., 43 Exchange Place, New York City. Booklet. Pp. 21; 4 x 9¼ in.; illustrated. A description of the company's nickel products for the use of prospective [illegible]

Stine Special Machinery for Mine Use. S. B. Stine, Inc, Osceola Mills, Pa. Bulletin 110. Pp 8; 6⅞ x 10 in.; illustrated. [illegible] company

How Columbian Rope is Made. [illegible] brief description accompanying

[illegible] sole agents. Bulletin. Pp 8; 8½ x 11 in.; [illegible]

Byproduct Coke and Gas [illegible] Koppers Co., Pittsburgh, Pa. Pp 67; [illegible] of The Koppers Co.'s booklet giving information about the Koppers oven and illustrations of some of the plants of this make in the United States. Byproduct oven and byproducts data noted.

Motor Trucks from a Practical Engineering Standpoint. International Motor Co., New York City. Booklet. Pp. 75; 4½ x 7¼; illustrated. The motor company states that it has tried (in this booklet) to express in simple, straight-forward language, the outstanding features of the Mack truck and the various reasons why each feature of construction has been adopted.

Milliken Buildings. — Milliken Brothers Manufacturing Co., Inc., New York, N. Y. Catalogues 10 and 11, respectively. Pp. 44 and 31, respectively; 8½ x 11 in.; illustrated. Catalogue 10 — "Choice of a Thousand Buildings." Catalogue 11—"Erection Handbook." These catalogues are descriptive of Milliken buildings, constructed under the standardized truss unit system designed and perfected by the Milliken company.

Sanitary Drinking Fountains. —Department F; **Metal Stools and Chairs**, Department D; **Sanitary Washbowls**, Department A; **Metal Lockers**, Department B; **Miscellaneous**, Department G. Above — pp. 8; 6 x 9 in.; illustrated. **Racks**, Department E Pp 16; 6 x 9 in.; illustrated Manufacturing Equipment and Engineering Co., Boston, Mass. These catalogues illustrate and note details about the various specialties in question. Additional information is published for distribution in the form of sheets and folders covering various metal, sanitary and fireproof equipment, lists of users and price lists.

Details Allis-Chalmers Oil Engines, Diesel Type. Allis-Chalmers Manufacturing Co., Milwaukee, Wis. Bulletin 1537. pp. 31; 7⅞ x 10½ in.; illustrated. Illustrates and notes special parts of the various pieces which make up the Diesel engine made by this company to assist in ordering repair and spare parts. **Centrifugal Pumps and Centrifugal Pumping Units.** Allis-Chalmers Manufacturing Co., Milwaukee, Wis. Bulletin 1632-C. Pp. 51; 7⅞ x 10½ in.; illustrated. Complete description of the special types of centrifugal pumps and centrifugal pumping units made by the Allis-Chalmers Co.

Industrial News

Nashville, Tenn.—The Phoenix Coal Co. of this place has increased its capital stock from $100,000 to $200,000.

Clarksburg, W. Va.—The Wolf Summit Coal Co. has increased its capital from $350,000 to $750,000 to provide for proposed business expansion.

Follansbee, W. Va.—The J. C Arnold Coal Co. is planning for the development of an additional mine in the Follansbee district

Cleveland, Ohio—The International Collieries Co., has been incorporated with a capital of $10,000 by Robert E. Roehms, George M Roudebush, Horatio Ford, K. C. Junke and N. I. Young.

Pittsburgh, Pa. — The Blanchard Coal Co. has been incorporated with a capital of $300,000. The incorporators are: Wm. G. Blanchard, Frank H. Robinson, Walter H. Hopple, of Pittsburgh, Pa.

Canton, Ohio—The Willard Gas Coal Co. of this place has been incorporated for $150,000; George A. Williams, C. A. McDonald, Celsus Pomerene, Thomas H. Miller, Ralph S. Ambler, incorporators.

Lexington, Ky.—The Wisconsin Coal Co. has been incorporated with a capital of $200,000 to engage in general coal mining operations in the Lexington district. J. H. Bowling, N. B. Perkins, and A. V. Brown are the incorporators.

Canton, Ohio.—The Willard Gas Coal Co., has been chartered with a capital of $150,000 to mine and sell coal. The incorporators are: George A. Williams, C. A. McDonald, Celsus Pomerene, Thomas H. Miller and Ralph S. Ambler

Cincinnati, Ohio.—The Deaker Mining Co., of Kingwood, W. Va., has been incorporated to operate mines in Preston County; capital stock, $300,000; incorporators, A. T. Carnahan, George M. Anderson, J. A. Hagstrom, F. G. Carnahan and M. E. Schleb, all of Akron, Ohio.

Washington, D. C.—Blocks aggregating 9,115.92 acres in the Cook Inlet coal field were offered for lease about the first of January, by Secretary Lane under the [illegible] leasing law. Applications will be received at the general land office through the month of January.

Mortin's Ferry, Ohio.—An explosion in the Laughlin mine of the American Sheet & Tin Plate Co., near here, caused 18 miners to be imprisoned for a time but they dug themselves out. Three of the miners were badly burned. A fire following the explosion was quickly extinguished.

Himlar, W. Va.—The Matta Co-Operative Coal Co., of this place has been incorporated to operate mines in Mingo County; capital stock, $250,000; incorporators, John Matta, Martin Himler, E. J. Lang, William Fotta and Claude Clark, all of Himler.

Columbus, Ohio—The Echo Coal Co., has been chartered with a capital of $10,000 to mine and sell coal. The concern will increase its capital at an early date, and negotiations are now in progress for a large tract of coal lands in the Hocking Valley. The incorporators are S. Cottingham, Fred Essex, O. E. Harrison, T. J Frasure and H. C. Alread.

Birmingham, Ala.—Papers of incorporation of the Southern Appalachian Coal & Iron Co. were filed in Gadsden recently. The company has purchased about 12,000 acres of mineral lands near Ft. Wayne, De Kalb County, and, it is stated, will begin developments at once. The incorporators are W. L. Smith, D. E. Mitchell, E. R. Lefevre and G. E. Hill. E. R. Lefevre is president of the company, which is capitalized at $75,000.

Columbus, Ohio—In a decision handed down recently in the case of John H. Winder, president, of the Sunday Creek Coal Co., against John S. Jones, chairman of the coal company's board of directors, Federal Judge Sater refused to grant Winder's plea that a receiver be appointed. The court also reduced a $1,477,000 claim of Jones in the amount of $333,000, and ordered a receiver appointed for the Steadman Wholesale Grocery Co., of Athens, a holding of the company.

Brownsville, Pa.—The Diamond Coal & Coke Co., of Pittsburgh, Pa., is preparing to fire the 60 beehive coke ovens near here, recently purchased from the Brownsville Coke Co. The ovens are near the Pike mine of the Diamond Coal & Coke Co., from which workings the coal will be mined for use in these ovens. The mine of the Brownsville Coke Co. has been worked out and abandoned. W. Guy Sroder is general superintendent of the Diamond Coal & Coke Company

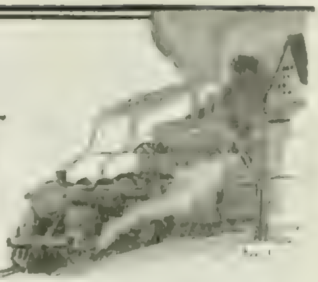
Princeton, W. Va. — The Monticello Smokeless Coal Co., recently organized with a capital of $400,000, is arranging plans for the development of approximately 1,800 acres of coal properties in the Princeton district. It is proposed to install complete mining machinery and equipment to provide an annual capacity in excess of 200,000 tons. F. M. Lee, Alpoca, W. Va., is president and manager; Richard Hancock, Lynchburg, Va., is vice president; H. E. Jarnette, Princeton, secretary, and E. M. Merrill, Beckley, W. Va., treasurer.

St. Louis, Mo.—The Merchants' Exchange, through Charles Rippin, traffic manager, is urging the Ways and Means Committee of the Board of Aldermen, which is considering the proposed $22,000,000 bond issue bill, to include an item for the completion of the free bridge, so that it will accomplish the purpose for which it was built—the elimination of the coal arbitrary of 20c. a ton. Rippin has suggested that team-track yards in the Mill Creek Valley, between Eighth St. and Jefferson Ave., could be used to good advantage. He has also urged that the city purchase locomotives and haul the coal across the bridge and if necessary construct a railroad from the bridge to the coal mines on the Illinois side

St. Louis, Mo.—The Illinois Traction Co. is continuing to make connections with Illinois mines with a view to greatly enlarging its shipments into St. Louis. The traction line has been handling the output of the K.-D. mine, at Worden, which was sunk by Vincent Kerens and G. H. Donnewald of St. Louis and later sold to the traction company. Recently tracks were completed from the main line to the Liberty Mine, at Gillespie, the output of which also will be hauled to St. Louis. Arrangements have been made to connect with one of the large mines at Carlinville and surveys have been made for running connections to two Edwardsville mines—those of the East Side Coal Co. and the Madison County Mining Co.

Welch, W. Va.—It is reported that the Central Pocahontas Coal Co. has acquired all the holdings and assets of the New Pocahontas Coal Co. of Hemphill, from W. E. Deegans, O. C. Huffman; Jack Faulkner and others. The property adjoins the holdings of the Solvay company.

MARKET DEPARTMENT



Weekly Review

Production Is Above Average for Some Months Past. Prices Are Under Government Control and Holding Steady. Demand Fairly Active with Little Trouble Anywhere From Lack of Market.

PRODUCTION for the week ending Jan. 3 is estimated at 10,950,000 tons. This was an increase of 20.9 per cent as compared with the preceding week and nearly 30 per cent as compared with the corresponding week of 1919. Recovery from the strike is thus complete and production is now at a level which is well above the average of the past year.

Few fluctuations in price are noted since the figures covering coal at the mines are fixed by the Government. Complaint is heard that some mines are unable to produce coal and absorb the increased wage rates granted and continue to sell their output at the fixed price without incurring serious loss. Some coal companies having contracts with public utilities have attempted to evade, or in a measure abrogate these agreements, giving car shortage as an excuse therefor, while at the same time endeavoring to ship coal to the seaboard for export. Such firms, as well as all others, are now finding it difficult to secure export permits unless they can show that they have kept faith with public utilities, and their other Americans customers generally.

Little complaint of no market is heard anywhere. Car shortage has become the chief factor tending to restrict output. In some regions the demand is so insistent as to absorb all available supply and leave no possibility of wholesalers or retailers building up any stocks.

Industrially the country is booming. The steel strike has been called off and mills are running to the limits of either their capacities or the labor supply. The same conditions prevail in certain other industries, and the demand for fuel is now, therefore, and bids fair to continue, strong for an indefinite period.

WEEKLY PRODUCTION

From a recent report of the Geological Survey the bituminous industry entered the year 1920 with production at a rate well above any period in the past year except the week of Oct. 25, just before the coal strike. The output on the five working days of the week ended Jan. 3, 1920, averaged 2,066,000 tons. This was larger than the performance during any New Year's week of the past three years, the period over which the Geological Survey's records of weekly production extend.

The total output for the week is estimated at 10,950,000 net tons. This was an increase over Christmas week of 2,391,000 tons. The increase was partly due to the fact that about 660,000 tons were produced on New Year's Day itself while on Christmas Day the production was negligible. Taking the country as a whole, New Year's Day counted for about three-tenths of a full working day. The greater part of the increase, however, was an actual gain in rate of production, a gain which amounted to 20.9 per cent. Compared with New Year's week, last year, the increase was nearly 30 per cent.

The completeness of the recovery from the depression of the strike period is shown by the fact that on the last three days of the old year production averaged 107 per cent of the rate for the four weeks ended Oct. 25, which may be regarded as normal.

The total movement of soft coal from the mines to Atlantic ports was 2,235,000 net tons, less than half the record tonnage of October, and with the exception of March, the smallest in any month of 1919. Compared with November of the preceding year, the decrease was 1,035,000 tons.

Atlantic Seaboard

BOSTON

Market drags with only scattering inquiry. Few operators have inclination to take spot business. Steam users comfortably supplied. Receipts show slight increase. Export shipments resumed via New York and Philadelphia. Shipping Board advance likely to slow down coastwise shipments. Hampton Roads market quiet. Anthracite domestic sizes ease somewhat but production falls off. Retailers disposed to keep taking coal.

Bituminous—Notwithstanding the manifest difficulty of buying spot coal under present regulations, there appears to be no snap whatever to the current market. The high grades are moving almost exclusively on old contracts, either at home or for export, and none but the inferior coals that in such a market would sell at less than the fixed price is available in any quantity. On the other hand, the demand in this territory is only scattering, and for the most part is confined to small current requirements that ordinarily are not the subject of contract.

Only a few large buyers show any interest: they are simply buying with accustomed prudence in anticipation of a possibly tightening market in February or March. Whether such a situation will develop it is difficult now to say; much depends upon receipts the next thirty days. The trade atmosphere is quiet, with more or less pronounced opinions on the futility of trying to carry through a fixed price under conditions such as now prevail.

In any case, there are relatively few operators who are at all inclined to accept spot business. Apparently there are ample consignments on file on which the wage increase can be assessed, and without doubt there will be resort to a number of expedients before any comprehensive order will be taken on the present Government price.

There is quiet selling on the part of producers who wanted to be as free as possible from season contracts, but judging from reports the number of operators who find themselves in this position is small. Those who have an output that ordinarily would not be considered in this territory are being favored with small orders by steam users who are impressed with the advantage of keeping coal coming. The aggregate of such business is not large, however, and it is quite likely that the mild weather will take something off the edge of what to-day promises to be a somewhat constricted market.

The Shipping Board has announced an advance of 75c. in the water rate from Hampton Roads to Boston, other destinations at the usual differentials. This is effective Jan. 10 and the trade is much interested to observe the effect on shipments the remainder of January. Today there is a bunching of steamers at both Norfolk and Newport News due to strenuous efforts on the part of the agencies to clear cargoes coastwise before the advance goes into effect. The demand for prompt shipments off-shore also tends to an accumulation of waiting tonnage.

Generally, the Hampton Roads market is quiet. Output is on a satisfactory basis, the great bulk of it moving on contract, and for the present the fixed Government price is likely to cause the operators no particular embarrassment.

It remains to be seen what will happen in the spring when advances on coal, tolls, and water freights are likely to be combined in making a still greater differential in favor of all-rail deliveries from central Pennsylvania. There are those who figure that the 50 per cent drop in receipts by water during 1919, as compared with 1918, will not be a circumstance to the decrease tonnage which will be New England's portion next season from the Pocahontas and New River fields.

Anthracite—The demand for domestic sizes has eased noticeably the past few days. Milder weather accounts for some of the slackening demand, but the broad reason is that their territory is becoming fairly well stocked. There are communities that still need shipments to make up their full quota, but these are expected to come forward with less difficulty from now on.

There is developing among retailers an inclination to take on now what coal can be comfortably stored. This attitude commends itself to some of the far-sighted members of the trade, although there are certain shippers who to-day have difficulty in disposing of sizes like egg and pea.

NEW YORK

Pressure for domestic coals easier and dealers cancel orders. Chestnut and stove in strongest demand. Long Island dealers are said to be well supplied. Steam sizes hard to move except on concessions. Bituminous market quiet Movement of coal slow and transatlantic steamers are delayed in sailing.

Anthracite—The intense pressure has become easier and the domestic sizes are in better shape. With the average temperatures remaining as they have been a few weeks longer, the situation will be considerably relieved, and there are tradesmen who venture the opinion that the piers will soon be stocked with coal.

Dealers are so well supplied that many of them have requested the companies to slow up their deliveries. Many cancellations of orders for individual coals were reported to have been made and it was said that no dealers were willing to pay more than 75c premium for domestic sizes.

Reports from the West, New England and Canada indicate good sized supplies on hand and the dealers not anxious to add to their stocks. Many dealers on Long Island are said to have full bins.

There were reports that some individual operators were out looking for buyers and that some of them predicted that unless the weather becomes colder within the next few days that concessions would have to be made to move the coal.

The large producing companies did not have any great amount of supplies here. They were taking care of their regular customers without any difficulty. Chestnut and stove were the sizes most in demand with egg and pea close seconds.

The steam coals are inactive. Demand for these sizes is quiet and they are accumulating rapidly. Buckwheat and rice are not yet a burden, but it entails considerable work to keep stocks down. Barley is the hardest to move and it is necessary very often to make concessions.

During the week ended Jan. 9 there were 5,190 cars of anthracite dumped at the railroad piers in this harbor as compared with 5,618 cars the previous week, a decrease of 428 cars.

Current quotations for company coals, per gross tons, at the mines and f.o.b., tidewater, at the lower ports are as follows:

	Mine	F.O.B. Tidewater
Broken	$5.95	$7.80
Egg	6.35	8.20
Stove	6 60	8 45
Chestnut	6 70	8 55
Pea	5 30	7 05
Buckwheat	3.40	5 15
Rice	2.75	4 50
Barley	2.25	4.00
Boiler	2 50	4.25

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

The following are the retail prices in Manhattan and the Bronx, following the advance of 50c. per ton on domestic sizes. 25c. on steam sizes and 65c. on bituminous, as the result of the $6 per week wage increase granted the employees of the dealers on Jan. 1:

Broken	$11 05
Egg	11.25
Stove	11.50
Chestnut	11 60
Pea	9 50
Buckwheat	7.15
Buckwheat No. 2	6 50
Buckwheat No. 3	6 00
Bituminous	7 90
Red Ash	12 50
Lykens Valley	13 25
Cumberland	8 65
Cannel	20 00
Coke	10 50

These prices are for coal delivered on consumer's sidewalk. Yards prices to peddlers are $1 less than above prices. On deliveries north of Mosholu Road, Bronx, a extra charge of 25c. per ton is made.

The retail prices in Brooklyn for the domestic sizes, put in consumers' bins, are:

Broken and egg, $11 25 ; stove and chestnut, $11.50, and pea, $9.50.

Advances in the retail prices went into effect in Jersey City on New Year's Day. The new schedule follows:

	Sidewalk	In Bins	Yard
Grate	$10 50	$11.00	$9 00
Egg	10 50	11 00	9 25
Stove	10 75	11 25	9 50
Chestnut	10 75	11.25	9 50
Pea	9 25	9.75	8 00
Buckwheat	6 75	7.25	6 25
Rice	6 15	6 65	5 80
Barley	5 65	6.15	4 65
Bituminous	7.75	8 25	6 75
Dust	2 75	3 25	1 75
Blacksmith	[illegible]	8 75	7 25
Coke	[illegible]	11 00	8 00

Bituminous—Considerable complaint is being heard here of slow deliveries. Several of the piers have been short of coal and frozen coal in the cars has also helped to make matters worse. Some boatmen say that less coal is being handled in this harbor now than was handled during the strike. In addition to dealers not receiving their requirements, there is much delay in bunkering vessels and many transatlantic steamers have been delayed in sailing several hours because of the slow deliveries.

Notwithstanding the slow movement of coal there was an increase in the number of cars of bituminous dumped at the local railroad piers during the week ended Jan. 9. The reports show 4,979 cars dumped as compared with 4,492 cars the previous 7 days, an increase of 487 cars. On Jan. 9 there were 2,011 loaded cars on the tracks as compared with 2,979 cars on Jan. 2.

An improvement in car supply was reported along the Baltimore & Ohio and the Western Maryland R.R. The reported advance by the Shipping Board of 75c. a ton in coal rates from Hampton Roads ports and Baltimore to Boston and other New England ports, which became effective on Jan. 10, is not likely to affect local conditions.

Contract deliveries are taking all the better grades of coal and most of what is left is being taken care of by those engaged in bunkering vessels. The spot buyer is having a hard time picking up odd lots. Free coals are hard to get but no one is suffering from lack of coal.

Under the orders of the Fuel Administration the maximum prices at the mine for certain grades handled here are:

	Mine-Run	Prepared	Slack
Central Pennsylvania	$2 95	$2.95	$2.95
Western Pennsylvania	2.35	2.60	2.35
Fairmont	2.50	2.75	2.25
George's Creek, Upper Cumberland and Piedmont Fields	2.75	3.00	2.50

PHILADELPHIA

Anthracite continues in strong demand, due to weather. Mines slow to work up to normal production. Stove and nut scarce; pea and egg free. Tonnages in yards show signs of gaining. Dealers advertise for trade. Size change under discussion. Retailers maintain prices. Pea still troublesome to shippers. Buckwheat only active steam size. Rice and barley quiet. Bituminous trade marking time. Small tonnage for spot business. Consumers demand the best. Government prices still in effect.

Anthracite—There has been some moderation in the weather during the past week, although at no time did the thermometer go more than a few degrees above the freezing point. With conditions such as these it is plainly evident that coal is being used and if anything there has been a slightly stronger demand on the dealers for supplies. There is no doubt that many buyers are endeavoring to replenish their supplies which have already been heavily depleted. Naturally the dealers are anxious to take care of all business that offers and they in turn are urging the shippers for more tonnage.

Most of the operators report great difficulty in getting their mines back to normal production, as the men at the mines seem inclined to prolong the holiday season. It was not until well past the middle of the week that shippers began to report anything like fair shipments of stove and nut and for a while quite a few dealers were entirely out of these sizes.

The public continues to show its preference for stove and nut and the retailers still report their inability to shift to the other sizes, pea and egg, which are now in plentiful supply, especially the former. Of course a fair volume of pea is going out of the yards all the time and it is expected that it will pick up right along through this month and February, as it always has, but it is far from the demand for this size that used to show itself at this time of the year. There is only a moderate demand for egg coal and it was thought that this size would be much more sought after at this time of the year, although ordinarily the call for it is well taken care of late in the fall. The dealers had expected that with the installation of so many hot-air heaters of a new type that they would have a run on egg, but to date this has not materialized.

Taking the situation in its entirety it is believed that so far as actual coal in the yards at this time is concerned the dealers have a trifle more coal on hand of all sizes now than at any time for several months. As stated above many still are short on stove and nut, but there are a number of favored dealers who have never actually been out of these sizes and are actually catching up and laying by stocks. That this is true is shown by the increasing number of retailers who are advertising in the daily papers. Most of them have not done any advertising since last spring and now they are coming out asking for business on all sizes. One large retailer even went so far as to advise customers to stock up coal now and avoid a possible strike on the 1st of next April, and in addition hinted that there might be only two sizes at this time and now was a good opportunity to get such sizes as might be desired.

The change of size proposition continues to be a live topic of discussion among the dealers. Inasmuch as the retailers are endeavoring to have the different coal associations in this territory to take favorable action, it begins to look as though a big majority of them will finally be won to the proposition. It is believed that the operators will insist upon being shown that the retailers want the change, and if this can be done it is thought it will become effective April 1, although the wage demands of the miners which are due at that time might upset the whole proposition.

In the way of wholesale prices in the trade, the big companies of course adhere to their circular prices, while the independent shippers are still in most instances collecting a premium of 75c above the circular, including pea coal. Many of them, though, are having considerable difficulty in maintaining the full price on this latter size, and we have heard of instances where they are not applying the full price to some of their trade. Some of the smaller operators have their salesmen out in an endeavor to move the surplus of pea, but they are meeting with little success and the coal is generally moved by sending it to their old trade, probably with an understanding as to the price.

With so much pea coal on hand, and with something of an accumulation of egg, it was thought likely that the chronic retail price cutters might be inclined to shade their figures, at least on the smaller size. Fortunately up to this time most of them seem to have held firm and the retail prices throughout the city are pretty well based on the following schedule: egg $11.25, stove $11,90, nut $11.90 and pea $9.55. Most dealers continue to make an extra charge of 40c a ton when coal has to be carried. In some of the outlying sections the above retail prices are from 10 to 15c. lower, but this difference has been in effect for years and has no bearing on the price situation in general.

The steam trade continues in fair condition, but it must be said that the only real demand is for buckwheat. Due to the collieries slowly resuming their normal production the big companies have been able to dispose of all their buckwheat without any difficulty and it is really believed that this phase of the steam trade will pick up for some weeks to come, even with increased production, as the industries hereabouts are working actively and the tendency is to increase consumption. Rice and barley are still quite draggy, with enough and more of each size to go around. The independents are at times bothered considerably to move all of their output of these sizes, but it is not believed that any of them have been compelled to move the coal at a reduction.

Bituminous—The soft coal trade is moving along in what might be called a routine of expectancy. There can be no doubt that the trade is being held back until the President's investigation committee can make a report. In the meantime there is a moderate amount of fuel being offered on the spot market at the fixed Government prices. There is some little demand from the consumer, but mostly only for high grade fuels and the buyer is somewhat wary of spot offerings and he realizes that the bulk of free coal is of ordinary grade, although allowed to take the full prices.

The prices for Central Pa. coal are $2.95, Fairmont mine-run three-quarter, $2.75; mine-run, $2.50; slack, $2.25; Pittsburgh three-quarter, $2.60; mine-run, $2.35; slack, $2.10. A commission of 15c. a ton should be added to these figures for coal sold by commission houses. Blacksmith coal approximates about $3.50. There is some little coke demand at prices of $8.25 for foundry, and $7.25 for furnace sizes. Many shippers during this period are spending their time on figuring on the possibility of contract business in the spring and looking out for desirable places to put their tonnage allotted for this purpose.

BALTIMORE

The market is in a tight place here as a result of government policy, but easier days are expected. Only export and contract coal to be had, and some big local concerns are running short. Movements improving, however. Hard coal situation becoming more active.

Bituminous—The local soft coal market is very tight, and many of the coal men blame it largely on the government policy since the ending of the strike. Briefly told, this is the situation in this section: The end of the strike found the port piers swept clear of coal and the Government having confiscated several thousand cars from the pool and running on contract. This coal has never been made up, and many with large credits in the pool are unable to secure any coal because the government has not replaced the coal taken, while others who owe the pool can not get coal to pay the debt.

The loading on the division, normally around 3,500 cars per day, recently dropped to about 1,800 daily average, and while at present it is increasing and has reached about 2,500 cars a day, the entire movement, based practically on the car supply situation, is running only between 60 and 70 per cent. About two weeks ago the government announced that exports could be resumed on permits—one permit to dump into a ship actually in hand, and another permit for coal to send to that ship. The producers are allowed the usual increase of $1 35 a ton over the government price for domestic coal on this fuel. Next it was announced that coal shipped after Nov. 13 on contracts made prior to Oct. 30 could be billed at the contract prices, even though the majority ran from a dollar up over the Government price for spot fuels.

The result is that in the light movement from mines to tide the producers are naturally shipping the coal on the contracts made above government prices or on export at the advanced rate. Because the tide was not filled with a reserve, the highest number of cars at the piers here these days being around 500, or contract delivery. There is no coal here for the open market and not much on the lower priced contracts.

A number of local industries are thus running desperately short, and there has been some talk by some of attempting to hold responsible financially, the government departments which seized coal sent to the local firms on contract and which have failed to make good the credits here, despite the fact that the government is allowing coal to be sent to foreign lands. Unless quick delief comes it is not at all improbable that an appeal to stop exports again until a local reserve is accumulated to prevent real trouble will be the order of the day.

That does not mean that much export coal is going out, as the red tape of permits delays things, but it does mean that much coal is being held at other points for that business as soon as loaded cars can be moved to tide. Since the export ban was lifted only 5 ships have loaded, all with modest cargoes, the highest being 6,857 tons. Some of these ships have been alongside the piers 3 and 4 days before enough coal could be put aboard to give clearance.

Anthracite — The anthracite situation is becoming more active. Midseason calls are now heard, especially following the recent spell of real cold weather. There is no talk in the local trade of retail price advances, despite similar moves in other places and despite the fact that high premium rates are being paid on much of the coal coming in. The receipts here are light, but are keeping pace with demand.

Lake Markets

PITTSBURGH

Car supplies in the Pittsburgh district are increasing. Production is now running at about 75 per cent of capacity. Domestic supplies are amply sufficient. Steel mills are only moderately well supplied with coal, while byproduct coking plants connected with steel mills are in many cases quite short of coal.

R. W. Gardiner, Commissioner of the Pittsburgh Coal Producers' Association, has prepared a statement saying in substance that the Pittsburgh district has a capacity of 4,000,000 tons a month, and produced about 3,500,000 tons in October, with no production to speak of in November, while December production totaled about 1,675,000 tons, there being practically no production in the forepart of the month. Mr. Gardiner states further that in the last two weeks of December the mines were able to produce 200,000 tons more coal than the railroads were able to handle.

The coal market continues very quiet, with only occasional lots of free coal available in the open market. Full Government prices are obtained: Slack, $2.10; mine-run, $2.35; screened, $2.60, per net ton at mine, Pittsburgh district, with a 15c brokerage allowance in some instances, paid by the consumer.

BUFFALO

News very scarce. Shippers not satisfied with the market. Prices out of line. Miners doing fairly well. Anthracite still plenty. More than local trade needs.

Bituminous—Shippers are not willing to predict the future of the trade and they are not pleased with the present situation. The Government price has again set Allegheny Valley prices above Pittsburgh. The result is that the lower priced coal is hard to get. Operators claim that it all goes on contract when asked for it, which means that they do not mean to accept the regulation price if they can help it.

This does not make it easy for the Allegheny Valley operators either, for they sometimes find it hard to sell their output. The demand is not brisk. Shippers have to get out and hunt for their customers, and they do not always find them. Neither this state nor Canada really wants coal at present prices. The idea is that prices are coming down, which is the bane of the trade. At the same time the shippers are positive that prices will not only stay up but they say that coal is going into consumption much faster than it is bought and that alone will make the demand very strong again just as soon as the stocks have run down far enough to make the consumer anxious.

Business improves greatly. Buffalo has a big new horse-shoe nail factory on its list, having come after cheap power and other manufacturing concerns are doing well. Coal will have to be plenty to keep pace with the industries, even if there is Niagara electric power to be had. That alone will never cut down the use of coal to any great extent, though it may cut out the increase somewhat. Only let the labor unrest subside.

Everybody reports car shortage in sight, but it is not very apparent yet. It is the light demand that is most apparent. While that will take care of itself in time it would be better to distribute the buying more evenly. Both shippers and consumers would be better satisfied. Bituminous prices cannot be sized up easily. They are pretty unsteady and there are reports of premiums paid, but as a rule the Government figures prevail.

Anthracite—"They will be stocking anthracite before long if this mild weather lasts," was the remark of a shipper in that branch of the trade this week. Nobody, not even the operators themselves, had any idea of the way this coal was going to loom up after the closing of the lakes. The retailers do not keep up with the supply, and of course the consumers are making no complaint. They are no longer asking for more than they need, and that alone is a big factor in the reckoning. If they had always been content with a moderate supply the trade would have been in a much better condition.

There are still outlying points to cover by rail, but Canada is not complaining much now and if the prices there had not been raised materially by the discount on Canadian money the trade would be in a better condition than it has been in a long time. It looks as if the money problem would be a vexed one for sometime, for England has no longer the gold to pay in at New York and meet the Canadian debts.

The special independent price of anthracite has about disappeared, for no consumer is going to pay from $1 to $3 more than the standard companies ask, when their coal is to be had at regulation prices.

CINCINNATI

The coal situation has changed little during the past week. The embargo placed on eastbound shipments on the Chesapeake & Ohio, R.R., will greatly help the situation here and practically the entire Middle West. Some improvement has been noticed in the re-routing of the cars at the mines, but nevertheless there still remains a car shortage.

Receipts by river during the week were about normal. This was largely due to the high stage of the river which enabled the barges to come down stream without any difficulty. Industrial consumers complained of their coal piles disappearing with meager prospects of coal coming in shortly. The output of the West Virginia and eastern Kentucky mines during the last six days has been below normal.

The tonnage of the Kanawha region increased somewhat over the previous week when only half of the usual tonnage was produced. Government prices still prevail on the local market. Retail dealers were interested last week in a report received from Chicago that retailers there have announced an increase of 60c. a ton on coal effective this week. This is taken for granted by local retailers that Chicago is not as well off as Cincinnati as to coal.

Since the strike was called off local retailers have been able to lay in enough supplies to take care of their regular business, with little free coal to offer. However, there is a coal shortage right now in Cincinnati and many other cities in this locality, and it probably will continue for some time. Coal men do not expect any serious disruption of business, nor a return of conditions such as existed toward the end of the coal strike.

Industrial concerns may find it hard to get all the coal they need and in fact some are finding it hard right now. Wholesale and retail dealers became indignant over a published report that they are making profits. This is not true. If they were forced to go out in the open market to buy coal now for the purpose of selling it at present prices they would lose money.

During the past week there has been a heavy demand for steam coal, which was satisfactorily met. No further improvement is looked for until production at the mines reaches a maximum and car shortage is eliminated.

Cincinnati has been fortunate as far as the supply of coal is concerned, having not seriously felt the shortage as have other cities of its size. This is because it is located near the great fields of West Virginia and eastern Kentucky.

Operators say that the embargo at Detroit even prevents shipments with a permit. The situation here is expected to improve somewhat since the Chesapeake & Ohio R.R. placed an embargo on eastbound shipments. The embargo was issued because the eastern yards are congested with coal for export trade.

LOUISVILLE

Car shortage blocking production with many mines down for days at a time. Good demand for all coal. Retailers want larger margins.

More miners worked during the holiday period than had been expected, due to having been off for so many weeks, and production as a whole was surprisingly good. However, transportation facilities are bad, due to the early January blizzards, and empties are returning to the mines so slowly that operations are almost at a standstill. Mines of the Illinois Central lines in western Kentucky have been getting fair supplies while mines on all sections of the Louisville & Nashville in Kentucky report that they are getting practically no coal. One company operating 9 mines reported that 4 mines were down for 5 days running. Another mine with a ten-car per week capacity has secured but one car during the past week. Mines that get two full days in at the present time are fortunate. Labor is ready and willing to work, but the operators are tied hand and foot.

C. D. Boyd, coal traffic manager for the Hazard, Harlan and Southern Appalachian Association, has gone to Atlanta, in an effort to get some relief from railroad officials there, in order to give Kentucky mines a better car supply.

Shipments by river are also being curtailed, due to the fact that there is a good deal of running ice in the Ohio River at the present time, and coal boats and barges are not safe.

Demand is good for all grades of coal. Steam is selling freely as industrial concerns are stocking, and cement, brick and other plants which are generally down at this season are running full to make up for time lost during the recent fuel regulations and shortage.

Domestic coal has been selling freely as a result of cold weather and snow, retailers reporting the most active demand since stocking dropped off in the fall. Indications are that there will be a good retail demand for the balance of the winter.

Louisville retailers upon hearing that Chicago retailers had been given a 60c per ton advance began figuring ways and means of getting a local advance, claiming that the margins allowed in 1918 are not sufficient for profitble operation in 1920. Retailers at present are operating on a $2.20 margin on domestic sizes; and $1.70 on steam. They want a $2.50 or $2.75 margin on domestic, and a $2 margin on steam. A meeting will be held shortly to take up this matter.

Some of the large mining companies with local sales departments handling domestic and steam business are being forced to buy outside coal wherever they can get it to supply demand, due to the fact that their own mines are not getting cars sufficient to meet requirements.

Jobbers report much better business, with orders coming freely, and it being merely a question of being able to secure coal from such mines as haven't tied up with selling agents. Retailers are now advancing prices on steam contracts about 25c a ton to take care of the fourteen per cent increase allowed the miners, and passed on to the retailers. In many cases retail contracts did not carry a clause covering wage increases

BIRMINGHAM

Sharp increase in demand for steam coal from all quarters. Domestic practically cleaned up on local retail yards as a result of cold weather conditions, receipts being much lighter than requirements of the wholesale trade. Production off following the holidays, mine workers being slow to return to the mines.

There has been a perceptible increase in the volume of the steam trade in the past week and there is a strong demand, especially for the better grades, inquiry being sufficient, however, to care for the full output of the mines at this time. The stocks of industrial plants, railroads, and other public utilities ran low during the holidays, and consumers holding contracts did not receive full shipments and there is inquiry in the spot market for additional tonnage by these interests. This is augmented by the needs of the regular spot buyers. Because of the high cost of production at some operations because of the increase in wages and restrictions of government selling prices, such mines are badly handicapped in producing coal for the spot trade where they are unable to pass this additional cost on to the consumer, and until some relief is obtained in the adjustment of selling schedules the production from the district will suffer materially as a whole. Inquiry for expert coal is good, but at present there is none of this class of fuel available. Some bunker coal is moving to the ports of Mobile, Pensacola and New Orleans.

Domestic coal is scarce and the past few days of cold weather practically cleaned up the stocks on most of the retail yards. The demand for increased shipments from the mines is insistent, but receipts are not sufficient to enable retailers to supply the requirements of the trade and accumulate any stocks.

Production during the week ending Dec. 27, totaled 162,000 tons, or a decrease of 50 per cent under that of the previous week. The past week will show some improvement, as practically full crews returned to the mines this week. Equipment is sufficient to handle all the coal now being produced.

Coke

CONNELLSVILLE

Production increasing and not far from normal. Byproduct production still curtailed. Some prompt business done.

Coke production in the Connellsville and Lower Connellsville region has been steadily increasing since the poor week ended Dec. 27. This week's output promises to be approximately normal, but more than normal production is needed if all requirements are to be met. There are requirements of furnaces normally dependent upon byproduct operations that would buy Connellsville coke if it were to be secured, but there is more prospect of byproduct operations regaining their normal rate than there is of Connellsville production exceeding its normal.

For a time after Government price limits were imposed on Dec. 8, there were no offerings of coke in the open market, but in the past week offerings have appeared, in a limited way, and in some cases, particularly with foundry coke, operators have been willing to sell to middlemen at a trifle under the Government limit, so as to allow the middleman a margin by selling into consumption at the full price.

A great deal of furnace coke, however, is moving at the Government price inasmuch as a large amount of contract business, say 35 or 40 per cent of the total, was not done for this year as the unsettlement of the market came before contracts were concluded, and in most of the cases coke is being shipped as formerly being billed at the Government price. Upon the removal of the price control the parties will probably negotiate contracts, but it is possible they will continue without a contract price and simply agree upon prices month by month.

The Courier reports production in the Connellsville and Lower Connellsville region in the week ended Jan. 3 at 237,730 tons, an increase of 31,880 tons.

The market remains quotable at Government limits, $6 for furnace coke, and $7 for selected 72-hr. foundry, per net ton at the ovens.

BUFFALO

The situation does not change materially. Such amounts as the smaller trade needs the local shippers are selling on the basis of $9.60 for 72-hr. Connellsville foundry, $8.60 for 48-hr furnace and nominally $7 for off-grades, though the last is not active now. Domestic sizes continue at $8, with breeze very quiet at $5. The summary of the iron-ore season by lake shows a receipt of 4,868,333 gross tons at Buffalo, the entire lower-lake receipts being 36,874,316 tons, with 9,998,475 tons to the upper lakes, including Detroit.

There is now on lower-lake docks 10,090,708 tons, of which Buffalo has 333,777. This amount is the largest in the history of the trade at this time of year, though the receipts for the season at lower-lake ports fell off 10,863,745 tons, as compared with 1918, due mostly to labor troubles.

Middle West

GENERAL REVIEW

The coal market continues strong and vigorous in the Middle West. In certain points in Iowa and the Northwest, the demand is even more than vigorous. Both manufacturers and dealers are beseeching operators and jobbers in Chicago to ship them coal, and to ship it quickly.

In Illinois and Indiana the situation is not quite so strenuous, although there is steady demand for any kind of good coal. Reports come in from all through the territory that the stocks of coal on hand are very low, and operators and distributors are predicting that there will be a good demand for fuel right straight through, until spring.

The railroads are now by far the most important factor in the coal situation. We frequently hear of coal which has been in transit from 30 to 60 days, which, under normal conditions is not in transit more than ten days to two weeks. Only some of this delay was caused by the coal strike. Anxious consignees have found it almost impossible to get any information from the railroad authorities as to where their transit coal is located. The car supply at the Illinois and Indiana mines has been exceedingly poor, during the past week, and the possibilities are not very great for better services from the Railroad Administration.

We understand from very good authority that there is no Fuel Administration left in Washington, as all of the experts heretofore employed by this important branch of the Government, have been forced to seek work elsewhere, this because the Fuel Administration is out of funds with which to continue operations. The above statement may or may not be accurate, but we do know that many inquiries and telegrams sent to the Fuel Administration at Washington, have been returned.

Probably the Railroad Administration is tending to all of the duties of the Fuel Administration. A little thing like adding the duties and responsibilities of the Fuel Administration on to the Railroad Administration ought not to bother so able an individual as the present Director-General and his staff of efficient helpers. The Railroad Administration, nerved no doubt by its success in solving transportation and labor problems since the ending of the war, feels fully confident to assume control of such an unimportant basic industry as coal.

CHICAGO

A peculiar situation exists in Chicago. The domestic market has kept up strong, while steam coal from all of the better known fields in Illinois and Indiana are still very difficult to get.

It has been noticed that some operators in the less favored fields producing a medium and inferior grade of coal, have been offering their product in Chicago during the past week, but have been making very few sales. This is because the industries in the city were pretty well taken care of during the coal strike, and since the settlement of the strike have received very liberal shipments from their regular connections.

An unexpected development has taken place in the domestic market. During the latter part of 1918, and the early part of 1919, it was pretty generally conceded that eastern coal would never regain its old place in Chicago. It seems that our own local coals had earned a position which they were never going to lose. During the war no eastern coal was allowed to come into the West, and as a result the public had to buy Illinois and Indiana coals.

It was thought that these coals would be so satisfactory that the public would continue their use, but this seems to be erroneous, as high grade splint from West Virginia and Kentucky is now more in demand than ever before, while Pocahontas and New River coals have entirely won back their old position of supremacy. Eastern shippers are looking forward to regaining all of their old business and valuable new business. It is said there will be several new offices in Chicago representing eastern operations, as soon as conditions get anywhere near back to normal.

MILWAUKEE

Coal market quiet, with prices unchanged. An advance in Illinois coal in prospect. Scarcity of cars bothers shippers.

The coal market continues quiet, with prices unchanged, despite the fact that stocks of soft coal are fast being dissipated. Hard coal is in good supply, however. There is a brisk movement of coal to the interior, but shippers are unable to get a proper supply of cars.

Illinois coal is beginning to show up on the tracks, and there is some speculation as to the probable price of the new product, because of the advance of 14 per cent in miners' wages. No bills have been received for the consignments received thus far and dealers say an advance is inevitable.

While many yards are well supplied with soft coal, others are running low and will have to order Western coal and pass the increased cost on to the consumer. The advance of 60c. per ton by Chicago dealers to meet higher cost of handling and delivery is naturally the subject of favorable comment in coal circles here, but thus far there is no indication that such a step will be taken in this city.

ST. LOUIS

Inability to move steam sizes causing trouble, together with a 50 per cent car shortage on some roads. Railroad service poor. A scarcity of domestic coal everywhere. Miners not inclined to work full time.

The local condition is one that is beginning to be like it was in former years; not enough of one kind and too much of the other. In the Mt. Olive and Standard fields there is a tonnage of screenings that cannot be absorbed, with the result that mines have been obliged to run on mine-run, and sell to railroads in order to keep going when they had cars.

The market on screenings in both of these fields has held up pretty well until the last day or two when in the Standard field they went down to $1.95 in a few instances.

There is a serious shortage of domestic sizes in both of these fields and car shortage became severe the last week on the Illinois Central, Louisville & Nashville, Pennsylvania, and Mobile & Ohio, R.R., some of these roads being as short as 50 per cent. Of the equipment furnished much is hopper cars and the trade in this part of the country has an unusually hard time taking care of this equipment.

Locally in St. Louis there is an ample supply of coal, but in the country districts there is considerable anxiety and some places have been short of coal and will be for some time. Carthage, Mo., for instance, has had no domestic lump or egg coal to speak of and the trade there is obliged to use mine-run and screenings.

At many mines in the field the miners do not seem inclined to work full time, laying off with the slightest excuse.

The embargoes of the past week were eased up some in the last few days, especially on the Burlington, Wabash, Missouri Pacific and Missouri, Kansas & Teras R R.

Transportation over all the roads, including the Terminal, has been bad on account of congested conditions. In the Carterville field the car shortage is beginning to be almost as bad as in the Standard district. Some of the mines are now averaging three to four days a week excepting where several roads supply cars.

All sizes in this field are in good demand, but very little of this coal is coming into St. Louis on account of the operators asking a price higher than that permitted by the Government and at a price which cannot be paid in Missouri, according to the Fuel Administration rulings applying to St. Louis and vicinity. The dealers have handed their case over to the United States District Attorney, who expects to prosecute the Franklin County operators.

There has been no change in retail prices. A little anthracite is moving in, but no smokeless. The supply of gas house and byproduct coke is good and in fairly good demand.

Business shows considerable improvement in the St. Louis district. The first severe snow of the winter started in on Jan. 6 and continued through the next day, holding up traffic and in other ways reducing the coal business to about one-half.

COAL AGE

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Coal Strike Settlement Commission

By R. Dawson Hall

IT WAS quite natural, in view of the way in which the Coal Strike Settlement Commission was formed (as the result of a private deal on a Pullman car in which only representatives of the federal legal department and the unions were present) that the formation of a commission should, at first, be regarded with some disfavor by the operators. This attitude persisted even after the national authorities at Washington had recognized the understanding and shown themselves willing to overlook the fact that the pledge was given without instruction from the President and the Department of Labor.

The natural reaction of the operators continued even after the commission was appointed, despite the fact that against the individuals comprising the commission little or no complaint could be made. The members of the committee, Henry M. Robinson, Rembrandt Peale and John P. White, if they decide matters after due consideration and on their real merits, will render a verdict that may be immensely valuable in future disputes and which should furnish a basis for the settlement of like controversies in the luxury industries as well as in those that are basal.

It is fair that what is applied to one industry should be applied to another. Speaking in terms of weeks and months rather than years, the steady operation of a semi-essential industry like that of manufacturing automobiles is essential to the coal business, for if automobiles are not made, the iron and steel mills, furnaces and converters are idle, and the coal miner is unemployed. The miner therefore and his employer have just as much right to require the automobile manufacturer and his workmen to come to a speedy, and also equitable, agreement in case of a strike as for those latter to require the coal miner and the mine operator to reach such an early and just decision.

The commission, it is to be hoped, is bound, and disposed to recognize, only the understandings, verbal and otherwise, revealed to the public before its appointment. The socialist mine leader, Alexander Howat, of Kansas, declared that all kinds of concessions were promised the miners and that if the union leaders had revealed all the facts to him earlier he would have made absolutely no protest. This hint that there are further understandings of which the public has no knowledge is probably untrue. The commission is therefore almost sure to judge the whole matter on its merits.

It will be at a great disadvantage however. It will have extensive information about coal operations and no knowledge of other industries. Statistics are the weak spot of the coal industry. No occupation is more meticulously measured. Yardsticks are industriously applied by two bureaus at Washington, the Geological Survey and the Bureau of Mines. No one can object to such careful evaluations of fact. Some of them serve to aid the industry in establishing its position, but others always seem, by the advertising they receive from the bureaus, to militate unduly against it. Thus the irregular working of the mines is regarded as phenomenal, whereas temporary idleness is almost universal in all trades. Since, however, no inquiry has been made into the subject and some trades are so conducted that no simple statement of fact could possibly be made about them, we are suffered to believe that steady work is the general rule of industry rather than the exception.

Again, the inquiries into accidents have induced us to believe that the death and accident rate in the mines is far greater than it really is, as compared with the rates in other industries. The public is entitled to facts, but not to become acquainted with the conditions of one industry and to remain ignorant of the facts in others. Let us hope that the commission may not assume that what it does not learn or know about the irregularity of other occupations is only unlearned or unknown about them because there are no such irregularities in the conduct of their operations.

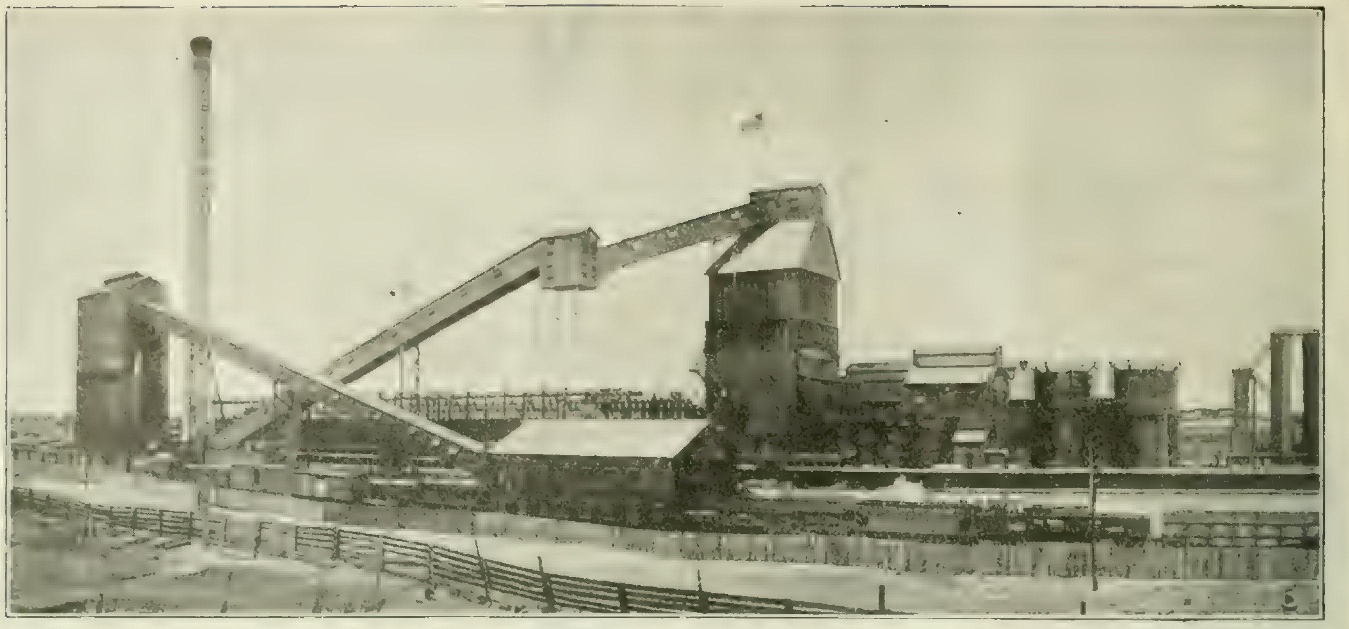

FIG. 1. GENERAL VIEW OF PLANT OF MINNESOTA BY-PRODUCT COKE CO., ST. PAUL, MINN.

From the left are: Coal crushing tower, stack, housing for inclined coal conveyor from coal dumping building in center foreground to top of the coal crushing tower, housing for inclined coal conveyor from bottom of coal crushing tower to top of coal storage bins at end of Battery B, from which bins the larry car is loaded with coal to be charged into the ovens. In the left-hand background are the two batteries totaling 65 ovens. To right of battery storage bins in order are: By-product buildings, rich and lean gas holders, final gas coolers and light oil scrubbers.

Coking of Illinois Coal in Koppers-Type Oven[*]

An Operating Test at the St. Paul Plant of the Minnesota By-Product Coke Co. on the Coking of the Coal Extracted in the Orient Mine in Franklin County, Illinois

By R. S. McBride[†] and W. A. Selvig[‡]
Washington, D. C.

THE great importance during the war period of substituting Mid-Continent coal for coals from more distant sources even in byproduct coke-oven work was well recognized. The Bureau of Standards was ordered to conduct an investigation of a new coke-oven process claimed to be especially suited to this purpose, and in connection with this the Bureau was requested to conduct a test of the St. Paul plant of the Minnesota Byproduct Coke Co., which is owned by the Koppers Co., Pittsburgh. The Bureau of Standards, in coöperation with the Bureau of Mines, carried out this operating test, using during 7½ days about 7700 tons of coal coming from the Orient Mine, Franklin County, Illinois.

The plant is usually operated with a mixture of Pittsburgh, Elkhorn and Pocahontas coal at normal coking times of about 16 and 17 hours. The normal capacity of the plant is approximately 1100 tons of coal per day. For the test period only Orient coal was used. Since the coking time for this coal was slightly longer than for the usual mixture, the capacity of the plant was reduced somewhat.

All phases of coal handling, byproduct recovery and laboratory tests were under observation by the staff of 37 Government engineers and chemists employed on the work. In addition, those in charge had the benefit of advice and comment from a considerable number of experts who are specialists in the field of coke-oven operation. The quantity of all coal used and of all byproducts obtained was carefully weighed or measured at regular intervals and samples of each material were taken for analysis. The Bureau of Standards was responsible for the general planning and supervision of the test work. Its representatives made all observations of battery operation, high temperature measurements, byproduct recovery and chemical laboratory work on gas and byproducts. The Bureau of Mines was responsible for the sampling of the coal both as it was loaded at the mine and as crushed at the plant. It supervised the weighing, coal-handling, coke-handling and coke-sampling operations and made all analyses of coal and coke. Its representatives also made general observations on the character of the coke and operation of the ovens.

The Minnesota Byproduct Coke Co. plant consisted of 65 ovens, built with a gross regenerative system, operating during the test period with an average gross coking time of 19 hours and 33 minutes, with coal finely pulverized, 12.75 tons per oven as charged. Each oven was 39½ ft. long, 9½ ft. high, 17 in. wide at the pusher side and 19½ in. at the coke side, making a 2½-in. taper with an average width of 18¼ in. The coke was

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[*] This is an advance publication in abbreviated form of Bureau of Standards Technologic Paper No. 137. Published by permission of the Directors, Bureau of Standards and Bureau of Mines.

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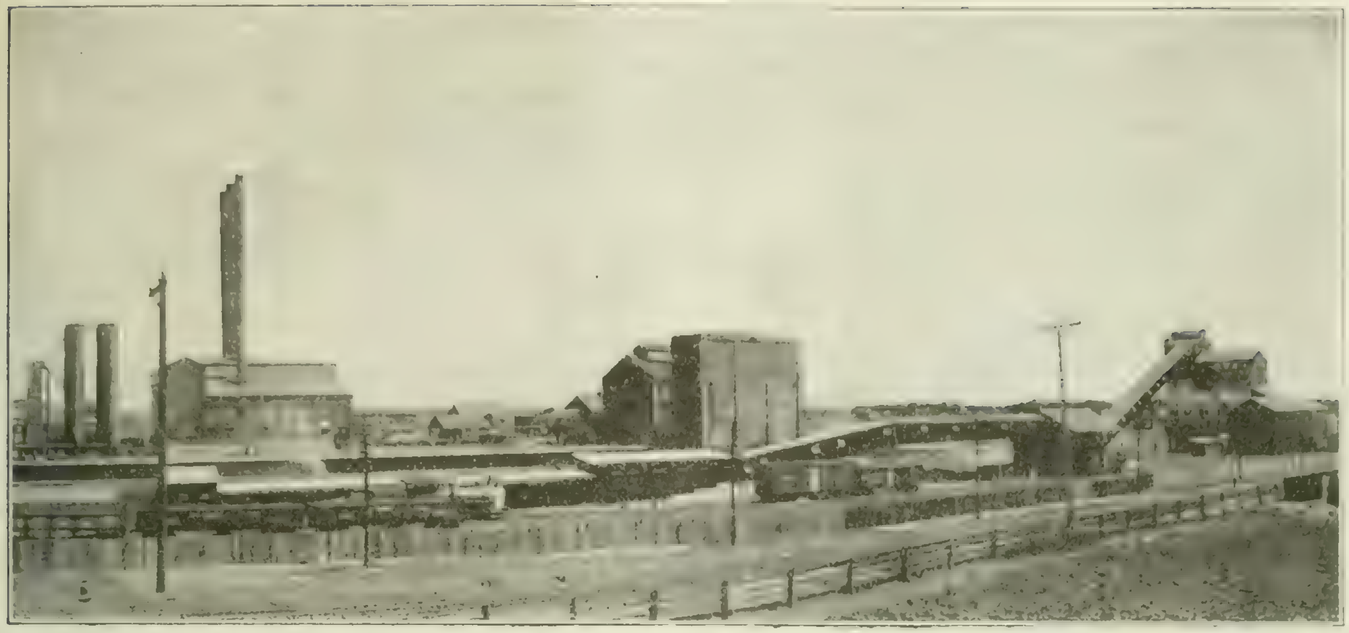

FIG 2 GENERAL VIEW OF PLANT (CONTINUED)

In the foreground from left to right are shown: Coke wharf, housings for the coke conveyors, the first screening station where large furnace coke is separated from run of oven coke, and the housing for the inclined coke conveyor to final screening station, where the coke is further separated into small furnace and domestic sizes. In the background are the final gas coolers and light oil scrubbers, shown also in Fig. 1, the power plant, laboratory, complete light oil refining buildings and coke-quenching station.

discharged from the ovens by the usual style of ram pusher into the common form of hot coke car and quenched in a tower of the usual kind. After discharge on the wharf it was handled by a typical conveyor system through two screening stations. The coke was screened to produce large and small furnace sizes; stove, nut and pea, domestic sizes and breeze. The gas was separated into rich and lean at the battery. Separate test records were kept of each size of coke and of each quality of gas. Practically all of the ammonia produced was made up into sulphate immediately through the direct recovery process. Although the plant operated for the production of pure light-oil products, only the total production of light oil was measured, but the yield of various constituents was determined by analysis.

The coal was apparently clean and very well screened. The impurities consisted of a small amount of pyrite, mostly in the form of thin layers, calcite, mother of coal and shale. The coal was crushed at the plant with the intention of making it as fine as was feasible with the apparatus available. As charged to the ovens, over 95 per cent. passed through a 4-mesh sieve, and about two-thirds passed through a 10-mesh sieve.

A composite sample of the crushed coal sampled from the conveyor belt was made up from the daily plant samples and analyzed according to the laboratory methods described in Bureau of Mines Technical Paper No. 8; the results are presented in Table I. In Table II is given the total amount of coal used and the average coking time for the period of the test.

TABLE I COAL ANALYSIS AND HEATING VALUE

	As Charged, per Cent.	Dry Basis, per Cent.
Moisture	8.07	
Volatile matter	34.66	37.70
Fixed carbon	48.38	52.63
Ash	8.89	9.67
Sulphur	1.04	1.13
Hydrogen	5.32	4.81
Carbon	67.51	73.44
Nitrogen	1.49	1.62
Oxygen	15.75	9.33
Sulphur in fixed carbon from volatile determination	0.51	0.55
Heating Value:		
Calories	6.677	7,263
British thermal units	12,019	13,073

No consecutive record was maintained of the current necessary to push the oven charges. However, sufficient data were obtained to show that, in general, the charges pushed easily, though not as easily as with the usual coal mixture. It generally required from 180 to 250 amp. to start the charge and from 120 to 180 amp. to keep it moving; in an occasional oven the amperage required to start the charge amounted to from 300 to 350, with 200 to 300 amp. required to keep it moving. Very few of the charges stuck, so that it was impossible to push the charge out before the circuit breaker acted; as high as 550 amp. was noted in one or two of these cases. One charge in particular, oven No. 49, on Sept. 29, gave a great deal of trouble; three attempts were made to push the charge before it was possible to clear the oven. However, in no case was it necessary to rake or dig the coke from the ovens.

TABLE II. COAL USED AND OVEN OPERATION

Coal Used, in Tons:	
As charged	7,688.3
Dry	7,067.2
Ovens Charged	603
Coal per Oven, in Tons:	
As charged	12.75
Dry	11.72
Coking Time, in Hours and Minutes:	
Average gross	19:33
Average net	19:11

High temperature measurements were made continuously for several days during the test period in order to give an accurate idea of the operating conditions of the battery. Records were taken of the temperature in the oven walls, regenerators, waste-heat flue, in the coal mass and in the vapor above the coal. Measurement of high temperatures in a byproduct coke oven is attended with great difficulty because of the inaccessibility of certain points where temperature measurements are desirable and because of the limited variety and high cost of apparatus which can be used for these purposes. The results obtained are sufficient, however, to give an accurate idea of the range and average temperature maintained at the important points in the heating system.

A complete survey of temperature conditions through the entire battery was, of course, impossible; but representative points were chosen and the results given in Figs. 3 to 6 inclusive are typical of all operations.

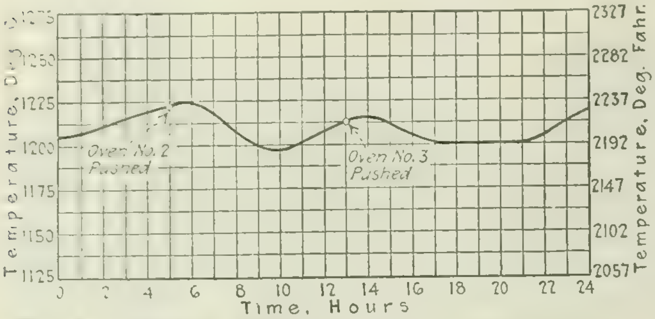

FIG. 3 AVERAGE TEMPERATURE OF HEATING WALL
Showing effect of charging and pushing temperature recorded 7 ft below top of battery between ovens No. 2 and No. 3

During the period of the test certain optical pyrometer measurements were made by the company engineers which confirmed the fact that the locations chosen for our regular measurements were typical.

The general trend of heating wall temperatures, before, during and after charging the adjoining ovens, is given in Fig. 3. These temperatures, of course, are not as high as prevail in certain parts of the wall refractory, for example at the lower regulating brick near the air port, where the maximum temperature is reached. To show the effect of gas and air reversal on the temperature in the heating wall, the curve of Fig. 4 is given.

Temperature measurements were made at three places in four consecutive charges of coal in oven No. 3. Readings were taken with couples 10 ft. long, introduced through charging lids as nearly as possible midway between the oven walls. The mean of the temperature-time curves for these locations is plotted in Fig. 5. Short thermocouples were introduced through the charging lid nearest the pushing end of oven No. 3 to measure the vapor above the coal. Four curves for four consecutive charges are shown in Fig. 6.

Over the checker-brick in the right half of the regenerator under oven No. 3 at the coke end 54 in. in from the face of the regenerator wall the temperature averaged 1140 deg. C. The variation in temperature during reversal of direction of gas burning was about 55 deg. C. at this point. Temperature measurements taken at the junction of the waste heat tunnels from the two batteries averaged 272 deg. C.

During the test, two different systems of screening were used as follows:

Screening System No. 1—The coke was delivered by the conveyor over an inclined-bar-grizzly screen in the first station. The screen was about 5½ ft. long, 4 ft. wide and consisted of 1½-in. bars spaced from 1¼ to 1½ in. The oversize was delivered in the railroad cars and weighed as "furnace coke." The undersize delivered on a second belt conveyor was carried to a second screening station, where it passed through an inclined-rotary-cylindrical screen, the first half of which consisted of ¾-in. square perforations, and the second half 1⅜-in. square perforations. The material passing through the ¾-in. perforations was re-screened on a ½-in. shaker screen to separate the breeze and pea size coke. The material passing through the 1⅜-in. perforations was called nut coke, and that passing over the 1⅜-in. perforations was classified as stove coke. The breeze, pea, nut and stove sizes were separately loaded in railroad cars and weighed before shipment or storage. Nut and stove sizes, as delivered from their respective bins, passed over shaker feeders before going into the railroad cars. The pea and breeze sizes were thus very completely eliminated from these two domestic sizes.

Since the separation of "furnace coke" by the inclined-bar-grizzly in the first screening station was not considered satisfactory because the screen was not large enough to handle the quantity of coke passing over it and make a good separation, a change was made after three days of the test to the second system, which was as follows:

Screening System No. 2—The inclined-bar-grizzly in the first screening station was discarded and replaced by a 2½-in. rotary grizzly, the oversize of which was delivered directly into railroad cars as "foundry" or "large furnace" coke. The coke passing through the first rotary grizzly was carried to the second screening station, where it passed over a second rotary grizzly set at 1¾ in. The oversize of this second grizzly was designated as "small furnace" coke. The material passing through the second grizzly was separated by the rotary cylindrical screen and sized exactly as in the first system. The furnace coke from the first system and both sizes of furnace coke from the second system, after being weighed, were stacked in a pile at the plant during the test period, so that they were subsequently available for a blast-furnace test as described later. The stove, nut and pea sizes were sold for domestic fuel, as is customary from this plant. The breeze produced was used as boiler fuel at the plant, following the regular practice.

Table III shows the different results obtained from the two screening methods. The results for the entire period are summarized together in Table IV.

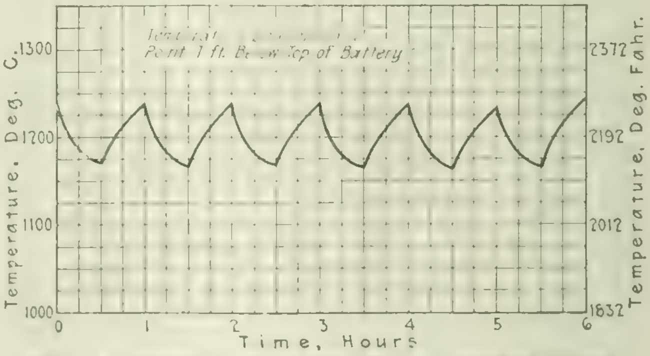

FIG. 4 TYPICAL HEATING WALL TEMPERATURE SHOWING EFFECT OF REVERSALS

It is to be noted that 82.7 per cent. of the dry coke produced in screening system No. 1 was classified as furnace coke, oversize of the 1¼- to 1½-in. inclined-bar grizzly. As explained under description of screening system No. 1, the separation of the furnace coke by the inclined-bar grizzly was not considered satisfactory, as the screen was not large enough to make a good separation; the very high percentage obtained for furnace size is, therefore, not representative. The total dry furnace coke was only 40.3 per cent. of the total dry coke screened during that part of the test when screening system No. 2 was used. However, it should be noted that the yield of stove size is very large, 34.8 per cent. of the total coke as screened; there is no doubt that a large amount of the stove size would have been included in the furnace size if it had been possible to install a 1½-in. inclined-grizzly-bar screen large enough to handle the coke produced and make a good separation.

The small percentage of large-size coke obtained together with the large percentage of the smaller domestic sizes indicated that it would not stand handling and screening without breaking up into smaller pieces, due to the fingery and brittle characteristics of the coke.

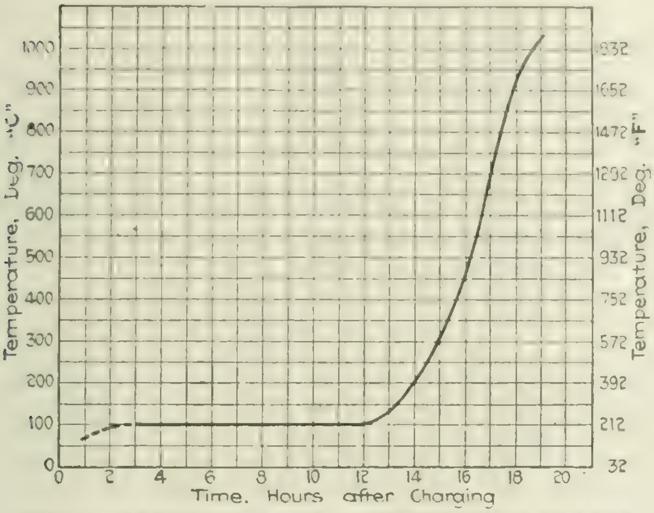

FIG. 5. AVERAGE OF COAL TEMPERATURE CURVES

The hot coke as pushed from the ovens was observed in order to know the temperature and general performance of each oven and each lot was again observed after quenching and dumping on the wharf. By these observations a very complete idea of battery performance was obtained. These observations may be summarized as follows:

TABLE III. RESULTS WITH TWO SCREENING SYSTEMS

	Screening System No. 1, per Cent.		Screening System No. 2, per Cent.	
Furnace Sizes:				
Large	...		18.3	
Small	...		22.0	
Total		82.7		40.3
Domestic Sizes:				
Stove	6.7		34.8	
Nut	5.2		15.0	
Pea	0.9		2.4	
Total		12.8		52.2
Breeze		4.5		7.5
Total		100.0		10 00

The top of the coke mass was, as usual, colder than the rest of the charge. In fact this condition was somewhat exaggerated during the test, as it was impracticable to adjust the battery for the best use of the leaner gas from the Illinois coal when this was to be used for so short a period. From the level of the horizontal flue in the heating wall down to the bottom of the oven the coal was usually thoroughly coked; and in general the heats were uniform for the entire length of the charge. From a number of the charges some uncoked material remained in the center of the charge at the level of the horizontal flue.

From most of the charges a large amount of smoke and flame arose as the coke was pushed from the oven; this was especially noticeable in cases where uncoked material remained at the level of the horizontal flue. The overhang of the coke as it fell from the coke guide into the quenching car was irregular; on the coke side it ranged from 12 to 24 in., while on the pusher side the coke frequently showed signs of crumbling. Immediately ahead of the pusher ram the charge generally crumbled, thus causing a great deal of fine coke. A distinct line of cleavage was noted through the center of the charge in almost all cases.

The coke on the wharf was very irregular in size, but on the average the pieces were distinctly smaller than for the average byproduct coke mixtures. There was no tendency to blockiness and very few pieces were as large as 6 in. in each dimension. The material was decidedly lighter than the average byproduct oven coke, weighing only about 23 lb. per cu.ft. The color varied somewhat, but in general the furnace-size was of a dark silver color.

TABLE IV. COKE YIELDS

Coke Produced (Dry):	Tons
Furnace	2,704 4
Stove	1,178 1
Nut	549 5
Pea	89 9
Breeze	308 4
Total	4,830 3
Ratio of Dry Coke to Dry Coal:	**Per Cent.**
Furnace	38.3
Stove	16 7
Nut	7 7
Pea	1.3
Breeze	4 4
Total	68.4
Sizes of Coke Produced:	**Per Cent.**
Furnace	56 0
Stove	24 4
Nut	11.4
Pea	1.8
Breeze	6.4
Total	100.0

The coke had a decided longitudinal fracture and many of the pieces before reaching the wharf were broken up into fingers. Even the larger pieces showed a tendency to fingering, and by completion of the decided longitudinal fracture generally these broke up into several smaller pieces before reaching the cars. There was no apparent cross fracture, but the brittleness of the long fingers was such that these frequently broke up into shorter pieces during handling.

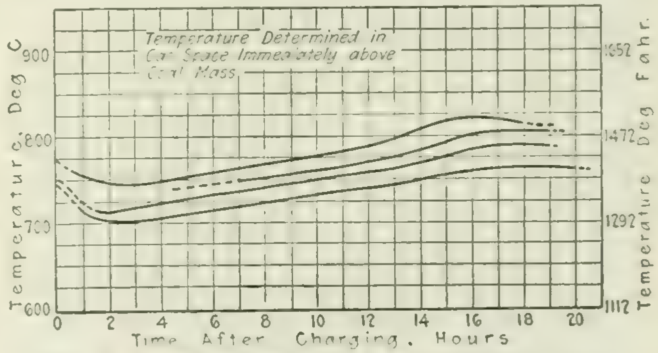

FIG. 6. TEMPERATURE OF VAPOR ABOVE COAL

In the railroad cars the furnace size from screening system No. 1, in which a 1½-in. inclined-bar-grizzly screen was used, consisted mainly of small fingers from 1 by 2½ in. up to a maximum of about 2 by 6 in. There were very few blocky pieces about 2½ by 3½ in. The oversize of the 2½-in. rotary grizzly, used in screening system No. 2, in the cars was about half fingery and half blocky coke, averaging much larger than from screening system No. 1. The small-furnace size from this second system, through the 2½-in. but over the 1⅞-in. rotary grizzly, averaged about 2 by 2½ in. The great difference in size between the coke on the wharf and after loading in the cars shows the decided tendency to breakage during handling.

The cells of the coke were small and regular and in general of a structure indicating suitable characteristics for furnace use. There was no sponge formed, but there was a decided tendency to form a pebbly seam at a distance of 2 to 6 in. from and, in general, parallel to the oven wall. This seam appeared only in a part of the pieces in which it formed an incipient cross-fracture. In general there were no pebbly seams in the coke at the bottom of the oven. The small amount of pebbly mass noted seemed to come from the top and center of the oven in the form of small loosely-cemented lumps of material which were readily crumbled in the hands. Although the coal contained considerable "mother of coal," there was very little evidence of "foreign matter" in the coke, probably because of the fineness to which the coal was crushed.

Each size of coke was carefully sampled for analysis and for determination of moisture content in order to correct to true weight at the time it was loaded in the railroad cars.

The results of proximate and ultimate analysis and heating value determination of the composite sample of each size of coke are given in Table V.

TABLE V. COKE ANALYSIS AND HEATING VALUE

	Furnace Coke		Domestic Coke		Coke Breeze	
	As Loaded Per Cent.	Dry Per Cent.	As Loaded Per Cent.	Dry Per Cent.	As Loaded Per Cent.	Dry Per Cent.
Moisture	7.15		11.51	....	17.07	.....
Volatile matter	2.18	2.35	2.81	3.18	4.06	4.90
Fixed carbon	77.93	83.93	73.15	82.66	64.69	78.00
Ash	12.74	13.72	12.53	14.16	14.18	17.10
Sulphur	0.85	0.92	0.82	0.93	0.87	1.05
Carbon	77.81	83.80	3.47	83.03	[illegible].68	79.20
Hydrogen	1.17	0.41	1.67	0.44	2.54	0.77
Oxygen	6.55	0.20	10.60	0.41	15.83	0.79
Nitrogen	0.88	0.95	0.91	1.03	0.90	1.09
Phosphorus	0.009	0.010	0.010	0.011	.	...
Heating Value:						
Calories	6,385	6,877	6,049	6,836	5,453	6,576
British Thermal Units	11,493	12,379	10,888	12,305	9,815	11,837

The weight per cu.ft. of furnace coke was determined on one car of large furnace coke and also on one car of small furnace coke. This was done by leveling the cars and making the calculations from the net weights of coke and the rated cu.ft. capacity of the cars.

Apparent specific gravity determinations were made on three composite samples of furnace-size coke and an average of these is given as representing the entire lot. A single composite was made up for the entire lot and the true specific gravity determined. The porosity of the coke was calculated from these results for apparent and true specific gravity. These physical properties of the furnace coke may be summarized as in Table VI.

In order to test the behavior of the furnace-size coke produced from the Orient coal, arrangements were made to use about 1800 tons of this material in the blast-furnace plant of the Mississippi Valley Iron Co. The coke regularly used at that furnace is produced in Koppers ovens of the Laclede Gas Light Co., St. Louis, from a mixture of Elkhorn, Pocahontas (low volatile) and Illinois coals. The substitution of the Illinois coke for the regular supply was accomplished abruptly and continued without interruption throughout the ten-day period. Several experts were present during this test, and it was the unanimous opinion of those persons and of the blast-furnace operators that the Illinois coke had shown highly satisfactory results. However, it should be borne in mind that the furnace used for this test was of small capacity, and it is not certain, therefore, that the results in this case would be duplicated on a large-size furnace.

TABLE VI CHARACTERISTICS OF FURNACE COKE

Weight per Cubic Foot of Dry Coke	
Furnace size from screening system No. 1	23.4 lb.
Large furnace size from screening system No. 2	22.8 lb
Apparent specific gravity	0.88
True specific gravity	1.85
Porosity	52.4%

SPECIAL OVEN TESTS

In order to study the effect of lower temperature and longer time of coking, and to get some idea of the value of certain special coal mixtures, a few ovens were operated under different conditions than normal. The lower temperature trials were made in oven No. 1 during the period of the test by cutting down the quantity of gas burned in the heating walls of this oven. The special mixtures were made up at the end of the test period and tried out in one or more ovens.

Low Temperature Coking of Orient Coal—Oven No. 1 was changed from its regular operating period beginning Oct. 1 and three charges of distinctly longer periods, 22¾, 23½ and 25¾ hours, were pushed on Oct. 3, 4 and 5 respectively. The temperature of this oven was from 50 to 100 deg. C. lower than the temperature of the remaining ovens in the battery. The coke from these special tests was very similar to that obtained from the same coal coked for the usual 19-hour period in that the cell structure was not materially different and that there was the usual small amount of "foreign matter" and no sponge. However, the material as it lay on the wharf appeared decidedly larger and blockier and there was slightly less of the pebbly mass or pebbly seam. The blocks of coke were decidedly stronger, judged both by their action when handled and by the shatter test described below. The results of this special work at lower temperatures were very closely comparable with the results obtained at Dover, Ohio, when using the same coal in a narrower oven and coking at a corresponding rate, measured in inches of coke formed per hour. It is evident from these tests that stronger, larger coke will be obtained at the somewhat lower temperatures used in this work than at the temperature at which it was necessary to operate during the full test at St. Paul in order that the gas supply of the city would not be interrupted.

Mixture of Orient and Pittsburgh Coals—In order to study the character of coke produced from a mixture of equal parts of Pittsburgh and Orient coals, a single oven was charged with this mixture. Oven No. 60 was charged 5:30 p.m. Oct. 7, and pushed 11:30 a.m. Oct. 8; the charge was 25,100 lb. The coke from this 18-hour test was thoroughly coked, but the appearance on the wharf was not encouraging. There was decided longitudinal fracture, indicating the fingery tendency common to high volatile coals, but the coke was fairly tough. The cell structure resembled that of Orient coal alone, except in the upper central section of the oven, where considerable sponge was formed. There was no noticeable cross-fracture, but the irregular shapes showed that the breakage of the material in regular handling would probably be rather high. The pebbly seam so frequently noted in coke from 100 per cent. Orient coal was not apparent in this single test; but the tendency of Pittsburgh coal to produce sponge was not counteracted by the mixture.

Mixture of Orient and Pocahontas Coals—A mixture of 25 per cent. Pocahontas and 75 per cent. Orient coal was used in three ovens charged on Oct. 7 and pushed after approximately 17 hours of coking. In each case the charge was about 25,200 lb. The coke produced under these conditions was blocky and on the average of large size, but the pieces were very irregular. There was no tendency to finger, but a decided cross-fracture was shown. The coke, although appearing soft, was unusually tough, as will be evident from the high percentage unbroken in the shatter test. The cell structure was irregular and the general appearance of the material on the wharf would have indicated undercoking, but the appearance while hot, as it was pushed from the oven, showed that this was not the fact. The very small percentage of fine material indicated that an unusually high percentage of furnace-size would be available from this mixture.

Shatter Test of Special Cokes—In order to get a rough check on the relative strength of the different special cokes which were made, a shatter test was carried out on each of the samples. For this test a 50-lb. sample of large pieces of coke taken from the belt, none of which pieces would begin to pass through a 2-in. square mesh screen, was dropped four times from a height of 6 ft. onto an iron plate. The pieces of coke which following this test would not in any position pass through the 2-in. screen were weighed and their ratio to the weight of the original sample was taken as the "percentage unbroken" in results indicated below.

The usual foundry mixture, consisting of 30 per cent. Pocahontas, 35 per cent. Pittsburgh and 35 per cent. Elkhorn coal, was found to give a result of 68 per cent. unbroken by this test. The straight Orient coal coked for 19 hours gave a coke of which only about 27 per cent. remained unbroken by this test. The coke obtained from 22- to 26-hour coking periods was somewhat stronger, ranging from 27 to 38 per cent. unbroken. The mixture of 50 per cent. Orient and 50 per cent. Pittsburgh showed about 53 per cent. unbroken, and the mixture of 25 per cent. Pocahontas with 75 per cent. Orient was strongest of all, with 74 per cent. unbroken.

The foregoing results are merely an indication and must not be taken as any accurate measure of the strength, since only a limited number of tests were made. Large irregularities are always found in this kind of testing and moreover this test is not strictly significant as to the strength of the material, since at the best it really gives an accurate measure only of the likelihood of breakage during handling.

The results obtained during six days from 8 a.m., Sept. 29, 1918, to the same hour Oct. 5, 1918, were used as the basis for byproduct and gas results, since during this period only Orient coal was in use and the system contained only products from this coal. During this period 6092.3 tons of natural coal were charged to the ovens, equivalent to 5600.6 tons on the dry basis, and these figures are used in calculating the yield of tar, ammonium sulphate, light oil and its products, and gas, which are reported in the following sections.

During the test, daily inventory was taken of the quantity of the tar and liquor in stock, accurate weights and specific gravities of tar shipments were recorded, and other necessary arrangements made to permit accurate determination of the quantities of these materials produced.

TABLE VII. YIELD AND CHARACTERISTICS OF TAR

Tar produced, as measured, gal	47,560
Tar produced, dry (computed), gal	46,100
Tar, as produced, per ton of coal as charged, gal	7.81
Tar, dry, per ton of dry coal, gal	8.23
Water in tar, by weight, per cent	2.6
Specific gravity, as produced	1.187
Specific gravity, dry basis (computed)	1.192

It was the intention during the test to produce only ammonium sulphate and maintain the minimum practicable supply of ammonia liquor. However, a slight variation in the quantity of liquor at the beginning and end of the test inevitably resulted, and appropriate correction for this difference in inventory was made and appears in the record of results reported. Samples of the tar, liquor and sulphate were taken for analysis regularly, so that the quality as well as the quantity of these materials would be a matter of record.

The sulphate delivered from the saturators into wheelbarrows was weighed as it was conveyed from the saturator room to the storage pile. The weight of sulphate produced daily varied largely in accordance with the amount of ammonia liquor accumulated or worked up into the sulphate during the day. From the measurement of volume, the temperature, specific gravity, and per cent. of NH_3 by weight, as determined in the laboratory test, the pounds of NH_3 and the equivalent weight of $(NH_4)_2SO_4$ were computed for the initial and final inventories.

The rich and lean gas produced at this plant are separately scrubbed for light oil recovery, but the light oil separated from the wash oil in the stripping stills is collected together. During the test period two sections of the light oil "running tank" were used on alternate days in order to permit careful measurement of each day's light oil production.

TABLE VIII. YIELD OF AMMONIUM SULPHATE

Produced, scale weight, lb	155,510
Produced, pure, lb	151,100
Equivalent liquor, start of test, pure, lb	15,920
Equivalent in liquor, end of test, pure, lb	34,700
Equivalent due to liquor increase, pure, lb	18,780
Total production, pure, lb	169,880
$(NH_4)_2SO_4$ per ton of coal as charged, lb	27.88
$(NH_4)_2SO_4$ per ton of dry coal, lb	30.33
NH_3 per ton of coal as charged, lb	7.19
NH_3 per ton of dry coal, lb	7.82
Average of NH_3 in ammonium sulphate produced, per cent	25.06

Table IX gives the total production of light oil for the six-day byproduct period and the yield based on the analysis of the composite sample analyzed according to methods prescribed in Ordnance Publication No. 1800.

The gas produced at the plant was separated at the ovens into rich and lean, the quantity of rich gas being so regulated as just to supply the requirements for the St. Paul Gas Light Co., to which all of this

TABLE IX. LIGHT OIL YIELD AND ANALYSIS

Produced, gal	22,570
Composition:	Per Cent
Boiling under 200 Deg. C. (Engler Flask)	84.4
Washing loss	5.7
Steam distillation residue	5.5
Benzene (Laclede still)	56.8
Toluene (Laclede still)	13.4
Solvent Naphtha (Laclede still)	3.5
Residue	15.1
Produced per Ton of Coal:	Gal
As charged	3.71
Dry	4.03
Produced per Ton of Coal: (Per Cent. under 200 Deg. C.)	Gal
As charged	3.13
Dry	3.40
Benezene per Ton of Coal:	Gal
As charged	2.11
Dry	2.29
Toluene per Ton of Coal:	Gal
As charged	0.497
Dry	0.540
Solvent Naphtha per Ton of Coal:	Gal
As charged	0.130
Dry	0.141

gas is sold. The lean gas remaining was used for heating the battery, and, if there was any excess, for firing the boilers.

The average analysis and total production of gas for the six-day byproduct test period, together with the yield per ton of coal and relative heating value calculations, are presented in Tables X and XI.

As a result of the test it is clearly demonstrated that some of the Illinois coals can be coked in the "chamber-type" oven without radical change in operating methods for the production of coke which can be successfully used in a blast furnace. However, it appears that the temperature at which Illinois coal should be handled for the production of the best coke is somewhat lower than the best operating temperatures for Eastern coals and moreover the speed of coking of the Illinois coal is somewhat less. The yield of gas and byproducts from Illinois coal of the kind tested is excellent both in quantity and quality. Of course the coal tested in this case represents one of the best Illinois coals for coking purposes, being lower in ash and sulphur and otherwise superior to many from this field.

TABLE X. GAS ANALYSIS

	Rich Gas, per Cent	Lean Gas, per Cent.
CO_2	4.5	3.8
Illuminants	4.4	2.4
O	0.6	0.4
CO	11.0	12.4
CH_4	31.5	25.1
H_2	42.4	50.7
N_2	5.6	5.2
Sp.gr. (Air = 1)	0.476	0.437
H_2S (grains per 100 cu.ft.)	430	340

TABLE XI. GAS PRODUCTION

[illegible]	Tons
As charged	6,692.3
Dry	5,600.6
[illegible]	M Cu.Ft.
[illegible]	31,982
[illegible]	1,440
[illegible]	33,422
[illegible] Battery A	2,842
Battery B	29,015
[illegible]	31,857
[illegible]	65,279
Gas per Ton as Charged:	Cu.Ft.
[illegible]	5,490
[illegible]	5,230
[illegible]	10,720
[illegible] Dry [illegible]	
[illegible]	5,970
To ovens	5,690
[illegible]	11,660
[illegible]	48.8
[illegible]	B.t.u. per Cu.Ft.
[illegible]	569
Lean	490
Heat [illegible]	B.t.u.
[illegible]	1,550
[illegible]	1,280
[illegible]	2,830
Heat [illegible] Dry [illegible]	B.t.u.
In [illegible]	1,690
In gas to ovens	1,390
Total	3,080
Heat [illegible]	45.2

In general, the comparison of Eastern coking coals with those from the Mid-Continent field must be made upon an economic basis, since which source will be preferable depends altogether on local conditions which will affect the cost of the material and the relative expense of handling. These phases of the question have, however, not been discussed in this report.

The authors wish to acknowledge the assistance and coöperation of the engineers and chemists who were associated with them in this work, as well as that of T. G. Janney, manager, and K. G. Richards, superintendent, of the plant, and F. W. Sperr, Jr., chief chemist of the Koppers Co., all of whom did all in their power to make the work both pleasant and successful. Special acknowledgement is also made of the great assistance which I. V. Brumbaugh has given us in working up the data contained herein and in preparing this manuscript.

Coal as a National Asset

Enough has been said, perhaps, to indicate how vast are the fields of coal which this country holds. It may be that any day some genius will release from nature a power that will make of little value our carboniferous deposits save for their chemical content. By the application of the sun's rays, or the use of the unceasing motion of the waves of the sea, the whole dependence of the world upon coal may be upset. That day, however, has not yet come; and until it does we may consider our coal as the surest insurance which we can have that America can meet the severest contest that any industrial rival can present. It is more than insurance—it is an asset which can bring to us the certainty of great wealth, and if we care to exercise it, a mastery over the fate and fortunes of other peoples.

Next to the fertility of our soil, we have no physical asset as valuable as our coal deposits. Although we are sometimes alarmed because those deposits nearest to the industrial centers are rapidly declining and we can already see within this century the end of the anthracite field, if it is made to yield as much continuously as at present, yet it is a safe generalization that we have sufficient coal in the United States to last our people for centuries to come. An extra scuttleful on the fire or shovelful in the furnace does not threaten the life of the race, even if some Russian or Chinese of the future does not resolve the atom or harness the hidden forces of the air. Whatever fears other nations may justifiably have as to their ability to continue in the vast rush of a machine world, there can be no question of our ability to last.

The recent strike, however, makes quite clear, perhaps for the first time, that it is not the coal in the mountain that is of value, but that which is in the yard. And between the two there may be a great gulf fixed. Therefore, we are put to it to make the best of what we have. We turn from telling how much coal we use to a study of how little we can live upon and do the day's work of the nation. And this is, I believe, as it should be. Indeed, I feel justified in saying that the problem of this strike was soon solved.

Conditions in Alabama in 1919

By Erskine Ramsay
Birmingham, Ala.

THE years 1917 and 1918 were marked with great strenuosity, patriotic efforts being made by both operator and miner in Alabama, as in all the others, to produce the maximum output of coal which was needed to meet the unheard-of demands coming from all branches of business, because of the extra efforts all were making to help win the war.

After the signing of the armistice in November, 1918, there was a decided let-up in the demand for coal, and as a result on Jan. 1, 1919, the coal-mining industry over the whole country was confronted with a large supply of fuel in stock.

Alabama had its full share of stocked coal to contend with. There was a sharp decrease in railroad and industrial fuel consumption and a mild winter reduced domestic demands. During the early months of the year, in addition to the slackening of activity of various war industries and the railroads, many blast furnaces throughout the Birmingham district shut down for the want of business and as such furnaces consume the greater part of the coke made in Alabama, this brought about a serious decrease in the production of coking coal.

SLOSS-SHEFFIELD STEEL & IRON CO.'S NEW BYPRODUCT COKE-OVEN PLANT

PITMOUTH AND FAN HOUSE, VIRGINIA MINE, GULF STATES STEEL CO

The general coal production gradually slowed up until March 1, 1919, when the output was probably not above 60 per cent of normal. Beginning with July 1, 1919, approximately 750,000 tons of railroad fuel heretofore supplied by Alabama mines was transferred to eastern Kentucky and Tennessee fields. This, coupled with a loss of close to 1,000,000 tons of fuel oil, at Gulf and South Atlantic ports and near-by territory, resulted in a further loss of running time.

Beginning with Sept. 1, 1919, the demand materially improved, but the output could not be brought up on account of a short car supply which for some time did not average over 60 per cent of the requirements.

The Alabama mines were operated during all of 1919 under the Garfield agreement, which, from its beginning on May 15, 1917, proved satisfactory. The mines ran with little or no trouble and any question between operator and miner was quickly and satisfactorily settled without difficulty by reference, when necessary, to Judge H. C. Selheimer, umpire, who was appointed by Dr. Garfield to handle questions requiring his attention, as and when they arose. He is handling his work with great satisfaction to everybody concerned.

The nation-wide strike called on Nov. 1, 1919, did not affect Alabama's output seriously, as it did some other sections of the country. Many of the mines, and this included nearly all of the larger ones, continued to operate at practically 100 per cent capacity during November. After the wage increase of 14 per cent was fixed by Dr. Garfield, it was made effective by the Alabama operators on Dec. 1. This has increased the cost of production in many cases to a point where the operator faces a loss.

The demand for pig iron increased considerably about Oct. 1, and as a result a number of the furnaces that had gone out of blast earlier in the year resumed operation. The outlook for 1920 in the iron business is good. It is expected that the furnaces will continue in practically full operation during the year. Since the coke ovens and other operations of the iron companies consume a large proportion of the total Alabama output, it is felt that the production for the year will be fairly good.

DISTRIBUTION OF ALABAMA COAL

Uses	Per Cent
Coal made into coke	33
Iron companies	10
Railroads	20
Steamships	5
Domestic purposes	10
Miscellaneous steam purposes	22
Total	100

As is well known, a large portion of Alabama's miscellaneous steam-coal business comes from cottonseed-oil mills, their refining plants, steam cotton gins and fertilizer plants, of which there is a considerable number tributary to our district. The very nature of their business causes them to close down or suspend operations during the spring months. Throughout the summer and until late in the fall they are idle, as a rule. Of course, they consume no coal during this period. If it could be made to the advantage of this kind of a coal consumer to put in a year's supply, beginning, say, April 1, it would be of great benefit by employing miners more steadily during the summer, by giving the railroads more tonnage during their dull season, and relieving both equipment and human effort from the strenuous period which always comes during the fall and winter months.

The same condition applies to all fixed, stable steam plants, municipal as well as privately owned, and also railroads. It is recognized that some extra expense would be incurred, first in the preparation of a place wherein to store the coal and second in picking it up for consumption. This could be well and profitably borne by the miner, the coal operator, and the transportation company, each making a proper sacrifice, which in the end would be offset by their gaining steady all-year-round work.

The managers of a plant with its winter season's supply of coal on hand, say, by Oct. 1, would have a feeling of independence not always present under prevailing conditions. Concerns of standing would have no trouble in making payment for both coal and transportation, by giving acceptances due at periods estimated to cover the coal as consumed. A lower range of prices could be quoted by operators and dealers, and lower freight rates would encourage the movement of coal during the spring and summer months.

NUMBER AND KIND OF COKE OVENS IN ALABAMA JAN. 1, 1920

County	Beehive	Byproduct	Total
Jefferson	5,739	*1,074	6,814
Tuscaloosa	665	60	725
Walker	660	....	660
St. Clair	60	....	60
Etowah	....	37	37
Total	7,124	1,171	8,295

* The above includes the 120 byproduct ovens of the Sloss-Sheffield Steel & Iron Co. nearing completion in Jefferson County; also 50 byproduct ovens of the Birmingham Coke & By-Product Co., nearing completion in Jefferson County.

ALABAMA COKE PRODUCERS SHOWING NUMBER OF BEEHIVE AND BYPRODUCT OVENS

Jan. 1, 1920

Company	Beehive Ovens	Byproduct Ovens	Total
Tennessee Coal, Iron & Railroad Co	1,746	434	2,180
Sloss-Sheffield Steel & Iron Co	1,177	*120	1,297
Republic Iron & Steel Co.	908	....	908
Alabama Co	894	....	894
Woodward Iron Co	300	230	530
New Castle Coal Co	374	....	374
Semet-Solvay Co	....	300	300
Birmingham Trussville Iron Co	301	....	301
Sheffield Iron Corporation	300	....	300
Gulf States Steel Co	451	37	488
Imperial Coal & Coke Co	103	....	103
Yolande Coal & Coke Co	100	....	100
Jennifer Furnace Co	100	....	100
Empire Coal Co	100	....	100
U. S. Cast Iron Pipe & Fdy. Co.	100	....	100
Pratt Consolidated Coal Co	60	....	60
Seaboard Coal & Coke Co	60	....	60
New Connellsville Coal & Coke Co	50	....	50
Birmingham Coke & By-Products Co	....	* 50	50
Total	7,124	1,171	8,295

* Now in building in Jefferson County.

This particular feature of the coal business is of vast importance to the whole country. The railroads are often not able to handle the business offered them during the fall and winter, and until some satisfactory plan is worked out to solve the problem, we will continue to experience coal famines in portions of the country during the winter period.

Such an arrangement of seasonal prices would somewhat follow the long-established practice of the anthracite people. The practical working of this plan has been quite satisfactory.

Since the completion of the locks, the use of the Warrior River as an outlet to the sea for coal and other products from this district presents an encouraging outlook for the future. During the year 1919 some 115,000 tons of coal were shipped by this waterway to Mobile and New Orleans. Much of this coal was used to bunker ships calling at these ports. Development of coal mines along the river will be made to take advantage of the additional barges and towboats now being built by the Government. The Port of Birmingham near Short Creek is now being equipped with facilities for handling material shipped from the Birmingham district down the river, as well as for merchandise coming up the stream. Steel is being shipped down the river to the large shipbuilding plants at Mobile. The shipbuilding industry promises great growth and will afford a substantial market for Birmingham products. The distance from the coal mines to the Gulf is about 400 miles and the river is used throughout the entire year, there being no difficulty here with freezing as is the case farther north.

The reports compiled by Chief Mine Inspector Nesbitt show that fewer fatal accidents have occurred in the mines during 1919 than in any year for the past 15, with one exception. The decrease in fatalities is due, in a large measure, to the safety instructions given the employees during the past several years. The Alabama Safety Association is doing much good instruction work along the line of preventing accidents and also in furthering the application of first aid to the injured.

The Tennessee Coal, Iron & Railroad Co., a U. S. Steel Corporation subsidiary, has been and is the leader in establishing the most modern mining plants, together with all that goes with them in the way of towns having the most up-to-date houses, stores, schools, kindergartens, churches, hospitals, bath houses, etc.

Other companies, however, have done also their full part in work of this character.

TIPPLE SCENE AT AN ALABAMA MINE

Coal Mining Laws Compared

By Alex Moss
New York City

SYNOPSIS—*A few tabulations of the requirements of the mining laws in regard to quantity of air, number of men on each split, spacing of crosscuts, distance in advance of air, number of men allowed in mines with single openings, distance between openings, spacing of refuge holes, clearance for cars and drilling for water.*

WHAT is deemed a safe measure of precaution in one state, insofar as the conditions surrounding coal mining are concerned, is often disregarded by some other state in the drawing up of rules and regulations intended to safeguard the workers in its coal mines. Of course, local conditions, local preferences and local practices quite often decide whether a rule promulgated for the safety of the underground workers be rigid or flexible. The basic idea, however, underlying the mining laws adopted by the different coal-mining states is the same, namely, to protect the lives and health of the mine workers, and it is of interest therefore to observe how with a single purpose in mind and conditions so equal such differences in legislation as exist have been allowed to continue.

Of first importance to the underground workers in the mines is plenty of air. Without a continuous circulation of fresh air it would be impossible to carry on operations. Rules for ventilation therefore have received the careful attention of the lawmakers, and important differences can be noted in essentials. Ventilation requirements that lend themselves readily to tabulation have been presented in that form in Table I.

TABLE I. COMPARISON OF VENTILATION REQUIREMENTS

State	Cu Ft. of Air per Man per Min.	Cu.Ft. of Air per Animal per Min.	No. of Men Permitted on Each Split	Break-Throughs, Distance Apart, Ft.	Permissible Distance of Air from Working Place
Alabama	100	500		70	
Arkansas...	100		50	40	
Gaseous				30	
Colorado	100	500	100[1] 65[2]	(See Note)	60
Illinois	100	500	100	60	60
Gaseous	150				
Indiana	100	200	50	45	
Iowa......	100	500	80		60–70[3]
Kansas..........	100	...	...	40	....
Kentucky.......	100	...	...	90	60
Maryland	100			Big vein 35 Other veins 25	
Michigan	100	300	100		
Gaseous .	200	600			
Missouri	100	600	50		
Montana	100	600		60	
Gaseous .	150				
New Mexico.....	100	300	...	....	
Ohio	150	500			
Oklahoma	150	750	45	...	
Gaseous.......	200	...			
Pennsylvania (A)	200[4]	...	75	....	..
Pennsylvania (B)	150		70 to 90	60	60
Gaseous	200				
Tennessee.......	150[5] 100[6] 85[7]	600[5] 500[6] 500[7]	50	....	
Texas..........	100	300	100		
Utah........	100	300	75	50 to 100 75 to 200[8]	
Virginia . .	100			80	
Gaseous .	150				
Washington......	100	500	70 to 90	60	
West Virginia.	100		60	80	
Gaseous	150				
Wyoming........	150	...	50		

NOTE—As often as inspector may order

[1] In mines opened before passage of act

[2] In mines opened after passage of act

[3] Crosscuts in entries for air courses.

[4] In mines generating explosive gases, velocity must not exceed 450 lin. ft per min. if gage safety lamps are used, except in main inlet or outlet airways.

[5] In mines generating firedamp.

[6] In dry and dusty mines.

[7] In non-gaseous mines.

[8] In main entry.

TABLE II. LEGAL DISTANCES SEPARATING FIRST AND SECOND MINE OPENINGS

State	Minimum No. of Men Before Two Openings Are Required	Ft. Separation of Natural Strata Required		
		In Slope Mines	In Drift Mines	In Shaft Mines
Alabama	20	25		100
Arkansas				100
Colorado				300
Illinois	10			500 to 2000[2]
Indiana	10			200
Iowa	5	200		300
Kansas	25	80	50	80
Kentucky	10	100	50	100
Maryland	20	150	30	150
Michigan	5	200		300
Missouri	5	300		300
Montana	10	(See Note)		100[3] 300[4]
New Mexico...........	....	50	...	50
Ohio		100		100
Oklahoma		50		150
Pennsylvania (A)				150[5]
Pennsylvania (B).......	20	150	...	200
Tennessee	20	150[1]		150[1]
Texas.................	....	...	...	150[6]
Utah..................	....	...	...	150[6]
Virginia..............	....	50	...	100
Washington . .	20	75		75
West Virginia..........	....	50	...	300
Wyoming		50		50

[1] In slope and shaft mines where slope is greater than 20 deg.

[2] In mines employing 10 men or less the distance between hoisting shaft and escapement shaft is to be not less than 250 ft.

[3] Where steel headframes are used.

[4] Where wooden headframes are used.

[5] Measurement given is on surface; underground the distance apart should be at least 60 ft.

[6] Not less than 30 ft. at any place

NOTE.—Where slopes or drifts are driven in or on the coal strata, the distance apart between escapement road or travelway and the slope drift or haulingway shall be not less than 50 ft.

MINE OPENINGS

Every state in the union in which coal mining is being carried on legally requires two openings to the surface from every seam being worked, some states stipulating that both of these openings do not necessarily have to be in the same mine, but that one of the openings may be made in some contiguous operation. The mine inspector, as in a number of other matters, is permitted to exercise his discretion as to whether the regulations be adhered to rigidly. In Table II are given data relating to the distances between first and second openings required by the laws of the state.

REFUGE HOLES

The laws in the majority of the coal-mining states require that refuge holes be cut on all roads where hauling is done by machinery and draft animals, and where it is necessary for men to travel. Some states merely stipulate that these refuge holes be cut where sufficient clearance does not exist between the side of the car and the face of the rib, while other states specify in detail the width, depth and height to which these shelter holes should conform. In Table III is given the legal minimum distance apart for shelter holes in mines in the states listed. Shelter holes are not required where the clearances given in Table IV obtain.

WASH-HOUSES

Not all the coal-mining states in the union make provision by law for wash-houses for its mine workers.

Recent amendments to old laws in some few states would seem to indicate, however, that the importance of furnishing adequate facilities for the changing of clothes and for washing up after the day's work is coming in for more recognition. As yet Alabama, Arkansas, Colorado, Iowa, Kentucky, Maryland, Missouri, New Mexico, Tennessee, Texas, Utah, Virginia, West Virginia and Wyoming have passed no law making the building of wash-houses at mines compulsory. Indiana, Michigan and Pennsylvania (anthracite) stipulate that wash-houses are to be erected upon the written request of 20 or more employees, and that where fewer than 20 are employed, then upon the written request of one-third of the number employed. Kansas goes extensively into the question of wash-houses in its mining laws, even going so far as to specify construction details and the kind of equipment to use. Montana and Ohio laws merely state that wash-houses are compulsory. Oklahoma and Pennsylvania (bituminous) operators must erect wash-houses upon the request in writing of 10 or more employees. The state of Washington requires the erection of a wash-house upon the petition of 60 per cent. of the employees at a mine, but does not enforce the law where less than 20 men are employed.

TABLE III. LEGAL DISTANCE APART OF REFUGE HOLES

State	Maximum Distance Apart, in Yds	State	Maximum Distance Apart in Yds.
Alabama	No provision	New Mexico	100
Arkansas	....	Ohio	60
Colorado	50	Oklahoma	30
Illinois	60	Pennsylvania (A)	50
Indiana	20	Pennsylvania (B)	30
Iowa	20	Tennessee	20
Kansas	30†	Texas	No provision
Kentucky	60	Utah	150 ft.
Maryland	No provision	Virginia	80 ft.
Michigan	60	Washington	60 ft.
Missouri	No provision	West Virginia	60 ft.
Montana	20	Wyoming	No provision

† Mule haulage 60 ft

Miscellaneous Safety Regulations

In the matter of boreholes when approaching dangerous places, the laws of the respective states show a little similarity. The differences are noted in Table V. Rules regarding the insulation and installation of electric wiring are more or less exhaustive, depending in great measure possibly on the extent of the knowledge possessed by those framing the laws. Stretchers and first-aid material are required at the mines, in all states without exception making provision for the installation of the necessary paraphernalia. Timbering of places and the precautions surrounding the handling of explosives are thoroughly gone into, but the nature of the information bearing on these subjects is such that it does not lend itself readily to tabulation. Every state makes the sprinkling of dusty mines compulsory.

TABLE IV. CLEARANCE REQUIRED ON HAULAGEWAYS WHERE MEN ARE REQUIRED TO TRAVEL

State	Distance from Side of Car to Rib, in Ft.	State	Distance from Side of Car to Rib, in Ft.
Alabama	No provision	New Mexico	2
Arkansas	No provision	Ohio	3
Colorado	3 (a)	Oklahoma	4
Illinois	3 (a)	Pennsylvania (A)	2½
Indiana	3 (a)	Pennsylvania (B)	(*)
Iowa	8 (b)	Tennessee	No provision
Kansas	No provision	Texas	No provision
Kentucky	2½	Utah	(*)
Maryland	No provision	Virginia	(*)
Michigan	3	Washington	2½
Missouri	No provision	West Virginia	(*)
Montana	2½	Wyoming	No provision

(a) On mechanical haulageways; where hauling is done by draft animals, 2½ ft is the distance required.

(b) Dimension given is width from one rib or side of the entry or haulageway to the opposite side.

(*) Of sufficient width to enable persons to pass moving cars with safety.

Insofar as possible, it would appear from an analysis of these laws that an effort should be made at standardization, wherever standardization is possible. Where a stringent law in one state puts the operator to considerable expense in the endeavor to comply with it, it is manifestly unjust that the law in an adjacent state should be lax enough to permit the operators in that state to evade the law, or to comply with the requirements at a comparatively small outlay. The cost of mining has a direct bearing on the selling price of coal, thus the states having the less restrictive laws run away with the trade of the states having laws that are more srict.

Uniformity in the regulations relating to the distance between crosscuts, or breakthroughs, is greatly needed as the legal requirements vary considerably, and in most cases the distance allowable should be increased, for the making of excessive breakthroughs is a waste of labor, adds to the expense of coal extraction and causes loss of mineral. As it weakens the support of the drawslate, it has its effect also in loss of life.

The rules were made when artificial ventilating equipment was almost unknown and when scientific methods of distributing the small amount provided by natural ventilation were crude. With canvas available in gaseous mines, with shooting done after men have left the workings, with the abolition of the foul oil torch, with an energetic current that more effectively clears the air wherever it goes, the law should direct itself less to keeping the distance between breakthroughs and develop those features which provide for the proper ventilation of the coal face.

TABLE V. REGULATIONS TO BE USED IN THE APPROACH OF DANGEROUS PLACES

State	Distance from Dangerous Places When Precautions Should Be Observed, Ft.	Width of Excavations When Approaching Dangerous Places, Ft.	Length of Center Borehole in Advance of Face, Ft.	Length of Flank Boreholes in Ft.	Distance Apart of Flank Boreholes, Ft.
Alabama	100	8	9	15	6
Arkansas	No provision	No provision	20	No provision	No provision
Colorado	No provision	8	12 (two)	12	8
Illinois	50	20	10	10	On each rib
Indiana	No provision	8	9	No provision	No provision
Kansas	No provision	No provision	12	No provision	No provision
Kentucky	50	No provision	12	No provision	No provision
Maryland	No provision	10	20	No provision	8
Michigan	60	8	20	15	No provision
Missouri	No provision	No provision	20	No provision	No provision
Montana	100[2]	No provision	12	12	On each rib
Ohio	100[1]	No provision	12	12	On each rib
Oklahoma	No provision	10	12	12	8
Pennsylvania (A)	No provision	12	20	No provision	No provision
Pennsylvania (B)	No provision	8	12 (two)	12	8
Utah	No provision	No provision	25	25	85
Virginia	No provision	No provision	12	No provision	No provision
Washington	No provision	8	20	12	No provision
West Virginia	No provision	No provision	12	No provision	No provision

[1] Where there is a map, [illegible]. [2] Where there is no map, distance is 100 ft. [3] Where there is no map, distance is 200 ft.

NOTE—Iowa, New Mexico, Tennessee, Texas and Wyoming make no reference whatever to boreholes.

Coal Market in South America

By Frederick Todd *
New York City

THE statistics of current deliveries of coal into the existing markets of South America contain little real information concerning the possibilities now and in the future for American fuel there. Prices of coal everywhere in the large-consuming localities are obviously far from what they will be when the readjustments of ocean transportation and of international commerce become effective. There is much abnormality in the movement of coal. Nobody should attempt to judge what the future will be upon the basis of the present.

There are several big developments in progress in various places upon the continent of South America which will have their effect in the near future on the possibilities of selling foreign coals on a much greater scale than ever before. It may be well to mention incidentally the three developments that might seem adverse to the marketing of American coal there, before saying anything about the favorable signs.

GENERAL VIEW OF BARRIA DO PIRAHY

First, and undoubtedly in the light of what data is now obtainable, the most important, is the use of petrol and of "motor spirit" derived as a byproduct from coking. There is a considerable movement in different parts of South America to use oil. In visiting a number of important manufacturing plants in Sao Paulo, Brazil, and near Buenos Aires, Argentina, where coal-gas is now used in various mechanical processes (such as in glass manufacture and enameling) I found that new apparatus was being installed for the substitution of oil to take the place of coal.

These industries are not very important, but they are typical. I was also informed by an important government official in the immediate executive charge of an extensive state railway system that it was probable that upon all new locomotives ordered or built for these roads, equipment for oil-burning would be substituted for coal. Oil and motor-spirit are right now selling at high prices in South America, but there is a feeling that even on imported fuel-oils a better organization of economies is coming.

At the same time there is some prospect of local oil developments. The Rivadavia region in southern Argentina, has been developed only to the extent of scratching the surface, because, as generally said, of the government refusal to permit private exploitation on any adequate scale. Nevertheless the crude oil, lacking in certain rich elements, is now going in large quantity to the River Plate, and a great American business organization is pushing the sale of its internal-combustion machinery on the basis of the fact that this comparatively cheap fuel can be used with good success.

In addition to the Rivadavia oil, a new source of remarkably rich crude product has lately been discovered in the north of Argentina. Certain financial interests in Buenos Aires that are fully equal to the big operations involved, have taken hold of this situation. A pipe line may be laid down to Buenos Aires, or a highly interesting scheme may be adopted of transporting the oil a thousand miles by river, on barge-rafts built so that they may be broken up at the journey's end and sold for timber.

A new and important oil field is just reported as discovered in south Brazil. Another great development at first sight adverse to coal is the expectation of hydro-electric power development on an extensive scale.

The Brazilian government has just asked for plans and bids for the electrification of the "central" railway from Rio de Janeiro as far as Barria do Pirahy, a junction 68 miles out, whence government lines branch northward into the rich state of Minas Geraes, and southward into Sao Paulo. A serious proposition for an immense government steel plant at this point has been officially made but has not been adopted. Coal is now used for all traffic in the zone to be electrified, because of the mountain grades.

There is so much reliable power going to waste all through the highly developed region about Rio and Sao Paulo that there is much talk of further electrification of railroads. These roads now burn wood altogether, except in small zones near Sao Paulo. Hydro-electric development on the Andean slopes of Chile seems also promising and almost an assured fact.

RAILROAD STATION AT LA FAYETTE, STATE OF MINAS GERAES, BRAZIL

The third development that seems adverse to the sale of American coal in South America is the search for and the use of local coals. Brazil has coal fields. The output from these is now brought regularly to Rio de Janeiro. It is used in a few large industries, notably in the extensive shops of the Lloyd Brazileiro, but imported coal is mixed with it.

I took pains to seek out the opinion of capable

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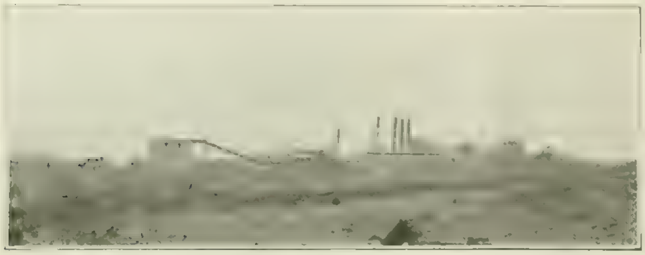
*Mr. Todd, who is the editor of "The Americas," the magazine of the National City Bank of New York, has recently returned from a business observation trip overland through Brazil, Uruguay, Argentina, Paraguay, Chile and Peru.

Brazilian engineers as to the future of this fuel. They say that the coal so far known in Brazil is of low grade, containing a high percentage of dirt or ash material. And the man whose judgment seemed best to me, because of his position and his accomplishments in efficient production in a great establishment, frankly stated that he would not use this fuel at all, even to mix with imported coal, except for the necessity of meeting the wishes of other executives.



AN AMERICAN CEMENT FACTORY AT SERRAS BAJAS, ARGENTINA
Large consumers of American Coal

The concensus of opinion is that Brazilian coal can hardly compete when supplies of imported fuel begin to arrive under normal circumstances. I was forced to this opinion in spite of predilections the other way, being a great admirer of Brazil's show of enterprise in all kinds of productive development.

Coal has been found in Argentina, but I failed to meet anybody at Buenos Aires who took the Argentine coal prospects with much seriousness. There is coal also in Chile, and it is said to be of good quality. My stay in Chile was too brief (owing to delay in the Andes crossing) to satisfy myself just why more is not being done to develop this supply, and to develop industries to take advantage of it.

There is good coal in Colombia, and if the supply is developed, it may feed manufacturing industry, also railroads, along the Carribean coast. It even may constitute the source of supply for the coaling stations at the Panama Canal. As far as the Brazilian and Argentine markets are concerned, it would probably only rank as a competitor with the United States and Welsh coal field.

The foregoing are developments apparently adverse to the marketing of American coal in South America. In reality, all would probably assist in making the market greater. Cheap motor fuel supplied will without doubt be absorbed in a big development of bonanza farming, from Patagonia up to the far limits of Mato Grosso in Brazil and of the vast Chaco of Paraguay and Bolivia. If cheap electric power ever enables Brazil to secure cheap transportation through the rich country of Minas Geraes, Sao Paulo, South Brazil, and on the projected lines into the great cattle country of Mato Grosso and into Paraguay, so great a general growth of prosperity will follow as to require vastly increased supplies of coal for various purposes.

There is even now, an important growth of manufacturing industry in Brazil, Uruguay, and Argentina. It is well organized, efficient manufacturing industry that needs coal.

Everywhere, better railroad transportation is demanded. There are extensive regions where it will never be possible to use hydro-electric power.

At present, the chief fuel of all South America is wood. Nobody who has been brought up in the United States can realize, until he sees it with his own eyes, how wood figures as fuel in coalless countries in this age. For hundreds of miles, along the South American railways, one sees the great stacks of firewood, literally lining the rights of way. It is brought for miles, by ox teams, down the hills and across country. Here and there spurs of railway run off as side tracks to tap a supply of wood. Gathering and hauling wood seem to use up a high proportion of the energies of the inhabitants along the railways and of the railways themselves.

The locomotive tenders are piled high with wood, but the train must wait 15 to 20 min. at intervals when stops are made in order to replenish supplies. On side-tracks long trains of wood-cars are waiting enroute to the cities. Wood comes down river on barges and steamers, and on lumber rafts in vast quantities.

But South America has already burned up the forests adjacent to the larger cities. It is becoming a problem where the wood-fuel of the future is to be obtained. The vast forests of Brazil, on the Amazon, are inexhaustible for perhaps a thousand years, but they are 2,000 miles away from Rio de Janeiro as the bird flies, and from 3,000 to 4,000 miles, by water. Already, the forests along the rail lines have receded.

Buenos Aires has a large supply of firewood in the artificial forests that line the banks and cover the islands of River Plate for 50 miles upstream. The eucalyptus and other trees of rapid growth, are cultivated in a systematic way on stretches of flat land, laid out in squares bounded by irrigation ditches, with straight trees growing in mile-long rows only a few feet apart. The wood is cut in blocks, as it reaches cutting maturity. As seen by the voyager coming down by steamer from Asuncion, this is an impressive industry. Corporations operate the industry, some sections being owned by *frigorifico* companies that cultivate fuel for their own factories, other by companies that sell the wood in Buenos Aires.

Now wood is becoming dear in price, owing, some say, to a scarcity. Even in the country towns, wood sells for the equivalent of $5 and $6 a cord, and the statement is made that the firewood piles owned by glass factories, etc., in Buenos Aires cost them as much as coal would have cost, even in war-time, unit for unit in value as fuel.

CARS LOADED WITH WOOD USED AS FUEL AT LAFAYETTE, MINAS GERAES, BRAZIL

There can be little doubt that South American cities will soon offer a large demand for high-grade domestic coals if the market is developed and prices are right. The railroads must soon find wood as a fuel not only unsatisfactory, but much costlier than coal on a peace basis. And the hundreds of important industries now springing up will surely be attracted by offers of coal at prices based upon normal transportation conditions.

Southern West Virginia in the Year Past

By Josiah Keely

Kayford, W. Va.

ANY summary of the coal business of southern West Virginia cannot be complete without the records of the mines on the Kanawha & Michigan, the Norfolk & Western, and the Virginian. The mines on the Chesapeake & Ohio, however, comprising the Kanawha, New River, Guyan River, Coal River and part of the Big Sandy valleys, combine to make such a large field that its history will give a fairly accurate résumé of what has happened in 1919 in southern West Virginia.

The signing of the armistice in the latter part of 1918 began to show its effect in January of 1919, and from then until well into June the low tonnage was a reflection of poor business. However, the difference between the spring of 1919 and the preceding one was not so much as might be supposed. During the first six months of 1918 the Chesapeake & Ohio handled 14,000,000 tons while during the same period of 1919 it hauled 12,500,000 tons, or during the whole of 1918 there were 29,000,000 tons loaded as compared with 27,000,000 tons in 1919, so the loss of two million tons seems to have almost entirely come about in the first six months, in spite of the car shortage during August and September, and the strikes in November and December of 1919.

In July of 1918 the Chesapeake & Ohio broke all previous records by hauling a little over three million tons. This was done under the stress of a war drive. In October of 1919, the output, sustained by the anticipation of the November strike, was only a few tons under this figure. The exact figures were 3,129,950 and 3,123,090 respectively. It is worthy of note that this railroad was serving 485 mines in 1918 and 512 in 1919, an increase of 27 mines since war times.

Southern West Virginia came somewhat well through the stringency of the spring months. A fall of only one-and-half million tons, or about 10 per cent occurred along the Chesapeake & Ohio during the first half year, and, in the year as a whole, despite the strike the tonnage was only two million tons below that of 1918. Even during the war it was hard to find a month better than October of last year. Union men left the union fields during the strike and went to the Guyan field where steady work was obtainable.

The following table gives the distribution of the coal routed over the Chesapeake & Ohio from southern West Virginia in 1919:

CHESAPEAKE & OHIO LOADING FOR THE YEAR OF 1919

(In Tons)

Mouth	New River	Kanawha	Coal River	Logan	Kentucky	Unalloted	Total
Jan....	451,810	453,280	151,610	595,220	237,190	174,800	2,063,910
Feb.....	325,140	338,010	88,390	370,350	160,030	155,500	1,437,420
March.	415,800	367,590	125,340	450,940	194,880	181,550	1,736,100
April...	523,460	414,430	129,570	567,210	205,790	163,400	2,003,860
May...	624,360	523,010	195,580	786,760	255,370	166,000	2,561,080
June...	634,970	563,130	216,660	896,220	268,900	161,500	2,741,380
July...	631,170	571,850	218,770	949,340	304,170	192,250	2,867,550
August.	470,160	396,590	158,140	631,250	224,160	136,200	2,016,500
Sept....	470,910	478,520	186,560	755,560	239,250	158,300	2,289,100
Oct....	655,850	632,880	234,430	997,450	378,430	224,050	3,123,090
Nov....	314,770	260,320	115,630	977,660	251,640	165,900	2,085,920
Dec.*..	387,370	212,900	126,560	724,980	261,450	171,650	1,884,900
Total.	5,905,770	5,212,510	1,947,240	8,702,940	2,981,260	2,051,100	26,810,810

*Up to and including December 24th.

Following down each column the tonnage is a fair index to the history of each district. Down through January, February, March, April and May was when the railroads and the public were holding off for cheap fuel. The break in prices came after this economic war, and everybody began loading coal. June and July sufficed to overtax the car capacity, and the car shortage cut down the tonnage in August and September. In August, New River and Kanawha, which have nearly the same allotment, show a difference in loading of 70,000 tons, representing just that much inequality in car distribution. However, this was being made up to the Kanawha Field in September, when a rather unusual thing happened. First, Labor Day was a loss and then on Sept. 5, by a preconcerted agreement, all mines in Kanawha, Cabin Creek and Coal River were shut down two or three days as a protest against the unorganized field of Guyan.

The men met with arms, and ammunition and uniformed in new overalls. In spite of the warning of Governor Cornwall a body numbering a thousand or more marched toward Guyan. This advance was only stopped when two messages were received simultaneously one from the Governor and one from the armed deputies and men of Guyan who had a large army of scouts and 50 automobiles full of special officers waiting for them. It is a matter of some speculation which one of the messages were most heeded, but the invading army returned. A little later another attempt was made to get up an army for Guyan, but the only result was more loss of coal in the Kanawha field in September.

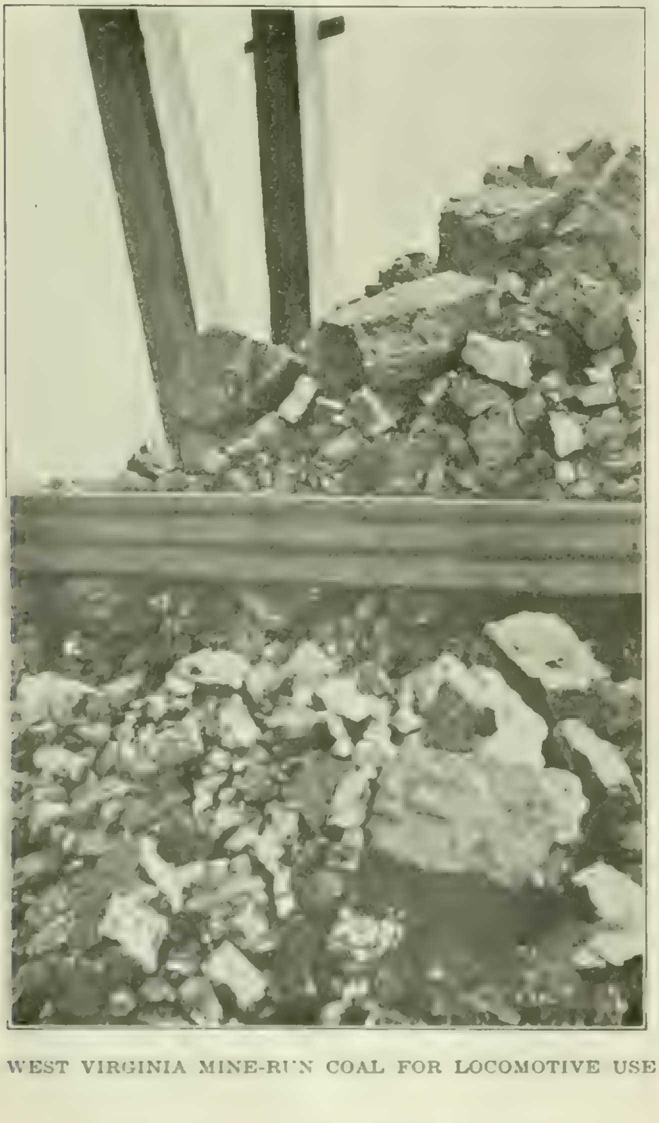
In October a rush was made in all fields to lay by supplies for the strike called Nov. 1. This resulted in the biggest month of the year.

During November and December the table shows the effect of the strike order in the various fields. New River and Kanawha at first showed almost complete suspension. The Logan field of Guyan was not effected. In fact, many of the miners from the union fields crowded in and filled up these mines. But for car shortage Guyan would probably have broken its record of July, 1918.

On Nov. 11, the miners received the order to return to work, but as anticipated, it did not seem to have been given in the right tone of voice. Illustrating, a driver can say "get up" to a mule in an impersonal, conversational way, and the mule does not even hear it; but when the driver wants him to really "get a move on," he says the same words with a different inflection. That seems to be about what happened in the case of the strikers. Occasionally a mule is listening for the word to go, especially if he happens to be headed in the right direction. A considerable number of mines, especially on New River, seemed to be listening. Anyway, New River worked better than Kanawha. In fact, all the southern districts did better than Kanawha on the order to resume work.

However, most of the mines finally started and coal was moving again until the Garfield settlement was announced about Thanskgiving time. This seems to have been a signal for another general suspension, lasting, except on New River, until the Palmer interpretation held out hopes for a reconsideration, which put Kanawha and the rest to work about Dec. 13.

In two or three days the field was hit with such a car shortage that not quite as much coal was loaded as when the men were striking, for Guyan could load during the strike but seemed helpless against the car shortage. The Chesapeake & Ohio records seem to indicate that this road has offered southern West Virginia 270.27 days' work this year. It further shows that the mines have only availed themselves of 169.23 days. By a simple mathematical calculation it can be shown that this region has lost 101.04 days in strikes and failure to load. However, in looking over the records, by some strange coincidence, the days on which the mines and the miners want to work are the very days when there are no cars, and, when there is a 100 per cent car supply, there is either a strike of miners, or a strike of buyers in progress. This has happened with such regularity that among the more suspicious of us there is a feeling that transportation is such a limiting factor that it makes little difference whether we strike or work. In corroboration of this, the Chesapeake & Ohio last year with all sails set, and the nation clamoring for coal to win the war, was able apparently to handle only two million tons, or a partial month's run, more in 1918 than in 1919, the first part of which nobody was ordering and the last part the men were striking.



WEST VIRGINIA MINE-RUN COAL FOR LOCOMOTIVE USE

No, the railroads can not offer cars for 270 days in the year at present, and thus, regardless of any annual summary reciting causes of non-performance, we may be sure that the history of transportation is now the real history of the coal business.

LOCOMOTIVE FUEL FROM THE KANAWHA FIELD

Oklahoma Wage Scale

Below are tables showing the wage scales in effect during the year in the southern and northern fields and the selling prices of the various grades of coal at the mines. The operators have granted the 14 per cent wage increase, as made a condition of the strike settlement.

WAGE SCALE IN EFFECT IN 1919

(Southern Field)

(a) Miner (pick work)	78, 83 and 99 cents per ton
(b) Driver	$5.25 to $5.40 per day
(c) Timberman	5.25 to 5.30 per day
(d) Laborer	5.25 per day (underground)
Laborer	4.40 per day (surface)

PRICES PAID FOR COAL AT THE MINES, 1919

(a) Lump	$3.60 to $4.50 per ton
(b) Nut	3.10 to 4.25 per ton
(c) Slack	1.60 to 2.00 per ton
(d) Mine Run	2.60 to 2.70 per ton

(Northern Field)

(a) Miner	57½ and 62 cents per ton (machine)
Miner	78 and 79 cents per ton (pick work)
(b) Driver	$5.45 to $5.50 per day
(c) Timberman	5.46 to 5.50 per day
(d) Laborer	5.46 to 5.50 per day (underground)
Laborer	4.76 per day (surface)

PRICES PAID AT MINES, 1919

(a) Lump	$3.60 per ton
(b) Slack	1.35 per ton
(c) Mine Run	2.60 per ton

Fusibility of the Ash from Certain Eastern Coals*—I

By W. A. Selvig, O. C. Brown and A. C. Fieldner
Fuels Chemical Laboratory, Bureau of Mines, Pittsburgh, Penn.

THE Eastern coal province, which includes the anthracite regions of Pennsylvania and Rhode Island, the Atlantic Coast region of Virginia and North Carolina, and the great Appalachian region, contains the best known and most extensively mined coals in the United States.

Previous papers[1] gave a description of the standard gas-furnace method used by the Bureau of Mines in making ash fusibility tests, a discussion of the relation of fusibility tests to clinker formation, and complete tables giving results obtained for West Virginia, Pennsylvania and Mid-Continent coals. This paper includes a table giving the results obtained for all coals tested from the remaining states of the Eastern coal province and includes coals from Ohio, eastern Kentucky, Virginia, Maryland, Tennessee and Alabama. No coals from Rhode Island, North Carolina or Georgia are represented. The states of Rhode Island and North Carolina are of little commercial importance as coal producers.

INTERPRETATION OF FUSIBILITY TABLE.

The samples represented are standard mine samples collected by representatives of the Bureau of Mines, the U. S. Geological Survey, or by the various state geological surveys, according to the methods used by the Bureau of Mines.[2]

The arrangement in the table of the coals tested from each state is alphabetical according to bed, county, town and mine. The number of samples from each mine, the lowest, highest and average softening temperatures in degrees Fahrenheit, and the per cent of ash and sulphur in the dry coal are tabulated for each mine tested. Average values for each mine were computed from the individual samples, and from these values averages representing each bed were obtained. It is evident that the greater the number of mines sampled the more representative are the average values for the beds. This should be kept in mind, as in many instances the average values given for the beds represent only a few mines and are then not truly representative of the coal bed.

DEFINITION OF FUSIBILITY TEMPERATURE

The point taken as the softening temperature is that at which the ash when molded into solid triangular pyramids ¾ in. high and ¼ in. wide at the side of the base, and mounted in a vertical position, has fused down to a spherical lump. Samples remaining unfused at 3010 deg. F., which was the highest temperature attained in the test, were marked plus 3010 (+ 3010), and used as such in figuring the average values for the mine from which the average values of the beds were computed.

For convenience in discussion, the order of fusibility of coal ash from the various coals of the country may be divided into three groups as follows: Class 1—refractory ashes, softening above 2600 deg. F. Class 2—ashes of medium fusibility, softening between 2200 and 2600 deg. F. Class 3—easily fusible ashes softening below 2200 deg. F.

The coals of Ohio which were tested gave ash of medium fusibility; the average values of the different beds come mainly in class 2. The softening temperature of the coals of eastern Kentucky and Virginia cover a wide range of fusibility from readily fusible ashes coming in class 3, to refractory ashes coming in class 1. Many of the coal beds of Maryland which are represented give coal having a refractory ash coming in class 1 or in the upper part of class 2. The coals tested from Tennessee and Alabama come mainly in class 2, giving ash of medium fusibility, though both class 1 and class 3 are represented.

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*Published by permission of the Director, U. S. Bureau of Mines.

[1] Selvig, W. A.; "Fusibility of West Virginia Coal Ash," *Coal Age*, Vol. 15, No. 1, 1919, pp. 12-16.
Selvig, W. A., and Fieldner, A. C.; "Fusibility of Ash from Pennsylvania Coals," *Coal Age*, Vol. 15, No. 24, 1919, pp. 1086-1089.
Selvig, W. A., Ratliff, W. C., and Fieldner, A. C.; "Fusibility of Ash from Coals Found in the Interior Province," *Coal Age*, Vol. 15, No. 16, 1919, pp. 698-703.

[2] Holmes, J. A.; "The Sampling of Coal in the Mine," Technical Paper 1, Bureau of Mines, 1911, 18 pp.

TABLE OF SOFTENING TEMPERATURES OF COAL AS FROM EASTERN COALS

Locality, Bed, Etc.			Number of Samples from Mine	Softening Temperature, Deg. F.			Average Analysis of Dry Coal, Percentage of	
				Lowest	Highest	Average	Ash	Sulphur
1			2	3	4	5	6	7
VIRGINIA—Continued								
Glamorgan Bed								
County	Town	Mine						
Wise	Glamorgan	Glamorgan No. 3	2	2130	2190	2160	5.86	1.22
Imboden Bed								
Wise	Dooly	Intermont No. 6	2	2540	2640	2590	10.25	0.90
Wise	St. Paul	Twin City No. 1	1	....	....	2240	12.69	2.22
Average of mines in Imboden Bed		.....	3			2420	11 47	1.56
Jawbone Bed								
Wise	St Paul	Twin City No. 3.	1	..	....	2240	19.86	1.03
Kennedy (Widow Kennedy) Bed								
Dickenson	Nora	Nora Mills	2	2130	2260	2200	9.79	0.74
Russell	Dante	Clinchfield No. 103.	1		.	2220	7.64	1.83
Russell	Della	Flat Rock	2	2090	2160	2130	9.58	0.84
Russell	Drill	Drill	1	.		2230	6.94	1 03
Russell	Drill	Sandy Ridge	2	2070	2220	2150	5 81	1.00
Average of mines in Kennedy (Widow Kennedy) Bed			8			2190	7.95	1.09
Large Bed								
Montgomery	Blacksburg	Plunkett & Wall	1	. .	....	+3010	18 06	0.52
Montgomery	Blacksburg	Seymour-Price	1	. .	.	2960	19.34	0.59
Montgomery	Blacksburg	Slusser	3	2360	2440	2410	17.55	0.60
Montgomery	Christiansburg	Lyken Hill	1	....	. .	+3010	22.70	0.72
Pulaski	Parrott	Parrott	1	. . .	...	3010	23.28	0.69
Average of mines in Large Bed		...	7			+2880	20.9	0.62
Little Bed								
Montgomery	Merrimac Mines	Merrimac Prospect	1	....	....	+3010	21.29	0.49
Little Town Hill Bed								
Tazewell	Richlands	East	2	2390	2500	2440	8.40	0.56
Lower Banner Bed								
Russell	Dante	Clinchfield	1		.	2350	6 59	0.66
Russell	Dante	Clinchfield No. 52	4	2110	2290	2180	6.61	0 69
Russell	Wilder	Clinchfield No. 55	3	2200	2450	2320	5.92	0 82
Average of mines in Lower Banner Bed			8			2280	6.37	0.72
Lower Bolling Bed								
Wise	Flat Gap	Reuben Bolling	1	....	....	2720	8.74	1.12
Meadow Bed								
Tazewell	Richlands	Richlands No. 2.	2	2300	2660	2480	12.92	0.62
Milner Bed								
Scott	Ka	Milner Prospect.	1	....	...	2120	5.89	1.69
Mohawk Bed								
Buchanan	Blackey	Blackey	2	2060	2260	2160	3.49	1.32
No. 4 Bed								
Russell	Slemp	Clinchfield No 201	3	2160	2200	2180	6.58	0.79
Pardee (Parsons) Bed								
Wise	Pardee	Pardee No. 1	2	2420	2500	2460	8.04	1.59
Pocahontas No. 3 Bed								
Tazewell	Boissevain	Big Vein No. 2.	2	2410	2500	2460	4.40	0 60
Tazewell	Boissevain	Boissevain	14	2030	2560	2270	4.05	0 51
Tazewell	Pocahontas	Baby	3	2490	2580	2530	4.33	0 53
Tazewell	Pocahontas	Big Vein No. 1.	5	2380	2640	2520	3 98	0 62
Tazewell	Pocahontas	West	4	2190	2500	2320	4.52	0 46
Average of mines in Pocahontas No. 3 Bed.			28			2420	4.26	0.54
Pocahontas No. 5 Bed								
Tazewell	Faraday	Altizer.	1	....	.	2090	5.19	0.82
Red Ash Bed								
Tazewell	Red Ash	Raven Red Ash	2	2230	2240	2240	5.96	0.64
Small Bed								
Montgomery	Blacksburg	Clements Hollow	1	....	....	+3010	42.98	0.34
Splash Dam Bed								
Dickenson	Mart	Owen's	2	2690	2750	2720	5.77	0.65
Upper Bed								
Pulaski	Dublin	Cloyd	1	. .	.	+3010	24 23	0.42
Wyth...	Max Meadows	Ellison & Johnson Prospect	1	. .	.	+3010	35.20	0 34
Average of mines in Upper Bed			2			+3010	29 72	0.38
Upper Banner Bed								
Dickenson	Prater	Yellow Poplar	2	2430	2630	2530	7 02	1 08
Russell	Dante	Clinchfield No. 2	8	2080	2320	2210	6 88	0 63
Russell	Dante	Clinchfield No. 3.	3	2200	2570	2350	7.88	0 63
Russell	Wilder	Clinchfield No. 6	3	2260	2360	2300	5 86	0 57
W.	[illegible]	Swansea	1			2520	5 65	0 53
Wise	Tom's Creek	Cranesnest No. 1	2	2510	2660	2580	5 28	0 55
Average of mines in Upper Banner Bed			20			2420	6.43	0.67
MISCELLANEOUS [illegible] BEDS								
Buchanan	Big Rock	Oliver Elswick	1		.	+3010	7 23	0 69
Buchanan	[illegible]	Whitewood	1		.	+3010	13 74	0 73
Lee	Pockett	Reed Creek Coal Ass'n	2	2140	2250	2200	9.14	3 59
Pulaski	Max Meadows	Summit	1			3010	25 59	0 78
Russell	[illegible]	Jackson	1			2070	12 96	0 96
Scott	[illegible]	Hagan	1			2530	29 61	1.01
Tazewell	[illegible]	Christian	1			2360	4 15	1 03
Tazewell	[illegible]	Patrick	1			2260	3 67	1 14
Tazewell	[illegible]	Jewell Ridge No. 1	2	2500	2640	2570	5 94	0 78
Wise	Norton	Norton No. 4	1			2600	3 89	0 93

TABLE OF SOFTENING TEMPERATURES OF COAL ASH FROM EASTERN COALS

Locality, Bed, Etc.			Number of Samples from Mine	Softening Temperature, Deg. F.			Average Analysis of Dry Coal, Percentage of	
				Lowest	Highest	Average	Ash	Sulphur
1			2	3	4	5	6	7
EASTERN KENTUCKY—Continued								
Fire Clay (Dean, or No. 4) Bed								
County	Town	Mine						
Bell	Fourmile	East Jellico	2	2910	+3010	+2960	7.92	1.02
Bell	Fourmile	Magnet	3	2440	2910	2650	6.71	1.10
Knox	Bradel	Bennett No. 1	3	2840	2960	2910	6.42	0.78
Perry	Douglass	Douglass	4	2620	+3010	+2860	3.55	0.74
Perry	Hazard	Hazard	3	2910	+3010	+2940	3.64	0.63
Perry	Hazard	Hazard-Dean	2	2370	2460	2420	4.12	0.86
Perry	Hazard	Ross Petrey	1			+3010	6.16	0.68
Perry	Lennut	North Fork	4	2630	+3010	+2900	4.24	0.87
Perry	Lothair	Ashless	3	2320	2610	2490	5.39	0.67
Average of mines in Fire Clay (Dean or No. 4) Bed			25			+2790	5.35	0.82
Flag (No. 7) Bed								
Perry	Lothair	Kentucky Jewel	4	2730	2970	2880	7.52	0.83
Harlan Bed								
Harlan	Harlan	Clover Fork	3	2510	2930	2720	2.95	0.75
Harlan	Harlan	Coxton	2	2520	2550	2540	3.52	0.88
Harlan	Harlan	Wood	3	2600	+3010	+2840	5.36	0.92
Average of mines in Harlan Bed			8			+2700	3.94	0.85
Hazard (Haddix, or No. 6) Bed								
Perry	Domino	Himyar	4	2020	3010	2460	8.56	0.79
Hickory Bed								
Bell	Rim	Rim No. 4	4	2020	2490	2340	5.37	1.07
Jellico Bed								
Knox	Elys	New Hughes	4	2360	2590	2460	6.92	1.56
Kellioka (C) Bed								
Harlan	Benham	Benham	1			2230	2.21	0.49
Lower Bolling Bed								
Letcher	Flatgap	Mullin	1			2880	11.65	1.01
Lower Hignite Bed								
Bell	Chenoa	Chenoa Hignite	3	2370	2500	2440	4.57	1.10
Lower Standiford Bed								
Letcher	Flatgap	Local	1			2260	5.24	1.81
Mason Bed								
Bell	Chenoa	Log Mountain No. 1	4	2140	2390	2250	2.53	0.85
Bell	Colmar	Arman	3	2240	2390	2330	6.09	1.61
Bell	Tejay	Tejay	4	2320	2430	2390	3.18	0.97
Average of mines in Mason Bed			11			2320	3.93	1.14
Miller Creek (No. 1) Bed								
Johnson	Van Lear	Van Lear No. 1	2	2010	2280	2150	3.50	1.17
Johnson	Van Lear	Van Lear No. 2	1	....		2030	3.54	1.90
Johnson	Van Lear	Van Lear No. 3	1	....		2080	3.49	1.54
Johnson	Van Lear	Van Lear No. 4	1			2400	2.46	0.68
Laurel	East Barnstead	Bonar	4	2020	2460	2220	4.97	2.40
Laurel	Pittsburgh	Acme	4	1990	2120	2060	7.39	3.70
Average of mines in Miller Creek (No. 1) Bed			13			2160	4.23	1.90
Popular Lick Bed								
Bell	Harrison	Log Mountain No. 52	4	2440	2960	2670	5.30	1.05
Rawl (Gas, or No. 2) Bed								
Pike	Sprig	Burnwell No. 2	1			+3010	5.25	0.64
Whitley	Barthell	No. 1 (North Main)	1			2340	9.80	3.16
Average of mines in Rawl (Gas, or No. 2) Bed			2			+2680	7.53	1.90
Straight Creek Bed								
Bell	Arjay	Glendon	4	2100	2120	2110	3.12	0.90
Bell	Fox Ridge	Fox Ridge	4	1970	2070	2010	1.98	1.07
Bell	Kettle Island	Pioneer	4	1990	2380	2170	4.85	1.38
Bell	Straight Creek	Barker No. 2 and 3	4	2110	2170	2140	3.66	1.33
Average of mines in Straight Creek Bed			16			2110	3.40	1.17
Thacker Bed								
Pike	Thacker	Little Thacker	1			2430	4.42	1.39
Upper Hance Bed								
Bell	Varilla	Varilla	4	2150	2550	2330	4.74	1.61
VIRGINIA								
"B" Bed								
Henrico	Gayton	Carbon Hill	1			2420	17.73	2.21
Big Bed								
Montgomery	Blacksburg	Slusser	1			2260	15.64	0.56
Montgomery	Merrimac Mines	Merrimac	1			2650	20.07	0.48
Pulaski	Parrott	Parrott	1			2350	23.97	0.68
Average of mines in Big Bed			3			2420	19.89	0.57
Big A No. 2 Bed								
Tazewell	Seaboard	Empire No. 6	2	2310	2320	2320	6.34	0.60
Big Town Hill Bed								
Tazewell	Richlands	West	2	2190	2290	2240	11.84	0.48
"C" Bed								
Henrico	Gayton	Carbon Hill	2	2160	2250	2210	10.26	1.40
Clintwood Bed								
Dickenson	Clintwood	Yeates	1			2670	3.26	0.87
Duncan Bed								
Scott	Ka..	Hagan Prospect	1			2160	6.65	0.88

TABLE OF SOFTENING TEMPERATURES OF COAL ASH FROM EASTERN COALS

Locality, Bed, Etc.			Number of Samples from Mine	Softening Temperature, Deg. F.			Average Analysis of Dry Coal, Percentage of	
				Lowest	Highest	Average	Ash	Sulphur
1			2	3	4	5	6	7
OHIO								
Anderson (Bakerstown) Bed								
County	Town	Mine						
Guernsey	Hartford	Andy Slovak	1	...		2120	10.86	3.92
Lower Freeport Bed								
Columbiana	East Liverpool	Kinsey	1	...		2300	10.86	4.66
Columbiana	East Liverpool	Moore	1			2470	12.16	3.18
Columbiana	Wellsville	Scheckler	1			2520	12.25	1.58
Jefferson	Amsterdam	Amsterdam	4	2060	2190	2120	7.66	3.03
Jefferson	Amsterdam	Eastern Ohio	3	2050	2260	2150	9.12	2.92
Jefferson	Amsterdam	Elizabeth	3	2120	2210	2170	7.91	3.12
Jefferson	Steubenville	La Belle	1			2300	7.71	1.9[illegible]
Noble	Belle Valley	Noble	2	2130	2350	2240	8.71	3.13
Average of mines in Lower Freeport Bed			16			2280	9.55	2.95
Lower Kittanning Bed								
Columbiana	East Liverpool	Malone	1	....	....	2400	11.94	8.25
Columbiana	Wellsville	Ainsworth	1	....	....	2060	5.18	3.68
Columbiana	Wellsville	Wooster	1	....	....	2060	8.92	5.87
Jefferson	Irondale	East Ohio No. 2	1	....	....	1960	10.90	5.07
Average of mines in Lower Kittanning Bed			4			2120	9.24	5.72
Mahoning Bed								
Columbiana	Wellsville	Dangel	1	....	....	2040	6.59	3.67
Meigs Creek (Sewickley) Bed								
Belmont	Alledonia	Shipman	1	....	....	2060	18.46	4.20
Belmont	Barnesville	Davy	1	....	....	2490	11.72	3.82
Noble	Mount Ephraim	Wiley Carter	1	....	....	2320	10.81	4.32
Noble	Quaker City	Griffin	1	....	....	2460	13.17	3.77
Noble	Steamtown	Moore	1	....	....	2310	10.92	5.05
Average of mines in Meigs Creek Bed			5			2330	13.02	4.23
Middle Kittanning Bed								
Columbiana	East Liverpool	Delaney	1	....	....	2430	4.82	1.53
Columbiana	East Liverpool	Duck	1	....	....	2220	6.31	2.18
Columbiana	East Liverpool	Johnson	1	....	....	2600	7.80	1.88
Columbiana	East Liverpool	Smith	1	....	....	2420	6.51	2.72
Columbiana	Wellsville	Wooster	1	....	....	2600	11.13	0.72
Jefferson	Cream City	Cream City	1	....	....	2410	11.45	2.13
Average of mines in Middle Kittanning Bed			6			2450	8.60	1.8[illegible]
Pittsburgh (No. 8) Bed								
Belmont	Bailey Mills	Cochran No. 2	2	1960	1960	1960	9.35	4.64
Belmont	Temperanceville	Jeffries	1	...		2260	9.86	4.75
Guernsey	Quaker City	Sayre	1			2180	9.14	5.07
Jefferson	Brilliant	Goucher No. 2	2	2170	2190	2180	8.04	3.94
Jefferson	Empire	Culp	1			2150	9.67	4.15
Jefferson	Hopedale	Parlett	2	2160	2250	2210	8.11	2.91
Jefferson	Piney Fork	Piney Fork No. 1	1			2120	7.62	2.73
Jefferson	Piney Fork	Piney Fork No. 2	2	2630	2710	2670	5.33	0.85
Jefferson	Smithfield	Plum Run No. 5	1	...		2160	7.26	2.68
Jefferson	Yellow Creek		1	...	...	2170	10.34	4.08
Average of mines in Pittsburgh Bed			14			2210	8.47	3.58
Uniontown Bed								
Belmont	Hunter	Kemp	1	....	..	2160	16.10	2.99
Monroe	Coats Station	Mobley	1	....	....	2290	16.10	4.16
Average of mines in Uniontown Bed			2			2230	16.10	3.58
Upper Freeport (No. 7) Bed								
Columbiana	East Liverpool	Gaston	1	..	....	2050	9.44	4.2[illegible]
Columbiana	New Salisbury	McClain	1	..	..	2030	11.32	4.43
Columbiana	Wellsville	Householder's	1	.	.	2440	8.73	3.98
Columbiana	Wellsville	Smith	1	..	...	2400	7.75	2.96
Columbiana	West Point	West Point	1			2240	8.29	3.79
Guernsey	Hartford	Waldhoning No. 2	2	2460	2570	2520	5.91	0.92
Guernsey	Lore City	Black Top	2	2280	2300	2290	7.92	2.01
Guernsey	Senecaville	Cleveland	2	2330	2460	2400	8.43	2.02
Jefferson	Irondale	Nicholson	1			2210	8.82	2.98
Jefferson	Yellow Creek	Yellow Creek	2	2140	2330	2240	8.22	3.54
Average of mines in Upper Freeport Bed			14			2280	8.48	3.09
Washington Bed								
Belmont	Alledonia	Moore	1	....	....	2520	21.90	2.98
Waynesburg Bed								
Belmont	Alledonia	Stoffel	1		..	2390	15.14	2.71
Belmont	Boston	Thomas	1	...	....	2370	15.44	3.16
Belmont	Hunter	Milhoan	1	....	....	2370	16.95	3.69
Belmont	Somerton	Brown	1	....	....	2460	16.15	3.03
Average of mines in Waynesburg Bed			4			2400	15.92	3.15
EASTERN KENTUCKY								
Alma Bed								
Pike	Thacker	Little Thacker	1		...	2940	4.37	0.61
Elkhorn Bed								
Letcher	Fleming	Acme	2	2300	2390	2350	3.18	0.68
Letcher	Fleming	Elkhorn No. 301	4	2550	2640	2590	4.18	0.64
Letcher	Jenkins	Consolidation No. 204	2	2490	2660	2580	5.24	[illegible]
Letcher	Jenkins	Local	1			2520	3.92	[illegible]
Letcher	McRoberts	Consolidation No. 213	4	2350	2670	2500	3.42	0.56
Letcher	McRoberts	Consolidation No. 214	4	2430	2730	2540	3.79	0.60
Letcher	[illegible]	Elkhorn or Kona	4	2390	2510	2450	4.6	1.02
Pike	Hellier	Edgewater	1			2260	2.75	0.58
Average of mines in Elkhorn Bed			22			2470	3.83	0.68

Coal Mining in Utah During 1919

By A. C. Watts
Salt Lake City, Utah

SYNOPSIS — *Production in Utah declined, but not as much as in other states, because the mines operated during the strike, relieving the difficulties over large areas of the West where the strike made severe coal shortages. Utah pays large compensation rates, and as a result the state is laying aside a large fund for the protection of employees. The National Government sold 329 acres of coal land. Title to school coal lands needs clearing by Federal enactment. Taxation is now based on coal-land valuation.*

THE coal-mining industry of Utah began the year 1919 with a most discouraging outlook. The market for the product of its coal mines promised to be unusually limited. A serious slump occurred in the demand for coal, when the armistice was signed in November, 1918; for with the war at an end there was a general curtailment of operations at all the metal mines, smelters and other industries in the territory served by Utah coal. A mild winter, which reduced consumption of domestic fuel below normal, added to the difficulty.

The railroads, smelters, industrials, domestic dealers and consumers carried over good stocks from 1918, and there could be no hope of much improvement in general demand until these reserve stocks were at least partially depleted. This gloomy outlook in the early part of the year caused all the coal operators in Utah to materially reduce their working forces in the hope that the men remaining might be given sufficient work to maintain themselves in reasonable well-being. The operators not only reduced their working forces but also limited development work in the mines and stopped all except absolutely necessary improvements.

By decreasing the number of their employees the operators were enabled, after the first week in January, to work more steadily, though the production was not so large as before. These conditions prevailed until about June, when the manufacturing industries and metal mining began to show signs of increased activity and when domestic and industrial storage was resumed.

The wisdom of storing coal, during the late spring and summer months, for use in the winter, has been generally accepted in the West, although it has, in the past, been necessary to stimulate demand in the summer by lower prices. The large percentage of coal used for domestic purposes in the West is the cause of the great variation in the need for coal as between winter and summer. The prices of prepared sizes were reduced 40c. per ton for the months of May, June and July and were restored to the full Administration figures on Aug. 1.

HEAD OF INCLINE AT HIAWATHA MINE OF U. S. FUEL CO.

With a national coal strike threatening, the demand for coal was excellent during the rest of the year. After the strike began Utah's mines were called upon to furnish coal to the less fortunate states, and the amount permitted for local supply was, in consequence, limited. However, as much had been stored by manufacturing industries, not many of these suffered, nor, in general, did the people of the state or those in the territory normally served by the Utah mines at any time lack fuel, although in many localities outside this territory the situation was acute. The Utah mines operated all through the strike and roughly 75 per cent of the production from Carbon County during all of November and the first two weeks of December was sent east. It was this coal that kept the lines of the Union Pacific System running.

The production by months was as follows:

Month	Tons	Month	Tons
January	370,900	Carried forward	3,055,918
February	312,961	October	455,840
March	317,532	November	458,374
April	236,559	December*	467,000
May	293,077		
June	341,859		4,437,132
July	376,621	Estimate of small mines	100,000
August	412,367		
September	394,042		4,537,132

*Estimated.

This is a decrease of 599,693 tons from the 1918 production, but an increase of 411,902 tons over that of 1917, and it probably shows a normal increase of 289,000 tons, which would be expected from the growth of the industry.

GARAGES AT CASTLE GATE, UTAH, BUILT FOR EMPLOYEES OF UTAH FUEL CO.

Several new companies began operations during the year, but only one of these acutually began to ship, this being the Kinney Coal Co., which has leased coal lands from the Union Pacific interest. This company is opening a mine just north of the Union Pacific Coal Co.'s old mine at Scofield, which is now being operated under lease by the Scofield Coal Co. At present the Kinney company's mine is only in the development stage, and the coal that is being shipped comes from entries. At its present rate of development, it will probably, by next spring, be shipping 500 or 600 tons a day.

The coke market, like the coal market, had, in general, a poor outlook during the year just past. Shortly after the signing of the armistice the smelters curtailed operations so rapidly that it was necessary for the Utah Fuel Co. to close down over one-half of its Sunnyside coke ovens. While there has, during the last six months of 1919, been slight improvement in demand for coke, it has not been sufficient at any time during this period to warrant the operation of over 60 per cent of the Sunnyside ovens, and from present indications it is questionable if the coke market will permit full operations of the present Sunnyside plant during any part of 1920.

The Utah Coal & Coke Co., with property holdings in the coking field south of Sunnyside, did some work on the outside preliminary to opening a mine. The current reports are to the effect that this company intends entering the coking industry, but all work at this property has been suspended for the winter.

WATER FILTRATION PLANT AT CASTLE GATE

Early in the spring of the year certain citizens of Salt Lake City started proceedings, which culminated in the formation of the Mutual Coal Co. Previously they had tried to have the city of Salt Lake go into the coal-mining business. This was impossible under the law, and two bills, presented to the State Legislature by the City Attorney, which would have given the city power to own and operate coal mines and coal yards, failed of passage, as presented, but as amended they did give the city power to own, operate and maintain heating plants.

The organizers of the Mutual Coal Co. went ahead and formed a company with a capitalization of $250,000, represented by 25,000 shares of a par value of $10 each. The company leased 640 acres in Spring Cañon from the State and obtained 329 acres of Government land, also 160 acres for right-of-way and townsite purposes. Half, or $125,000 worth, of the capital stock is offered for sale, the stockholders being given an opportunity to buy coal next year at not more than $5.50 per ton, as against the current price of $8.25 per ton.

Another company is reported to have started operations in Spring Cañon, and two or three small concerns are said to have started up in Iron County, but so far its purpose will only be to supply the local market. The Iron County coal is so high in sulphur that it is not likely to at any time be a formidable competitor with the Carbon County (Utah) coals.

A consolidation of considerable importance was effected between the Wattis Coal Co., operating in Carbon County, and the Lion Coal Co., having mines in Wyoming. According to newspaper reports the new concern, known as the Lion Coal Co., has an authorized

VIEW OF THE TOWN OF SUNNYSIDE, UTAH. LARGE COMMUNITY BUILDING IS IN RIGHT FOREGROUND

capitalization of $5,000,000. Among the incorporators are David Eccles, president of the Eccles Estate; W. H. and E. O. Wattis, of the Utah Construction Co.; Jos. Scowcroft; M. S. Browning and J. M. Browning of machine-gun fame.

During the year there has been much interest shown in such State lands as are coal-bearing. The Supreme Court decision in the celebrated Sweet case unsettled the question of the state's right to coal lands in school sections, so that the title to such lands is uncertain in that it depends upon whether or not they were known to be valuable for mineral or coal at the time the state's rights attached, if at all, or on Jan. 4, 1896. Several suits have been instituted and continued litigation may be expected until Congress shall, by appropriate statute, settle the question definitely.

For years the status of the so-called "Milner interests," which claimed many thousands of acres of valuable coal deposits in Carbon County, has been in doubt, but it has, at last, been settled apparently by a compromise made with the State Board of Land Commissioners. The State relinquishes whatever claim it might have to 5564 acres of coal lands for a consideration of $556,400. It is intimated that these "interests" contemplate a large iron-and-steel plant, handling iron ore from the southern part of the State.

A new coal-mine tax law was enacted this year. By this enactment all coal lands are valued according to their coal contents. Coal companies no longer have to pay the occupation and net-proceeds taxes, but are now taxed on the value of their holdings and improvements.

This law is provocative of much uncertainty in regard to some lands. Apparently, as applied to lands recently appraised by, and purchased from, the Government at such appraised prices, the question is simple, as the Government's appraisal was based on the value of the coal contents. But development has sometimes proved such appraisals inaccurate. For instance, the burning of coal beds may in places have extended much further in from the outcrop than was supposed; or the coal bed may have thinned, or faults may have been discovered by development, and these defects will have affected land valuations adversely.

However, as the new law was not enacted until late, there was not sufficient time for the State Board of Equalization to make a thorough examination and appraisal of value, so that it temporarily adopted the Government's figures and made such adjustments as were obviously necessary. The State Geologist then undertook a comprehensive survey of the principal coal fields and has proposed a new method of valuation, based on royalty value per ton of coal contents. This method was submitted to the coal operators and is now under discussion.

Although there have been a few minor local labor troubles, the situation as a whole for the year has been tranquil, and Utah mines worked in full force during the national strike. Immediately following the Garfield award of 14 per cent advance in wages, Utah operators granted this increase. The wages of coal miners in Utah are now very high, and any industrious miner is assured of a good living. This, together with good working and living conditions and adequate educational facilities, will result in eventually attracting a better grade of miners to this field.

Operators still continue their efforts to improve these conditions. As an instance, the new rapid sand water-filtration plant built by the Utah Fuel Co. at Castle Gate may be mentioned. This plant is one of the most modern of its kind and was designed by the Pittsburgh Filter Manufacturing Co., which concern has installed some of the largest and most successful filtration plants in the United States. An illustration on page 182 shows the substantial way in which this important but often neglected detail of operation has been cared for by the Utah Fuel Company. A good water supply means healthier workmen and steadier operation of the mines.

The report of the State Insurance fund, which handles workmen's compensation, showed a net premium income of $354,387.59 and net benefits paid to injured employees or their dependents of $66,077.54. This covers a two-year period ending June 30 last. Effective July 1, the rate for the compensation of coal-mine workers was reduced from $7.81 to $7.29 per $100 of payroll.

The death of three men prominent in the coal-mining industry of the State must be recorded. The first, J. S. Thompson, general superintendent of Utah Fuel Co., had long been identified with coal-mining interests in this State and Colorado. A month after his decease, C. H. Gibbs, geologist of the same company, also died. In July W. G. Sharp, one of the pioneer coal men of the State passed away at his home in Boston. Mr. Sharp was largely influential in placing the industry on the sound basis on which it stands today.

Increased Output of Alaska Coal

The production of coal in Alaska in 1918 was 75,606 tons, valued at $411.850, according to the U. S. Geological Survey, Department of the Interior. This may be compared with 53,995 tons, valued at $265,317, in 1917. The production for 1918 was by far the largest in the history of coal mining in Alaska, being 40 per cent larger than the output for 1917, which was also greater than that of any previous year. It is believed that a substantial coal-mining industry has at last started in Alaska. The larger part of the output in 1918 came from the Matanuska field, which yielded 63,092 tons. The remainder came from eight or ten small mines in different parts of the Territory.

All these mines, except those in the Matanuska and Bering River fields and at Port Graham, produced coal for local use under free-use permits. About 12 mines were operated, employing 239 men for an average period of 254 days.

In the Matanuska field the Eska Creek mines were operated regularly throughout the year by the Alaskan Engineering Commission, to supply fuel for railroad and other Government use. At the Chickaloon mine, also operated by the Alaskan Engineering Commission, the work has consisted primarily of exploration and development, and only a small amount of coal, won incidentally, has been produced. In 1918, for the first time, Matanuska coal was shipped beyond anchorage. Private operations preparatory to mining were continued by two lessees in the Matanuska field, and some coal was mined by one of them, but their mines are not yet regularly productive. A detailed account of coal mining in Alaska is contained in a report on the Alaskan mining industry in 1918 just issued by the Geological Survey at Washington, D. C.

Fatalities of 1918 and 1919*

THE FIGURES shown below, compiled by Albert H. Fay, of the U. S. Bureau of Mines, seem reassuring but it must be remembered that the record for 1919 is one of low production. As compiled the records for both periods apply only to the first eleven months of the year.

	1918	1919
UNDERGROUND		
Falls of roof (coal, rock, etc.):	-	
At working face	717	599
In room or chamber	167	101
On road, entry, or gangway	207	152
On slope	14	11
Falls of face or pillar coal:		
At working face	89	112
On road, entry or gangway	16	25
Mine cars and locomotives:		
Switching and spragging	15	10
Coupling cars	10	5
Falling from trips	33	18
Run over by car or motor	180	134
Caught between car and rib	104	100
Caught between car and roof while riding	25	19
Runaway car or trip	64	41
Miscellaneous	31	24
Explosions and burning gas:		
Due to open light	55	63
Due to defective safety lamps	2	22
Due to electric arc	3	19
Due to shot	9	6
Due to explosions of powder	3	2
Miscellaneous	23	27
Coal-dust explosions (including gas and dust combined):		
Due to open light	2	22
Due to defective safety lamps	...	....
Due to electric arc	...	....
Due to shot	26	11
Due to explosions of powder	1	1
Miscellaneous	...	....
Explosives:		
Transportation	4	95
Charging	11	15
Suffocation	4	4
Drilling into old holes	2	....
Striking in loose rock or coal	...	....
Thawing	...	....
Caps, detonators, etc	3	3
Unguarded shots	...	1
Returned too soon	17	5
Premature shot	39	51
Sparks from match, lamp, or candle	11	8
Delayed blast	4	2
Shot breaking through rib or pillar	9	7
Miscellaneous	20	7
UNDERGROUND		
Electricity:		
Direct contact with trolley wire	53	35
Bar or tool striking trolley wire	4	2
Contact with mining machine	7	5
Contact with machine feed wire	12	11
Contact with haulage motor	1	2
Miscellaneous	9	9
Animals	8	3
Mining machines (other than 8c.)	17	27
Mine fires (burned, suffocated, etc.)	26	24
Other causes:		
Fall of person	5	5
Machinery (other than 10)	1	2
Rush of coal or rock	20	12
Falling timber	11	19
Suffocation in chutes	3	4
Hand tools, axes, bars, etc	22	1
Nails, splinters, etc	...	1
Miscellaneous	.	21
IN SHAFT		
Falling down shafts or slopes	21	20
Objects falling down shafts or slopes	9	6
Cage, skip, or bucket:		
Runaway	17	6
Riding with rock or coal		1
Riding with timber or tools		1
Struck by		5
Miscellaneous		5
Other causes:		
Overwinding	...	....
Breaking of cables	1	...
Miscellaneous	3	1
ON SURFACE		
Mine cars and *mine* locomotives	80	63
Electricity	14	8
Machinery	40	20
Boiler explosions or bursting steam pipes	7	5
Railway cars and locomotives	31	15
Explosives	11	..
Fall of person	11	13
Falling objects (derricks, booms, etc.)	10	9
Suffocation in chute, bin, or culm	4	3
Falls or slides of rock or coal	3	8
Steam shovels	1	1
Hand tools		1
Miscellaneous	22	13
Grand total	2,415	2,121

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* Period covered is but eleven months ending November 30th

BUSINESS SECTION OF THE TOWN OF MONONGAH, W. VA.

Northern West Virginia in 1919

By H. A. Williamson
Fairmont, W. Va.

In MANY ways 1919 marks the beginning of a new epoch for northern West Virginia. After many vicissitudes the byproduct coke plant located at Fairmont is being completed. This installation, the first of its kind in the region, was started in order to supply the demands of the war. Ground had hardly been broken when the work was abandoned from some cause never made public. Later it was again started and again abandoned. Finally taken over by the Domestic Coke Corporation, the work of construction has reached such a point that completion can be safely predicted for next summer. The ovens are being erected by the Koppers Co., and as Fairmont coal has already been tried out in this type of oven there is no question as to the success of operation, it being merely a matter of working out the details.

The Lynn producer plant of the Monongahela Valley Traction Co. was put into operation during the year and while it is still in the experimental stage, it has progressed to such a point that there is no doubt as to its success.

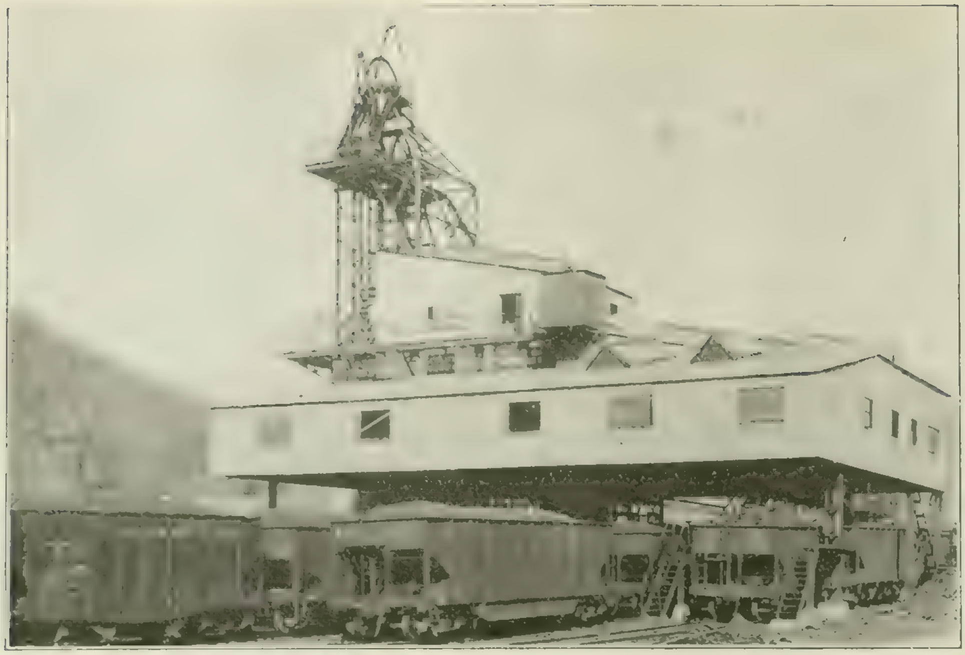
As both the byproduct ovens and the Lymn plant are but the first units of proposed large plants, their installation means the development of an entirely new series of industries in the upper Monongahela Valley. Enormous quantities of coal will be used locally and manufacturing industries can be assured a steady and cheap supply of gas fuel.

The most important completed development of the year has been the Rivesville power plant of the Monongahela Valley Traction Co. This plant, located between Fairmont and Morgantown, has been put into operation and is carrying practically the entire electrical load along the line from Rivesville to Fairmont and thence to Clarksburg. It also supplies points in the vicinity of these towns. This allows the several smaller electrical plants to be placed in reserve, making the ssupension of electric service highly improbable. The accompanying illustrations give some idea of the magnitude of this plant and the amount of detail involved.

Development on the Monongahela Ry., connecting Fairmont and Pittsburgh via Brownsville, has continued and a number of new mines have been opened. The Morgantown & Wheeling R.R. construction has been pushed steadily. A large portion of this road is already in operation and approximately 20 miles have been opened along it. This road develops an area of coal previously unserved—the part of the road so far completed and operating developing 100,000 acres of coal lands or even more. At the present time this coal moves over the Monongahela Ry., connecting with the New York Central and Pennsylvania lines. When the road is completed through to Wheeling it will give a direct Lake connection as well as one to the Middle West which with the westward roads out of that city will enable the Fairmont coal to reach all the Midwestern cities.

Quite a number of the smaller mines opened during the 1917 period have either closed down or passed into the hands of more experienced operators. The mines which during the war loaded railroad cars from horse drawn wagons are practically things of the past. The region is all the better for the disappearnce of these mushroom growths which were the product of an extremely abnormal period.

Early in the year deals in coal lands and formations of new coal-mining companies were frequent and more numerous than in 1918. At least two corporations capitalized at $1,000,000 have been organized and are actually mining coal. Ten other companies with capital stock ranging from $25,000 to $150,000 have



TIPPLE AT MINE 87 OF CONSOLIDATION COAL CO.

started operations. A number of sales ranging from $30,000 to $65,000 have been recorded; one sale in Marion County involved 5,660 acres of land while in one in the Philippi district $425,000 changed hands. Records of this kind have continued throughout the year despite the prospect of labor difficulties. They appear a clear index of the confidence entertained in the future of the region. This faith has not been confined to the Pittsburgh bed as in the past, in fact a large number of the transactions cover seams other than the Pittsburgh.

Whether or not these operations in the smaller beds will pay a dividend in normal times is a disputed question which cannot be answered now. Regardless of whether they pay or not, their development brings to the region a new problem, that of mines above mines. In the past the question of protecting upper beds has had little attention but in the future, when mining advances sufficiently, the question of protecting one mine from damage from another below it will demand a solution.

Another problem crying for attention is that of oil and gas wells drilled through coal beds. Drilling has increased rapidly during past years. The need of legislation defining the rights of drilling companies and coal companies, and some method for the proper protection of the miners' lives, as well as the coal, without unfair hardship to either party, is constantly becoming more pressing. As the matter stands some of the companies have gotten together in mutual agreements for protection both of mines and wells, but this is at best an unsatisfactory condition and the smaller companies are making practically no effort at protection either way.

TURBINE ROOM, RIVESVILLE, W. VA.

It is safe to say that at least one rather large area of coal will probably have to be considered as permanently lost on account of the numerous wells drilled through it. One of the worst features is that many of these wells are not accurately located on maps and there are no permanent markers on the ground so that in future years mining operations will be in constant danger of making contact with an old well abandoned either as a dry hole or exhausted, yet making enough gas to cause an explosion.

Lack of cars and a desire to give the men work as steadily as possible has caused serious consideration of many coal storage propositions. A number of storage bins have been erected and considerable coal has been stocked in piles on the ground—by far the larger part of this has been slack. The two difficult questions involved in this problem are: sufficient room and the danger of spontaneous combustion. The latter can be largely overcome by careful and proper work. If this and the matter of proper facilities for storing coal at terminal points was given more attention it would go far toward relieving the car shortage situation.

The year has been marked at intervals by several bad fires. The Consolidation Coal Co.'s tipple at Mine 37 was completely destroyed with a loss of $20,000, the tipple of the Mound Coal Co. at Moundsville burned, the tipple at Mine 56 of the Consolidation Coal Co., located at Fairmont was also burned. This is one of the older mines in this field and is of historic interest. It was opened in 1860 by J. O. Watson, Sr., and Ex-Governor A. B. Fleming. The mine workings are quite extensive and lie under the residential portion of Fairmont. The mine has not been worked for a number of years but is not permanently abandoned as there is a large quantity of coal still available. The electric power plant at Mine 38 of the Consolidation Coal Co. was likewise destroyed by fire with a loss of $10,000. A part of the Jamison Coal and Coke Co.'s plant at Mine 7 was destroyed. Within the mines there has occurred two or three small fires, among them quite a stubborn one within Mine 21 of the Consolidation Coal Co. This required hard and con-

POWER PLANT OF THE MONONGAHELA VALLEY TRACTION CO. AT RIVESVILLE, W. VA.

tinuous work for several days before it was controlled.

Safety and welfare work have received continued attention. The most notable feature in this direction was establishment by the State Mining Department of a rescue station at Fairmont.

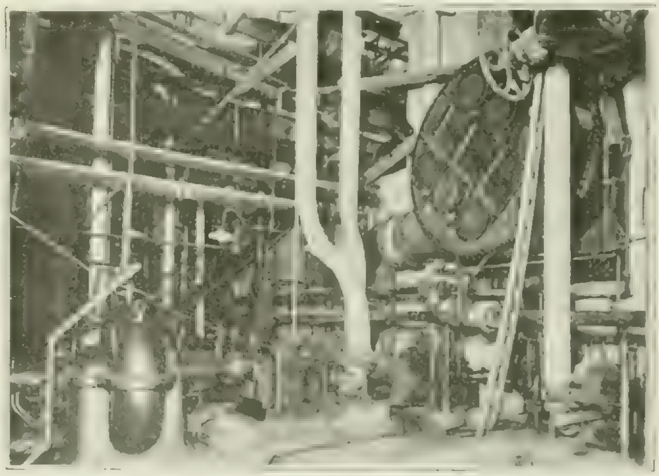
An estimate of production of the region is always difficult to make owing to the many local factors that affect it. Ten and one-half million tons is probably a fair estimate for 1919. This figure is about 20 per cent less than the output of 1918. The reduction in tonnage was due to several causes. The November strike, of course, diminished the possible output but the weekly figures of the U. S. Geological Survey show that the total time lost (not including the strike period) ranged from 20 to 60 per cent. During the early part of the year a large part of this loss was charged against "No Market." However, though as much as 60 per cent is at times charged to this cause there is no point where the charge of "Car Shortage" entirely disappears for a sufficiently long period of time to be noticeable.

Car Shortage Is Keenly Felt

In other words, there was practically never a time when sufficient cars were on hand to load the booked orders. The charge against "Car Shortage" steadily increased during the year as that against "No Market" disappeared. The charge against "Labor Shortage" is small, as is the charge against "Mine Disability" while there is practically nothing to charge against "Strikes" other than during the November period. Culled and sifted the report harks back to the same old proposition of no cars.

Early in the year there was undoubtedly some improvement in the car situation, due more to lack of demand than anything else, but when the demand increased the situation immediately became acute again. Because of this feature there was in reality no labor shortage and the labor available could not work full time. Operators made constant effort to keep the men busy, but in spite of the best they could do, there was a continuous movement of men from place to place. This situation has been unsatisfactory since shifting labor brings many other problems in its wake.

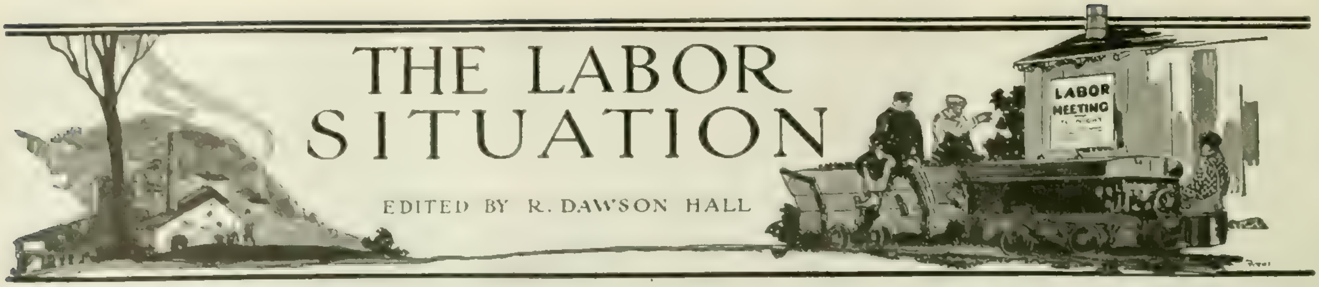
It appears then that the tonnage decrease has arisen more from car shortage than from all other causes combined and the general opinion is that the tonnage would have increased over that of 1918 had cars been available for shipment.



CIRCULATING PUMP UNITS AND CONDENSERS AT RIVESVILLE, W. VA.

The coke tonnage for the year decreased under the previous year probably 60 per cent, largely because of price. It has been pretty thoroughly proven that northern West Virginia operators do not care to make coke unless under special inducements and it appears that about the only special inducement that is presented is an abnormal price.

On the other hand, the shipment of coal to lake ports increased about one-fifth over that of last year and the total shipments for 1919 will run in the neighborhood of one million tons.



THE LABOR SITUATION

EDITED BY R. DAWSON HALL

Miners and Operators Meet With Coal Commission

Formal presentation of the miners' side of the coal controversy as well as the personal attitude of the miners' representatives makes it increasingly clear that everything possible is being done to forward the nationalization plan. It is very clear that mines in a competing position cannot meet the demands of labor without pooling, and it is recognized that there can be no extensive pooling without nationalization of the coal mines.

The representatives of the miners, now that the Government is going to make a ruling, have taken from their graveyards all their lost causes of the past twenty-five years and have laid them before the commission.

The operators have agreed to be bound by the award of the commission with one reservation: that they will not be bound by any decision of the commission which may fix prices beyond the duration of the Lever Law. Many fear that operators of the Central Competitive field place themselves in a position where nationalization will furnish the only means whereby the award of the commission can be carried into effect.

Philip H. Penna of Indiana, representing the entire group of bituminous operators, created a most favorable impression on the commission by the manner in which he met the claims advanced by the officers of the United Mine Workers. Mr. Penna made a formal request of the commission that it ask Congress to enact necessary laws to require certain qualifications of those who enter into collective bargaining so as to make both parties responsible to a contract.

At Tuesday's hearings Ralph Crews, counsel for the operators, submitted a statement in which it was stated that there was no desire on the part of the operators to make their acceptance of the commission's award in any manner contingent upon the answers to the questions which were submitted at the initial hearing. He explained that since the operators have the best of legal advisors, that they may not lawfully be parties to any arrangement by which the price of coal is fixed beyond the date on which the Lever Law expires.

Operators Want Decision To Bind Both Sides

He said that the operators were willing to submit all other matters in respect to the mining of bituminous coal with the understanding that the award of the commission is to embrace a decision upon all such matters, "binding upon the miners and operators, and shall, in and of itself, constitute the final contract between the miners and operators for such period of time as shall be fixed by the commission." Beyond the reservation which applies solely to the price of coal Mr. Crews stated that there is no thought of any other reservation.

At that point of the proceedings John L. Lewis, the president of the United Mine Workers, interposed to say: "I trust that a record is not being made that may be used subsequently to prevent fulfillment of the obligation to meet in joint conference, and write into the agreement the basis of the commission's award." This objection was met to his satisfaction, however, when Chairman Robinson said: "I may say that the chairman's thought of that is, that in reply to the chairman's question, as to whether the record is completely open on that subject that it is for the commission to decide and Mr. Crew's reply was that it is for the commission to decide. I am wondering if that would clear the record sufficiently."

Mr. Lewis in his opening argument for the miners submitted all the demands which had been made at Cleveland, and in addition paved the way for the introduction by the district presidents of all the minor grievances which have been subject of the negotiation during the past twenty-five years. He declared that the miners would not be satisfied with being restored to their pre-war status as wage and working conditions at that time, he declared, were far from ideal and he urged that no decision be made on a mere comparison of living costs now with living costs in 1913. "We are placing the rights of humanity, carrying with them the joys of life and the pains of death, alongside the property right of those who are operating the mines. We are mindful of the rights of capital to earn a proper income upon its investment but we say to you that humanity has a prior right of consideration and society owes an obligation to the men who toil in the mines."

Short Day, Weekly Pay, No Strike Penalties

While Mr. Lewis declared that there should be a shorter working day so that the miner would not be held in the fetid atmosphere of underground workings, his principal argument for shorter hours was based on the desirability of continuity of employment rather than there being work on an average of 30 hours per week. Even President Lewis in his generalization took up such details as a weekly pay day, and he made one of the features of his presentation the necessity of abolishing the automatic penalty clause.

In the course of his argument, William Green declared that the operators are committed to this arbitration because at the last joint conference held between the miners and operators in Washington before the strike, Mr. Penna had moved that there be a tribunal created by an equal number of the miners' representatives, coal operators, and an equal number representing the public, to whom all of these differences shall be referred, and that we agree to accept the result, to constitute a contract effective until March 21, 1922.

Much of Mr. Green's presentation looked to the establishment of the fact that the annual wage of the coal miners is not sufficient to maintain a decent family budget. He urged the commission to go most exhaustively into the matter of the profits of the coal operators. He declared the Government prices had been so fixed that the high-cost mines could make such a profit as to stimulate great production. He expressed the opinion that the public would be surprised when they learned the truth about the enormous profits which have been made by the mines with low costs.

In summing up his argument Mr. Green declared that "the miner is not a machine to be laid upon the shelf when there is no work for the machine to do and taken off the shelf and used when there is work to do. The human equation must be considered and consideration must be given the family budget for the year. This is in addition to the hazard of the industry."

Philip Murray, president of the western Pennsylvania district, presented the specific claims of the miners in that district; payment for the removal of slate and bone coal; differentials between the thick and thin vein portions of the Pittsburgh district; furnishment of electric cap safety lamps and permissible explosives and the relief of the miner from the pushing of mine cars.

John Moore presented the specialized grievances for the Ohio mine workers, Edward Stewart made the argument for Indiana miners, and Frank Farrington for the Illinois workers. Mr. Stewart made a particular point of the fact that the Indiana operators have not complied with the law in that state providing for a weekly pay day. He also contended that the 14 per cent increase should apply on the rate that the men were receiving including the bonuses.

Mr. Farrington was particularly caustic in his comment on the publication of the statement that political rivalry between himself and Mr. Lewis had much to do with the calling of the strike. He expressed the belief that the publication of that article prompted the Government to attempt to meet the strike by injunction. He said it was an effort to capitalize the woes of the miners of America.

Mr. Farrington's idea of Dr. Garfield's methods of arriving at the 14 per cent increase was expressed to the commission as follows: "Dr. Garfield predicated his opinion upon some academic theory unknown to anyone but himself. I assume it is the means they apply to mining coal at Williams College. At least I never heard of the rule being applied to mining anywhere else. He accepted Secretary Wilson's figures to the effect that the cost of living had increased 79 per cent, and in order to meet that increase the miners were entitled to 14 per cent more in wages. This was an implication that they already had received, since the beginning of the war, an aggregate increase of 65 per cent.

CANNOT SOLVE "WHAT A DAY'S WORK IS WORTH"

All of the representatives of the districts submitted extensive statistical compilations, showing cost of living and various deductions to wages. Mr. Crews, after listening to the mass of detail which had been laid before the commission by the representatives of the districts, made this statement to the commission: "In my judgment you must deal with the situation as a whole which has been produced by these many years of bargaining, or sit here reconciled to deal with this industry for months and months to come. A gentleman said yesterday, with deep feeling, 'Why should a man spend 25 per cent of his time moving slate for nothing?' He should not.

"No operator contends that a man should go down into the earth and move slate for nothing. I do not doubt that that statement as it was made would make some impression upon you, gentlemen, as an isolated fact. How are you going to deal with it?—What is involved?—Under what conditions does that man work?—What is the wage scale?—How is it arrived at?—Were the conditions under which he works taken into account when his wage scale was fixed?

"It cannot be that those men expect this commission to take up and dispose fairly of all those matters, picked out for purposes of presentation from the general mass of events. The whole issue before this commission is the wage scale and when you reach a conclusion upon the wage scale that is fair and just, it absorbs and disposes of all these matters."

The refutation of the more detailed claims of the miners was left to Mr. Penna and he declared that he was in entire accord with the miners on most of the points which they have made. "It will be a sorry day for the nation," he said, "when people reach a state of contentment with the position in which they find themselves," so that he regards it as quite proper that the miners should object to going back to 1913 conditions.

He also stated that he is in accord with the demand that the industry be made safe and sanitary, and he pointed out that there are men among the coal operators who recognize the human equation. He said the miners were not sincere in their demand for a 60 per cent increase in wages, but there is no need of discussing that question because the commission will be influenced by data presented, rather than claims made.

He declared that coal miners in the Central Competitive field maintain a standard of living that becomes American citizenship, and that this is made possible by the fact that they receive a sufficient wage. Miners do not live in squalor. "They do not require the sympathy of anybody. They are a class of men who stand erect with confidence in their own manhood; they maintain good homes, homes that they own; their children go to schools and colleges; they are educating their children and they are living in comparative comfort. There is not a mining community anywhere in this country where this does not prevail.

"The time has gone when employers of labor can oppose labor unionism. The right of the laboring man and woman to unionize is just as sacred, and just as compelling as the right of the employer to unionize, either to unite as persons or as individuals in a corporation.

"The laboring people of this nation are going to unionize themselves. They cannot defend their interests individually. With unions there come contracts which are of no avail, except when supported by an organization, and enough responsibility is necessary to enforce the contract.

"The mine workers come and ask that the automatic penalty clause be taken out. The only semblance of liability with which they have had to contend—the only suggestion of responsibility that they have accepted—to be bound by contract provisions is this fining system, and they come now and ask that they be relieved of it."

Mr. Penna explained that much of the good effect that could have been obtained from this provision had been lost due to laxity in its enforcement. He asked that instead of removing this safeguard the commission make it stronger. The check-off system came in for vigorous denunciation in Penna's remarks. "The coal operators are desirous of abolishing, once and for all, this check-off system. It was introduced for the purpose of enabling the mine workers to unionize their forces to enforce contracts but since the very purpose for which the institution was created has failed there is no necessity longer for the system.

It imposes burdens upon the operators for which there is no economic justification and it is unjust to many employees of the operators." The commission was asked by Mr. Penna to cover in its findings the matters of including house rent and household coal in contracts. He opposed this system as it is a source of irritation and a species of paternalism which should be abolished.

Particular emphasis was laid on the necessity of making the national officers of the United Mine Workers and the national organization responsible for enforcing the terms of contracts in the various districts. He explained that the national officers are not obligated to enforce contracts except as to violations between districts but not within the districts.

UNION OPPOSES NEW MACHINES AND TIME CLOCKS

With reference to yardage and the differential in machine mining Mr. Penna said among other things: "The idea is that the mine workers should receive the benefit from the introduction of machinery, the operator being allowed only a profit on the investment. Pursuing this policy we have been prevented from introducing other machines.

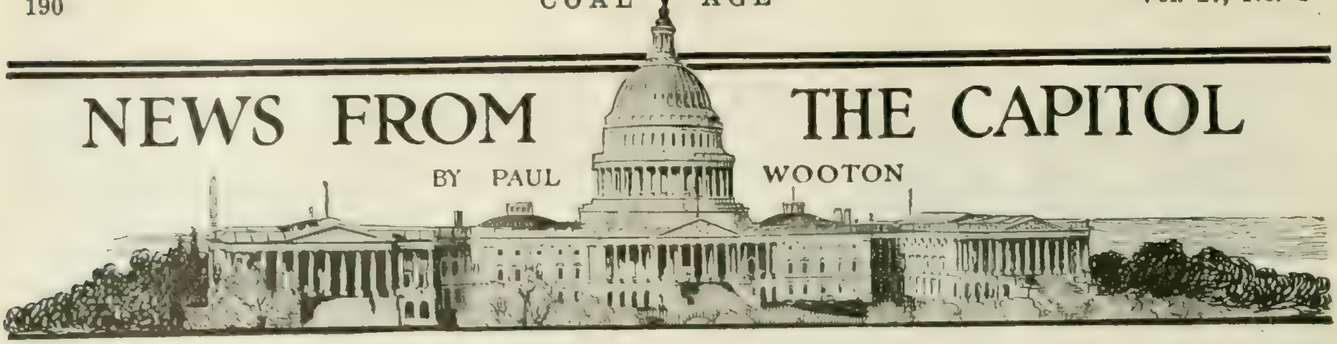
"Other machines have been developed that will cut a great deal more coal and perhaps a great deal cheaper. We have not been permitted to try them." The necessity of installing time clocks in the mine and for the use of the surface workers was another point made by Mr. Penna. "It seems almost unbelievable, that in a great industry surrounded with so many complications and dangers as the coal industry, there is now no system by which actual working time of the miners can be determined. We have been interfered with in the installment of such devices. The right of the owners of property is questioned as to its control, except as provided in our contract."

Mr. Penna criticized the representatives of the different districts for bringing several of the grievances here when they fully understand that these changes would have been made but for the restrictive provisions of the interstate agreement.

In concluding, Mr. Penna took issue with the statement that the wages of the miners were too low in 1913. He asserted that there were no wages paid by other industries in the same region which were as high as those paid at coal mines.

NEWS FROM THE CAPITOL

BY PAUL WOOTON



Hines Says Coal Strike Cut Down Rail Earnings

As indicated a few days ago, says a statement issued last week by Director-General Hines, the operating results for November were very seriously affected by the coal strike. Detailed statistics of the operating results for the month of November have now become available for practically all of the Class 1 railroads and large terminal companies in federal operation.

These results indicate that there will be a net operating income for the month of November from the operation of these properties of $22,000,000, which represents a loss of $53,000,000 to the government, after allowing one-twelfth of the annual rental, or $61,000,000, on the basis of the net operating income earned during the average November of the test period.

Philadelphia Retailers Protest

The National Retail Coal Merchants' Association addressed the Attorney-General on Dec. 24 protesting against the imposition of a retroactive price agreement which might be arrived at by the President's Coal Commission, upon the retail coal trade. The letter explained the inability of the retailer to bill back upon his large number of small consumers for an additional amount to cover a retroactive increase in the mine price, and protested against this practical imposition upon the retail coal merchants of the entire burden of increase to cover a further wage advance.

The association stated further that the only remedy is the removal of retail price restrictions. The letter to the Attorney-General has also been put before the President's Coal Commission, and the association shall probably be called upon later for more details.

Bureau of Standards Test Track and Mine Scales

A great deal of work has been done by the Bureau of Standards three sets of railroad track scale testing equipment. Car No. 1 operated during the past month in Tennessee, Pennsylvania, and the District of Columbia, testing three industry and one master scales.

The work included a special investigation upon a new grain hopper scale at Altoona, Pa. Equipment No. 2 operated in the States of Washington, Oregon, Utah, and Colorado, testing 18 railroad-owned scales and 10 industry scales. Equipment No. 3 covered the States of Wisconsin and Illinois and made tests on 27 railroad-owned scales and one industry scale.

Owing to the unsettled conditions in the coal mining districts, due to the recent strike and also to unfavorable weather and bad roads, the Bureau's mine scale testing equipments were not in use during December.

Refuses to Take Up Harris' Coal Corporation Tax Resolution

Senator Harris, of Georgia, author of the resolution (S. Res. 247) requesting information from the Secretary of the Treasury relative to income and profits tax returns of coal corporations, made an unsuccessful effort in the Senate last Friday to call up his resolution for consideration. Objection was made by Senator Smoot, of Utah, and the resolution, under the rules of the Senate, went over without action.

Britain Permits Coal Exports Under General License

The British Board of Trade last week announced that, with a view to the decentralization of coal export control, an open general license had been issued, effective Jan. 1, permitting the export of coal, coke and manufactured fuel to all foreign destinations, except Russia, Germany, Hungary, Austria, Turkey and Bulgaria, subject, however, to previous approval of the Comptroller of Coal Mines, and subject to shipment being made in a vessel approved by the Commissioners of Customs and Excise.

President Asked to Enlarge Coal Commission

The *Wall Street Journal* of New York City states that representatives of five groups of public utilities in Indiana have petitioned President Wilson to enlage the Coal Commission by increasing the public's representation.

Tariff Commission Studying Coal

The *Weekly Digest* reports that the U. S. Tariff Commission is making special studies of certain commodities now on the free list relating, among other things, to coal, including both anthracite and bituminous When completed and published the report will be presented to Congress for its consideration, in connection with proposed tariff legislation.

Recovery in British Output of Coal

Trade Commissioner Leonard B. Gary states, in Commerce Reports, that there has been a substantial recovery in the output of coal in Great Britain since the railway strike, which ended on Oct. 5. For the last week of that strike the figures were 2,871,610 long tons; for the following week, 4,076,862 tons; for the week ended Oct. 18, 4,727,465 tons; and for the week ended Oct. 25, 4,761,037 tons.

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Our Vanished Thrift

MANY WERE the gratulations, during the war, on the growth of frugality. "Baby-bond" holders, we were told, were being created by the millions. Henceforth we would be a frugal nation. Every man would have a nest egg, every one a reserve for the rainy day. Instead it may be wondered if the Liberty Bond purchases did not have an unfortunate effect. Bought by the infrugal, as well as by the frugal, they were sold in numbers after the war for the purchase of luxuries hitherto unattainable. This raised the standard of living and the cost of maintaining all standards.

We are suffering today from the boost thus given to luxury. Silk shirts and hosiery, fur coats, talking machines and automobiles were purchased or partly purchased by parting with Liberty Bonds (often as low as 30 points below par). The difficulties in completing payments, in keeping the pace set or in running or maintaining in condition the luxuries thus bought made a high wage more than ever necessary. The spenders were continually being augmented in number. When one bought the others had to buy. People can go without food but they cannot afford to be out of style. Frugality was thrown to the winds. The hope of those who saw in Liberty Bonds a chance to make the public thrifty faded with the armistice. The Liberty Bonds after the war acted only like a delayed pay day or a period of detention in a lumber camp far removed from opportunities for expenditure. They caused a wild era of spending when the chance to spend came and when all was spent came the bitter period of dissatisfaction.

The public would duplicate the orgy of spending but refuses to prepare therefor by a period of saving. The discontent is natural but inexcusable; the return to the old standards forced irrevocably by our production capacity will be long and difficult. The return from silk to cotton must be indeed made soon, but the road is long and exceedingly hard to travel.

Seasonal Differential in Coal Freights

ANY differential in coal freights between winter and summer, such as is now quite generally being advocated by authorities in the coal and railroad industries and elsewhere, would doubtless be greater on long-distance transportation than on that nearer home. The differential would therefore act most markedly on the proportion of the freight service involving longer hauls. Such a difference in rates would result in concentrating the long hauls to the summer and the short hauls to the winter. The railroad lines might well have less to do in the frigid than in the balmy months due to the fact that the tonnage produced could be equal the year round (or even greater in the summer as is often the case in the anthracite region), and the transportation needed in the winter would be greatly reduced per ton delivered.

It is interesting to note, however, that even today without any differential the consumers furthest away from the source of supply buy first. In the more distant cities there was little trouble during the present strike but the consumers in the coal fields had let their opportunities slip and were without coal. The more remote municipalities do, out of fear, what they cannot be induced to do by frugality. They know that winter brings snowbound railroads, storm-staid boats and frozen rivers. It also brings frozen coal, embargoes and much uncertainty. Thus all the distant points bought coal while the nearby cities failed to do so and suffered from this lack of prescience.

That being so, it passes understanding how railroad cars have been so hard to obtain since the strike was concluded, seeing that they had been quite largely directed into idle coal fields or areas nearby. Surely when the coal mines reopened these cars were handy for distribution, though the non-union fields might be bereft. Only one thing explains the car shortage that followed the strike and that is that car shortages are now almost the normal condition and will threaten industry at all times except when business is bad. Year by year we approach the time when the coal used by the country will be determined not by our consumptive abilities but by our railroad facilities, just as now the main reason for short shipments to Europe rests not so much in an inadequate merchant marine as in a shortage of coal-loading facilities. It is said that while boats might be had to transport in excess of 25,000,000 tons per annum there are no docks to take care of any larger tonnage.

Thus it is that, as we grow older, our power to supply ourselves with food and with fuel is now no longer conditioned by the spread of both before us but by the rapidity with which our palsied arm of transportation can perform the journey between the table and the mouth. In short we may starve in sight of plenty as enfeebled and forsaken persons have sometimes been known to do.

Of All Unwise Boastings

UNHAPPY are the boasters. Most of us have sat under banquet orators and heard them tell how coal was the master, coal was the king, that the United States could not do without fuel. We have cheered them to the echo, for we delight to be important. Now we know that our sorrows all are bound up with that importance. Like the hard-working drab old maid of the family we have been so egregiously important that we are now held to a sterner course of action than is demanded of our more frivolous sisters.

In the past week a correspondent wrote *Coal Age* that the industry had gained by the strike, for everyone now recognized what coal meant to the nation. Alas! it is an irony of our importance that we are made to serve. The public relies on us. It cannot spend the time to inquire into other and less needful industries, to fetter and control them, to condemn and to berate them, but us it *must* find time to coerce.

The railroads were tied to the plow because they were found useful and serviceable. Across their broad backs were laid the whips of regulation. Not because they watered their stocks were they punished and destroyed. Many luxury industries made larger profits and paid bigger dividends, and they escaped even investigation. But they were not important. If only the coal industry were the least necessary, a malingerer in the field of production, something we could do as well without, there would not be so many laws written for our admonishment, so many boards created for our control. May the public forget the importance of the public utilities and give them the freedom they accord so readily to other industries—that freedom that has made the non-essential industries expand so luxuriantly and develop so astoundingly.

Rights of the Public

FEARSOME indeed is the individual who dares question the rights or doubt the right purposes of the public. Is not the purpose of all government to protect the public interest and is it not necessary to have faith, a blind faith, in that public that must in the end make our laws? However, it would appear that much good oratory has been wasted in making out a good case for the public as against the individual.

Looking back in the laws of earlier days it may be seen that it was usually found more necessary to protect the individual than the public. When a man was tried for treason, the most abhorrent of crimes, the British law gave counsel the right to make thirty-five peremptory challenges, whereas the public (in its phraseology termed "the crown") was not allowed to challenge a single witness without giving to the judge a satisfactory cause for such a challenge. In criminal cases in our own land the accused is given more peremptory challenges than the accuser in some jurisdictions.

The logic for these provisions is clear. The public has a large interest in the suppression of treasonable and criminal persons but the country will go on in reasonably comfortable conditions even though the criminal escapes unconvicted, whereas the accused if condemned will lose his life or his liberty, about all that he has.

A similar condition exists when questions regarding an industry are at issue. If the producing or operating company is given conditions which make operation impossible it will be obliged to close down. Under those circumstances the whole investment will be lost, for, to particularize, the mine that produces coal at a loss is worth nothing except as a futurity. So long as the price is too low the property has no real but only a potential value.

The mine worker who gets an unfair wage is injured by the amount that the wage is unfair. Let us suppose the increase in the wage rate conceded by the Coal-Strike Settlement Commission is such that 25c. per ton will just cover the increase. On 500,000,000 tons per annum that would mean an increased cost to the nation of $125,000,000, or, roughly, $1 per person a year. The public is terribly wrought up about that dollar, strange to say.

But what does it mean to the mine workers of whom there are 600,000? About $200 per year. And what to the operator? All or nearly all he is making and almost all he has already made, for what he has invested is depreciated if the price paid is not right. It is clear that the mine operator, mine worker and public have a very different interest in the issue. The public really cares little, the mine worker more and the mine operator most. For this reason the interest of the last looms largest and the public being only one of the parties at interest is not entitled to be the sole judge of the justice of its claims

Let the matter be illustrated in another way. The railroads cost the public ten cents per day for each man, woman and child in the country. A slight increase above that would not be seriously felt by any one but it would put life and vigor into the railroads.

The public as a whole is too often not inclined to be fair. It is a party at interest as is the particular industry being tried. Owing to its bias it has made decision that have ruined the railroads and the traction lines. So far it has been more considerate of the farmers, the coal companies and the packing trades, but the elements of injustice which have injured two basal industries exist to jeopardize the existence of the others.

It is important that the mine workers shall get nothing more than justice, for it would be demoralizing if by a combine in flagrant restraint of trade, pursued almost to the point of demoralizing the country, the mine workers were to acquire anything larger than what is just.

We cannot regret that the public is not more largely represented on the commission. The commissioners will doubtless decide that they will base their agreements on certain premises the nature of which they will probably set forth at length.

If the public does not approve of those premises it will not matter if there are three or thirty on the commission. There are few questions of fact. The inquiry is really as to the economic basis on which the decision shall be determined.

If the basis of the award is presented forcibly the public will be impressed; if not the public will see nothing but its selfish present advantage. It will recognize only that it has to buy coal whether it will or not and that it finds it hard to raise the money to pay for it and without further inquiry will condemn the commission, large or small.

It will be well if when the commission registers its decision it lays down some homely words of wisdom that will lend strength in the settlement of other disputes of like nature to this.

How the Coal Strike Starved the Copper Miners

The copper miners have been working very irregularly during the past year, much more irregularly than the coal miners. When the coal strike came, it shut down the copper works at Butte. Says the *New York Times* of Jan. 11:

> "The copper mines were shut down during the coal strike, and such miners as could get away, including many of the best of them, had left the place. Families that stayed during the period of idleness furnished destitution cases by the hundreds.
>
> "The city and the Salvation Army did what they could in the way of relief of the many cellar tenement families very near the starvation stage, and even nearer to freezing—for this non-employment and coal shortage and the blizzard with subsequent way-below-zero weather all came together.
>
> "The copper company also did relief work. But all the agencies together were no match for the destitution. The head of the Salvation Army told me that if the thing lasted much longer the grocers would cut off credit and the town would starve. But the gradual reopening of the copper mines after the ending of the coal strike staved off the calamity."

DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

Electric Mine Haulage

Letter No. 2—The difficulty cited by Charles F. Sherman, *Coal Age*, Nov. 27, p. 861, regarding the tendency of a mine locomotive to lift at its front end enough to allow the front wheels to spin, thereby throwing most of the load on the rear wheels and motor, will be interesting to all motormen, as this is a common trouble, particularly in mines where the loads must be hauled up a grade.

One of the largest coal mines in this country used a 6-ton electric haulage motor on a run having a fairly stiff grade against the loads. The motor gave fair satisfaction, until that section of the mine in which it was employed became enlarged and the size of the loaded trips increased. Even then the locomotive worked all right on the level track, though it was just able to creep over the top of the grade with a loaded trip attached.

It was the practice, in that mine, for the motorman to ride on the rear end of his machine, while the snapper rode on the front end. This snapper thought it quite a joke to jump off the front end when the locomotive slowed down on nearing the top of the grade. This, of course, increased the trouble and both the motorman and snapper would then have to go back one or two cars and push. With this assistance, the locomotive was just able to make the top of the grade and land the loaded trip.

When this condition became known to the mine foreman, he ordered the 6-ton locomotive taken to another section of the mine where the work was more suitable for a light machine and where it gave no further trouble. A heavier locomotive was then placed on this run and had no difficulty in hauling a loaded trip of cars to the top of the grade, without manifesting any tendency to lift at its front end.

LOCOMOTIVE TOO LIGHT FOR THE WORK

It is clear that the 6-ton locomotive, in this case, was too light for the work it had to perform in the section first named. It so happened, however, that there were 40 or 50 electric haulage locomotives at work in this large mine. These machines varied, in weight, from 6 to 30 tons each, their heights also varied to suit the particular conditions in the sections in which they were employed, and the lower machines were mostly used in pillar workings where the roof was low.

While it was an easy matter, in this mine, to transfer a light motor that failed to perform the required work on one run, and replace it with a heavier machine that was adapted to the service, there are many small mines, employing but a few locomotives, where it would not be possible to overcome the difficulty as readily.

For example, the Northwestern Improvement Co.'s Mine No. 3, at Roslyn, Wash., a while ago, was operating a light machine on a grade where it had difficulty in handling the loaded trips. No trouble was found in hauling the load on the level track; but when the trip reached the grade, the front end of the locomotive had a tendency to lift. In other words, the weight of the machine was transferred, in part, to the rear wheels, which reduced the tractive force of the front wheels and caused them to slip on the rails.

WEIGHTING THE HEAD END TO PREVENT LIFTING

Though the motorman, in this instance, was a young man, he reasoned that if the front end lifted, the proper remedy was to weight it down. Accordingly, he loaded that end of the locomotive with from 800 to 1000 lb. of rock, which answered the purpose intended and held the front wheels to the rails so that they exerted their full tractive force. The locomotive was, of course, overloaded, but the grade was for a short distance only and the overload was not a great objection.

The proper and practical remedy to apply when a loaded trip of cars hauled up a grade has a tendency to lift the front end of the locomotive and thus reduce the tractive force of the machine is to use a larger and heavier machine on that run. Weighting the front end of the machine will give relief, but it has the disadvantage of requiring the hauling of that amount of dead load, which is of benefit only on the grade.

California, Pa. RALPH W. MAYER.

Mine-Haulage Proposition

Letter No. 8—If not too late, kindly permit me to refer to the discussion of the mine-haulage proposition, regarding which I estimated, in my letter, *Coal Age*, July 10, p. 70, that the method I advocated might result in a "saving of 65 tons a day," by increasing the output of the mine this amount. I stated further that, based on the market value of $3 per ton, this would mean an increased revenue of 3 × 65 = $195 per day.

Commenting on this remark of mine, Andrew O. Bain, in his letter, Sept. 4, p. 417, thinks I am in error in not allowing for the increase in the charges, particularly the mining of the extra 65 tons a day. Mr. Bain estimates that, in his opinion, the taking of these charges into account, would reduce the value of the extra tonnage to $2 per ton, and the increased revenue would be 2 × 65 = $130 per day, instead of $195 per day.

Mr. Bain will allow me to draw his attention to my closing remarks, in which I suggested that if my estimate were even cut in two, I would consider the investment required to make the change in the haulage road a good one. Observe that the making of this allowance reduces my estimated value per ton 50 per cent, making it $1.50 per ton, which is 50c. a ton less than Mr. Bain's figure. To my mind, this makes a very generous allowance for whatever increased charges are made necessary by reason of the increased output.

Let me say it is my belief that there will be no necessity for increasing the mine equipment and providing new mine cars or even increasing the dayhands employed in the mine. It is important to notice, also, that hauling the increased tonnage over the shortened haulage roads will require no increase of motormen, tripriders or drivers, as the case may be, though it may require one more driver on the gathering haul.

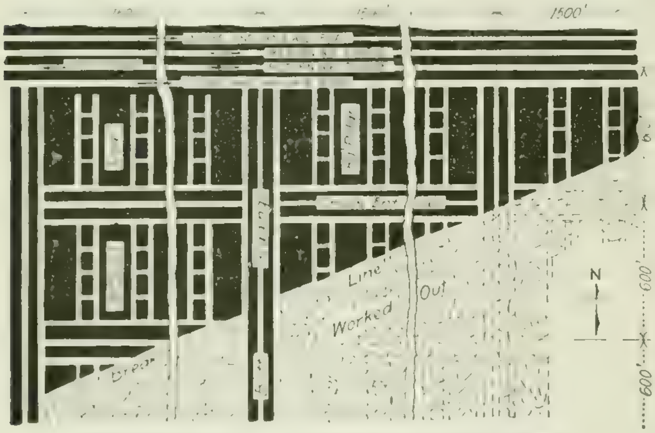
The shaft-bottom men will be able to handle the increased tonnage without difficulty. It is clear that, owing to the shorter haul, the mine cars will be returned to the working face more quickly and, perhaps, even a less number of cars will be required than formerly. With this explanation, Mr. Bain will certainly agree that my "error," if such it be, was on the right side.

Pocahontas, Alta., Canada. J. H. McMillan.

Problem in Coal Extraction

Letter No. 12—Kindly permit me to correct a statement in my previous letter, *Coal Age*, Oct. 16, p. 662, in respect to the manner of working out the coal in the several panels. In that letter I do not seem to have made my meaning clear and desire, now, to submit the accompanying sketch, which shows plainly the manner of working the panels.

As previously described, the main entries are first driven, north, south, east and west from the shaft, dividing the property into four quadrants or sections. The plan, however, shows only a portion of the southeast section of the mine.



REVISED PLAN OF WORKING OUT PANELS

After driving the main entries four abreast and turning butt headings off these, three abreast, on 1,500-ft. centers, cross-entries are driven three abreast, on 600-ft. centers, off the butts and parallel to the main headings. The work of taking out the coal in the several panels thus formed should be started at the far end, in the southeast panel of this section of the mine.

The entire work of extracting the coal is on the retreating plan. In the discussion of this question, I understand that what is desired is a greater recovery of the coal. The cause of failure to obtain a large recovery in mining is chiefly due to attempting to take out too much coal in the first working. In reality, narrow entries or stalls should be driven to the point where it is desired to start the work of extraction.

The correction I desire to make is the following: Starting in the southeast panel, drive 8-ft. stalls, in pairs with 12-ft. pillars in each pair, and leaving 80-ft. pillars of solid coal between the several pairs of stalls. These stalls are driven up in each panel, by driving crosscuts on 40-ft. centers in the 12-ft. pillars. As the stalls reach the limit, the work of drawing back the 80-ft. pillars of solid coal is commenced and carried on the retreating plan.

Working the Panels from the Butt Headings

Another plan of working the panels, other than that shown in the figure, and which I prefer as giving a more uniform breakline, is to drive the 8-ft. stalls in pairs with 12-ft. pillars in each pair and 80-ft. pillars of solid coal between them as before, only starting these off the butt headings and driving them west parallel to the main entries, instead of north as shown in the figure. This plan, also, reduces both the amount of narrow work and the distance of haul, besides giving an earlier development.

In either plan, back haulage is employed in all the sections. Practical experience has demonstrated that this is a sure and profitable method of extracting coal and obtaining a large recovery under the conditions named.

Before closing, let me state that the crosscuts in the 12-ft. pillars will require no extra track and afford shelter for the men.

Harmarville, Pa. C. W. Atkins.

Letter No. 13—After reading the different letters that have been written on the problem of getting the largest possible extraction of coal in working a seam, I want to ask to explain my own method, which I believe has many advantages and will prove to be both safe and economical in working.

In order to make my meaning clear, I have prepared the following sketch, showing a single panel lying between the 3 N and 4 N entries off the main east. As shown in the figure, the north headings are driven three abreast, or on the triple-entry system, while the cross-entries are driven, in pairs, between them. The distance from the 3 N to the 4 N is about 900 ft., making a panel of solid coal of the same width, which allows for two 60-ft. barrier pillars, one on each side of the panel, to protect the headings, and permits the driving of 16 rooms on 50-ft. centers, the rooms being 32 ft. wide, with 18-ft. pillars between them.

This arrangement will give sufficient work to keep one machine busy on each cross-entry; or, as indicated in the sketch, one machine can work on each side of the panel. The arrows show the circulation of air in each machine section. The air being deflected by a canvas curtain to the face of No. 1 room on the intake and, passing through the breakthroughs at the faces of these rooms, enters the last room on the return and circulates back through these rooms to No. 1, from which it passes out onto the main return heading.

In every case, the center heading is the main intake air-course, the two side headings being used as return entries and the coal hauled out on one of them. As shown in the figure, crossovers for all track are driven at an angle of 45 deg., which provides easy curves on the haulage roads. Overcasts are built on the main intake heading where the haulage road crosses that air-course.

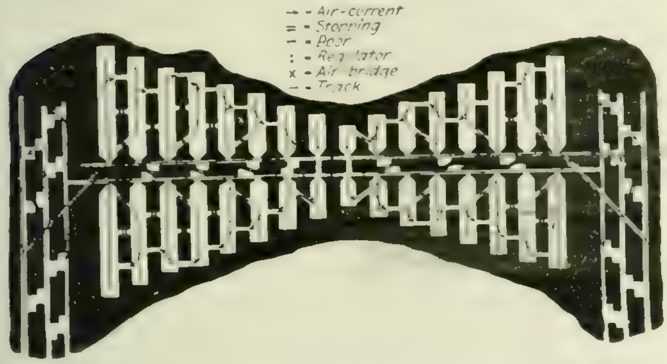
Also, as shown in the figure, the crosscuts in the

20-ft. entry pillars are driven from each entry in such manner that the rib of one crosscut corresponds to the center line of the other. Driving these crosscuts 18 ft. wide gives a good machine cut and saves yardage, while the opening at the center of the pillar is only 9 ft. wide, which gives a good opportunity for building the stoppings in that opening.

Another feature that has advantage is the driving of the first crosscut in No. 1 pillar and each alternate pillar, at a distance of 30 ft. from the entry, while the first crosscut in No. 2 pillar and each alternate pillar is driven at a distance of 60 ft. from the entry. After driving these crosscuts on a 45-deg. angle, the remaining breakthroughs are driven 60 ft. apart throughout the length of the room.

As indicated by the heavy line representing the track in the figure, entry switches are laid only at the mouth of each alternate room, starting with No. 1, and these are the permanent switches on the entry. A temporary switch is then laid at the mouth of each next adjoining room, but as soon as the breakthrough is driven between two rooms, the temporary switch is taken up and laid in the first room, just inside its mouth, so as to enable a track to be run through the crosscut into the adjoining room.

This system has the advantage of requiring only one-half the number of switches on the entry and is a good plan in motor haulage particularly, or when mules are employed. Staggering the breakthroughs in the rooms and in the entry pillars, as I have described, is of particular advantage in working under bad top.



SHOWING SYSTEM OF TRACKS IN A PANEL

Driving rooms 32 ft. wide has a certain disadvantage in loading coal at the face, unless the track can be shifted over to either side. If this is impracticable, I would recommend a double track approaching the face. It will generally prove an advantage, however, to lay a double track in each room, laying one track along each rib. This will enable the drawing back of the pillars more quickly than where a single track is laid up the center of the room.

When starting to draw back pillars in a panel, I would double my force of men, in order to perform this work more quickly. There is much to be considered in drawing pillars. Under shallow cover, roof falls may admit surface water to the mine. On the other hand, at a greater depth of cover, the excessive roof pressure may cause a squeeze. Better results are always obtained where the pillars are drawn back quickly.

As each panel is worked out and nearing completion, work on the next panel should be started. A new overcast will then be required on the main intake heading, which will do away with the previous one, that being taken down and the crossover closed with stoppings. In the end, when the 60-ft. barrier pillars and the entry pillars are drawn back, this method should give a 100 per cent extraction.

Harrisburg, Ill. G. D. YORK.

[This letter will close the discussion of "Problem in Coal Extraction."—Editor.]

Promotion of Ambitious Workers

Letter No. 7—Of the many questions discussed in *Coal Age*, one bearing on the promotion of ambitious workers must prove not only interesting but have besides an educational feature. Especially is this true in respect to those whom it directly concerns. In my own experience, I will say that the matter of looking forward to promotion has caused me to spend much time in thought and has stimulated my efforts in the performance of work.

For the encouragement of the ambitious worker let me remind all such that their efforts in seeking promotion will meet with ultimate success if such efforts are honestly put forth. Success may be slow but it will come sooner or later if the worker retains his ambition and does not become discouraged.

Let me suggest just here that the worker examine carefully his environments to ascertain, if possible, what it is that is retarding his success. In most cases it is my belief that he will find the fault is his own. It is human to think that the foreman or superintendent has slighted a worker whose ambition has led him to expect early promotion. It may be there are others equally ambitious and expectant. The promotion can not go to all and patience and perseverance are factors in success.

AMBITIOUS AND WILLING WORKER AT TIMES HANDICAPPED BY JEALOUS BOSS

It is well known that failure to receive merited promotion may be due to the fact that another worker jealous of the success of this one may be pulling against him. It may be that the competitor for promotion has a friend in a position to speak for him and the result is an injustice may be done to one who is more deserving.

At times, the boss himself in immediate charge of the work, fearing the ambition and capabilities of a worker in his employ, will think that of necessity he must belittle the accomplishments and work of this man in order to prevent him from gaining too much ground and even surpassing himself in the race for promotion. How much better would it be, in such a case, for the boss to recognize the capabilities of his worker and make him an assistant, giving him charge of a portion of his work. This would show the desire of the boss to attain the highest efficiency and make himself the more valuable to the company. Jealousy in workers can never prove their efficiency but instead will show an incapacity that must lower his standing in the estimation of the company.

I have long realized how discouraged and discontented truly ambitious workmen, especially ambitious miners, must become when the way is blocked to them by conditions beyond their power to overcome. However, let me suggest that the difficulties in the way are often assumed and that, to my mind, is unwarranted. Rather let the ambitious worker look on the bright side and his chances of success will be greatly improved. The man who continually thinks that everything is against him is not the one who attains the greatest measure of success. But, on the other hand, the man who takes things as he finds them and pushes forward with the same determined spirit is the man who will eventually find his place. He is of value to the company and a credit to himself.

It is true the ambitious worker should not fail to let his ambition be known so that his capabilities can be rightly judged. As I recall a recent writer stated that what a man wants he should seek to gain. In other words, if a man wants promotion let him get after it. Nothing will be gained by lying down on the job expecting promotion to come unsought.

Linton, Ind. W. H. LUXTON.

Finding a Mine Door Set Open

Letter No. 15—The letters that have been written on the question of a fireboss finding a mine door set open have been interesting to me as showing how far short of proper discipline many mines are being operated.

I have tried to read these letters with some degree of patience; but, to my mind, this is not a question to be discussed in the way of trying to show what the fireboss should do in such case. Instead, we should emphasize the fact that the mine door *should never be found set open.* A man who would prop a door open and leave it so, in a mine of which I had charge, would not work for me another minute.

In the first place, when a mine door is hung, the hinged post should be set plumb and the door should be made to fit close to the post. Then, by extending the lower hinge 1 in. or 1½ in. over the upper hinge, the door when opened will not remain so but will fall shut of itself. The lower hinge, as I have described it, should extend 1 in. or 1½ in. further beyond the edge of the door than the upper hinge, which will have the effect of tilting the door upward as it is opened and giving it a good fall so that it cannot remain open unless it is propped back.

SOMETHING WRONG IN THE MANAGEMENT

Returning to the question of a fireboss finding a door set open, let me say that something is radically wrong in the management of that mine. Either the foreman is asleep or he does not know what mine discipline means. The men have not been properly instructed, and there is not sufficient oversight given such matters in the working of a nightshift. If the door has been damaged by a driver so that it cannot be properly closed, it should be reported and repaired promptly.

As I stated before, it is not a question we should discuss in any shape or form, as it tends to uphold the foreman in his lack of discipline, or his failure to properly instruct his men regarding the importance of keeping all doors closed throughout the mine and the air current moving in its proper course. Ventilation is the first and most important rule in mining.

Referring to the statement of Robert A. Marshall, *Coal Age*, Nov. 6, p. 757, regarding detecting an open door by observing the water gage, I question whether he would be able to discover from the reading of the water gage that a mine door was standing open somewhere back in the workings. It is true if a heavy fall has taken place on the intake airway of a mine, the water-gage reading will show that something is wrong, and a good fireboss will proceed at once to find the trouble. But, where a door, back in the mine, is set open, I say that no fireboss can tell it by the reading of the water gage.

Oliphant Furnace, Pa. JOHN H. WILEY.

Letter No. 16—The discussion of how a fireboss should proceed when finding a mine door set open, which was started by the inquiry of Richard Bowen, *Coal Age*, Sept. 11, p. 462, has attracted much attention. Mr. Bowen states that it has been his "invariable practice" to leave an open door as he found it and proceed to examine the section, before closing the door and restoring the circulation therein.

It is my belief that such a procedure will not meet with the general approval of practical mining men, in considering a mine generating gas. The case cited by Mr. Bowen, though possible, does not offer a sufficiently strong argument in favor of attempting to enter and examine a gassy section in which the circulation has been destroyed.

Assuming that the mine in question and the section to be examined is gassy in a true sense, let me ask which is the lesser of two evils both of which must be considered; namely, entering a gas-charged section when knowing that the air is cut off, or closing the door and chancing the possibility of a burning gas feeder starting an explosion.

DANGER OF TRAVELING IN GAS-CHARGED AIR

One would not travel far in gas-charged air before the gauze of his safety lamp would become heated, making the lamp no longer safe. Again, assuming it as possible that a feeder is burning in the section, is it not true that the natural expansion of the gas in that section would have resulted in its ignition and explosion some time since? This latter consideration minimizes the possibility that there is a feeder still burning in the section.

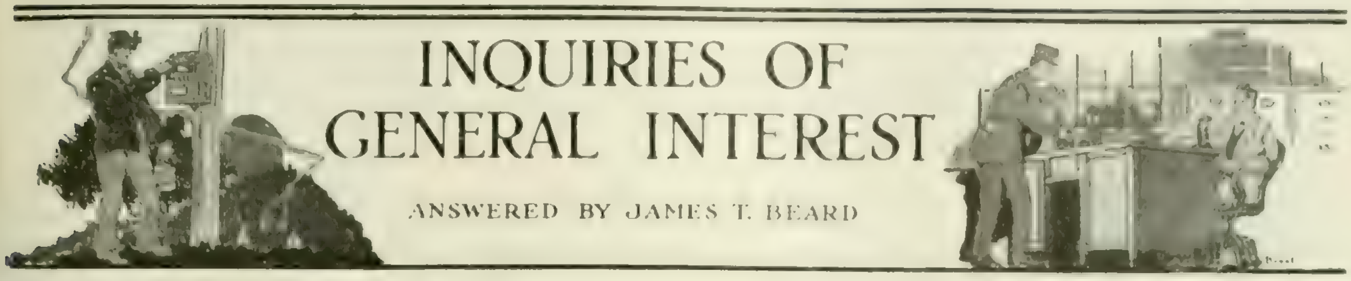
Now, in regard to entering the intake and following the air when making an examination of a section, or entering the return end and proceeding against the air, my opinion is that whether the gas is explosive or otherwise, the safest plan is to follow the air.

Speaking of a gas feeder having been ignited by a shot, let me say, the firing of shots in a gassy mine should only be entrusted to thoroughly competent men whose duty it is to see that no gas feeders are left burning after firing each shot. Where this rule is strictly obeyed, the fireboss is assured that he can safely close the door and proceed with his examination.

Referring, again, to entering the return end, because of geological considerations, as suggested by Mr. Bowen, it must be admitted that a fireboss may be overcome by the poisonous gases of gob fires, which are not easily detected with a safety lamp. This may happen before he has proceeded any great distance. Or, he may find that the return air is charged with some considerable amount of methane, and as it would be dangerous for him to proceed against such a current, he would be compelled to return and enter the intake. The old saying is, "The safest way is the best way," and this is particularly true with respect to our dealings with mine gases.

J. H. MCMILLAN, Supt.,
Pocahontas, Alta., Canada. Jasper Park Collieries, Ltd.

[This discussion will close with Letter No. 18, which is now on hand.—Editor.]



INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD

Unaccountable Explosion

Kindly permit me to present, for the consideration of the readers of *Coal Age*, an instance that has caused not a little speculation here and kept us guessing as to its nature and cause.

An explosion occurred in a room where the pillar was being drawn. The mine is working the No. 7 or Upper Freeport seam, in the Cambridge district in Ohio. The pillar was being cut by machine and was nearly all extracted, the practice being to cut through, seven runs wide on the butt.

At the time of the occurrence, the men were making the second cut from the entry pillar and the coal was partly loaded out. The fireboss had examined the place about two hours before and had found "no gas," as he reported. It may be of interest, however, to say that there had been noticed an oil smell in this district for several weeks previous.

When the loader went to the face of the working place, holding his carbide lamp in his hand near to the floor, an explosion occurred, burning him severely and knocking down men out on the entry. The concussion was felt and the explosion heard by men working in other places.

This seam of coal is overlaid with a slate varying from 5 to 8 ft. in thickness, and above the slate is sandrock that has been found to give off small quantities of oil, nearly all through this district. The mine has given off very little marsh gas, which was seldom found or reported by the fireboss. Moreover, it is generally believed that this explosion could not have been due to the presence of gas.

My solution is that a fall of roof, which had occurred back in the waste between the time when the fireboss examined the place and the explosion occurred, had liberated possibly an unusual amount of this oil, which was vaporized from the floor. I believe that it was this vapor of the oil that was ignited and caused the explosion. At the time, there was a fair amount of air passing the place, though the velocity was not strong.

About one hour after the explosion occurred, the place was examined by two firebosses and the mineboss. A safety lamp held near the floor was extinguished; but this could have been the result of the afterdamp of the explosion settling to the floor. I want to ask if *Coal Age*, or any of its readers, can suggest the nature of the gas or what caused the explosion.

Buffalo, Ohio. MINE SUPERINTENDENT.

There are numerous instances on record of explosions of gas taking place under conditions such as are here described, the gas, or in some cases the dust, that exploded being ignited at the floor. The old idea that an ignitable mixture of gas and air must always be found at the roof of a working place has long since been found untrue. Experience has shown that gas will frequently be ignited at the floor of a working place; and, what seems equally at variance with former ideas, a lamp held at the roof will frequently be extinguished when no considerable amount of methane is generated and the extinction of the lamp could not be due to a body of pure gas unmixed with air.

Temperature plays a considerable part in determining the relative densities of gas and air, in mine workings. A warm fresh air current, entering a working place that is generally cooler, will travel along the roof, while the cooler air that may be charged with some gas occupies a position near the floor. It frequently happens that the warm air current entering a working place at the roof, proceeds from some hot abandoned workings and carries sufficient blackdamp to extinguish a light held at the roof.

Again, in other cases, methane may be given off from the floor of a seam and blackdamp issue from the roof. In either case, the gas will generally be found in a seemingly abnormal position with respect to its density. It must be remembered that the density of air or gas is a determining factor in its location, only in a quiet atmosphere that is not disturbed by a moving current. Also, one must consider whether the gas in question is coming from the roof, the coal, or the floor of the seam, in order to render an intelligent judgment of its nature.

It has been shown that where methane and carbon dioxide diffuse into each other in the strata, in the absence of air, the mixture though lighter than air will extinguish a lamp. This mixture has been properly called "flashdamp," because it gives a brief cap on the flame of a safety lamp when first the lamp is raised into the gas, but which as quickly disappears. Hence the name flashdamp.

In answer to the question asked as to the nature of the gas that was ignited, or what caused the explosion in the case before us, it is possible only to surmise. The suggestion that the vaporized oil may have been ignited and exploded with the force described by our correspondent is hardly reasonable, as such a condition would require an atmosphere that would seldom, if ever, be found in a coal mine where the strata produced but small quantities of the oil.

James Ashworth, mining engineer, however, has advanced a theory that the coal formations may contain, at times, certain liquid hydrocarbons that vaporize immediately upon exuding from the strata, and form explosive conditions in mine workings subject to such emanations, which he admits are rare. It is claimed that the result of such an emission of vaporous hydrocarbons is similar to a large outburst of gas.

In the present instance, our opinion is that the explosion is due to gas that came from the floor, or accumulated there by reason of its relative density, being probably forced down by the cooler air at the roof. We should be glad to have the opinions of others.

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Illinois Examinations Held at Springfield, Nov. 11, 12, 1919

(Selected Questions)

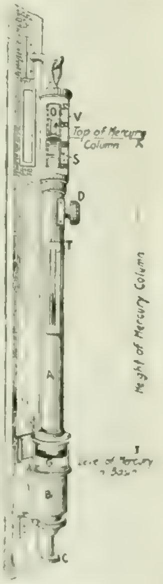
MINE EXAMINERS' QUESTIONS

Ques.—The water gage, in a certain mine, is 1.5 in. and the quantity of air in circulation 85,000 cu.ft. per min.; find the horsepower on the air.

Ans.—The unit pressure corresponding to a water gage of 1.5 in. is 1.5 × 5.2 = 7.8 lb. per sq.ft. The power on the air, in mine ventilation, is found by multiplying the quantity of air in circulation by the unit pressure; thus, 7.8 × 85,000 = 663,000 ft.-lb. per min. The horsepower on the air is then found by dividing this result by 33,000, since 1 hp. is the equivalent of 33,000 ft.-lb. per min.; thus, 663,000 ÷ 33,000 = 20.09 *hp.*

Ques.—(a) What is a barometer? (b) Under what conditions can it be used to advantage? (c) At what season of the year are mines that are dry the most dangerous?

Ans.—(a) A barometer is an instrument used to measure the pressure of the atmosphere. The most reliable instrument for this purpose is the mercurial barometer shown in the accompanying figure. This consists of a glass tube closed at one end and open at the other. The tube being first filled with mercury is inverted and its open end immersed in a basin or vessel of mercury. The surface of the liquid in the basin being exposed to the pressure of the atmosphere, the column of mercury in the tube now sinks to a level such that the weight of the mercury column is supported by the atmospheric pressure acting on the surface of the mercury in the basin, there being a vacuum or no pressure at the top of the tube. Since each cubic inch of mercury weighs 0.49 lb. and the height of the mercury column supported by the atmospheric pressure at sea level, under normal conditions, is 30 in., the atmospheric pressure at sea level is 30 × 0.49 = 14.7 lb. per sq.in



MERCURIAL BAROMETER

(b) The use of the barometer is a practical advantage, in the operation of a mine, by showing the changes in atmospheric pressure as they occur. A careful study of these changes in pressure, in connection with the gaseous condition of the mine workings, enables a more intelligent arrangement and control of the ventilation, and will often forecast a dangerous gaseous condition existing in the mine, owing to a rapid fall of the barometer.

(c) In the winter season, the intake current has a temperature above that of the mine. As a consequence, even though the intake air is saturated with moisture or nearly so, the rise in temperature when it has passed into the mine, increases its capacity to absorb moisture in the workings, since the capacity of the air for holding moisture is greatly increased by a rise in its temperature. This has the effect of rendering the mine workings dry and dusty and increases the danger due to the fine dust being raised and held in suspension in the mine air. In the summer season, the temperature of the intake current is generally higher than that of the mine.

Ques.—If the pressure producing ventilation is equal to 13 lb. per sq.ft., what is the water-gage reading?

Ans.—The pressure producing ventilation is the unit pressure (lb. per sq.ft.) in the fan drift. Then, assuming the required water-gage reading is taken in the fan drift where the pressure is 13 lb. per sq.ft., the corresponding gage reading is 13 ÷ 5.2 = 2½ *in.*

MINE MANAGERS' (FOREMENS') QUESTIONS

Ques.—The bearing of an entry taken from a mine map is S 75° W and the declination of the compass, 5¼ deg. E. How would you give sights on this entry with a plain compass?

Ans.—The declination of the compass being 5¼ deg. E, means that the north point of the magnetic needle is deflected 5¼ deg. to the right of the true meridian. In other words, the needle is setting in the northeast and southwest quadrants, and a magnetic bearing, in either of these quadrants, if greater than the declination, is less than the true bearing by the amount of the declination. Therefore, in this case, the magnetic bearing corresponding to a true bearing of S 75° W is S 69¾° W.

Ques.—The diameter of the piston of an engine is 10 in. and the length of stroke 15 in.; the engine makes 250 r.p.m. with a mean effective steam pressure of 40 lb. per sq.in. What is the horsepower of the engine in this case?

Ans.—The sectional area of the 10-in. cylinder is $0.7854 \times 10^2 = 78.54$ sq.in. and the total pressure on the piston is 40 × 78.54 = 3141.6 lb. For a length of stroke of 15 in. (1¼ ft.), at a speed of 250 r.p.m., the piston speed is 1¼(2 × 250) = 625 ft. per min. Therefore, the indicated horsepower of this engine is (3141.6 × 625) ÷ 33,000 = 59.5 *hp.*

Ques.—(a) Give the breaking strain of a 9$\frac{1}{16}$-in. crucible, cast-steel, hoisting rope, having 6 strands of 19 wires each. (b) State the safe working load, using 5 as a factor of safety.

Ans.—(a) The breaking strain of a 1-in. crucible, cast-steel, 6-strand, 19-wire, hoisting rope is 39 tons. Therefore, the breaking load of a $\frac{9}{16}$-in. rope of the same kind of material is $39(\frac{9}{16})^2 = 12.31$ tons.

(b) Using a factor of safety of 5, the safe working load of this rope is 12.31 ÷ 5 = 2.462, say 2½ tons.

FOREIGN MARKETS AND EXPORT NEWS

Coal Exports Again Restricted

Restrictions have again been placed upon shipments of bituminous coal abroad, announcement of which is contained in the following authorized statement by L. W. Baldwin, regional director of the Allegheny region, with headquarters at Philadelphia. "The Regional Coal Commission of the Allegheny region has found it necessary again to place restrictions on exportation of bituminous coal. This is due primarily to the threatening shortage of coal for domestic purposes brought about by a combination of circumstances.

"At a meeting of the Regional Coal Committee Friday it was decided that until the domestic requirements are fully taken care of, favorable action will be withheld on any application for a permit for coal to be exported. It is expected, however, that it will not be necessary to continue these restrictions very long as every effort is being made by the Railroad Administration to expediate the return of the empty coal cars to the mines and quicken in general the movement of coal."

Coaling Facilities at Durban, South Africa

The *South African Mining Journal and Engineering Record* devoted considerable space in its October (1919) issue to a description of the new coaling installation at Durban. This article is quoted below as of special interest to American shippers in view of the direct steamer traffic between South Africa and the United States which was an outgrowth of the war:

The development of the Natal Coal industry, and particularly the expansion of the export and bunkering trades at Durban, has called for improved coaling facilities at that port. The equipment existing there to-day has a maximum capacity of about 1,400 tons per hour, but when the railways are in a position to deliver more coal and satisfy the demands of shipping the present equipment will require considerable extension.

Natal was the first of the South African States to discover coal (in 1838), and mining commenced in 1888. The Cape Colony commenced mining in 1865, tne output then being 16,500 tons, which amount had increased in 1899 to 208,655 tons. The Cape Colony's output after that date has been comparatively insignificant as compared with that of Natal and the Transvaal, which latter commenced mining in 1893. The development of the coal industry has been and will continue to be most beneficial to Natal, as it will result in largely increasing traffic to the coast. Railway facilities to-day are much improved since the early days of the coal traffic, but there is a great dearth of rolling stock. In 1907 it took 90 hours for the coal to travel from the mines to the harbor, and to-day it can be conveyed in 70 hours.

The progress of the port of Durban since the days of tne Boer war has been most gratifying. In those days mail steamers and smaller craft lay outside the harbor and cargo was unloaded thence into lighters. Now, the mail steamers and larger vessels come inside and are unloaded alongside the wharf. This advance may be attributed partly to the great increase in the coal industry at the port. About the year 1905 it was found that the old methods of coaling, by means of baskets, were altogether inadequate; designs were therefore got out for a coaling plant, which was erected in 1907, and this plant has done excellent service during the last 10 years.

In 1913 it was decided that a new coaling plant was necessary, partly as an extension and partly to take the place of the old one should anything go wrong with it. This new plant was to have been erected in 1915, but owing to the outbreak of war that was rendered impossible. In 1917, however, the plant was completed.

Coal Exports for November

Exports of coal and coke as reported by the Department of Commerce for November, 1919, and the figures for November, 1918, as finally revised, are as follows:

EXPORTS OF COAL AND COKE

(In tons)

	November 1918	November 1919
Anthracite	430,369	320,719
Bituminous	1,616,914	724,650
Exported to:		
Italy	.. ..	45,933
Canada	1,384,147	336,641
Panama	3,188	8,482
Mexico	9,475	8,932
Cuba	99,679	59,835
Other West Indies	21,028	10,345
Argentina	1,168	19,954
Brazil	59,247	24,699
Chile	25,335	....
Uruguay	10,321,000	17,653,000
Other countries	3,326	192,176
Coke	146,647	66,873

	Tons	Value
Total	724,650	$3,718,316
Anthracite	320,719	2,828,372
Coke	66,873	540,234

Bituminous

Port:	Tons
Italy	45,933
Canada	336,641
Panama	8,842
Mexico	8,932
Cuba	9,835
Other West Indies	10,345
Argentina	19,950
Brazil Chile	24,609
Uruguay	17,653
Other countries	192,176

DOMESTIC EXPORTS OF COAL AND COKE FROM THE UNITED STATES BY COUNTRIES AND BY CUSTOMS DISTRICTS. BUNKER COAL SUPPLIED TO VESSELS IN THE FOREIGN TRADE AT SPECIFIED DISTRICTS DURING NOVEMBER, 1919

	Coal		Coke
Countries	Anthracite Tons	Bituminous Tons	Tons
Austria-Hungary	30	212	200
Azores and Madeira Is.	.....	17,857	
Denmark	......	5,705	
France	1,697	64,338	
Germany	......	7,905	
Gibraltar	... ..	9,533	
Italy	13	45,933	924
Netherlands	...	36,950	8,308
Norway	2	. .	37
Portugal	20	.	
Spain	680		
Sweden	100	16,247	
Switzerland	.	17,417	4,290
Bermuda	1	3,719	5
Canada	301,773	336,641	19,945
Guatemala	.	2	
Honduras	.	235	
Panama	.	8,482	
Salvador			2
Mexico	159	8,932	20,464
Miquelon, Langley, etc.	25		
Newfoundland and Labrador	5,270	.	
Barbados	80	6,510	
Jamaica	.	1,664	
Trinidad and Tobago	2	. . .	12
Other British West Indies	1	....	
Cuba	5,525	59,835	278
Danish West Indies	. .	958	1
Dutch West Indies	.	851	
French West Indies		.	11
Haiti	1		2
Dominican Republic	3,852	362	.
Argentina	..	19,954	
Brazil	995	24,699	
Chile	91		12,237
Colombia			3
Peru	406	3,814	40
Uruguay		17,653	.
Venezuela	2		14
Dutch East Indies	......	......	100
British East Africa		6,174	
French Africa		2,068	
Total	320,719	724,650	66,873

	172	173	174
	Coal		Coke
Customs Districts	Anthracite	Bituminous	
Maine and New Hampshire	124	1	182
Vermont	1,496	78	33
Massachusetts	411	.....	..
St. Lawrence	77,829	28,521	1,212
Rochester	37,478	5,878	237
Buffalo	178,546	89,379	8,828
New York	15,585	2,077	1,585
Philadelphia	6,025	78,933	8,898
Maryland	91	35,523	15,937
Virginia	......	238,471	1
South Carolina	......	11,089	
Florida	..	12,208	
New Orleans	20	490	80
Sabine	..	. ....	31
San Antonio	49	846	277
El Paso	103	4,610	3,659
Arizona	2	3,419	16,455
Southern California	5	10	
San Francisco	......	2	4
Washington	. . . .	101	
Alaska	......	1,877	.
Dakota	905	7,737	180
Duluth and Superior	1,937	7,756	114
Michigan	102	34,919	8,848
Ohio	11	160,394	311
Porto Rico		331	1
Total	320,719	724,650	66,873

BUNKER COAL

Customs Districts:	Tons
Maryland	30,099
New York	277,270
Philadelphia	43,420
Virginia	122,693

Shortage of Coal in Canada

America's bituminous coal strike is seriously affecting the foundries throughout this country, states a trade report from Canada. The non-shipment of coke from the United States into Canada is aggravating this situation rather more than the scarcity of bituminous coal, as coke is largely used for molding purposes. There are some foundries engaged largely in the turning out of car wheels, and large quantities of coke are used for this purpose.

Users of coke in Canada have been living on a hand-to-mouth policy, and they have practically no reserve of coke on hand. Manufacturers who use bituminous coal are more fortunately situated, though inquires reaching the Manufacturers' Association and the Fuel Controller are multiplying from these sources in which some anxiety is expressed with regard to the future. No bituminous coal has come into Canada in any considerable quantity for over a month, and though many of the manufacturers seem to have sufficient supplies to do them for from one to three months, they are becoming somewhat apprehensive that their situation beyond that time may develop unfavorably if the American strike is not settled and production commences on a large scale, to make up for the time that has been lost. Some time ago the Manufacturers' Association sent out a letter advising manufacturers how they could secure coal if it was absolutely necessary. Advantage has been taken of this assistance in the case of coal, and now that foundries have been threatened, at least one foundry has already applied for information which would help it to secure needful supplies.

On the whole, there is a growing anxiety over the situation, though there seems to be no immediate danger of a dislocation of industry on account of coal shortage.

Coal Bunkering Prices at Foreign Ports*

	Price per Ton
Gibraltar	$24.80
Algiers	28.25
Malta	28.06
Oran (15c.)	28.63
Port Said (plus Emergency Tax)	29.02
Newcastle	16.20@17
Southampton	20.00
Liverpool (Welsh coal)	20.38
Plymouth	20.00
Hull	9.60@10.50
Fowey	19.43
London-Gravesend	20.85
Dartmouth Portland	121/6
Cardiff (according to quality)	75/ to 100
Swansea	10.40
North of Scotland	No coal available
Copenhagen	32.20
Trondjem	26.75
Gothenborg	32.20
Amsterdam	26.25
Rotterdam	26.25
Antwerp (Baseoup)	26.60
Antwerp (American)	34.42
Havre Bordeaux	No coal available
Azores	26.60
Madeira	24.00
Teneriffe	25.00
Las Palmas	25.00
St Vincent	24.60
Barbados	20.85
St Lucia	20.85
Trinidad	20.75
St Thomas, V. I.	20.75
Bermuda	25.00
Curacao, D. W. I.	22.00
Rio de Janeiro	29.00
Pernambuco	31.40
Bahia	31.40
Santos	29.50
Rosario	28.00
Bahia Blanca	27.20
Buenos Aires	57.55
La Plata	27.55
Montevideo	27.55
Coronel (approximate)	26.60@13.50
Delagoa Bay	6.50
Port Natal (according to quality)	6.85@7.25
Cape Town (according to quality)	7.50@8.50
Dakar	25.50
Singapore (according to quality)	17.50@17.85
Colombo (according to quality)	14.80
Aden (So. African or Indian coal)	20.85
Bombay (Welsh coal)	10.25
Karachi	10.10
Newcastle	27.40@29.50
Port Kembla	3.45
Adelaide	6.75
Albany	8.20
Fremantle	8.20
Melbourne	6.10
Sydney	5.00
Sydney Harbor	4.00
Port Pirie	6.50
Barcelona	37.80
Valencia	37.80
Castagena	36.75
Malaga	36.75
Huelva	34.75
Corunna	34.00
Bilbao	31.20
Pasages	31.20

* In compiling this table the foreign exchange on Dec. 20 was: Shilling worth 19c.; peseta, 19.4c.; kronen, 19.5c.; guilder, 37.5c., and a rupee, 46.5c.

* Plus 19c. Export Duty

Ulster Coal Fields Promise Well

Concerning the coal fields in Ulster, it was pointed out by the senior geologist, Geological Survey, Ireland, in the course of an address delivered in Dublin early in 1919, that the most promising coal field in this district was that beneath and around the northern half of Lough Neagh and in this region two bores were being put down by the branch of the Ministry of Munitions known as the Department for the Development of Mineral Resources, which is located at Dublin.

If the coals known to occur in the Tyrone coal fields were found to extend over even a fraction of the area indicated by the geological reasoning the resulting coal output [illegible] to revolutionize the industrial life of Ulster. An analysis of the geological structure of the north of Antrim [illegible] coal field there [illegible] [illegible] Lough Neagh, but still well worth exploitation for future development.

[illegible] to occur, but it was feared that the highly-faulted nature of the ground would make [illegible] lined for continuing and extending the exploitations started by the Ministry of Munitions.

Ruhr Coal Output

The *Iron & Coal Trades Review* report that the statistics regarding the production of coal in the Ruhr from the beginning of the Revolution down to the end of October have now been published. They are given month by month, in tons, together with the number of men employed (these figures in brackets), and are as follows:—October, 8,457,360 (445,000); November, 6,205,596 (395,042); December, 5,773,060 (405,165), January, 6,263,070 (425,380); February, 5,130,776 (429,514); March, 6,299,591 (418,649); April, 2,132,007 (416,828); May, 5,826,873 (413,087); June, 5,007,977 (413,930); July, 6,703,416 (418,709); August, 6,501,494 (424,822); September, 6,580,219 (434,014); October, 6,945,901 (452,415).

It will be seen that there has been a constant increase in the number of men since June, and the average output per day has advanced at the same time, the average in that month having been 241,208 tons, and 257,256 tons in October. It has to be borne in mind, however, in considering these figures that many of the new men employed are unskilled, and that the shift was reduced from 8½ to 8 hours on Nov. 18 last, and to 7 hours in the strike month last April. The output in October was equivalent to an annual output of 83,500,000 tons, or 73 per cent of the quantity (114,500,000 tons) raised in the pre-war year 1913. A reduction in the 12 months under review is also shown as compared with 1914 and 1917, the output in the Ruhr district having been 98,300,000 tons in 1914, 86,800,000 tons in 1915, 94,200,000 tons in 1916, 99,100,000 tons in 1917, and 95,900,000 tons in 1918.

Shippers Secure Permits With Difficulty

Steamers can be had to carry coals to European ports at considerably less than the Shipping Board rates, but shippers are experiencing great difficulty in securing licenses, except for Shipping Board boats at Shipping Board rates. To South American ports, the same conditions apply, although shippers are now having the same extreme difficulty in securing permits, and to West Indian ports, rates are firmer.

The Shipping Board's rates by steam, are as follows:

Port	Rate	Tons of Displacement
Genoa/Leghorn	$26.50 —	1000
Spezia/Savona	26.50 —	1000
Piraeus	23.50 —	1000
Trieste/Venice	31.00 —	800
Algiers	26.00 —	800
Cadiz/Bilbao	23.50 —	1000
Barcelona	26.00 —	1000
Antwerp/Rotterdam	22.50 —	1000
Lisbon	22.50 —	1000
Gothenburg	24.00 —	1000
Marseilles	26.00 —	1000
Stockholm	26.00 —	800
Hamburg	25.00 —	1000
Rouen	23.00 —	1000
Malmo	25.00 —	800
Pernambuco	16.00 —	500
Bahia	16.00 —	500
Rio	17.00 —	1000
Santos	18.50 —	600
Rio Grande do Sul	19.50 —	500
Buenos Aires or	16.00 —	1000
La Plata or	or	
Montevideo	17.50	750
Rosario	19.00 —	750
Bahia Blanca	17.50 —	1000
Nitrate Range	14.00 —	...
Havana	7.50	600
Cardenas or Sagua	9.00 —	400
Cienfuegos	9.00 —	500
Gaibarien	9.50 —	300
Guantanamo	9.50 —	300
	9.00 —	400
Manzanillo	9.50 —	300
Bermuda	9.00 —	300
Bermuda p. c. and dis. free		
Kingston	9.50 —	400
St Lucia	11.00 —	500
Barbados	11.00 —	500
Santiago	8.50 —	500
	9.00 —	400
Port of Spain, Trinidad	11.00 —	500
Curacao	10.50 —	500
Free p. c. Curacao		
Demerara	13.00 —	400
St. Thomas	10.00 —	500

All above rates gross from charter.

The exportation of anthracite and bituminous coal, briquets, and coke from Germany without special permit is made punishable with imprisonment under a proclamation dated Dec. 1, issued by the German Ministry of Economics.

Industrial Coal in Belgium

The reviving industries of Belgium continue to be greatly embarrassed by lack of fuel supplies. Practically no foreign coal is arriving except the shipments from Germany stipulated by the Peace Conference, and these are said to be irregular and insufficient. Belgium is, of course, a large producer of coal, but much of it is unsuitable for industrial purposes. Furthermore, production of the Belgian mines is hampered on account of the shorter working day with the greatly increased compensation which has become general, and railway congestion, as states in a Department of Commerce report.

Coal is one of the chief products relied upon by Belgium to diminish its adverse trade balance, and during the first nine months of this year exports amounted to 233,586,611 francs. Stipulated deliveries of Belgian coal now are being made to certain foreign countries, Switzerland receiving 30,000 tons, Holland 10,000, Rumania, Argentina, and Italy 50,000, and France 320,000 tons per month. These heavy exports of course occasion a shortage and advance the price in the domestic market. As coal is one of the very few important raw materials that Belgium has in exportable quantities, it is likely that the Government will make every effort to continue exports so necessary from a standpoint of foreign exchange.

During the first eight months of 1919 exports of coal amounted to 2,650,000 tons, while September exports totaled 320,000 tons. In 1913 coal exports for the first eight months amounted to 3,300,000 tons.

The difficulties of coke production in Belgium, due to insufficient supplies of industrial coal from Germany and France, is indicated by the exports for the first eight months of the present year, which amounted to 210,000 tons as compared with 700,000 tons exported during the same period in 1913

Coal in South Wales

From a report Consul W. F. Doty, Cardiff, Nov. 26, 1919, and later published in a report of the Department of Commerce, the announcement by the Government through the president of the Board of Trade of a reduction of 10 shillings per ton on inland coal has been most welcome in the South Wales and Monmouthshire district. It appears that this is based, not upon increased production but upon the profits from the export trade. At the rate of production during the past two weeks the output would be only 198,000,000 tons per year, which is considerably below the estimate of 217,000,000 tons stated by the president of the Board of Trade.

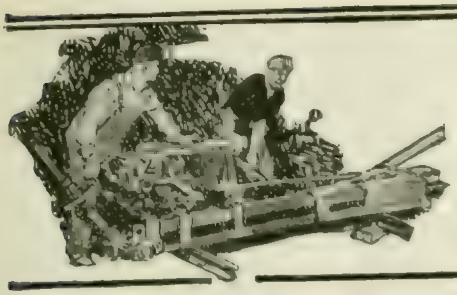
During the four months ended October, 1919, cargo exports of coal amounted to 11,005,183 tons at the rate of 33,000,000 tons annually, while bunkers amounted to 4,294,308 tons or at the rate of 13,000,000 tons a year. This would make a total of 46,000,000 tons annually, which is far in excess of the estimate by the president of the Board of Trade, namely, 32,000,000 tons a year. The value during the four months ended October, 1919, of cargoes of coal was £30,239,138, and of bunkers £11,809,347; total, £42,048,485.

The total for the year ending June, 1920, might therefore reach the sum of £126,000,000. The export trade in coal and bunkers has received added impetus from the American strike which enabled the United Kingdom to exploit markets that had been supplied for some time with American coal.

No Rolling Stock Shortage in Belgium

The situation remains unchanged, says the *Iron & Coal Trades Review*, there being no improvement yet in the rolling stock shortage. Stocks have been slowly accumulating at the mines since the middle of October, and fuel is still scarce; although the output for November has reached 98.6 per cent of the normal before the war. The working day has been reduced by half-an-hour since Dec. 1, and the festivals of the patron saints were celebrated as usual, hence there will be a serious falling-off in the output during December.

As regards coke, all export licenses remain suspended, and the scarcity of coal is limiting the output of the cokeries. The 80,000 tons of coking coal ceded to Belgium by France have not yet arrived. Prices are to remain in force until the end of the year.



COAL AND COKE NEWS

Charleston, W. Va.

General car shortage more acute and protracted than at any time last year. Thousands of loaded cars held in the East. Car supply from 50 to 60 per cent of normal in New River field. Embargoes added during the week. Similar conditions prevailed in Kanawha field. Producers falling further behind with orders.

The car shortage in this section of the state between Jan 5 and 10 was even more pronounced than it had been during the latter part of the previous week. Indeed the first full week of the new year brought a car shortage more serious than had been observed at any time during 1919. Not only was the shortage more acute but it was more general and appeared to be more protracted than any other one during a period of 12 months. The shortage was so serious in fact as to vie with labor problems in importance and was the principal topic of conversation among producers not only in one field but in all fields.

It is extremely doubtful if the number of cars available in any field reached by the Chesapeake & Ohio, during the week ended Jan. 10, was above 60 per cent of normal. During certain parts of the week the supply was as low as 40 per cent. While the Sunday accumulation furnished some relief, such a supply was soon exhausted, and during the remaining five days of the week mines were hardly able to work more than half the time, so that there was a good deal of idleness among the mines in this area, tending toward disorganization and inefficiency and coming at a most inopportune time.

Producers claim that the present car shortage could be avoided if the railroads would cease holding coal, the report being in circulation that there are still thousands of cars in the East being deliberately held after having been diverted in transit; one effect of this has been to lead to further diversions of coal by the Railroad Administration, and this policy has brought sharp protests from producers and shippers in this section. On Saturday, Jan. 10, the supply of cars at Chesapeake & Ohio mines was not over 40 per cent.

Railroads have been unable to handle coal trains as promptly as usual through inadequate motive power and that also has tended to demoralize operations in several fields, interfering with the movement of coal and with the delivery of empties to mines, as sidings have been heavily congested.

Frequent embargoes imposed also tended during the week ended the tenth, to retard the shipment of coal either for domestic or export markets. Producers are complaining that shipping conditions do not warrant a continuance of the limitations upon export business.

While receipts from coal confiscated and diverted during the strike were somewhat larger during the period ended the tenth, large amounts were still outstanding and the names of final consignees had not been learned in many cases.

Complaint was general in the New River field during the week ended Jan. 10 of a car shortage. As a matter of fact up until Jan. 7, there had not been two full days of operations. The scarcity of cars in the New River field remained unbroken throughout the week above referred to, averaging from 50 to 60 per cent only of normal, and forcing mines in many instances to mark time while waiting for cars. Daily production in the New River field at Chesapeake & Ohio mines fluctuated between 18,000 and 20,000 tons a day

Although limitations still existed as to the volume of New River coal which could be exported, it was found impossible even to ship up to the tonnage permitted owing to inability of mines to secure enough cars. Another factor which retarded export shipments was the addition of embargoes during the week. As might be expected there was an excellent demand for New River coal, but with a shortage of cars prevailing, producers were utterly unable to keep up with the demand.

An acute car shortage plus an embargo on shipments to Michigan and other points whittled down production very materially in the Kanawha region during the week ending Jan 10 In that field there was not on an average, at any time during the week, more than half enough cars to insure full production at the mines, and during the latter part of the week the supply hovered between 40 and 50 per cent. On the tenth in fact there was only a 40 per cent supply and many mines were forced to go without cars. Production, in fact in the Kanawha field, was less than 100,000 tons for the entire week, at least insofar as mines on the Chesapeake & Ohio were concerned, running about 16,000 tons a day. To make matters worse a slide on the Coal River division of the Chesapeake & Ohio near Whitesville, in Boone County, forced a suspension of traffic on the Coal River branch and materially affected the production of coal.

Producers in the Kanawha region attribute the general car shortage to the fact that so much equipment is still tied up when as a matter of fact there is no longer an excuse for such conditions.

The demand for Kanawha coal was such as to far exceed the supply and owing to conditions already described producers were falling further and further behind with orders, and of course were utterly unable to take care of spot business, having no assurance of any relief from the car shortage.

Bluefield, W. Va.

Railroads in smokeless territory unable to supply empties demanded. Deficient motive power, great amount of coal still unloaded in the East and large number of cars retained in the West, the cause. Demand for coal portends general shortage. Situation in various smokeless regions. Export market strong, especially for gas coal.

Acute car shortages still prevailed in the several smokeless regions during the week ended Jan. 10, the Norfolk & Western, Virginian and the Chesapeake & Ohio all being utterly unable to supply the demand for empties (though the shortage was more pronounced further north), cutting down production to the extent of 25 or 30 per cent in the extreme southern part of the state and to the extent of about 50 per cent elsewhere in smokeless areas. As a result of the general prevailing scarcity of cars, the output in all regions was materially reduced as compared with the week ended the third. While railroads have been deficient in motive power, the absence of cars cannot be wholly attributed to that cause, the great amount of coal still unloaded in the East as well as the large number of cars still in the West being factors in the shortage. There is an especially strong demand for coal for export, especially gas coal, but limitations imposed are preventing any large exports of fuel, the permit of the regional director still being required as a prerequisite to shipping export coal.

Receipts of funds for coal diverted during the strike are beginning to be somewhat more plentiful, although a large amount of extra work is still being entailed in order to secure data concerning diversions and final consignees.

In many places scattered throughout regions in southern West Virginia, the car shortage was such that mines had no cars at all and consequently numerous shutdowns were reported. As a result of such conditions, mines are far behind in their deliveries, although there has been a steady increase in demand ever since the first of the year, and such an increase is regarded in many producing quarters as portending a shortage of coal throughout the country.

The supply of empties in the Winding Gulf field during the week ended the tenth was exceedingly weak, especially as to the Chesapeake & Ohio. It is stated that on Monday, the fifth, when there should have been a liberal supply of cars, it proved to be one day in the history of the Chesapeake & Ohio in the Gulf field, that mines had practically no empty cars. The car supply on the Virginian for the first two days of the week was excellent, but during the remainder of the week not more than half enough empties were furnished Consequently, although there was a stiff demand for smokeless, the mines were utterly unable to take advantage of it. Of course with restrictions still existing as to exports, the volume of coal sent to tidewater for overseas shipment, was far below the prestrike level. As a matter of fact operators were unable to make contract deliveries. The labor situation was pronounced as being favorable to a large production

Loadings were less in the Tug River field during the week ending the tenth than during the previous working period, dropping from 77,000 to 69,950 tons. A shortage of cars still exists as to this field and such a shortage, it is stated, cannot be blamed altogether on insufficient motive power, although that has held back the loading of coal to some extent. Approximately 20 per cent of the Tug River output is being moved to tidewater, a part of such tonnage being for export. Export coal can only be moved under permit from the regional director. The export demand is pronounced as being strong, especially for gas coal; one Bluefield representative of an exporting company now assembling fifteen thousand tons per week to run for seven weeks. This contract calls for gas coal which will probably come largely from the Thacker field.

As miners of the Pocahontas field had returned to work for the most part by Jan. 5, losses from a labor shortage, as compared with losses from the same cause during the previous week, had been materially reduced, but inability of the mines to secure an adequate car supply was still affecting production to about 25 or 30 per cent.

Huntington, W. Va.

Coal shipped to essential industries still being confiscated for railroad use. Causes much confusion. Serious car shortage in Logan field. Embargo on eastbound shipments imposes hardship. Increase in Chesapeake & Ohio transportation facilities would increase production in Logan and Guyan fields.

The most significant development in any of the volatile fields during the week ended Jan. 10 and subsequent to that period, has been the confiscation of fuel shipped under contract, notwithstanding the fact that the strike is over. A part of such coal is being confiscated for railroad use, and a large tonnage, moving on contract to public utilities and other essential consumers, is being taken indiscriminately by the railroads simply because (it is charged by operators) the railroads failed to make provision last summer for an adequate supply of coal. The action of the railroad companies is causing much confusion and is throwing industrial machinery out of gear, coal producers being particularly wrought up over this latest development.

The effect of a serious car shortage in the Logan field, during the week ended Jan. 10, was seen in greatly reduced loadings, only 3,558 cars of coal being loaded in the period just mentioned as against 4,194 during the previous week, a loss of 636 cars or approximately 31,000 tons. Such a loss was due entirely to the car shortage as labor conditions were conducive to a large supply. The failure of the Chesapeake & Ohio to furnish an adequate supply of cars was attributed to cold weather and the large number of Eastern cars still in the West.

An embargo on eastbound shipments from the Logan field, placed on the ninth, imposed a general hardship as it shut off contracts obtained in the East at a great expenditure of time and effort.

Little relief from present conditions in the Logan field is looked for until the Chesapeake & Ohio increases its present facilities and provides for additional facilities for handling Logan coal.

The demand for Logan coal is beyond the ability of Logan producers to supply, and it is certain that such conditions will prevail for some time to come.

Large development work under way would increase production in the Guyan field at least fifty per cent in the next two years, but under present limited railroad facilities, such development will be at a standstill.

The shortage of cars on the Chesapeake & Ohio system during the week ended the tenth was reflected in the loading figures for that week; statistics compiled by the road showed that only 10,914 cars of coal or about 545,700 tons of coal transported as compared with 12,127 or about 606,350 tons handled during the previous week, a loss of 60,650 tons, the biggest loss being in the Logan field.

Fairmont, W. Va.

Slump in production owing to drop in number of cars furnished northern fields. Coal goes to Eastern points. Emphatic protest at diversion of export coal for use of gas companies at Government prices. Payment for coal diverted during strike still seriously delayed.

There was a decided slump in production in the northern part of West Virginia during the weekly working period ended Jan. 10, owing to a drop in the number of empties furnished during the latter half of the week. The week gave promise of being an auspicious one from a production standpoint, since for a day or so cars furnished, somewhat approached normal, although it might be added that mines generally were ordering more cars to take care of the heavy demand. On Monday the fifth the supply available was virtually normal. Beginning with Thursday, however, there was a marked decrease, nearly fifty mines in the Fairmont region alone being idle on that day. On Friday the situation was even worse with more mines idle.

While a less number of cars were furnished on the tenth, they were more widely distributed, although nearly seventy mines were idle on the tenth. There was quite a lean supply on the Monongahela, partly relieved when more cars were furnished, after the issuance of a peremptory order from the manager of the Eastern Car Pool at Pittsburgh, to the Pittsburgh & Lake Erie, to provide more cars for northern West Virginia points. Late placements also figured to some extent, as being responsible for a curtailed production. Northern West Virginia operators claimed during the week, that the Central Coal Committee was still holding coal loads in the East in reserve, until after the Columbus convention of the miners, and that such a policy was limiting the supply to some extent at least.

The greater part of the coal produced in various northern West Virginia fields was being moved to Eastern points, and, while the bulk of west-bound coal was still being shipped to Ohio and Michigan, the tonnage was rather limited during the last half of the week. Curtis Bay shipments were increasing during the early part of the week but declined when production was reduced. The tonnage of coal shipped for railroad fuel was materially reduced, running far below recent weeks. Diversions of gas coal intended for export, for the use of certain Eastern gas companies at Government prices brought emphatic protests from northern West Virginia operators. While they were not opposed to the diversion the operators did not feel that it was just to divert export coal at Government domestic prices. Producers were experiencing much difficulty during the week in securing the issuance of permits for the exporting of gas coal. In fact during the latter part of the week no such permits were issued.

Payment for coal diverted during the strike is still being seriously delayed according to reports from all parts of northern West Virginia. When information as to who received much of the coal diverted is being received, yet payment has not followed, and even the railroads have been stalling in settling for coal taken by them during the emergency.

Ashland, Ky.

Poor car supply reduces output to 49 per cent of capacity. Chesapeake & Ohio again discriminates in favor of mines furnishing railroad fuel. Commercial coal confiscated. Producers cannot supply strong market.

Production in northeast Kentucky was running 27,000 tons or 25 per cent behind the production for the same period last year, during the week ended Jan. 10 not through any lack of demand, as was the case during 1919, but solely because of an inadequate car supply. As a matter of fact the shortage in the northeast Kentucky region during the period named cost in production losses 120,000 tons, or 46 per cent out of total losses aggregating 51 per cent of capacity, the total output being only 49 per cent. It is claimed now by railroad officials that the poor car service is due to congestion at terminals. While such officials predict that there will be a larger production during the present month than at the same period in previous years, operators find little encouragement in that since conditions have always been sub-normal at this time, during the last three or four years from first one cause and then another.

The Chesapeake & Ohio has again returned to the policy of assigned cars or, in other words, is discriminating in favor of mines from which it obtains its fuel supply. In fact no bones have been made of the fact that car distributors have been directed to furnish mines in this region as well as in other regions an arbitrary full supply, the excuse being that the road is experiencing a severe shortage of fuel. It was also learned in Ashland on Monday, Jan. 12, that the Chesapeake & Ohio was confiscating commercial fuel, claiming that such action was necessary in order to move trains. The action of the Chesapeake & Ohio in discriminating in favor of railroad fuel-supply mines has been brought to the attention of the Railroad Administration by officials of the northeast Kentucky Associaton.

While the number of cars available on Jan. 12 and 13 was somewhat larger than during the previous week, northeast Kentucky operators were not sanguine of any permanent change for the better in transportation conditions. With mines falling so far behind in production, owing to transportation disabilities, it is being found impossible for producers to keep pace with the present strong demand in all markets.

Victoria, B. C.

British Columbia coal via Panama canal for Ontario and Quebec. Matter being considered. Engineer for Commission of Conservation discusses the situation. United States developing European markets. Changed conditions may allow British Columbia to aid eastern Canadian manufacturers. Canada no longer easiest market for U. S. coal operators. Restrictions on export of coal from Canada withdrawn.

The announcement that the Canadian Manufacturers' Association is to investigate the possibility of developing sufficient coal in Canada to meet the requirements of Canadian industry has given rise to the suggestion that the time may not be far distant when the coal of western Canada will find its way via the Panama canal to the St. Lawrence River.

On a previous occasion when the subject was broached, the statement was made in the East that British Columbia was too far away to be considered as a source of supply for manufacturing purposes in Ontario and Quebec. But with the changing conditions and the fact facing them that the United States may develop other markets for export besides Canada, the whole question probably will be reconsidered and the possibility of this province coming to the aid of eastern manufacturing concerns will be thoroughly investigated.

Arthur V. White, consulting engineer for the Commission of Conservation, in discussing this matter recently, said that the war had brought out the fact that nations which did not possess within their own borders coal and other fuel supplies, from which to derive light heat and power, have found themselves in desperate straits. Formerly Great Britain was a heavy exporter of coal, especially to those European countries which either had no coal of their own or were only partly able to supply their requirements. But Great Britain is unable now to supply this demand.

Concerning countries which require coal they have not only been making extreme efforts to produce fuel from all possible sources of their own, but have been looking outside to ascertain what are the maximum deliveries that may be secured from those countries fortunate enough to have coal for export. The United States, it was said, is stepping to the front as an exporter and Great Britain, among other countries, is looking to the United States for assistance in this respect.

"It is manifest, therefore," Mr. White said "that Canada no longer occupies a favored position as being the easiest market for United States coal operators. It may be the easiest market insofar as transportation is concerned but there is the question of price. European countries have demonstrated the fact that they are practically ready to pay any price demanded because it is so evident to those in charge of affairs of these countries that they cannot go on, either economically or in many instances even maintain physical existence, unless additional fuel is available.

"British Columbia, like her sister provinces on the Atlantic seaboard, possesses coal and waterpower both readily available at tidewater. When one comprehends the significance of the fact that countries like Italy and France have found it necessary to pay from $30 to $90 a ton for coal, it becomes evident that past considerations are not likely to have anything like the same weight, in appraising the value of British Columbia's coal fields to Canadian industry. Add to the present price the cost of haulage to practically anywhere in Canada, and the price of British Columbia coal per ton still may be found to be substantially less than the prices which European countries are prepared to pay."

All restrictions on the export of coal from Canada were withdrawn by the Fuel Controller of the Dominion on Dec. 31, 1919; instructions to this effect were received by W. G. Gaunce, Pacific Coast Fuel Controller, in common with occupants of similar office in other parts of Canada. The understanding, it was explained by Mr. Gaunce, was that this action would be taken simultaneously with the abolition of fuel control in the United States. On the Pacific coast there was no scarcity of coal for domestic or general use. The collieries continued production at a high pitch and it was possible to export considerable quantities from British Columbia without in any way affecting the local situation. In some sections of the prairie provinces a more or less embarrassing condition was threatened because of the possibility of a strike in District 18 (U. M. W. of A.). This however, did not develop and the critical period has passed.

PENNSYLVANIA

Anthracite

Scranton—Plans for the new breaker to be erected by the Delaware, Lackawana and Western company to replace the present Bellevue breaker are being prepared and it is expected that work will be started on the structure within two months.

Pottsville—The Holmes workings of the Wadesville colliery, one of the most important operations of the Philadelphia & Reading Coal & Iron Co. developed a fire recently. Officials of the company said that the fire would shortly be under control. Foreman J. C. Culver, Harry Childs and William Davis, of St. Clair, and John Barry, of East Mines, were overcome by smoke. Gaseous conditions made effective fighting of the fire difficult.

Bituminous

Starford—J. Mack Stewart, of Clymer, Pa., has sold his one-half interest in the Harve-Mack Coal Co., whose mines are located here, to his partner Harvey Hetrick, for a consideration of $40,000. The mines have been in operation about two years and have a daily capacity of about 250 tons. Mr. Hetrick is now sole owner of the mines.

Perryopolis—The Jamison Coal & Coke Co. is rushing work on its new No. 2 mine here, which is located on the Alfred Fuller tract composed of 522 acres. The company has erected 22 houses and 45 more are in the course of construction. The plant will be one of the most modern and largest in this region.

Washington—Dr. J. B. McMurray, of this place, has just sold the coal underlying his farm of 105 acres in Independence Township, Washington County, to L. M. Irwin, of Avella, for $21,000, or $200 per acre. Mr. Irwin has also purchased the coal underlying the farm of James Boles, in Independence township, at $150 per acre; the tract contains 100 acres.

Waynesburg—Among the coal land deals consummated recently is the sale of a tract of 104 acres from the Green Improvement Co. to the Cumberland Coal Co. for a consideration of $62,164.60. This tract is located in Cumberland Township, Green County, Pa. Another deal was the transfer from Elizabeth J. Brown to the Cumberland Coal Co., of 83 acres in Cumberland Township for a consideration of $113,833.75.

Altoona—The board of directors of the Central Pennsylvania Coal Products Association (headquarters at Altoona) adopted resolutions expressing the pleasure of the board over the appointment of a Central Pennsylvania operator, Rembrandt Peale, as a member of the commission and pledging their support to him in the discharge of his duties. The meeting was presided over by Chairman T. H. Watkins, of New York, president of the Pennsylvania Coal & Coke Co. Harry Boulton, of Clearfield, president, and M. J. Bracken, vice president, of the Central Pennsylvania Coal Producers' Association, also attended. The board of directors also discussed the car shortage, it being asserted that 12,000 cars had been diverted to the West during the strike and that none had been returned as yet. In most cases the coal was unloaded.

Uniontown—Officers and directors of the Washington Coal & Coke Co., were reelected at the annual meeting of the stockholders held recently at Dawson, Pa., M. M. Cochran, president; W. Harry Brown, of Pittsburgh, vice president; J. H. Price, Dawson, secretary-treasurer; and M. E. Strawn, Dawson, assistant secretary-treasurer.

Philadelphia bankers and investors have incorporated a $1,250,000 company—The Pennsylvania & West Virginia Coal Corporation—to develop 661 acres of coal land near Gilmer, in Gilmer County, W. Va., and in Somerset County, Pa. They have taken over the Gilmer-Pittsburgh Coal Co. J. H. B. Egan is president; Francis O'Kane, vice president and secretary; J. Edward Thompson, treasurer, all of Philadelphia. Biddle & Co., Philadelphia bankers, are among those interested.

Brownsville—The sale of the Orient Coke Co. in Pittsburgh is understood to be the initial move in the organization of another large fuel subsidiary by powerful steel interests. The property was sold to Frank E. Peabody and his associate, E. S. Reilly, in the Reilly-Peabody Fuel Co. Title to the property will be taken in the name of the American Coke Corporation. The sale of the Orient company removes another prominent coke concern from the merchant class and further intrenches furnace interests in the Connellsville coke trade. On the directorate of the American Coke Corporation, now being organized, as the holding company of the fuel subsidiary, will be Eugene S. Reilly, Frank E. Peabody and W. Russell Carr. The same men are also stockholders and directors of the American Connellsville Coal & Coke Co. which a few years ago purchased the old Sunshine properties, and now own about 900 ovens in Fayette County. Other directors of the corporation will be announced, it is understood, when the organization has been completed and other deals now pending are consummated. R. M. Fry, who has been general manager of the company since the death of O. W. Kennedy, will be retained in the same position by the new owners of the Orient Coke Co.

Seriousness of the coal situation through shortage of cars is indicated in a statement issued recently by Richard W. Gardiner, commissioner for Pittsburgh Coal Producers' Association. The statement, in part, follows:

"Production of coal in the Pittsburgh district has not approached as near normal, since the strike ended, as was hoped.

"During October the mines in the Pittsburgh district, with an actual capacity of 4,000,000 tons, ran about 90 per cent of production, being about 3,500,000 tons. All of these mines were down during November.

"About the middle of December the men began to come back to work, and the actual tonnage lost by the strike during December was 1,688,000 tons. After the mines started up there was a further loss of 648,700 tons, due to the fact that not all of the men on the payroll in October reported for duty.

"Notwithstanding these losses, the mines still were able to produce 200,000 tons more than the railroads could transport in the last two weeks of December, and this loss of 200,000 tons production was due to car shortage alone. The figures are taken from 136 mines and are representative of conditions existing all through the Pittsburgh district."

WEST VIRGINIA

Charleston—An important meeting of the Smokeless Coal Operators' Association of West Virginia—the first since the regular annual meeting—was held at the Bellevue-Stratford Hotel, in Philadelphia, Pa., Jan. 15, when conditions in general affecting the smokeless region formed the general subject of discussion. Of paramount importance is the car supply which has so seriously affected the production of smokeless coal in recent weeks, and to that subject the association gave its major attention. Members of the association say they cannot understand why export shipments of smokeless should be so seriously curtailed when so many vessels are idle. Producers of smokeless coal point out that all facilities for the production of smokeless are available except means of transportation.

Fairmont—An agreement has been reached, subject to confirmation by Judge Thompson, in the Federal Court under the terms of which exceptions to the report of the referee in bankruptcy in the case of Josiah V. Thompson, of Uniontown, filed by West Virginia judgment-lein creditors, are not to be pushed, conditioned upon a settlement being made in full in favor of the judgment-lein creditors. This has been agreed to by the committee representing Pennsylvania creditors. Originally it had been decided to pay to West Virginia creditors, out of the sum of $5,000,000 realized from the sale of the Thompson properties to the Piedmont Coal Co., only $1,000,000 in settlement of West Virginia claims. That fell short $500,000 of satisfying judgment-lien creditors whose judgments of course gave them prior liens. Not only will West Virginia creditors be paid in full but will receive interest on their claims at the rate of 4½ per cent. The Piedmont company has been granted until March 1 to make payments, that time being necessary in order to complete the examination of titles.

Mt. Hope—Impetus was given to the movement for the improvement of the mines of Fayette County, W. Va., and for better conditions within the mines by the organization at this place, on Jan. 5, of the Fayette County Mining Institute. The new institute includes mine managers, superintendents, mine foremen, fire bosses and a number of others interested in learning more about mining, there being fully 70 present at the organization meeting. The State Department of Mines was represented by W. J. Heatherman, chief of the department, and by deputy inspectors, who have been lending encouragement to the organization of mining institutes in various counties of the state, in accordance with the suggestion of the West Virginia Mining Institute. The meeting at Mt. Hope was called to order by P. M. Snyder, head of the Pemberton Fuel Co. and other companies, Mr. Snyder presiding pending the election of a temporary organization. Temporary officers elected were: Robert M. Lambie, a district mine inspector, temporary chairman; Geo. W. Bright, temporary secretary. A committee, consisting of Tom Donelson, Sun, W. Va.; Joe McCauley, of Harvey, W. Va.; John Whitehead, Star, W. Va.; John Malabone, Summerlee; T. H. Snyder, Mt. Hope, was appointed to submit a report at the mext meeting of the institute, which will be held on the evening of the second Saturday in February, as to a constitution and by-laws and also to submit nominations for permanent officers.

Gary—In keeping with its annual custom, the United States Coal & Coke Co. held here on the night of Jan. 10, its tenth annual safety-first banquet, General Edward O'Toole, general manager of the company, acting as toastmaster and introducing several prominent speakers. Covers were laid for about 300, including executive officials, mine foremen, other employees, ex-employees and their guests. Discussion revolved around the accomplishments of the past year in safety and welfare work and plans for even greater work in the future.

MARYLAND

Cumberland—In its report submitted to the court, the Grand Jury (January term) of Allegheny County urges that a bill be prepared for presentation to the General Assembly providing for an assistant to the mine inspector. The report says, in part: "We believe that it is a physical impossibility for the mine inspector personally to visit every mine in Allegany and Garrett counties once every 60 days, as required by law, there being in both counties 135 or more mines in actual operation." It is also pointed out that according to the law and in order that the inspector perform his duties properly, a certain amount of time, in some cases from two to three days, must be spent at some of the mines, and therefore advocates the appointment of an assistant mine inspector.

ALABAMA

Birmingham—The Alabama convict board has renewed contracts for the hire of convicts to the Sloss-Sheffield Steel & Iron Co., Pratt Consolidated Coal Co., Bessemer Coal, Iron & Land Co. and the Montevalle Mining Co., for the term of two years ending Dec. 31, 1921. A new provision in the contracts stipulates an 8-hour day for convict labor, after which time the laborer may elect to stop work, or remain at work for a longer period, receiving compensation for all time spent over the eight hours.

Official figures show that 115,961 tons of coal was barged via the Warrior River to the ports of Mobile and New Orleans during 1919. Transportation facilities which will soon be available in the way of additional barges and tow boats provided by the Federal Government will create a heavy increase in this movement in 1920.

OHIO

Columbus—Secretary B. F. Nigh, of the Michigan-Ohio-Indiana Coal Association, has been overwhelmed with inquiries on the part of dealers concerning the report that the award of the president's wage commission is likely to be retroactive. Some shippers have been sending out the statement that in case the wage award is retroactive, they will collect the excess from the dealers. This has caused many dealers to go slow in buying. Secretary Nigh announces that there is no possibility for the wage award to be retroactive.

ILLINOIS

Christopher—Recently the main shaft hoist of the Valier Coal Co., at Valier, three miles south of here, made one of the largest hoists on record, as far as known. In one hour and 12 min. this company hoisted 1,258 tons of coal; this is at the rate of 1,048⅓ tons an hour, or 8,387 tons in a day of eight hours. The company states that no special preparations were made for this performance; some coal had accumulated at night and in the morning continuous hoisting was maintained for the time stated without having to wait for coal. An interesting description of the hoisting proposition at Valier is given in an article entitled, "Engineering Features of Modern Large Coal Mines in Illinois and Indiana," in the Nov. 27-Dec. 4, 1919, issue of *Coal Age.*

ARKANSAS

Fort Smith—Sustaining charges that Thomas H. Shaw, State Mine Inspector, had not worked for the public interest, the State Mine Examining Board has revoked his interest and has issued a license to A. W. Tomlin, who has been appointed to succeed Shaw by Governor Charles Brough.

Fort Smith—The Central Coal & Coke Co. has all of its Arkansas mines in operation again, following the closing of the mines by Thomas H. Shaw, who was recently removed as a state mine inspector. The Central company claims that Shaw had no right to close the mines and that he has lost $160,000 in wages to Arkansas miners.

KANSAS

Pittsburg—The headquarters of the state's receivers for the coal mining properties have been removed from Pittsburg to Topeka. The receivers, C. D. Sample, of Fort Scott and B. S. Gaitskill, of Girard, announced they desired to have their records easily accesible for the state legislature.

Obituary

John P. McCabe, veteran coke expert of Scottdale, Pa., and for 22 years coke yard superintendent of the Davidson plant of the H. C. Frick Coke Co., died at the home of his daughter, Mrs. Lawrence Eberhardt, Scottdale, Pa. Mr. McCabe was employed at the Davidson works since 1871 until his retirement from active service a few years ago. He was aged 75 years.

William Preston Yeatman, a well-known coal operator of the Birmingham district, Alabama, died suddenly Jan. 7 from an attack of acute indigestion. Mr. Yeatman was an executive officer of the Aetna Coal Co., with mines near Searles, Tuscaloosa County and was stricken while on an inspection trip at his operations; he died shortly after reaching his home in Birmingham. He had been interested in the development of various coal properties in this field for the past 15 years and was about 42 years of age at the time of his death. He is survived by his widow and two brothers, John T. and George M. Yeatman.

Personals

L. Epperly, Wytheville, Va., an old time employee of Justus Collins' interests, will succeed Mr Wolf as manager.

George Wolf has resigned as manager and treasurer of the Winding Gulf Colliery Co., Winding Gulf W Va., and the Superior Pocahontas Coal Co., Davy, W Va.

O. L. Walters, chief clerk of the H. C. Frick Coke Co., at the Bridgeport mines, has been made superintendent of the Filbert mines of this company

O. H. Millward has been promoted from superintendent of the Filbert mines of the H. C. Frick Coke Co. to assistant mine inspector of all the mines of the Frick company

William Keck resigned as superintendent of the No 2 mine of the Jamison Coal & Coke Co., at Perryopolis, Pa., to assume charge of all the mines of the Pittsburgh Steel Co. The plants are located near Monessen and Brownsville, Pa.

Richard Peters, Jr., formerly with W. J. Rainey and president of the Connellsville Coal Tariff Association, has resigned his position with Rodgers, Brown & Co., of Philadelphia, Pa., to become associated with Robert C. Lea & Co., of Philadelphia.

David Millward has resigned as superintendent of the Tower Hill mines of the Tower Hill Coal & Coke Co., at Tower Hill, Fayette County, Pa., to become superintendent of the new No. 2 mine of the Jamison Coal & Coke Co., at Perryopolis, Pa.

W. Roper, formerly with the Canadian Western Fuel Co., Ltd., has been appointed mine manager for the Pacific Coast Coal Co., South Wellington, Vancouver Island. This position has been held by Robert Bonner for some time.

J. T. Morris, late of the Pemberton Coal & Coke Co., of Affinity, W. Va., has given up his position as superintendent of the mines in question and has taken over a 2,000-acre lease west of Herndon, organizing the Morris Coal Co. Preparations for immediate development are being made and Mr. Morris says he will be shipping coal in sixty days.

Clyde Caldwell has accepted a position as purchasing agent for the Curry-Campbell Coal Co., of Philadelphia, and will purchase coal throughout central Pennsylvania for this jobbing concern. Mr. Caldwell served as a lieutenant in France and was severely wounded twice. He has just been discharged from the military hospital. His headquarters will be in Indiana, Penn.

George R. Collins will be treasurer of the two companies, besides taking a more active interest in operations as vice president. Mr. Collins' headquarters will be at Charleston and Mr. Epperly's at Winding Gulf. Mr. Wolf is organizing a bank at Davy; he is the president of the Atlantic Smokeless Coal Co. at that place, and the Very Top Seam Coal Co., at Beckley, where he will make his headquarters.

Charles M. Means, of Pittsburgh, Pa., has been retained as electrical expert by Chief of Mines S. E. Button for inquiry into the subject of locomotives in coal mines, according to a recent report from Harrisburg, Pa. Mr. Means will continue investigations already under way. He will attend a conference (called by Mr. Button) in Harrisburg on Jan. 27, at which mine operators, inspectors, employees, safety men and manufacturers will discuss the subject.

Industrial News

Kingwood, W. Va.—Ohio investors will organize a $300,000 company to develop coal mining properties in the district of Preston County. They have incorporated the Deaker Mining Co. The incorporators are, Geo. M. Anderson, J. A. Hagstrom and A. T. Carnahan, all of Akron, Ohio.

Chicago, Ill.—The [illegible] Coal Co., 840 State-Lake Building, has perfected arrangements for the development of about 1,200 acres of coal properties in the vicinity of Manchester, Ky. It is understood that th[illegible] tion of a new electric power plant. Charles R [illegible]

Fairmont, W. Va.—Although the Pitts-[illegible]

Wellsburg, W. Va.—The Follansbee Gas Coal Co has been organized with a capital of $150,000 The company plans to operate not far from Follansbee, W. Va., but Wellsburg, for a time at least, will be the headquarters of the new corporation. Behind the new company are: G. S. Irish and J. J. Walker, of Follansbee; J. S. Liggett and E. E. Carter, of Wellsburg; J. J. Arnold, of Washington, Pa.

Wolf Summit, W. Va.—The Wolf Summit Coal Co. has had plans prepared for the development of a total of about 2,200 acres of coal properties in the Wolf Summit district, to have a capacity of about 2,500 tons daily. Electric-operated equipment will be utilized wherever possible. The company has recently filed notice of an increase in its capital from $350,000 to $750,000 for proposed expansion. T. R. Craig, Clarksburg, W. Va., is manager.

Sutton, W. Va.—Operations will be conducted on an extensive scale in Braxton and Webster counties of West Virginia, by the American Fuel Co., just organized, mostly by Phliadelphia people. The capital of $1,500,000 discloses the extent of the company's development plans. Principal figures in the organization of the company were: H. C. Johnson, John E. Bassett, Randall F. Collins, H. S. Glazier, all of Philadelphia; William P. Cubberlye, of Trenton, N. J.

Beckley, W. Va.—C. H. Mead, of the Mead-Tolliver Coal Co., and Ingram Branch Coal Co., has lately consolidated the Meade-Tolliver Co., with the holdings of the Cadle Land Co. and acquired possession of the East Gulf Coal Co., on Stone Coal Creek. These three companies will be united in what will be known as the C. H. Mead Coal Co. The three companies combined have a large acreage and Mr. Mead intends to build up the output to 500,000 tons a year.

Morgantown, W. Va.—The Vienna Coal Co. will conduct mining operations in Monongalia County, the preliminary organization of the company in question having just been effected by Morgantown business men as follows: Lee R. Shriver, P. P. Weaver, R. P. Posten, R. H. Jarvis and M. J. Malamphy. The company has a capitalization of $100,000. It is understood that preliminary development work will be begun in the near future.

Welch, W. Va.—Construction work is being pushed on the new tipple of the Sagamore Colliery Co., at McComas, W. Va. The tipple is to be of reinforced concrete and will be one of the largest structures of its kind in the Pocahontas field. The tipple now under construction is to replace one destroyed by fire several months ago, since which time the company has made no effort to operate. Work will hardly be completed on the new tipple until late in the spring.

Kingwood, W. Va.—Development of Preston County coal lands will be undertaken in the near future by the Deek Mining Co., which represents in large part an investment of Akron, Ohio, capitalists. Headquarters of the company will be at Kingwood. The plant to be constructed will cost in the neighborhood of $300,000. Among those active in the preliminary organization of the company were George M Anderson, A. T. Carnahan, F. G. Carnahan, J. A. Haystrom and M. E. Schief, all of Akron, Ohio.

Logan, W. Va.—Announcement was made a short time ago that the Lincoln Smokeless Coal Co., a new $600,000 company in which the Hutchinsons of Fairmont are largely interested, would begin the shipment of coal from its mines near Rainelle on Jan. 10. It is also planned so far as can be learned to enlarge operations during the year with a view to the fuller development of the company's 3,000-acre tract. The new plant is on the Sewell Valley branch of the Chesapeake & Ohio R. R.

Northfork, W. Va.—The same people are behind both the Harlan-Cumberland Coal Land Co. and the Harlan-Cumberland Coal Mining Co. These companies were just organized largely by West Virginia business men, the capital of the mining company being $150,000 and of the land company $200,000. The land held is in Harlan County, Ky., where development work will be undertaken. Active in the formation of both companies as incorporators were: Harry Totz, of Northfork, W. Va.; Abe Foman, of Kimball, W. Va.; M. O. Litz, J. N. Harman and B. H. Gray, of Welch, W. Va.

Elkins, W. Va.—It is learned that the Brewer-Harrison Coal Co., organized a few [illegible] ago, will begin work on a new plant in the Collins district of Lewis County, W. Va., in April 1920. The company plans to produce about 150,000 tons a year. The company will purchase tipple and house [illegible] cars, rails and mining machinery. Preliminary development work will be in charge of W. W. Brewer, of Belington, president and general manager of the new company.

Chicago, Ill. — The Chicago Pneumatic Tool Co. announces the appointment of E. A. Woodworth and C. E. Laverenz as special railroad representatives attached to the staff of Manager of Western Railroad Sales, with headquarters at the Fisher Building, Chicago.

Mr. Woodworth has been for several years secretary of the Committee on Standards, U. S. Railroad Administration, at Washington, D. C., following varied service with different railroads. Mr. Laverenz has also had Government and railroad connections, gaining experience of value to him in his present service.

Beckley, W. Va.—The plans of the Crab Orchard Coal Co., organized since the first of the year, disclose the fact that this company will start work on its plant in connection with the drift mine it proposes to open, about April 1, completing the operation early in 1921. About $350,000 will be expended on the new plant. The company expects eventually to be able to produce about 125,000 tons a year. As a part of the equipment the company will install mining machines, motors, mine cars, rotary converters, and a power sub-station. Prince E. Lilly will be in charge of operations.

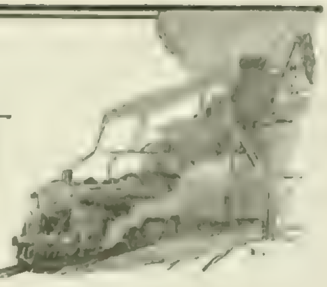
New York, N. Y.—A contract recently signed between the Fairbanks Co. and the Lincoln Electric Co., of Cleveland, Ohio, gives the former company the exclusive distribution of Lincoln electric motors for industrial applications. This line includes alternating-current motors for 2-phase and 3-phase circuits in capacities from one-half to 500 hp., for all commercial voltages and frequencies, and direct current motors from one-half to 150 horse-power. The Fairbanks Co. will also co-operate with the various Lincoln district offices in connection with the sale of the manufacturer's other products.

New Castle, Pa.—Local business men here perfected the organization of the Ellwood Coal Co., which is capitalized at $100,000. The officers of the corporation are: President, S. A. Barnes; vice president, L. S. McNab; secretary, M. S. Woods; treasurer, Samuel Douthett; counsel, Clyde Gibson. A charter has been obtained and the company has acquired 300 acres of coal lands in Beaver County, Pa., estimated by engineers to contain 2,000,000 tons of coal. The tract is located between Ellwood City and New Brighton and was formerly the Anderson farm. The coal is to be mined for domestic use, although there is said to be a seam which will later be opened for industrial purposes.

Williamson, W. Va.—A deal equaling in magnitude the purchase of the properties of the Red Jacket Consolidated Coal Co. by M. A. Hanna & Co. is that which it now appears certain is being consummated for the purchase of the extensive holdings, mines, plants, etc., of the Pond Creek Coal Co. by the Solvay company, for the sum approximately of $5,000,000, it is understood. Color is lent to the belief that such a deal is pending because of the fact that a complete inventory is being made of the Pond Creek plants. The annual production of the Pond Creek Coal Co. is approximately 1,000,000 tons a year, produced at 11 different plants. The company has been successfully operating mines for the last nine years or since 1911. A heavy tonnage of Pond Creek coal has been sold to the Solvay company, the product of the Pond Creek mines being suitable for byproduct ovens.

Philadelphia, Pa.—The Combustion Engineering Corporation of New York has enlarged its facilities for handling business in the Philadelphia territory. The office of the company in this territory is located in the Lincoln Building and W. C. Stripe, formerly of the Pittsburgh office and formerly of the Westinghouse company, becomes manager of the Philadelphia district. Associated with Mr. Stripe in that territory on the active selling force are C. L. Bachman, formerly manager of the Chicago office of the Combustion corporation before the war, and E. F. Kuehnle, formerly of the main office in New York. Among the types of stoker manufactured by the Combustion Engineering Corporation are the Type E underfeed stokers, designed for use with bituminous coal where heavy loads are required; the Type K stoker, designed for use with bituminous coal where moderate loads are required on small boilers, and the Coxe stoker which is designed for burning any kind of low-grade, high-ash fuel. This corporation also manufactures the Grieve grate which is designed for any plant (burning either bituminous or anthracite coal) that for any reason may not install automatic stokers.

MARKET DEPARTMENT



Weekly Review

Most Markets Are Fairly Well Supplied and Little Actual Suffering Is Felt. Production Is at a Low Point and Still Decreasing. All Over the Country Except in the South the Car Supply Is Inadequate.

FROM all sections of the country, except the Birmingham district, come reports of a car supply entirely inadequate to production needs. In this Southern district the output is reported as being nearly normal and approaching wartime records, yet even here the car supply is not wholly equal to demands. Throughout the balance of the country the car shortage is severe, and the output in many localities ranges somewhere between 30 and 50 per cent. Such short transportation facilities can have but one result. It is utterly useless to develop natural or manufacturing resources if, after the development, the product cannot be distributed.

Prices with one or two exceptions are unchanged from last week. Practically all coal is quoted at Government price, but little is sold at that figure as most of it moves on contract or to export. Cold weather and snowstorms in many parts of the country have increased the demand for fuel while rendering transportation problems somewhat more difficult. Stocks previously accumulated must therefore be drawn upon, and accordingly these are being gradually depleted.

In some places a scarcity of fuel exists which borders upon the critical. Thus in New York because of failures in delivery of both coal and fuel oil some industrial establishments are facing the necessity of closing down. Thus one of the largest markets in the world, lying within a few hundred miles of the source of supply, is in trouble solely because of a lack of suitable and adequate transportation.

The coke industry, both beehive and byproduct, is slowly increasing its output. This is, however, by no means up to the demand, and much more coke would be absorbed provided it could be made. Here again the car supply is the limiting factor. There is no question but that the byproduct ovens would greatly increase their output if only cars were available.

The whole adverse situation may be summed up in the words: The transportation lines during past years have been strangled, discouraged, regulated, repressed and finally "controlled." They must not only soon be amancipated but encouraged, if serious national disaster is to be avoided.

WEEKLY PRODUCTION

The high rate of production reached during New Year's week declined somewhat during the week ended Jan. 10. The daily rate is estimated at 1,905,000 net tons, compared with 2,060,000 tons on the five full working days of the week before. The total output for the week of the tenth, including lignite and coal made into coke, is placed at 11,432,000 net tons. This was an increase over the corresponding week last year of 1,071,000 tons, or 10.3 per cent. Indeed the week's performance was exceeded but five times during the entire year 1919. The total production to date of the coal year which began last April (1919-1920) amounts to 367,470,000 tons. Compared with the 460,890,000 tons of the preceding coal year (April 1, 1918, to March 31, 1919), this is a decrease of 93,420,000 tons.

According to the reports of the nine anthracite carriers, shipments were higher for the week of Jan. 10 than at any time since Dec. 13, amounting to 34,971 cars. On this basis the total production for the week, allowing for mine fuel and sales to local trade, would be approximately 1,796,000 net tons. Compared with the 5-day week of New Year's, this was an increase of 311,000 tons; compared with the corresponding week, last year, the increase was 145,000 tons, or 9 per cent. The current output of anthracite thus continues well above that of a year ago. The cumulative production the beginning of the coal year, however, shows a decrease of approximately 6,230,000 tons.

The beehive coke market continued active during the week ended Jan. 10. The total production for the country is estimated on the basis of rail shipments at 422,000 net tons, an increase over New Year's week of 24,000 tons, or 6 per cent. The output has been exceeded but six times since March 15, 1919. Compared with the corresponding week of last year, however, when the influence of the war demand was still felt, production showed a 22 per cent decrease.

The ninth week witnessed a general improvement in both car supply and attendance at the mines. Strike losses decreased 0.2 per cent.

Atlantic Seaboard

BOSTON

Market gradually tightening. All rail receipts slope off. Rumor that export coal will be excluded from New York and Philadelphia piers. Only scattered inquiry for spot coal. Short supplies at Hampton Roads. New England railroads reported uneasy over fare situation. Domestic sizes still in strong demand. Cold weather a factor.

Bituminous.—While there is general agreement among the trade that stocks are ample and that there will be no real ground for uneasiness if deliveries all-rail are maintained on their present basis, yet it is clear that buying grows more difficulty from week to week. The few orders that are in the market for anything like comprehensive tonnage are harder to place than a fortnight ago.

The fixed price, with no authority to add the wage increase, makes hot prices entirely unattractive to the great number of operators who are able to get on very nicely, car supply and labor situation considered, with the orders and contracts accepted prior to Oct. 30. There is much interest here in current reports from the Wage Commission, for it is realized that present regulations are operating against a fair share of output for New England.

For the first 14 days of January receipts all-rail through the far gateways averaged 312 cars daily of bituminous for commercial consigners, a considerable decline from average receipts the latter half of December. The fact is that this is the trend of both water and rail, and should the weather hold cold the next fortnight there will doubtless begin to be some anxiety, at least among a large number of small buyers. Retail dealers, as a whole, have very small stocks on hand and for that reason various lesser manufacturers have less tonnage on which to rely than would normally be the case.

It has been rumored the past few days that the Railroad Administration would shortly put on the clamps again, so far as over-seas coal is concerned, over the Philadelphia and New York piers. There has been complaint over the volume of coal removed from line and city water by the extra price for export, and apparently the authorities are disposed to confine the issue of permits for foreign cargoes to coal mooring via Hampton Roads. If such action were taken it would certainly improve materially the prospect for prompt coal at the New York loading piers.

There is no approach, however, to a broad market. Inquiries are still scattering with the accent slightly on deliveries all-rail. Some buyers who are in the market have despaired of arranging deliveries by water. Freights, particularly from Hampton Roads, are so high and heavy demurrage is so likely to accrue that there is every inclination to look for relief all-rail, if at all possible.

For that reason, more or less coal that would not be considered in ordinary times is being sold at the Government price and is coming forward for the sake of assuring certain of the anxious steam-raisers a continuing supply.

At Hampton Roads there is a general shortage of coal at all three piers for all shippers. The number of cars in the railroad yards is less than a third of normal. Permits have been granted for enough foreign cargo steamers to affect seriously the tonnage available for coastwise deliveries. There are 25 or 30 additional foreign cargo steamers waiting, for which permits have been asked, and from this it can be gathered how difficult it will probably be to arrange for shipments of smokeless coals on any but old purchases. On the 9th inst. there were but 140,000 tons on hand for all requirements. Should export loadings now be confined to Hampton Roads, and possibly Baltimore, this situation would hardly improve, at least from the standpoint of agencies interested in New England business.

Anthracite.—Notwithstanding the signs of easiness that were general a fortnight ago, shipments have again fallen off [illegible] there is very nearly as much pressure as heretofore to get domestic sizes, especially stove and chestnut. Egg and pea are still druggy so far as demand is concerned, although there are refill orders already being placed by consumers, and this will mean a better market for egg size in February.

There is still a feeling that it will be wise for the smaller retailers especially to take on what they can store conveniently. So many things can happen that the more prudent will be sure to line up for shipments during the balance of January and all of February. At this writing, low temperatures are distinctly a factor. Ice has embargoed some of the smaller ports on Massachusetts Bay.

NEW YORK

New York tidewater market adjusts itself to weather conditions. Cold weather increases demand. Easier situation felt by producers and shippers of individual coals. Dealers look for steady demand until April 1 when working agreement with mine workers ends. Bituminous stocks small. "Free" coals scarce because of contract demands. Ice in rivers and bay interrupts shipments.

Anthracite — This market has again showed its adaptability to weather conditions. So long as the conditions remained moderate domestic coals were in ordinary demand but as soon as the temperatures became nearer the zero mark there was a flurry and dealers could not make the deliveries required.

Supplies at the local docks do not show any appreciable increase over last week, but there was an increase in the number of cars dumped. The demand for chestnut and stove coals continues to be as active as it has been for the past few months with an almost equal call for egg.

There were 6,459 cars of anthracite dumped at the local railroad piers during the week ended Jan. 16 as compared with 5,190 cars in the week ended Jan. 9, an increase of 1,269 cars.

Current quotations for company coals per gross tons at the mines and f.o.b. Tidewater at the lower ports are as follows:

	Mine	Tidewater
Broken	$5 95	$7.80
Egg	6 35	8 20
Stove	6.60	8.45
Chestnut	6.70	8.55
Pea	5 30	7.05
Buck	3.40	5.15
Rice	2.75	4.50
Barley	2 25	4 00
Boiler	2 50	4 25

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—The lack of coal at the piers continues to be serious, with no immediate prospect of improvement. Demand is on the increase, but shippers can do little to ease the situation. Much of the present condition is attributed to the lack of cars and the resultant short deliveries. The local market is active in demand, but there is no coal to meet it. Contract coal is moving, with the result that there is little free coal available for the spot buyer.

Notices have been received here from the Regional Coal Committee that on account of the increased demand for coal by industries it has been found necessary to withhold for the present further approval of requisitions for the exportation of coal to other countries and that it will not approve requisitions for export coal until the domestic situation becomes easier.

PHILADELPHIA

Anthracite demand strong due to wintry weather. Consumers after more coal. Fair shipment by operators. Stove and nut the favorites. Egg picking up. Pea in fair call. Companies moving pea actively, but independents find it heavy. Retail prices not so firm. Good business in sight for many weeks. Buckwheat in strong demand. Other steam sizes flat. Bituminous in good demand, but only fair receipts. No spot market. Embargo at tide. Car shortage holds back trade. Fair coke demand.

Anthracite.—With wintry conditions still prevailing there is a strong demand for coal and [illegible] to give them increased allotments. The strongest demand is as yet centered about stove and [illegible] call for [illegible] of the [illegible] whom we have consulted said that their trade has [illegible] until at this time they are somewhat behind [illegible] also that the piles of this size in the retail yards are not as heavy as they have been.

It has also been pea-coal weather and a large percentage of the rush orders lately have been for this size, and every dealer, without exception, has been busy putting out pea. A large proportion of the deliveries made by all companies has been of this size, but it is the one coal that the dealers do not welcome, simply because it is not moving out at the rate they had expected. Some dealers have even gone so far as to order further shipments of this size held, at the risk of having their shipments of other sizes curtailed. However, we learn from some of the larger shippers that recently they have not had much difficulty in moving pea, and one shipper was actually picking up coal from storage to meet their orders.

It is an odd thing, but lately there has been discovered a tendency on the part of some dealers to be less firm in prices than has been their wont. As a standard, $11.25, $11.90, $11.90 and $9.50 respectively for egg, stove, nut and pea have been generally acknowledged, yet we have heard of some instances where stove and nut, the hard sizes to get, have actually been shaded 15c., and when the competition became a little strong a further cut of 15c. has been allowed.

This has happened in only one section of the city and under the present conditions of trouble in procuring an adequate supply of coal is hard to understand. It is believed that most all dealers, with the exception of the larger ones, are shading the price of pea coal when the customer is inclined to insist upon a reduction. With the severer weather conditions which have just set in it is possible that this one bad spot will eliminate itself very quickly.

The steam sizes continue to be in an odd position. The big companies report that so far as buckwheat is concerned they are at times unable to produce sufficient of this size to fill current orders. This is particularly true when the temperature falls to zero and below in the region, necessitating the suspension of their big washery operations. Most of the companies have cleaned up their storage yards on this size and as the demand for buckwheat usually grows stronger from this time onward it is quite likely that consumers will take a proportion of rice. There is little call for rice and barley and some shippers say their trade on these sizes is distinctly flat, although with the tendency of buckwheat to grow shorter, activity can be expected in these sizes before very long.

Bituminous.—There have only been fair receipts of fuel in the city during the past week, and the demand for coal has grown distinctly stronger. There is still no spot market worth mentioning and even such coal as is offered is not the kind to be quickly taken. Yet in spite of this even spot sales are taken subject to delay, as the car supply recently has been hovering around 30 per cent for all regions.

The embargo at tide has had the tendency to release a fair tonnage of coal for the local market, but even this has been mostly applied on contract trade, which class of customers is calling for good shipments, as the feeling is growing among them that with no heavy snow storms to impede delivery thus far this winter, the chances are that this handicap may develop later and they do not want to be caught short.

Ordinarily at the first of the year there has been some little contract business. Of course under existing conditions no shipper has gone out after new connections, but all of them have customers of this kind of long standing and agreements have been closed with this class of consumer at prices around $3.20, and of course with the understanding that any award of the investigation committee will be retroactive.

Coke.—There is a fair demand for foundry and furnace coke at the Government prices of $8.25 for the former and $7.25 for the latter, per net ton.

BALTIMORE

Big improvement in car movement noted with better deliveries of empties to mining regions. Recrudescence of export trade and deliveries on higher priced contracts taking largest tonnage, and little or no government-priced coal is offered. Hard coal prices not likely to advance despite rumors.

Bituminous:—A big improvement in the car movement is noted on this division. From a record for many days that seldom went above 2,000 cars per day, and frequently dropped as low as 1,600 to 1,800 cars, the last few days has seen the 3,000 car daily mark generally exceeded and loadings on particular days as high as 3,600 cars. This increased movement is reflected in the constantly bettered conditions of ship loading here on export and the larger deliveries on some contract relations in this section.

True, the movement has not caught up with the big gap made in the government clean-out of the local pool, and no attempt at general replacement of this feature has been made. Mine owners and shippers generally are devoting their energies on the increasing trade to the export selling line which allows $1.35 above the government prices, and which is generally split between producer and intermediate handler, and to deliveries on the higher-priced contracts. For the time being there is little or no government-priced coal in this market.

The export movement dragged for the first six days of the month, entirely due to the fact that, while vessels in large numbers were here ready to take the coal, the fuel was slow in starting on its run from mines to tide by reason of the government restrictions for supervision of permits to export, and which had to pass through Philadelphia, Washington, and then Baltimore again. Between the sixth and the fifteenth of the month a total loading a little in excess of 60,000 tons of cargo coal on export was noted.

Anthracite:—The hard-coal situation has suffered no material change. A little awakening of demand in mid-winter call has followed the recent snow and colder weather. The fact that the price of soft coal was raised 25c. per ton in Cumberland, and this was announced as a "domestic jump" led to a rumor here that prices were to be advanced in this city. The trade here in anthracite intends to proceed for the balance of the winter with the present schedule, unless some unexpected turn is taken to increase their overhead cost of wholesale purchasing price.

Lake Markets

PITTSBURGH

Car shortage continues. Slight increase in coal supplies to by-product ovens. Some consumers have probably overbought.

Car supplies in the Pittsburgh district have not increased appreciably in the past week and are still very unsatisfactory from the viewpoint of both operators and consumers. Coal production is about 75 per cent of capacity and is unequal to the demand, viewed from the angle that there is much seeking to buy coal on the part of consumers who ought to be well supplied from their regular sources, but on the other hand there is little evidence of manufacturing consumers, including the steel industry, curtailing their operations on account of not having sufficient coal.

An exception to this generalization is the byproduct coking industry, which is by no means fully supplied. There is probably not a byproduct operation that would not run full if it had the coal, but several are unable to do so, although there has been a slight improvement in this respect in the past week.

In their efforts to secure coal a number of consumers have placed orders almost indiscriminately, buying much more than they need. When they had bought enough, provided it were delivered, and found they were not getting deliveries, they simply made additional purchases elsewhere. Perhaps they felt that the coal was a good buy, at the Government price limit, even if not delivered until later. It is quite probable that if there were a large increase in the car supply many consumers would ask producers to postpone shipments on portions of their orders.

The market continues quiet and remains quotable at Government limits: Slack, $2.10; mine-run, $2.85; screened, $2.60, per net ton at mine, Pittsburgh district, with a 15c. brokerage allowance in some instances, paid by the consumer.

BUFFALO

Bituminous trade light. Cars are scarce. Miners working fairly. Plenty of anthracite.

Bituminous.—The trade is not very active. Consumers are coming back into the market rather slowly, though it is said that one reason for this apparent inactivity is that a good many contracts and long orders are in operation. The mining end of the trade favors this, as it is in that way enabled to ignore the government prices.

On this account also shippers without direct connection with mines are finding it hard to get all the coal they want. With the car shortage and the disposition to prefer the older arrangements it is hard to meet even the moderate amount of orders that come in.

From the general appearance it would seem that the demand is improving. For a time after the strike was over it was apparent that the consumers were using more coal than they were buying and it was predicted that the supply would soon be gone and then the prices would advance, but gradually the demand improved, especially as soon as it appeared to the consumers that prices were not likely to decline. The shippers never had any idea that they would decline.

Prices are still pretty unsteady. It is claimed that the regulations do not produce the uniformity that they should, on account of the special margins allowed in this or that branch of the trade. Slack is rather hard to get and sizes are not plenty.

Anthracite—The anthracite situation is still easy. Consumers are getting so much coal that they have for sometime ceased to ask for more than they want and they are now engaged in studying the coal itself, to see how far it can be made to go. There is considerable slate in it, and sometimes there is complaint of the screening, but on the whole the quality is better than it was last winter.

Perhaps never has the consumption of coal for fuel been so large during winter. With the temperature not going so low as it did two years ago the weather has been more colder and nothing is heard in the way of restriction. Some of the papers are predicting that the Upper Lake district will run short and there will be an early demand for coal again next spring, but it must be remembered that the shipment was next to the heaviest on record, so that it will take a long winter as well as a snug one to use the supply all up.

It is already predicted that next month is likely to see an end of steady early, as was the case two years ago, and then there will be a surplus. Some say that the big anthracite companies will be stocking coal by early summer, if not sooner. As to independent coal, it now sells on a par with other anthracite and does not find a very ready market at that.

Coke—The demand for coke is not strong and the contracts are pretty nearly sufficient to meet it. Jobbers find a car here or there wanted, at prices that are merely steady and are not likely to be very strong right away. The domestic demand is met by a surplus of small sizes of anthracite, so that breeze is not readily salable. Quotations remain at $9.60 for 72-hour foundry, $8.60 for 48-hour furnace, $7 for off grades and $8 for domestic sizes, with next to no market for breeze.

COLUMBUS

With embargoes and congestion still in force and car shortage growing worse, production in Ohio fields has been reduced to 50 per cent or even less. There is still a good demand for all grades, but more especially for domestic sizes.

In eastern Ohio the production is below the 50 per cent mark. Crooksville and Cambridge are producing about 40 per cent and these figures show how bad the transportation facilities are at this time. Cold weather, coupled with the wide distribution of coal cars under the Railroad Administration's regulations during the strike, are responsible for this condition. Embargoes are frequently announced by railroads which prevent the free movement of coal. Toledo is very much congested and with it many Michigan points, including Detroit, are cut off.

There is a good demand for all grades, but more especially for prepared sizes. Dealers are still buying actively, but not as rapidly as was the case several weeks ago. Householders are buying well, but many have been supplied and there is not the concern in the domestic market as formerly. Retail stocks are not large. Pocahontas is quite scarce and prices range high. West Virginia splints are coming in fair quantities. The larger part of the domestic coal in central Ohio territory comes from the Hocking Valley and Pomeroy Bend. Dealers have been handicapped in making deliveries because of the icy condition of the streets.

Steam business is also active in all sections. Large consumers are buying actively in the hopes of accumulating some reserve stocks. This is especially true of rubber plants and iron and steel concerns. Railroads are now taking a larger tonnage and some are exceeding their contract allowances.

Prices in Columbus are unchanged, as the government figures now prevail in every way. Dealers are permitted the $2 margin over and above the price paid at the mine plus the freight charges.

CLEVELAND

Anthracite pocahontas and domestic bituminous coal prices all have been advanced a flat 50c a ton. Receipts are somewhat improved over a week ago, but labor and car shortages are keeping receipts down to about half of normal.

Bituminous—All local price lists of dealers with the exception of steam coal have been increased a straight 50c a ton. Meeting a week ago with the Cuyahoga County (Cleveland) Fair Price Committee, dealers convinced the committee of the justice of their need for 50c a ton extra to cover additional labor and delivery costs since the Federal Fuel Administration first fixed their margins. The committee approved the request, and put the matter up to Washington. Attorney-General Palmer has notified dealers that while he cannot officially sanction the increase, he will not take any steps to combat it so long as the local committee has approved it.

Domestic bituminous therefore has gone up 50c. a ton all around. The 50c will be added to the revised steam coal price schedule being compiled from the average cost for steam coal purchased by dealers in December. Retail dealers now are permitted to add a margin of $2.08 a ton for steam coal delivered to manufacturers, $2.65 to apartments and churches and $2.80 to small domestic consumers.

Receipts from southern and eastern Ohio mines continue about 50 per cent of normal. While cars are short, labor is even more scarce, and the car supply last week just about equalled the actual need at the mines. Operators do not look for any great improvement in the labor situation until the President's Commission has reported and labor troubles are all adjusted. Incoming shipments are providing sufficient fuel for all industries, but the margin of safety is too small for comfort. Extremely cold weather this week and last has greatly increased consumption. Demand is so large, especially for steam coal, that in a free market prices would soar to easily twice the government maximums, operators say.

Pocahontas and Anthracite—All prices of both grades have been advanced 50c. a ton. Demand shows some increase, due to the recent zero spell, while receipts continue low enough to compel dealers to take business subject to delivery "when possible." Promised relief has not yet materialized, and much contract coal of both grades has been diverted.

Lake Trade—Unfavorable weather and a shortage of cars have combined to limit shipments off upper Great Lake docks. Daily shipments now are not averaging much over 1,000 cars, compared with nearly 1,600 daily in December. In November shipments from Duluth-Superior totaled 1,484,560 tons, and in December, 1,335,780 tons. January's showing may not be much over 1,000,000 tons. Even with decreased shipments, dock interests fear their stocks will be pretty well depleted by the opening of navigation, and will urge large early shipments from Lake Erie ports.

Prices of coal per net ton delivered in Cleveland are:

Anthracite—Egg, $12.25@12.40; Chestnut, $12.50@12.70; grate, $12.25@12.40; and stove, $12.40@12.60.

Pocahontas — Forked, $10.50@11.00; shoveled lump, $9.54@9.55; and mine-run, $8.25@8.50.

Domestic Bituminous — West Virginia splint, $8.30; No. 8 Pittsburgh, $7.80; Massillon lump, $8 to $8.10; Cannel lump, $11 and Coshocton lump, $8.10.

Steam Coal—No. 6 slack, $5.25@5.50; No. 8 slack, $5.20@5.50; Youghiogheny slack, $5.25@5.50; No. 8¾ lump, $6@6.25; No. 6 mine-run, $5.25@5.50; and No. 8 mine-run, $5.85@$6.

CINCINNATI

With empties at a premium in nearly all the mining fields in this locality, there was a decided downward curve in production, throughout the week, even from the very offset of the week, though the shortage in equipment was felt to a greater degree in the West Virginia regions.

The market during the past week was active, with domestic sizes in demand. However, there is a coal shortage here but its effects have not been felt to any great extent, because of the mild weather during the past ten days.

The embargo on tidewater shipments over the Chesapeake & Ohio is still on but so far it has not materially helped any in this vicinity. Operators report the car supply during the past week at [illegible] per cent. Loadings were limited in the Kanawha field throughout the week, that region being visited by a car shortage or rather a continuance of the car shortage so much in evidence during the latter part of last week.

Transportation facilities in the New River region have been so poor since the beginning of the new year that during the first week in 1920 mines as a rule had been unable to work over a period of two full days a week, although miners were available and demand was such as to have justified normal production.

There has been a steady demand for Ohio coal at least in the central part of the state, especially for domestic sizes, the domestic demand however not having been so pronounced further South in Ohio. Shippers find also a steady demand for steam grades.

Pocahontas producers have been making special efforts to increase exports owing to the larger prices allowed. Industrial plants who were complaining several weeks ago of not getting enough coal to operate their plants on full time schedule, have been alloted more tonnage during the past week than they had anticipated.

Market conditions in so far as they effect northern and northeastern Kentucky have been conducive to large production but mines in that area named are not allowed to ship much coal West of Cincinnati in recent weeks. There has been in the last few weeks a steady demand for steam and block coals in all fields owing to the necessity of industries replacing their somewhat depleted stocks. Retailers have also been heavier buyers.

There have been no changes in prices as Government restrictions still prevail. Coal receipts by river were below normal the past week.

DETROIT

Detroit receipts of bituminous are greatly reduced by railroad embargo and car shortage.

Bituminous—With no supply on tracks for open market requirements, Detroit wholesalers and jobbers are finding it is an uphill task to supply those of their customers who have no contracts. Limitations on shipments resulting from insufficient car supply are made more exasperating by the curtailment of movement due to the embargo, which the Railroad Administration is using in the effort to head off a threatened freight congestion in Detroit and Toledo.

Only perishable products, government supplies and railroad fuel are exempt from the embargo restrictions. Though it is possible to get coal through by securing a special permit from the Railroad Administration, jobbers say it has not been easy to obtain permits and that even when shipments are sent forward under that arrangement, four days or a week are required to get the stock delivered.

Many of the operators, according to local jobbers, have contracts on their books which were closed before the strike and which take practically all the coal that the mines are able to send out, with the present faulty car-supply. While shipments from some mines have been greatly reduced by lack of cars, the same condition is reported to have necessitated closing others, particularly in the Hocking district in Ohio.

With most of the coal sent forward, moving either under contract or sold before it arrives in Detroit, jobbers say that buyers who are dependent for their supply on the open market are finding the pickings unusually thin. Responsibility, in part at least for the restricted car-supply is placed with the Railroad Administration. It is pointed out that many cars carrying coal, instead of having been unloaded during the strike, apparently were moved about the country or left standing on sidings.

Anthracite—Though warmer weather conditions have been reflected in a slight falling off in demand for anthracite, considerable of that form of fuel is still being sold. Some of the retailers apparently were successful in accumulating a little reserve, which was worn away rapidly during the recent period of extremely cold temperature. The renewal of supplies is made difficult at this time by the embargo.

LOUISVILLE

Car shortage the only factor of importance at the present time. Demand keen, but mines operating less than two days a week average. Improved car supply promised.

There is a good market for all grades of coal, and operators have the demand and the business, but no cars. Operations in the state as a whole are not averaging two days capacity per week. Some of the big companies report going five and six days without a car. One company with nine mines had five of them down for four days. The situation apparently is much worse on the Louisville & Nashville lines than on other lines.

E. R. Clayton, secretary of the Harlan Coal Operators Association, has advised Representative Robison, of the eleventh district, Kentucky, that operators are seriously considering complete shut down until conditions improve. In his letter he said: "Under present conditions this would be a calamity, as a large number of public utility plants and the domestic trade is depending upon us for coal. We have done all we can, and if the mines are closed down, the Railroad Administration will have to accept the responsibility."

A telegram sent in by the Southern Coal Operators Association stated that during the first week of January many mines worked two days, and during the second week only one day.

C. D. Boyd, traffic manager of the Southern Appalachian, Harlan and Hazard Coal Operators' associations, in a letter to J. W. Backham, of the senate, said: "The car-service section has now agreed to arrange for a car for car-interchange at Louisville and Cincinnati, by which it is meant that the Eastern car pool lines will deliver to the Southern carriers one empty coal-car for every carload of coal delivered to them. In addition to this, arrangements have been made to move empty foreign coal-cars in the Southern region to mines in eastern Kentucky and eastern Tennessee through Atlanta and Knoxville. We expect a material improvement in the near future if these agreements are carried out and instructions observed, and we have every reason to believe that they will be.

Operators claim that the only drawback is the coal car shortage, which is the most serious ever known. Production is said to be even smaller than during the strike, as during that period there were many mines operating, whereas there are but few mines that are getting two days a week now.

There is a heavy demand for domestic consumption as well and retailers are taking all the coal they can get. Railroads are confiscating coal, including lump. Charles Crush, of the Atlas Coal Co., Louisville retailers, reported four cars of lump seized by the Chespeake & Ohio, from West Virginia, and one car of eastern Kentucky lump seized by the Louisville & Nashville, since Jan. 1.

Operators are so loaded with business that they are not accepting orders. One retailer reported that he sent out twenty letters asking for five or ten car-lots of block, mine-run, or screenings, at spot cash, and failed to secure an answer from any of the eastern Kentucky mines.

BIRMINGHAM

Market conditions are much more favorable than for many months past, with strong inquiry for both steam and domestic fuel. Production rapidly approaching war-time records. Labor and car shortage reported in a few instances, but lack of equipment has not seriously affected output as yet.

The Birmingham market is enjoying the best and longest spurt of active buying of steam fuel that has been noticeable in the [illegible] and [illegible] sales being booked—though some small con[illegible] period of six months. Some of the railroads are buying additional tonnage to supplement contracts, and it is understood that practically all lines are short on storage coal. [illegible] taking considerable coal, and the demand [illegible]

The acute [illegible] continues and retailers are not able to get a [illegible] of their [illegible] sufficient domestic coal for the trade re[illegible] to

the fact that the differential between the prepared and the mine-run prices in many cases is too small to warrant the extra expense and labor of making the domestic sizes. The major portion of domestic tonnage comes from steam-domestic operations, which do not produce domestic coal when the steam trade is dull and when it is active are inclined to dispose of mine-run product or steam coal only.

Production for the week ending Jan 10 aggregated 360,000 tons or a gain of about 90,000 tons over the previous week. Working organizations are about as near normal now as labor shortage will allow and the output of coal will continue heavy as long as the requirements of the trade demand it. Slight complaint of car shortage was heard the past week but no material loss in production resulted.

TORONTO

Supplies adequate to present requirements. Some difficulties from car shortage—Fuel Administration warns consumers to lay in stocks, fearing shortage before spring.

Market conditions show little change, though the cold snap of the last few days has slightly increased the demand for anthracite. Supplies of both hard and soft coal are coming forward in sufficient quantities to meet present requirements, though there have been some delays in delivery by reason of car shortage, which will probably become more acute before the end of the winter.

Fuel Administrator H. A. Harrington has issued a warning to consumers not to depend upon the continuance of present conditions, as imports of coal are gradually decreasing. There is an insistent demand in the United States for steam sizes, with a possibility of a suspension of anthracite mining. He foresees a shortage and urges the laying in of stocks at once.

Quotations for short tons are as follows:

Retail

Anthracite egg, stove, nut and grate	$12.75
Pea	11.25
Bituminous steam	9.00
Slack	8.00
Domestic lump	9.00
Cannel	12.50

Wholesale f.o.b. cars at destination

Three-quarter lump	$6.50
Slack	5.75

Coke

CONNELLSVILLE

Production gaining very slowly and insufficient for demand. Car supply is the limiting factor. No information as to removal of Government price control.

Coke production in the Connellsville and lower Connellsville region is increasing week by week, but only by almost infinitesimal amounts, while the requirements have increased largely in the past few weeks. Thus the pronounced coke shortage continues, but it is a shortage due to inability of the region to increase its output largely, rather than to the output being curtailed as compared with the operations of October, November, and early December. The limiting factor visible is car supply and in some quarters it is claimed that a very moderate increase in car supply would uncover a labor shortage, which would then be the limiting factor, but this has not been proved.

Open market transactions in coke are extremely limited in volume, and are confined chiefly to foundry grade. The furnace coke output seems to be taken up quite fully by contract requirements, or by movement between producer and consumer who had contracts in the second half of last year, the shipments being continued, on the basis of the Government price limit. There is much talk as to when the price control will be removed, but no one seems to have any real information on the subject.

The market remains quotable at Government limits, $6 for furnace, $7 for selected 72-hour foundry, and $7.30 for crushed, per net ton at ovens. The *Courier* reports production in the Connellsville and lower Connellsville region in the week ended Jan. 10 [illegible] increase of 2,651 tons.

Middle Western

GENERAL REVIEW

The demand for good coal is keeping up steadily; in fact it is increasing. This is particularly true in Iowa and the North west, although the trade in Indiana, Illinois and Missouri are ordering freely. At this time, of course, the matter of price does not enter into the market situation at all, as all coal which moves, either moves on contracts, or at the Government prices.

Practically all of the coal moving so far, is moving on old contracts and orders, because operators have not yet caught up with the shortage caused by the strike. Some distributors and operators however, are now taking on additional business, something which they were not doing two or three weeks ago. There have been some rumors that certain off grade coals in both Illinois and Indiana are not finding much of a market, in fact they are very difficult to move, but this is nothing unnatural when one considers that the best coal in the territory can be purchased just as cheaply as the poorest, as all coal is sold at Government prices.

It is persistently rumored that there are from 10,000 to 20,000 cars of Eastern coal on track in the West and Northwest, which were shipped here during the strike, and have not as yet been disposed of. If this rumor is true, it explains to some extent the car shortage, as this number of cars cannot be indefinitely tied up without hurting the coal industry. It is also rumored that the authorities are contemplating hauling all of this Eastern coal back, deadhead, as most of the coal was consigned, originally, to the steel mills and various industries in Pennsylvania and Ohio, but diverted West during the strike. As this territory appears unwilling to absorb this coal, the railroad authorities, from necessity, are forced to reship the coal back East where they know it can be disposed of readily. If this rumor has any foundation, there are a great many ways in which this condition of affairs might have been avoided, by use of a little grey matter, and a fair knowledge of the coal trade in the East and Middle West.

The labor situation appears to be fairly satisfactory and operators are becoming more optimistic daily as to the immediate future of the coal industry. A number of large factories which have heretofore been buying coal on the open market, are now clamoring for contracts, and we understand that a number of contracts have been closed—contracts to extend from date to Mar. 31, 1921. We know of one or two cases where five year contracts have been entered into, but the general run is until March 31, 1921. The car supply, of course, is a thorn in the flesh, at the present time, but it is thought that conditions will be very much improved when the railroads are put back under private ownership.

CHICAGO

Chicago is well taken care of these days by its coal supply. Every dealer has a comfortable tonnage in his yard, and all of our industries have either enough coal on hand, or in transit, to keep them from worry in the immediate future.

Looking at the Chicago market from a standpoint of demand only, we believe it is the poorest market in the whole Mid-western territory. However, there is a pretty good snow storm in progress, at this writing, and if it continues much longer, it will succeed in tying up traffic and delay shipments to Chicago.

Eastern coal is coming on in fairly normal quantities. There is enough hard coal being delivered to take care of the immediate wants, and Eastern coal from West Virginia and Kentucky is moving in fast enough to take care of the demand. In short, the Chicago situation, so far as coal is concerned, is fairly healthy and normal.

MILWAUKEE

Demand for coal not as brisk as the season warrants. Stocks are slowly being depleted, however. Prices unchanged.

Notwithstanding the prevalence of snappy winter weather favorable to a steady consumption of fuel, Milwaukee dealers say the demand for coal is not as brisk as could be expected. The drain upon stocks on the docks is becoming more noticeable with each passing day, however, and it is evident that rail-supplies will have to be drawn upon more heavily as the season advances. Illinois coal is being marketed here freely and the supply on track keeps increasing. Prices of all grades of coal, including the Illinois product, continue unchanged.

COAL AGE

Volume 17 New York, January 29, 1920 Number 5

Nation Faces a Railroad Crisis

By R. Dawson Hall

STEADILY the railroads have become less competent to meet the nation's needs. Uncle Sam has been growing while his railroads have for years stood still or gone backward. He thought when the war started that it was private mismanagement that caused the ills of the railroads. He could not believe that it was his own egregious blundering and interfering that had made so much trouble, so he took hold of the railroads, and they soon began to give less satisfaction than ever, while incidentally his experiment cost him a tidy sum of money.

The old gentleman will return the railroads on March 1, and the paramount issues are: are they going to go bankrupt when they are given back; will there be a panic when they are returned, or are they going to be handed back as profitable concerns with a prosperous and progressive future? Everything depends on the general public. If the people of the United States even whisper to their Congressional representatives that the profits of the railroads shall be kept down to a ridiculous maximum, we shall find that our railroads will not grow to meet the needs of our growing country, and we shall find that our miscalculations have permitted most of the railroads to go to the wall and the banks that financed them will be crowded there also.

In the end of 1919 there were 933 miles less track than at the close of 1916. Now let us look back. In 1908 the railroads ordered a smaller number of freight cars than at any time since 1901. Yet that year 62,669 cars were ordered. Last year orders were placed for only 22,062 and of those most were for private account, 15,295 being tank cars. What is worse, the freight-car manufacturers now have practically no orders on their books.

How is it with passenger cars? In the years between 1901 and 1917 from 1,124 to 4,514 passenger cars were ordered yearly. In 1918 orders were placed for only 131, and in 1919 the number ordered was 292. Thus in two years of government control only a third as many locomotives were ordered as in the slackest year between 1901 and 1917.

And how is it with locomotive equipment? Between the years mentioned above, the orders for locomotives ranged from 1,182 and 6,265. In 1919 the number of orders was only 214 and most of these were for industrial roads. While the tons carried per mile per year have increased 45 per cent since 1915, the number of freight cars has been increased only 1.6 per cent.

Between 1908 and 1916 the average passenger car carried from 15 to 15.9 persons. Now the average is 21. Between 1905 and 1916 the average train carried 48 to 57 passengers. In 1916, 90 formed the average passenger train load, an increase since 1916 of about 58 per cent.

Thus it goes—much increase in demand, no increase in service. No wonder we have embargoes and slow runs and men idle despite the clamor for all kinds of goods. The Railroad Administration has not sought to remedy matters. It is running its business so as to get maximum activity with minimum equipment, and the difficulties of the public cause it not a moment's worry.

The railroad has been an advocate of reservoiring all things to be transported. "Wait for the messenger boy" has been its motto. But it has itself done less reservoiring than any other organization. It will not buy or haul anything that it needs for its use until it needs it. It is largely to blame for the present coal shortage. That trouble has arisen as much from the railroads' failure to buy as from their lack of equipment to haul the product.

The public must insist that a new policy be pursued toward transportation, so that the railroads can supply themselves with equipment, and this is what the railroads need:

Additional main track	$1,250,000,000
Grade revision, cutoffs, curvature elimination, etc	600,000,000
Engine houses and shops	250,000,000
Station buildings	300,000,000
Extensions	600,000,000
Signals	52,264,000
Freight cars	1,662,000,000
Passenger cars	532,000,000
Shop equipment	61,230,000
Locomotives	702,786,000
	$6,010,280,000

Are we going to make it possible to make the railroads finance this extremely necessary program? If not, we deserve to have industry halt and waver.

(For the figures presented credit should be given to S. O. Dunn, the editor of the "Railway Age" and his associates.)

IDEAS AND SUGGESTIONS

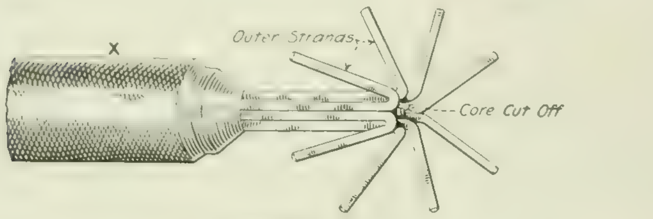
PRACTICAL SCHEMES THAT MAKE THE DAY'S WORK EASIER

How to Splice Stranded Wire Conductors*

By E. D. Hunt

St. Louis, Mo.

Almost any practical man can make a splice, between the ends of two stranded conductors, which will carry the current safely and satisfactorily, but few of them, apparently, know how to make such a splice in minimum time and so that it will have a neat, business-like appearance. The accompanying picture illustrates the steps in the process which experience has indicated, it is best to follow. The first step is to "skin" the wire and sandpaper it until it is bright and all the rubber or other insulation has been removed from the conductor. Next the ends of the outer strands should be bent back to expose the core which should then be cut off. The end of the conductor will now appear as shown at *I*.



SPLICING A STRANDED CONDUCTOR

Now the outer strands which were bent back, to be out of the way so that the core could be cut off, are forced almost to their normal positions. The two ends to be connected are laced together as suggested in *II*, where X^1 represents one of the conductors to be spliced and Y^1 the other.

Proceeding, each one of the free ends is twisted around the main conductor, as shown at *III*. First, a conductor of X^{11} should be made up around the main line and then one of Y^{11}. This process is continued until all of the free ends have been served around the main line. The joint should now appear as shown at *IV* and is ready for soldering.

To solder it, the molten metal should be poured, with a ladle, so that it will drain into the solder pot through and around the joint until the joint becomes hot enough so that the solder will permeate it and stick to it effectively. After the joint has thus been uniformly heated and appears to be "tinned" over its whole surface a wet piece of waste can be held on it to cool it quickly. Tape servings around the joint, to the thickness of the insulation of the original wire, complete the splice.

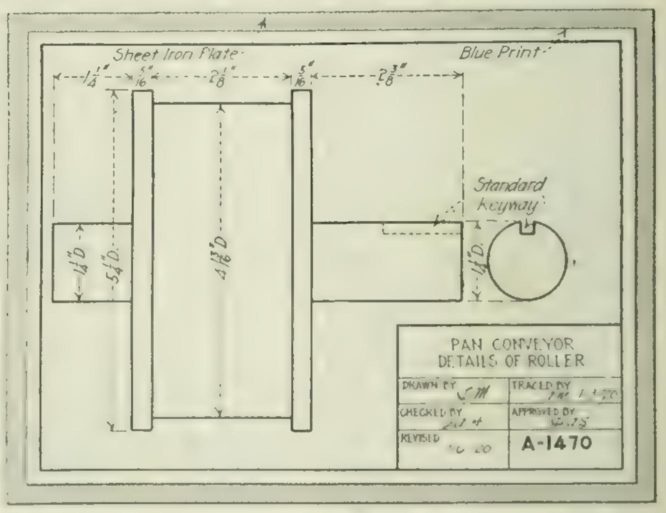
Mounting Blueprints on Steel Plates*

By Charles C. Cloud

St. Louis, Mo.

Where a blueprint must be referred to frequently it is often of advantage to mount it on a plate of sheet steel. Where the mounting is done in accordance with the method to be described, the print will remain intact for a long period.

Common black sheet iron about No. 22 gage may be used. Galvanized sheet iron is not satisfactory because it is difficult to make the prints stick to it permanently. In cutting the sheet, make it of such size that it is from ½ in. to ¾ in. larger all around than the blueprint which is to be mounted on it. Such a margin not only



THE BLUEPRINT AND ITS MOUNTING

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gives a finish to the job, but also protects the edges of the paper from being torn away from the metal.

The first step necessary is to remove all traces of the acid which was used in "pickling" the plate at the steel mill. Most of this acid is washed off at the mill, but usually enough remains to cause the blueprint to turn white in spots unless the acid is carefully abstracted. To remove the acid, the plate should be painted with, or preferably soaked in, a solution of ammonia and water. About one part of ammonia to 20 parts of water appears to be satisfactory. This ammonia solution neutralizes any of the acid which may remain. After a thorough sousing in the ammonia solution the plate should be washed thoroughly in clear water and allowed to dry.

After drying, the plate should be given a coat of a good varnish on both faces. An "outside" varnish should be used rather than one prepared for interior finish. The plate having been prepared as above described and being thoroughly dry, the blueprint is now mounted upon it with a cornstarch or flour paste which should be mixed until thoroughly smooth. It is well to soak the print in water so that it will be pliable before applying the flour paste.

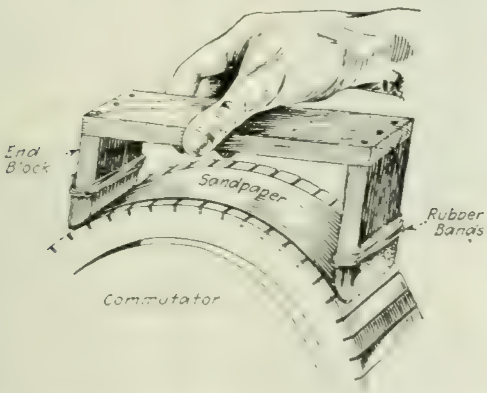
After the print has been stuck to the plate, the air bubbles should be smoothed out carefully by using a print roller such as is employed for mounting photographs or by using the smooth rounded edge of a wooden ruler. Again the print, now mounted on the sheet, should be allowed to set until the paste has entirely dried out, after which the plate (with the print upon it) should be given on each side two coats of white shellac. After this shellac has dried the mounted print is ready for service.

Simple Commutator Cleaner or Smoother

By J. R. Luxton
Linton, Ind.

A commutator cleaner may be easily constructed from a few pieces of ½-in. board, a sheet of sandpaper and one or more rubber bands.

The construction is so simple and the manipulation so easy that little explanation is required. Briefly, the cleaner consists of the bottom and two ends of a box, with sandpaper stretched across the top. The sides of the box are wanting.



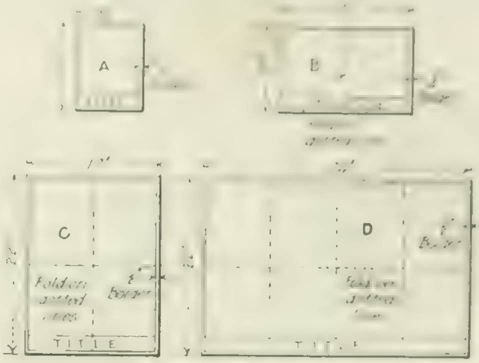
THE COMMUTATOR SMOOTHER IN OPERATION

The rubber band or bands by which the sandpaper is held in place permits the paper to give or sag sufficiently to approximately take the curve of the commutator.

Standard Drawing Sizes*

By Terrell Croft
St. Louis, Mo.

When an individual or small organization commences making drawings, odd-sized sheets are frequently used. These, when the collection of drawings become larger, are awkward to file and difficult to refer to. It is easy enough to adopt a logical series of sizes at the time the first drawing is made. Then if the system is followed consistently, the drawings which are produced subsequently can be filed and numbered without difficulty.



SIZES OF STANDARD DRAWINGS

The sequence of drawing sizes which appears to be best adapted to the requirements of the average mining company is that shown in the accompanying illustration. The basis or unit A of the system shown is a sheet measuring 8½ x 11 in. This is the size of the usual sheet of letter paper. Sizes B, C and D are multiples of the unit A size. The principal advantage of this system of sizes is that the unit A size can conveniently be attached to correspondence and it can be filed readily in correspondence files.

All of the larger sizes, which are multiples of the small one, can be so folded that they will measure 8½ x 11 in. overall. Therefore, the larger drawings when folded can be attached to and mailed with letter correspondence without inconvenient surplus extension at side and top. Furthermore, they may be filed with the material in the large envelope designed for letter-size sheets.

It is not often that the demands of any business are such that it is desirable to standardize all four sizes of drawings. The usual tendency of the beginner is to standardize more sizes than are justified. Where this is done, future confusion may result because of the difficulty in finding proper filing space for all of the odd sized sheets. As a rule, most concerns need adopt as standards only sizes A and D. Concerns such as machine tool manufacturers, can ordinarily get along with sizes A, B and D.

In filing the drawings, the A size tracings can be stored in vertical letter folders. The larger drawings may be filed either horizontally or vertically. Where extremely large drawings, maps, charts, and the like, are to be filed, it is usually most convenient to roll them and file them in pigeon holes.

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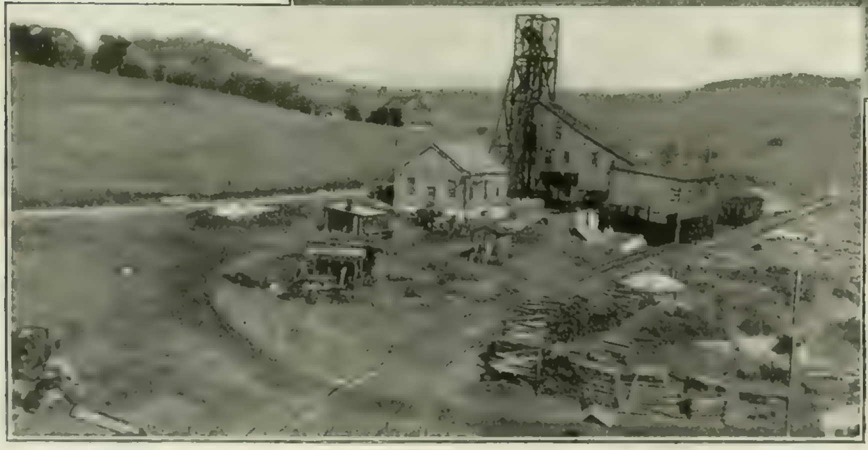
New Shaft Operation of the Jamison Coal & Coke Co. at Pleasant Unity

A Small but Modern Plant in Western Pennsylvania Is Blazing the Trail for Other Larger Operations in the Same Field—Six-Ton Skips Are Used to Hoist the Coal—Pleasant Unity Is a Modern Mining Village.

BY DONALD J. BAKER
Pittsburgh, Pa.

ONE of the smaller but more up-to-date mining plants in western Pennsylvania is that of the Jamison Coal & Coke Co. at Pleasant Unity. A visit to this operation leaves a decidedly pleasant afterthought for it is seldom that mining men of the Pittsburgh District have the opportunity to see the trend of the times indicated in engineering features as clearly as it is brought out here—at least not so near home. Yet to the layman passing the surface buildings in his car, there is only a suggestion of something new about the design of the different structures and certainly not enough to attract more than passing notice.

UPPER. PANORAMIC VIEW OF TOWN OF PLEASANT UNITY

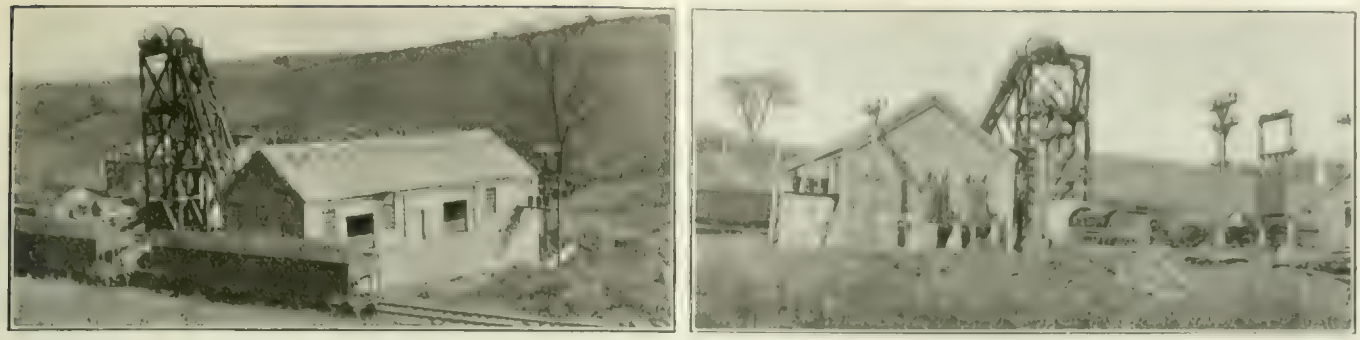


LOWER. BIRD'S-EYE VIEW OF THE TIPPLE, HOISTHOUSE AND HEADFRAME AT THE NO. 1 SHAFT

Four buildings (a substation, hoisthouse, tipple and a combination repair shop, supply room and a bathhouse) nestle together within a radius of 200 ft. and comprise the surface plant. The operation is situated in a pleasing locality among the rolling hills of Westmoreland County. No slate piles are burning in this vicinity and sending off columns of smoke such as we see and too readily condone when passing mining communities. Nor is the town nearby bleak and dreary with every house alike and none attractive. Times have recently changed conditions considerably. Every operator is trying to encourage desirable labor to take up its abode in his mining village. The site for his dwellings is carefully chosen and, when selected, is harmoniously laid out, and where the hills, as those around Pleasant Unity favor the town designer, the result is quite pleasing. The operator in such a town can feel assurred that he will have the pick of mine labor and that his turnover losses will be reduced to the lowest figure. Both man and wife will then think twice before they leave for less desirable quarters.

The demand for variety and individuality is not to be denied with impunity. The village that "just growed" without design, with the ideas of each inhabitant accommodated, is a village much more pleasant to live in than one having a single stereotyped building, bare and stark, repeated over and over again with conscience less iteration. A "packing case on stilts' 'too often describes the mine house. Not so at Pleasant Unity. There will be found that pleasing disunity that should mark any production of human effort.

One of the first impressions that is gained by a visit to the plant at Pleasant Unity, is the striking simplicity of the entire operation and a realization of



TWO VIEWS OF THE SUBSTATION AND HEADFRAME AT THE NO. 2 SHAFT

the extent to which it is possible to simplify the different processes of coal mining by the complete installation of electrically operated devices which make for the saving of labor.

The Jamison Coal & Coke Co. has long been recognized as progressive but in constructing the buildings for the No. 20 plant and the homes for the miners, it has surpassed any previous high water mark of faith and confidence in the coal industry. The mine under the superintendency of C. F. Keck has been laid out for an ultimate capacity of 2,000 tons daily. This figure should be attained as soon as construction of the surface buildings has reached a stage that will justify the employment of more men. At present about 175 men are at work of which 45 are loaders.

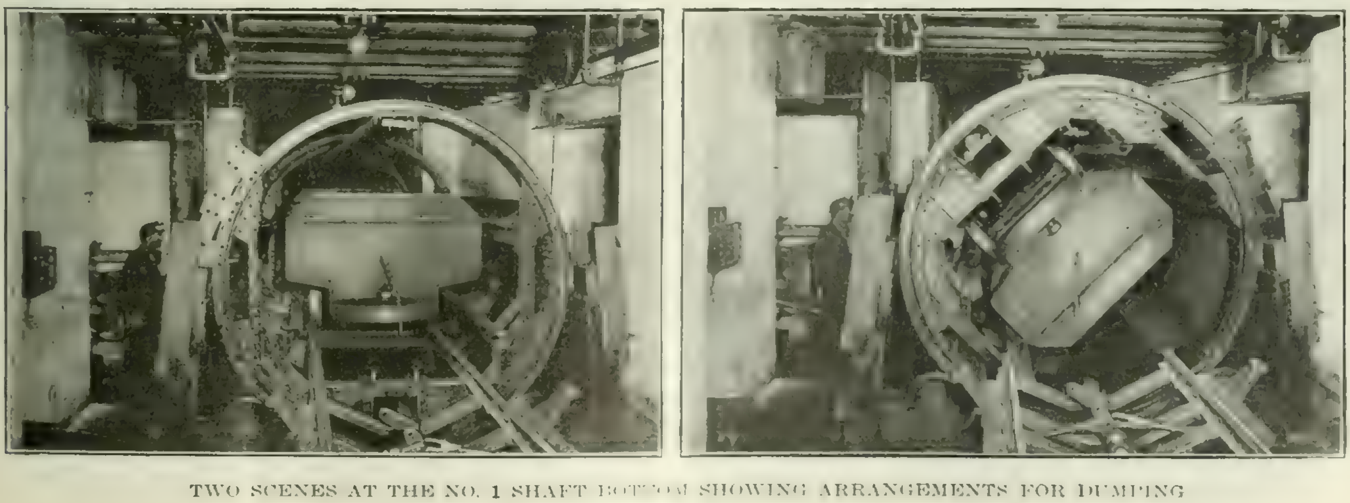
Over 1,600 acres of byproduct coking coal are available through the new opening which constitutes the last big piece of the Pittsburgh coal to be opened in the famous Connellsville Basin. All of this coal is now under development, and too soon will Father Time call a halt to one of the most potent factors in the development of the steel district of Pittsburgh. The bed averages from 8 to 11 ft. in thickness over the entire tract and is practically flat with only a few local dips.

September of 1916 saw the commencement of operation at Pleasant Unity and the initial period of development had scarcely been put into full swing when the war caused a slowing down of much of the construction work and necessitated the laying of more conservative plans. Materials for construction during this period were hard to secure. In particular was this true of sand and gravel because of the embargo placed on these materials by the railroads. Large quantities of these aggregates were needed for the concrete used in lining the shafts and for the foundations for the buildings.

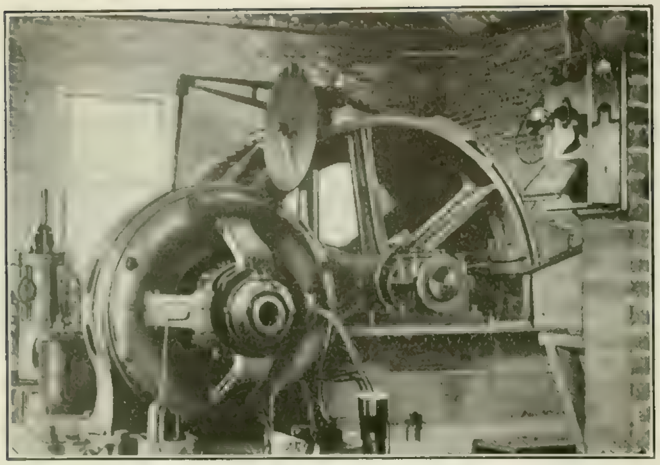
Since the war, however, and during the present period of return to normal peace-time conditions, construction and installation have proceeded at a rapid pace which has recently culminated in the finishing touches being placed on the buildings that make up the surface plant. Passing through the same stages as the work on the surface, the underground development proceeded slowly until the workings reached their present state which will now permit of large-scale operation. The adjustment from the old to the new labor conditions is rapidly taking place, assisted in no small degree by a general policy of the company toward improving the working conditions of the men as well as engaging to a considerable extent in welfare and community work among the employees and their families.

Power for running the plant is purchased from the West Penn Power Co. The 22,000-volt high-tension line of the above company from Connellsville, Pa., and Wheeling, W. Va., has been tapped in the near vicinity of the operation and brought to a brick substation of 30-x-74-ft. dimensions. Three, 200 kw. Westinghouse transformers are used to step the current down to 2,200 volts. These are located on one of the outer walls of the substation.

Lines from this point are carried inside the building to a large slate switchboard made by the Westinghouse Electric & Mfg. Co. of Pittsburgh, Pa. The board is located in one end of the building from whence the current is radiated to different sections of the plant by two- and three-pole switches. A Ridgway motor-generator set, manufactured by the Ridgway Dynamo & Engine Co. of Ridgway, Pa., is situated on



TWO SCENES AT THE NO. 1 SHAFT BOTTOM SHOWING ARRANGEMENTS FOR DUMPING



HOIST ENGINE AT THE NO. 2 SHAFT

one side of the room and is used for recharging the batteries of Edison safety lamps which are employed throughout the mine. In recharging the batteries of two gathering locomotives, the motor-generator set is also used as well as for generating the 250-volt direct current employed within the mine. Racks for holding the safety lamps are in close proximity to the motor-generator set.

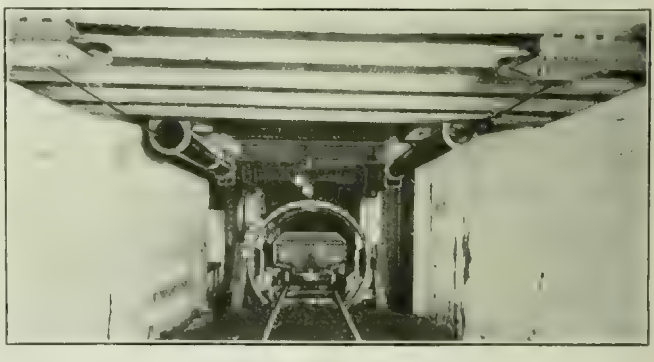
The other end of the substation is utilized as a hoist-house for No. 2 shaft. It contains an electric hoist-engine, made by the Connelsville Mfg. & Mine Supply Co. of Connellsville, Pa., and is operated by a 225 hp. 500 r.p.m., Westinghouse motor working on 2,200 volts. An 8-ft. Stine disk fan adjoining the substation and is direct connected to a 30 hp. 900 r.p.m. Allis-Chalmers motor.

Two shafts have been sunk to handle the underground development, one of which is known as the No. 2 and is used exclusively for the transportation of men and materials. It is 200 ft. deep and is situated close to the substation. A solid wall of concrete 3 ft. thick, lines the shaft which has an elliptical outline. Inside dimensions of 12 ft. 6 in. x 26 ft. 5 in., allow ample space for two compartments which are separated by a fireproof partition. Connellsville Mfg. & Mine Supply Co. cages are used. As can be noticed in the illustrations, the headframes are of unusually simple design, yet exceedingly strong. The legs are set in concrete pillars which make the base quite rigid. Cast-iron grips have been sunk in the concrete lining of the shaft which serve as supports for the wooden buntons. With this arrangement, the eventual wearing out of the timbers entails but little work in their removal and replacement in the socket-like grips.

The No. 1 shaft is about 300 ft. distant from the No. 2 and is of practically the same shape and construction. A depth of 212 ft. was reached before coal was found while 40 ft. below the coal extends the present temporary sump. Inside dimensions of the shaft differ a little from those of No. 2, this one being 21 x 7 ft. It likewise is divided into two compartments but lacks the fireproof partition. Six-ton skips made by the Connellsville Mfg. & Mine Supply Co., are utilized for the hoisting of the coal. The same design and type of headframe is employed and cast-iron grips in the concrete lining serve the same purpose as those in the No. 2 shaft. Adjacent to the shaft is a small brick hoist-house which contains an electrically driven hoist engine, manufactured by the Vulcan Iron Works at Wilkes-Barre, Pa. It is direct connected to a 300 hp. Westinghouse motor operating on 2,200 volts.

SWITCHBOARD AND MOTOR-GENERATOR SET

The tipple is of steel framework with corrugated iron siding and was erected by John Eichleay & Sons of Pittsburgh. As the skips come to the discharge point, they are dumped into a feeding hopper by a device that trips open the hinged side bottom. From the feeding hopper the coal passes onto a conveyor and picking table where rock and any other extraneous material is removed by a man stationed on either side. The Link Belt Co. of Chicago, Ill., manufactured the picking table. From the conveyor, the coal passes into a steel skidway that permits of a gradual loading into the car below. The conveyor is electrically operated and its movement is controlled by a switch on one end of the tipple. This is within easy reach of either man stationed on the sides. A 2-mile spur branch of the Pennsylvania R.R. off Palmer's siding which, in turn, is a branch off the main line near Latrobe, is the railroad connection. Considerable time as well as expense was involved in the construction of the railroad, for the cuts and fills are quite extensive, some reaching a height and depth of 50 ft.



LOOKING TOWARD THE SHAFT BOTTOM

The other building that completes the surface plant is a combination bath-house, supply room and blacksmith and repair shop. It is of the characteristic brick construction and is divided by two brick partitions. A complete installation of shower heads, lavatories and lockers is found in the bath-house. The work clothes of the men employed around the mine will only see their homes at such times as they may wish to have them washed, while a change to clean clothes at the end of the day and an opposite change in the morning keeps the employees in an excellent frame of mind, to say nothing of easing the work at the home. Hot water is available from a small boiler located in the rear of the building.

When the mine was first opened gas was encountered in certain of the splits but since the installation of the

TWO ATTRACTIVE TYPES OF MINERS' HOUSES OF STUCCO AND HOLLOW TILE CONSTRUCTION

present ventilation system, the working places are to all intents and purposes non-gaseous.

As has been mentioned before, the sump extends 40 ft. below the coal in the No. 1 shaft. Two Gardner 8 x 10 in. duplex pumps supplied by the Harris Pump & Supply Co. of Pittsburgh, have been installed at this point temporarily. The final sump location will be about 1,000 ft. from the bottom of the No. 1 shaft. The borehole has already been drilled and the removal of the pumps to this site will take place in the near future. The new location will permit practically all of the water to collect by gravity. One of the pumps will be used as a spare as is now the practice at the temporary location.

There is no difference in elevation between the new and the old sump sites, and the pumps will work against a head of approximately 200 ft. Each pump has a capacity of 2,550 gal. per min. and is operated by a motor on the 250-volt direct-current line. Four 4 x 5 in. Austin field pumps of the single-plunger type are in use in other parts of the mine and serve to force the water to the central location wherever local dips of the coal bed prevent a natural gravity flow.

The coal is developed on the block concentration scheme of the panel-room development system. All entries for the greater part are triple. As will be noted in three of the illustrations, the shaft bottom is of concrete construction with I-beam roof support.

AN AIR OF NEATNESS IS APPARENT

Community work on a large scale is part of the policy of the company. Twenty-five new houses of the bungalow type are in various stages of construction, the designs of which are varied and follow no one general plan. Many are of hollow brick and stucco construction, and all are equipped with running water and lights. An appearance of neatness and attractiveness is given by these types of miner's homes that is a considerable contrast to the mining town well known by its houses of one type and color. Especially is this contrast further heightened by mixing the designs in such a manner as to give the impression that all houses are of a different plan. This scheme has been attractively carried out at Pleasant Unity as well as that of not keeping the foundations on any set level.

Concrete streets give the village a scrupulously neat appearance. This type of street construction will be extended from time to time as the development of the mine proceeds and makes necessary the building of more houses to accommodate the increased number of workers. Over 75 per cent of the men in Pleasant Unity are employed at the mime in one capacity or another. Construction drawings for two garages have already been made, one of which will be located at the mine and will be used for the convenience of employees who drive to work.

The other will be located in the town proper and will be available for residents at a small nominal fee to cover the cost of maintenance. Two completely equipped playgrounds will soon be built and each will include a swimming-pool. No plans for a community theatre or amusement house have been made so far but undoubtedly will be in the near future. The city of Latrobe can be reached by street car, a short half-hour ride, and the amusements at that place are brought within easy reach of the populace.

The town is located about a quarter of a mile away from the mine. This eliminates any possibility of dust or dirt reaching the residential section, even though the mine is abnormally free from the average sooty atmosphere that has come to be expected as part of a soft-coal operation.

There is no doubt that the skip method of hoisting coal when used with loading booms at the tipple, does much toward eliminating the grimy appearance of a coal plant.

The bath-house at the mine was under construction before the western Pennsylvania miners voted to demand this convenience. This demonstrates the policy of the company to anticipate the desires of their employees. Such a policy more or less unknown ten years ago is fast gaining ground in the bituminous region and foreshadows the welcome, and not remote, time in the future when the drab shanties of former mining towns will give way entirely to the more picturesque types of bungalow homes and cottages. The general feeling of cleanliness that goes far toward creating a better and more desirable morale in the community will then have its reward in a betterment of moral conditions.

A CLOSE-UP VIEW OF THE TIPPLE

Toronto Coal Trade in 1919

By Phillips Thompson

Toronto, Canada

THE COAL trade in common with most other lines of business was much unsettled during 1919, owing to the sudden change from a war to a peace footing and the industrial disturbances incidental to the reconstruction period. The demand for coal in 1918 was greater than in any previous year by reason of the heavy requirements of the plants engaged in the manufacture of munitions and other war supplies.

The supply of coal for domestic purposes was limited and its distribution was regulated by the government Fuel Controller. With the declaration of the armistice the industrial demand suddenly terminated. The resumption of manufacturing industry on a peace basis proved much more gradual than was anticipated, investors being deterred by the steadily increasing cost of labor and materials and the uncertainty of market conditions, so that for the earlier months of the year the sales of coal for industrial purposes remained comparatively light.

Later in the season, widespread strikes and labor unrest affected manufacturing industry unfavorably. A prolonged strike of metal workers in Toronto caused the suspension or curtailment of operations by many plants. Owing to the disturbed situation there was a disposition among consumers to buy conservatively for immediate requirements only, so that the recent strike of bituminous miners in the United States found the stocks on hand comparatively low, and manufacturers were threatened with a serious shortage.

The beginning of the year found the domestic consumers generally well stocked with sufficient hard coal to carry them through the winter. As the season was unusually mild supplies in many cases lasted well into the spring, so that this branch of the trade was for some time quieter than usual. Early in the year the Fuel Controller repeatedly urged all consumers who were in a position to do so to lay in supplies as soon as possible, so as to avoid a congestion of orders in the fall and a possible shortage in the supply. This advice was generally followed and throughout the summer dealers were very busy with orders for much larger quantities than they were able to supply. Shipments from the mines came in too slowly to meet the demand and deliveries were much delayed. By the close of the season householders as well were stocked up for the winter and the yards had a good supply on hand, all danger of a serious shortage having apparently been avoided.

As a result of the strike at the bituminous-coal mines the Fuel Controllers for Canada and Ontario, whose functions had been in abeyance since the spring, were reappointed and are now in charge of coal distribution. The outlook for the trade during 1920 is largely dependent on the industrial situation, but present indications seem to predict that the volume of business will be somewhat below normal.

The steel industries have been adversely affected by the shortage of steel which has curtailed production, and should it continue, as is anticipated, for some time, many will shut down.

Coastwise Shipping Conditions in 1919

By G. G. Wolkins,

Boston, Mass.

THE supply of shipping in 1919 was more than ample for all coastwise requirements. Particularly was this true of steam tonnage. The "emergency fleet" was constantly in the market for charter, and only when there came an extra demand for space to carry anthracite in October was there any delay in honoring requisitions. The great drop in shipments by water accounted for the number of steamers lying idle, even when the movement of railroad-owned barges was paralyzed by wage disagreements, and there is no present prospect that this condition will be corrected. Most of the steamers now in operation on the coast are unfit for off-shore service, many of them are not risked even coast-wise during the winter months, and there is therefore every indication that enough space will be available for all the coal that is to be moved by water during 1920.

Rates until March were $3.25 from Hampton Roads to Boston, and $3.50 from Baltimore, but it was readily seen that no such high range could carry into another coal year. Pressure was brought to bear upon the Shipping Board by representative industries and on March 6 it was announced that all fixed rates were withdrawn. The Shipping Board rate was finally modified to $2 from Hampton Roads to Boston, $1.75 to Providence, and $2.15 to Portland, although no long term charters on this basis were drawn for any period beyond Dec. 31. Toward the end of the year there was a disposition among shipping authorities to advance rates 75c. to take care of deficits on certain of the steamers, and finally the announcement was made effective Jan. 10 that rates would be advanced on Shipping Board steamers 75c. This will make the new rate $2.75 to Boston from Hampton Roads, other destinations in proportion. The spurt of the Railroad Administration the latter part of December in chartering steamers, 10 at a time, to carry locomotive coal was attributed to an anticipated increase in rates, but factors in the trade were not generally taking such action. At this writing it looks as if more steamers would be tied up.

The trend of freights is surely upward. Rigid stipulations as to wages, food and accommodations for marine-workers make the problem serious. Marine freights are likely to be on a relatively high level for an indefinite period, high certainly as compared with through

RECEIPTS OF GROSS TONS OF BITUMINOUS COAL BY SEA AT BOSTON SHOWING PORT OF SHIPMENT*

	Baltimore		Norfolk		Newport News		Philadelphia		New York	
	1918	1919	1918	1919	1918	1919	1918	1919	1918	1919
January	41,238	42,499	182,079	156,720	22,750	32,097	8,004	8,906	10,237	[illegible]
February	44,102	5,465	237,412	123,668	47,570	25,194	[illegible]	5,413	4,433	23,426
March	60,244	. . . .	395,411	128,619	38,149	26,835	7,588	6,917	6,319	[illegible]
April	53,454	3,546	319,106	181,885	[illegible]	23,522	7,073	2,900	33,210	29,459
May	88,540	1,429	420,332	176,817	49,537	12,467	5,815	2,461	52,498	23,495
June	105,770	3,058	260,520	143,253	63,042	5,852	5,380	9,221	29,281	34,610
July	174,399	6,135	360,967	120,122	36,286	2,850	18,146	13,424	25,640	[illegible]
August	200,914	3,110	348,492	160,332	70,204	[illegible]	11,828	6,797	38,351	30,919
September	158,976	2,950	314,127	173,371	40,117	6,422	9,775	14,128	18,533	22,954
October	108,605	. . . . . .	242,701	119,772	25,217	6,000	6,986	10,846	30,592	[illegible]
November	81,257	. . . . . .	289,579	229,577	40,284	6,429	18,565	18,883	23,798	862
December	70,922	. . . . . .	140,499		[illegible]		7,785		13,834	
Total	1,188,421	. . . . . .	3,511,225		483,655		115,598		286,126	. .
1917	587,692		2,799,178		260,253		125,169		80,422	
1916	836,055		2,853,185		873,980		287,795		42,892	
1915	1,772,437		2,212,530		680,929		403,927		24,604	
1914	1,758,266		2,637,632		611,369		456,446		3,095	
1913	1,764,514		2,485,679		737,647		553,573		3,274	
1912	1,361,994		1,836,750		945,803		322,334		9,600	
1911	1,576,397		1,218,391		921,220		381,961		3,776	
1910	1,595,554		795,475		1,243,857		292,636		25,515	
1903	481,711		314,505		[illegible]					

* Courtesy of the Boston Chamber of Commerce, Statistics Department

tariffs all-rail, unless under private management the railroads show a determination to restore the equilibrium as between rail and water deliveries. Without much doubt, the railroads will strive to keep their present tonnage, and if at the same time that through tariffs are increased, the rates from mines to Tidewater and from Tidewater to ultimate destination are increased in the same proportion, it is hard to see how there will be any relief for steamers on the coast, at least for those of them built in war-time yards, or how the demand for them can be stimulated beyond the requirements of 1919.

The future of much of this shipping is involved with the coastwise coal trade, unless more of the war-built craft can be disposed of to foreign buyers. The wooden steamers, in particular, present a dilemma. It was demonstrated in 1919 that this type will not be used in merchandising if there are iron ships available. The wooden ships have less cargo space than was estimated, are very expensive to operate, and individual units have been known to sink on slight provocation. New England ports like Boston, Portland, and Providence can show wooden steamers lined up as if waiting patiently for trade development. At the end of the year, out of 70 steamers, aggregating 216,400 tons, 31 ships or 93,800 tons, of which 18 ships, 55,000 tons were of wood, lay idle, these being all under the supervision of the District Agent, Division of Operations, Boston. What is to be done with them?

STEEL COLLIERS MOSTLY IN FOREIGN TRADE

Modern colliers, of the type engaged in the coal trade prior to 1917, are still in oversea and in South American trade on lucrative charters, and so long as New England coal receipts by water are maintained in their present light volume there will be little inducement for their return. They were built to go anywhere in the seven seas, and manifestly such ships are far more serviceable than in trade between Hampton Roads and Boston, the more so now that there is a surplus of the lake-built model. The day is not far distant when 48 to 50 trips will again be considered a normal yearly performance between Norfolk and Boston.

The Shipping Board is also operating a fleet of barges and tugs, although these cannot yet be said to be a factor in the market. Just what part of the coal traffic they will eventually settle into is for 1920 to work out. It is probable that high enough rates will be named for this transportation to preclude their competition on any very keen scale with older fleets that are better balanced as between tugs and barges, and have a far lower initial cost on which to base earnings.

Sail tonnage almost disappeared from the trade. A few small coasters there were, faring back and forth from New York to Eastern Maine, but four to six-masters, such as used to carry the bulk of New England coal from Hampton Roads, are either off-shore or have laid their bones in different quarters of the globe. Small ports in Maine that ordinarily have relied for their coal upon schooners of 300 to 500 tons waited vainly through the fall for suitable craft to charter, but apparently the age of most of these boats is so great that sailors do not care to risk voyaging along the coast in winter. Almost every gale takes its toll from these craft whose names have been familiar to the trade for a generation.

TOTAL GROSS TONS OF BITUMINOUS COAL RECEIVED AT BOSTON

	Totals (Coastwise) 1918	1919
January	264,308	‡251,433
February	348,030	183,166
March	442,252	182,164
April	426,443	251,313
May	616,722	216,669
June	463,999	195,994
July	615,638	166,961
August	670,124	218,533
September	541,528	219,825
October	414,101	163,038
November	452,883	255,751
December	269,939	267,034
Total	5,525,967	2,571,881

‡Includes one cargo, 5,860 tons, from Charleston, S.C. Includes 11,627 tons from Charleston, S.C.

The use of the Cape Cod Canal by railroad-owned barge lines has been compulsory. The work of dredging has progressed gradually and proceedings are now pending to determine how much the Government shall pay for the property. Its practical value to shipping is no less a matter of controversy than when it was first projected, but it is certain now that the Government will own it and that more and more money will be poured in to make its service less questionable and of greater benefit to all shippers.

Testing of Coals for Byproduct Coking and Gas Manufacture[*]

By Horace C. Porter[†]
Philadelphia, Penn.

MOST of the bituminous and semi-bituminous coals of this country will coke, and all of them yield, on carbonization, more or less marketable gas and byproducts. We need, however, a finer distinction between various grades of coking coals and those of different degrees of byproduct and gas-making possibilities. There is required by the consumer or the coal producer a dependable test to show whether a certain coal or mixture of coals will make coke of good commercial value for blast-furnace, foundry, water-gas or domestic use, whether any difficulties in operation may arise from properties inherent in the coal; and whether gas and byproducts may be expected of good quality and in profitable quantity. For determining coke quality, the most dependable test is an actual run in an oven, but for byproducts a coal may be tested better and more accurately in the laboratory or in a miniature oven or retort.

> Most bituminous coals will coke, but the final product may be useless commercially. Mr. Porter's paper discusses various ways and means of treating coal in the laboratory to determine its commercial applicability to the coke oven or gas retort.

As to what constitute the most desirable qualities in blast-furnace coke, the furnace men themselves are not in complete agreement. Some desire a hard, well-burned "hot" coke, and others get better results from a "greener," less hardened product that burns somewhat more readily in the furnace. But certain qualities of cell structure and porosity are commonly agreed upon as desirable. Information as to what kind of coke a certain coal may be made to yield is valuable in advance, whatever may be the consumer's ideas as to the particular kind most suitable to his needs.

The question arises: Can we predict coking quality with any degree of satisfaction from a small-scale test? It used to be said that coals could not be tested satisfactorily on a laboratory scale either for the coke they would yield or the byproducts. On account of the mystery with which the coking quality of coal has been shrouded and the large determining influences that many believe are exerted by mass, pressure and the passage of carbonaceous volatile matter through the coking material, it has seemed difficult to reproduce in the laboratory the exact conditions of commercial practice. Great progress, however, has been made in recent years in elucidating the process of carbonization and many of the factors that make for the formation of high-grade coke and the recovery of the best quality and yield of byproducts are known. The matter of conditions is capable of careful analysis and it is possible to simulate closely in the laboratory the practical conditions of coke oven or gas retort.

By giving due weight to each factor derived from the analysis and nature of the coal and its behavior in a carbonizing test, it is possible to form a composite conclusion predicting with approximation the coal's coke-making possibilities. The factors that will be found most helpful are five in number: (1) Origin and geologic history; (2) proximate composition, particularly the amount of moisture retained by air-dried coal, amount of volatile matter and percentage of sulphur (an incidental impurity undesirable in coke or gas, but not affecting coking quality); (3) calorific (B.t.u.) value of volatile matter, calculated to a "pure" coal, or so-called unit coal, basis; (4) amount of water of combination and CO_2 obtained from coal in a carbonization test; (5) quality of coke obtained in a so-called "Dutch basket" test (in an oven) or in a laboratory carbonization test under carefully chosen conditions, having regard particularly to the rate of coking or of the progress of the plastic zone.

Byproduct yields may be determined by a laboratory carbonization test but unless conditions are used that, by careful analysis, prove similar to those of commercial units, the results will require correction by arbitrary factors—a procedure that is not entirely satisfactory.

To analyze, for purpose of comparison and duplication, the conditions in the various commercial carbonization processes it is well first to tabulate the values of certain common dimensions on an equivalent basis. Since the velocity of gas passage is a basic factor in determining byproducts, we may reduce the other dimensions to a basis of equal gas flow, say 1,000 cu.ft. per hour, and note their relative values in the different processes. In Fig. 1 are shown the more common carbonizing ovens, or retorts, compared as to relative size and shape, and in Table I are given calculated figures showing particularly the heated wall area, the average volume of charge traversed by gas, and the average free space above the charge, all on an equalized basis of gas flow—namely, 1,000 cu.ft. of gas per hour.

We see that in these three factors the processes vary considerably and that relatively the results of actual practice are such as may be logically predicted from these variations. For example, from the vertical gas retort, tar is obtained in greater quantity, but thinner and of much lower free carbon content, than from a byproduct coke oven or old-type horizontal retort; much less naphthalene, anthracene and off-take pipe carbon are formed in the verticals as well as a greater production of ammonia. The horizontals, however, commonly yield gas of higher candlepower. All of these results are largely attributable to the relationship shown by factor *D* of Table I, the greater contact of volatile products with superheating space in the horizontal retort and coke oven, the former being nearly three times that of the vertical and the coke ovens nearly twice that of the vertical. The coke oven, on the other hand, as shown by *A* and *C*, has a considerably lower coking velocity than the gas retorts and a greater volume of carbonizing mass per unit flow of gas so that, principally because of these differences, it makes a stronger and better coke for metallurgical furnaces. By the same reasoning, if coke-oven tops are kept cooler or somewhat restricted in volume of space for gas passage above the charge, the ammonia and light oil yields are increased and naphthalene and free carbon reduced.

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[*] Paper presented before the Chicago meeting of the American Institute of Mining Engineers, September, 1919.

[†] Chemical engineer, Chemical Service Laboratories, Inc.

Careful studies of the carbonization process have been made by Oskar Simmersbach[1] and others as pertaining to coke ovens and by O. B. Evans[2] and others in vertical gas retorts. It is well established thereby that in the coking processes a plastic zone forms and progresses through the charge at a rate dependent on the temperature of the wall and the distance of the plastic zone from it. The plastic state is formed at about 350 deg. C. and solidifies at about 440 deg. C. The rate at which this plastic material is transformed to hardened coke probably has considerable influence on the quality of the coke. Furthermore, during the plastic stage, the coal gives up about 10 per cent of its gas, and this passes chiefly through the uncoked core of the charge, but of the remaining 90 per cent evolved from the solidified coke, a large proportion passes through the partly coked charge between the plastic zone and the wall, depositing carbon on the cell walls of the coke and undergoing material change itself in the chemical composition of its constituents. Further changes in the gas and byproducts occur in passing through the heated open space above the charge, where such alteration is promoted by the slowing down of gas travel on entering the region of greater cross-section. The marked effect of these conditions on coke quality and byproduct yields cannot be doubted, and the necessity for having due regard in the design of a laboratory test apparatus, for the relative dimensions of the commercial plant as given in Table I, based on some such equivalent as unit flow of gas, is fully evident.

TABLE I. DATA IN REGARD TO THE VARIOUS CARBONIZING PROCESSES

	Beehive Coke Oven	Byproduct Coke Oven	Vertical Gas Retort*	Horizontal Gas Retort Old Type†	Horizontal Gas Retort New Type‡
Coal charge, tons	6.5	12	0.85	0.23	0.85
Carbonizing period, hours	48	17	11	4	6
Gas made per hour, thousand cubic feet	......	7.6	0.87	0.65	2.63
A—Coking velocity, inches per hour	0.50	0.53	0.68	1.1	1
Velocity of travel of plastic zone	......	0.82	1.25	......	......
Heated wall area, square feet	......	795	97.1	53.1	130
—Wall area per thousand cubic feet gas per hour	......	104.6	111.6	81.7	86
Volume of charge, cubic feet	290	472	35.5	9.4	34.5
Depth of charge, feet	2.2	8.5	15.5	0.5	0.82
C—Average cubic feet of charge per thousand cubic feet gas per hour	......	62.5	40.8	14.5	21.2
Open space above charge, cubic feet	......	83.25	5.2	10.3	10.4
Open space, per thousand cubic feet gas per hour	......	10.96	5.98	15.8	6.4
Approximate temperature in free space, degrees centigrade	......	950	800	1150	1050
D—Approximate time of gas contact with free space, seconds	......	39	21.5	58	23

*U. G. I. intermittent type, 18½ ft. long, 12x22 in top, 18x30 in. bottom, filled within 3 ft. of top.
†Old "stop end" type, 15x26 in. by 9 ft., charged to 6 in. depth.
‡Modern "through" type, 15x26 in. by 20 ft., charged to 10 in. depth.

Owing to the fact, for example, that a small circular cross-section, as of a laboratory tube, on being increased to the much larger section of a commercial retort, enlarges its area as the square of the diameter, the volume of coal through which a unit of gas flows per hour is much larger in the commercial retort than in such a tube, with equal rates of coking per linear inch. With a higher rate of coking, which is likely to prevail in the laboratory tube, this difference becomes even greater, and it is small wonder that coke quality cannot be judged from coking in a tube or in a platinum crucible. Byproduct yields, as determined in a small tube on a few grams of coal, require correction by abitrary factors but are of a certain limited value when carefully used by reference to a standard coal of known commercial performance.

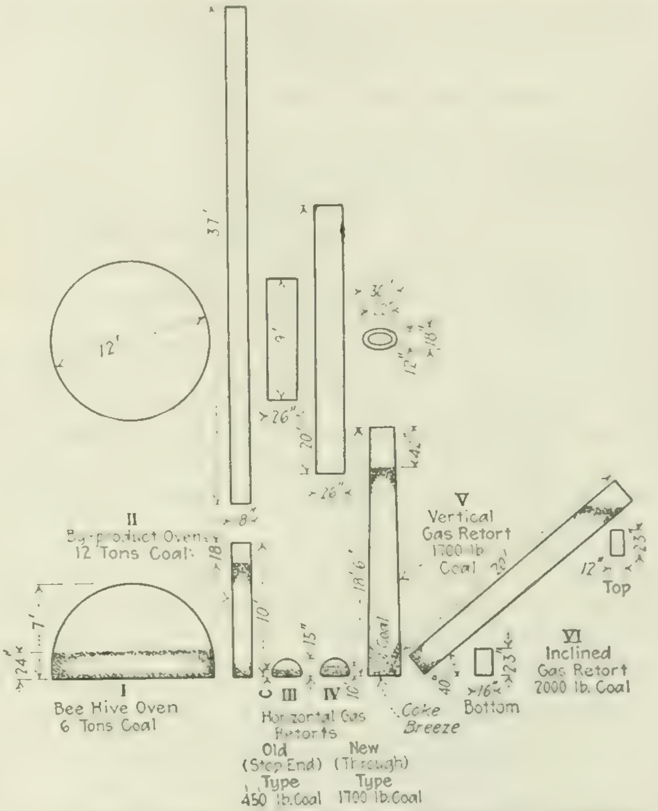

FIG. 1. COMPARISON OF SHAPE AND SIZE OF DIFFERENT TYPES OF RETORTS

Such a test, in a ½-in. glass tube on 20 g. of coal, is in use in this country in the laboratories of the U. S. Steel Corporation and of the Koppers Co. It originated in Germany, has been described by —— Schramm in 1913[3] and, with modifications, by the U. S. Steel Corporation (Chemists Committee) in a pamphlet entitled "Methods for the Commercial Sampling and Analysis of Coal, Coke and Byproducts," in 1916. It is claimed to be of value only when calibrated carefully against commercial results on the same coals and when the results are modified by application of suitable factors.

Tests on a larger scale, carbonizing about 1 lb. of coal in an iron retort, are used by the Semet-Solvayy Co., Syracuse, N. Y., the Westmoreland Coal Co., Irwin, Penn., the Illinois Steel Co., Gary, Ind., and by the

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[1] *Grundlagen der Kekschemie,"* Berlin, J. Springer, 1914.
[2] *Proc.* Amer. Gas. Inst. (1913).
[3] *Journal für Gasbeleuchtung* (1913) 56, 389.

U. S. Bureau of Mines. The results in such tests, particularly on ammonia yields, are found by the Semet-Solvay Co. to be a valuable check on plant-operating efficiencies. The other companies named also use this test as a valuable aid in estimating yields of gas and other byproducts from new or unknown coals. The conditions in such a test, compared to those of the smaller test, are more easily adapted to approximating those of commercial processes, so that a better indication may be obtained of coking quality and the quality of the byproducts.

Any catalytic action that may be exerted by the iron of the retort in decomposing ammonia or the other byproducts is considered by the above-named users to be too small to play a role of any practical importance. In Fig. 2, reproduced from a paper by Dr. L. C. Jones[4], chief chemist of the Semet-Solvay Co., by courtesy of the author, are shown the results of tests by the Semet-Solvay Co. on a good coking coal at different temperatures. The important influence of the maximum temperature of the retort on byproduct yields is readily to be seen.

One of the largest factors influencing byproduct yields is the relative size and temperature of the free space above the coal. This factor is controlled in the laboratory test by the use of a solid plug of suitable size fitting into the open space of the retort and slotted or otherwise shaped so as to permit flow of gas at the required rate.

To judge the quality of coke to be obtained from a coal, the laboratory test alone, for reasons explained in the foregoing, is not adequate. The most satisfactory test for this purpose is a full-scale oven trial. Proper weighing, however, of the five factors enumerated gives a good indication of the coking possibilities of any coal.

The geologic conditions under which the coal deposit lies are indicative, more or less, of its coking quality. In general, the older coals, the more remote from the peats and lignites, are likely to show the better coking characteristics. Geologic age, under conditions such as to have effected deoxidation (reducing the percentage of oxygen in the coal substance), in general seems to parallel coking quality, until the semi-anthracites are reached.

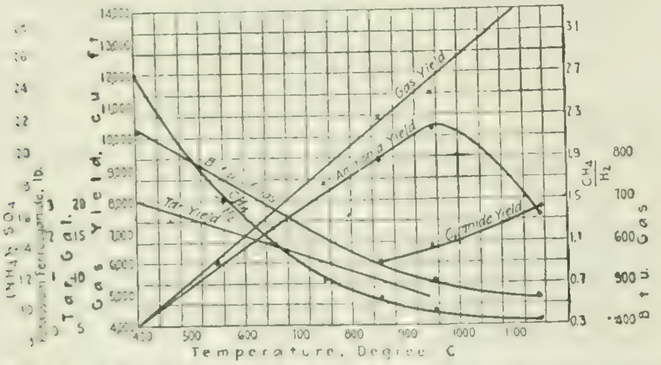

FIG. 2. RESULTS OF TESTS ON A GOOD COKING COAL AT DIFFERENT TEMPERATURES

From the proximate analysis, valuable information is obtained. The amount of water in the coal, after air drying, is a perfectly reliable indication of its degree of deoxidation and of its probable tendency to coke. A percentage larger than 5 ordinarily indicates that the coal substance has not been altered sufficiently by deoxidation to make a high-grade coke. The percentage of sulphur and ash are important as showing objectionable impurities that will remain after carbonization. The volatile matter in a good coking coal is ordinarily not less than 15 per cent nor more than 38 per cent on the dry basis.

As has been suggested by S. W. Parr[5] and by L. C. Jones[6] the "cokability" of a coal is strongly indicated by the relative calorific value of its volatile matter. Many coals that appear to be rich in volatile matters, as far as quantity is concerned, yield relatively large amounts of CO_2 and water in their volatile products, which have no heating value and denote a low order of "cokability." The calorific value of the volatile matter is computed from the calorific value of the coal itself and the percentage of fixed carbon (which has known calorific value) both being on the basis of "pure" coal—free of moisture, sulphur and corrected ash. Fig. 3 is reproduced from Dr. Jones' paper[7] and shows a comparison of the calorific values of the volatile matter for a number of typical coals. The author says, "By deducting the calorific value due to fixed carbon from the total calorific value and dividing by the percentage of volatile matter, all on the pure coal basis, we get a series of coals of increasing cementing or coking tendencies. . . . This variation in calorific value has been found to represent results in actual coking practice."

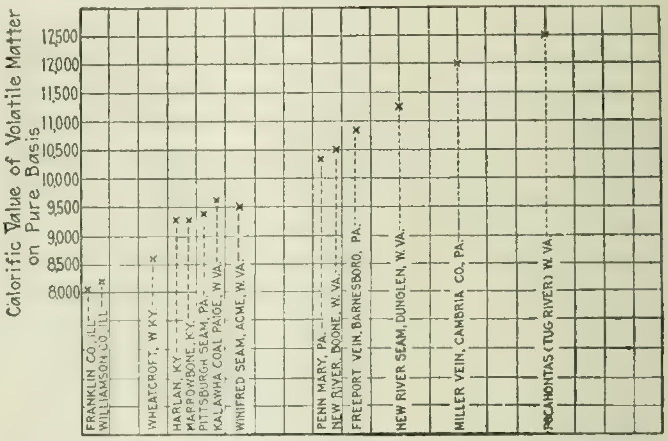

FIG. 3. CALORIFIC VALUES OF VOLATILE MATTER FOR TYPICAL COALS ON THE "PURE COAL" BASIS

The percentage of oxygen in a coal, or the ratio of oxygen to hydrogen, has been proposed as an index of its coking quality, but this factor adds little to that discussed in the preceding paragraph, since the calorific value of the volatile matter varies approximately in inverse ratio to the percentage of oxygen in the dry coal.

From a laboratory carbonizing test, if made on a sufficiently large scale, we have an opportunity to observe the quality of coke made and obtain an indication of the commercial possibilities. But in addition, this test shows the production of CO_2, CO, and water of constitution by the carbonization of the coal; and when these products exceed a certain amount, the coal may ordinarily be set down as unsuited for production of good commercial coke, unless, in other ways, it shows very favorable indications. The total heat units contained in the gas per pound of coal, coupled with the yield of tar and light oils in proportion to the percentage of volatile matter, give valuable indications also of the suitability of the coal for coking purposes.

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[4] "Coal and Its Byproducts," *Jnl. Frank. Inst.* (1914) 177, 531.

[5] *Bulletin* 20, Illinois State Geological Survey (1915).

[6] *Jnl.* Frank. Inst. (1914) 177, 511.

[7] *Op. cit.*, 529.

A "Dutch basket" test, in which a small quantity—say 10 to 50 lb. of the coal to be tested—is placed in a wire basket, or in a wooden box or keg, and lowered into the charge of a coke oven or retort, gives a valuable indication of the quality of coke to be expected, although the results are influenced by the passage of volatile products from the surrounding coal in the main charge.

Summarizing the main points in the foregoing discussion, it is evident from a careful analysis of the conditions and dimensions pertaining to the commercial carbonizing processes, that the rate of coking, the relative volume of charge per unit of gas flow, and the relative amount and temperature of the space above the charge per unit of gas flow vary in large degree and that these variations influence materially both coke quality and byproducts. The nature of the coal, of course, is also a large factor in the results obtained. It is possible, by a careful control of conditions, to judge both coking quality and byproduct yields by a laboratory carbonizing test, giving weight in this judgment to the proximate analysis of the coal, the nature of its volatile matter, and its geologic history. Such a test should be made comparative by choosing a standard coal having a known commercial performance.

With a view to the control of conditions in accordance with these principles and obtaining thereby concordant test results representing as nearly as practicable those of commercial practice, the Chemical Service Laboratories, Inc., are carrying out a series of careful experiments in an apparatus carbonizing about 4 or 5 lb. of coal. It has been impracticable, on account of the short time available for preparation, to include in this preliminary publication a report of experimental results thus obtained.

The Coal Situation in France

American Ambassador Hugh C. Wallace, of France, states that some improvement is manifested in the coal situation, at least so far as public services are concerned. Two of the largest electric power plants, which were recently forced to curtail the supply of electricity to their consumers, have now received moderate stocks of coal. The situation with respect to stocks for private consumption remains the same—there are no stocks on hand. The small amounts of coal distributed to restaurants cost as high as 300 francs a ton.* Special train services have been established to transport coal from certain of the French ports, notably Dieppe. Reports from the ports indicate regular arrivals of coal. It is stated that 350,000 tons of coal per month are being received from Belgium.

M. Loucheur, Minister of Industrial Reconstruction, at a meeting in Lille declared that there was not enough coal produced to meet the demands. He points out that France consumed 60,000,000 tons per year, and produces only 15,000,000. Germany, when the treaty is in application, will furnish 20,000,000 tons per year. England, which exported 80,000,000 tons, now exports only 25,000,000 tons.

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*Normally the franc is worth about 20c. which would place the value of this coal at $60 a ton. However, the franc has depreciated so in value that 300 francs represents considerably less in purchasing power.

Minecdotes

There Are Fire Bricks and Fire Bricks

SLIM and myself had just finished building a brick stopping over on the 3rd, East. We had gathered up our tools and were sitting in a room neck waiting for the driver when along came Gibbs, the mine inspector. He was a fine sort of chap, a man who was as fond of his "chewin terbaccer" as he was of his "likker." And when it came to telling stories, say, he was right there forty different ways.

"Howdy, boys," he greeted us.

After transferring his cud of "spit quick" to his east cheekpouch so that the drainage would not be impaired when he got into action, he began:

"I notice that you fellows have used fire brick in that stopping you have just built. It'll answer the purpose all right, but common red brick is better and cheaper. Every time I see fire brick though," he remarked with a smile, "it puts me in mind of an incident that happened to me once upon a time.

"I had been in charge of a big operation about a month. Everything was modern, but complicated and in poor condition and I had been working hard on the job as the tonnage had dropped away down. I was getting results, too, and was extremely anxious to make good.

"Well, one Sunday I had been in the mine all day with some men building an overcast. We had worked like the Dickens in order to complete the job so that the ventilation would be in good shape for the next day. After I came home and had eaten supper I was taking a cat nap by the grate when the telephone rang and the night engineer informed me that No. 2 stoker chain had broken.

"I got a repairman and went to the boiler house. We got the stoker in good shape, but the furnace lining on one side needed repairs. It was too late then to find a brick mason, so Tony the night fireman, said that he would 'putta ina de brick an' maka de nica job.' The repairmen said he would finish Tony's shift, so I gave final instructions and went home.

"At 3 a.m. the telephone called me out of bed. I was informed that there was something wrong with No. 2 furnace and that the fire had been pulled. Well, down I went again. I put on a suit of overalls, picked up a hammer and went into the furnace. Tony had made a neat job out of the wall, but instead of using fire brick he had used the blocks he found in a couple of barrels of boiler compound. This compound was in blocks about the size and color of fire brick. All hands dug in and at 7 o'clock the coal started going over the screens."

"Yep," says Slim, "an' I'll bet that poor Wop got a goin' over too."

"Honest, boys, I never said a word to him," Gibbs answered. "It was mightily discouraging for me right at the time and I was afraid my mental equilibrium was going to get an awful bump. It was a bonehead stunt that Tony pulled off, but even superintendents have a humorous streak in them.

"Well, after we got through I went over to the fan house and had a good laugh all to myself, for after all, optimism pays exceptionally large dividends."

Exit the "Butty System" in England

By M. Meredith
Liverpool, England

In the recent ballot for the presidency of the Miners' Association, Robert Smillie retained his position by a majority of three to one. While Mr. Smillie failed to bring the bulk of the miners into the Stockholm camp, yet as a miners' leader he has done great service. In the early stages of the war, Parliament fixed the increased charge for coal at the mine mouth at 4s. 6d. per ton. Before many weeks had passed the South Wales owners appealed for an additional 2s. 6d. The miners' president stated that, if the owners did that, they must expect the miners to follow their example, and that he much preferred both parties to stop as they were. That advice was ignored.

Coal scarcity has not ended during the war. London and other districts more or less remote from the coal fields will view with alarm the present unrest among the miners. One may readily imagine a feeling of bitter resentment in the mind of the average consumer. During the period of war, a section of the press was not slow to dub the miner as a "shirker," as being "unpatriotic" or even as a "profiteer."

Let us for a moment examine the miners' position. Nearly every miner before the war was paid on piece rates. With many trades this was not so, hence their ability to increase their output; while the miner, even during the war, could not beat his own record, but in many cases actually fell short, owing to food conditions. This fact has been overlooked.

Miner in Worse Straits Than Ever

True, he has received 80 per cent. increase in wages; on the other hand, the cost of living has increased by something like 120 per cent. Actually he is in a worse position; the same applies to other trades.

The Midland coal field at the present time is going through a mild form of revolution. It is a principle, rather than wages, that is at stake. Two or three countries are witnessing the death throes of what is known as the "butty system." The butty system is a form of contract whereby two, three or four men, for a fixed price per ton, agree to mine the coal on a certain length of face or seam, with from 5 to 20 men to whom they pay the prevailing day rate, be the aggregate earnings large or small. It will be seen that the day men are in the majority.

The bed rock principle of the butty system is based on the idea that the most efficient men become contractors, who know when, how and where to place the other men with a view to best results. Moreover, they are supposed to be acquainted with the dangers of falling roof, the actual winning of the coal, gas accumulation and many things of which the ordinary person is unable to judge. It would be folly to say that the system is altogether bad.

In the older mines the number of men employed on each contract or "stall," is small—generally from two to five—but with the more modern collieries, improved equipment and more efficient haulage facilities, the stalls or contracts are able to employ a greater number of men. Thus it follows that the chances of an efficient workman becoming a contractor are correspondingly reduced. Consequently, the butty's earnings have increased out of proportion to those of the day-wage miner.

So acute has the position become, that the bitterness and prejudices of a caste system have made its abolition not only desirable, but a necessity. From the viewpoint of individual efficiency the result is alarming, for with the prospect of the average miner becoming a butty being more remote, incentive and aspiration are reduced to a minimum, until the man himself has become a mere machine. This state of things is not good for the man, his employer or the community. Physically some men are more able than others, while some, at a glance, can weigh the needs of the moment. Uniformity of ability being impossible, it is equally untenable that the expert shall exploit his fellow trade-unionist and revert to a mild form of slavery.

Meetings are being held in all parts of the counties affected. So enthusiastic and determined have the day-men—that is, the majority—become, that the owners themselves are in agreement with their demands. It follows that there should be little difficulty of settlement on the understanding that every qualified miner shall share in the fruits of his labor.

The war has left deep impressions on the minds of working men and women. The fact that the war has been fought mainly on a moral issue has awakened the consciousness of evil existing in the conditions under which they labor. In their agitation for equity and justice, the men are fully alive to the fact that coal is badly needed, but for one to listen to their impassioned, if simply expressed, speeches, and then to charge them with exploitation would be folly.

The only bar is in the butty himself. In all fairness it may be added, some of these are conscious that their own position is indefensible, while the rest, being human, do not take calmly a reduction in their incomes. There are also vague hints that some insidious form of corruption has been used by some contractors, to enable them to obtain advantage over their fellows. Trade union leaders are not slow to realize that any form of favoritism is detrimental to industrial peace and even their own prestige. Hence their desire to remove the cause of contention.

Saving Coal

The two ways by which coal in greatest volume can be saved are the discovery of the method by which more power can be taken from the ton and the discovery of what kind of coal is best fitted for any particular use.

It has been everyone's business to save coal, and lately the railroads have experimented with some success. They get perhaps 10 per cent of the heat energy from a ton shoveled beneath the locomotive boiler, 10 per cent of the total in the ton. They use one-quarter of all the coal mined. Next to labor this is the greatest expense which our railroads have. This shows how great the problem is to them. Some have adopted a system of paying a bonus for the greatest distance made on a given quantity of given coal. But this laudable effort has not met with the coöperation that would be expected from the firemen.

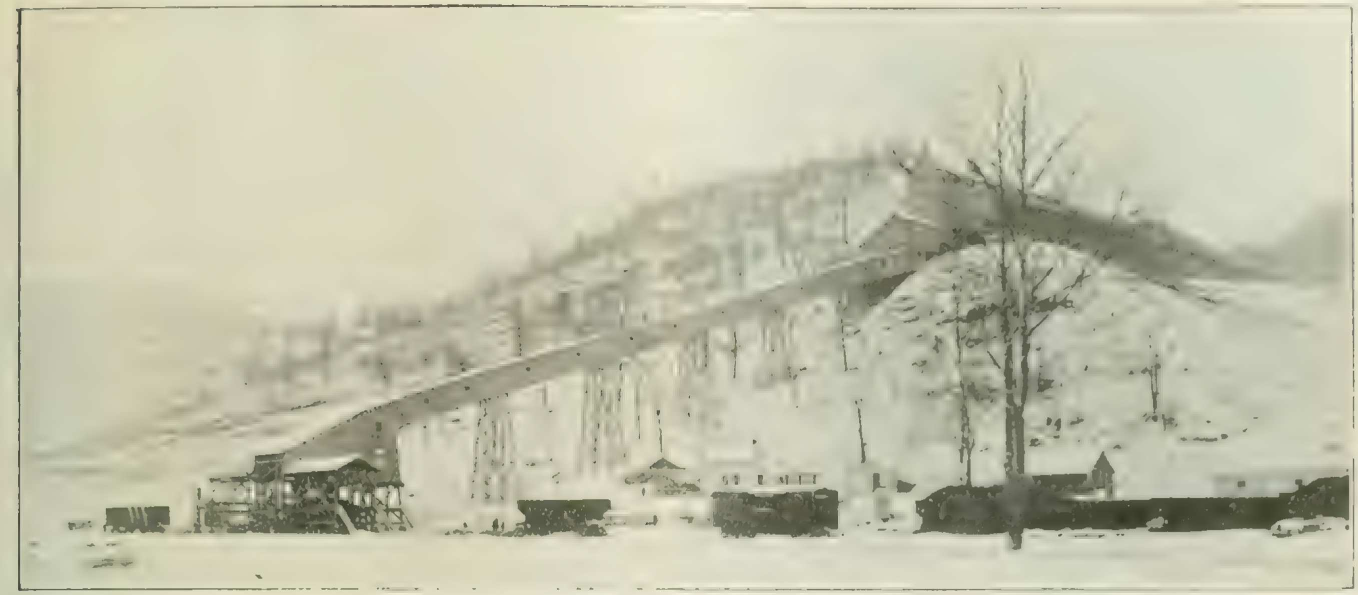

FIG. 1. A MIDWINTER SCENE AT THE BUD MINE SHOWING TIPPLE, RETARDING CONVEYOR AND HEAD-HOUSE

The Bud and Dorothy Mines of the Youghiogheny & Ohio Coal Co.

By W. L. Robinson
Cleveland, Ohio

THE accompanying panoramic view shows the town of Robbin, Ohio. This has been constructed by the Youghiogheny & Ohio Coal Co. midway between its two openings known respectively as its Bud and Dorothy mines. At the present time the Dorothy mine is in a state of development and construction is by no means complete. The Bud mine, however, is doing business in a modern and up-to-date manner as is indubitably attested by the balance of the photographs accompanying this article.

Fig. 1 is a general outside view of the Bud mine, showing the railroad tipple where the coal is screened and prepared for market, as well as the head-house where it is dumped, weighed, and fed to a retarding conveyor leading down the hill to the tipple.

Figs. 3 and 5 show views of the cable and button retarding conveyor leading down the hill. This conveyor is so arranged that the lower strand is the working member, carrying the coal in a trough down the side of the hill, while the upper strand returns in a somewhat similar trough above the lower. In one of the views the empty strand may be plainly seen returning on the upper track.

Fig. 4 shows the interior of the head-house looking out over the trestle which leads to the mouth of the mine. Coal is delivered to this point by a large electric locomotive, which in the picture is shown as just having uncoupled from a trip. After being detached from this locomotive, the trip is pulled into the tipple by a Jeffrey trip feeder which may be plainly seen in the illustration, and passed from thence to a Phillips crossover dump.

The empty cars are retarded by a Heyl & Patterson wheel brake and the empty trip is made up into trips again by a Jeffrey trip maker.

Two men handle all of the coal onto and over the Phil-

FIG. 2. PANORAMIC VIEW OF THE TOWN OF ROBBIN, OHIO, SHOWING NATURE OF COUNTRYSIDE

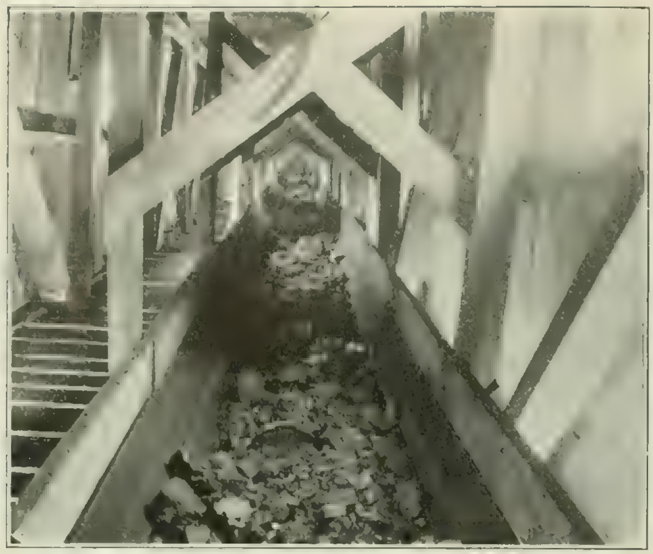

FIG. 3. VIEW OF THE RETARDING CONVEYOR

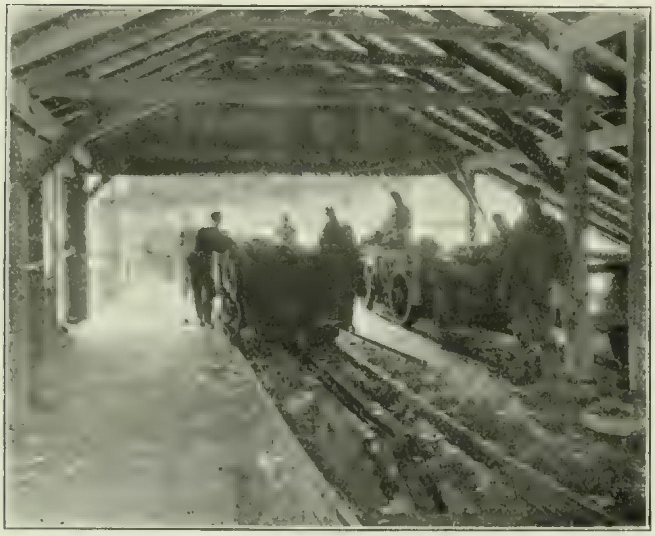

FIG. 4. SCENE INSIDE THE HEAD-HOUSE

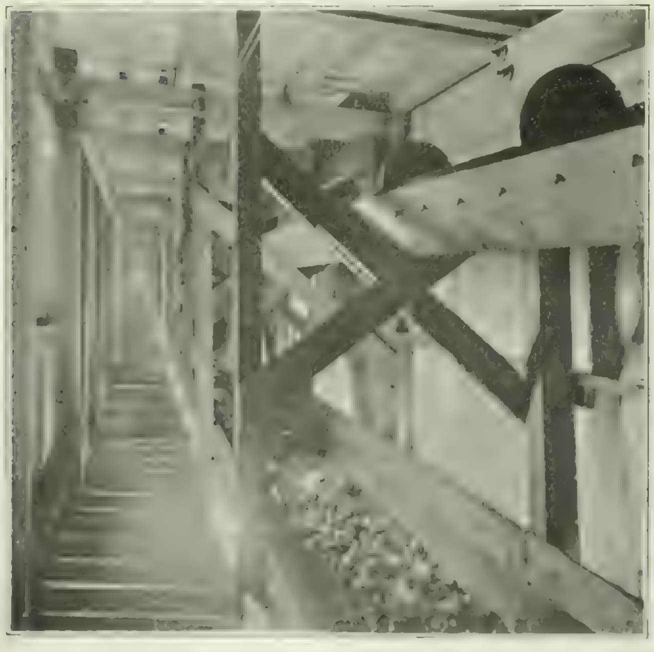

FIG. 5. RETURNING STRAND OF THE CONVEYOR

lips crossover dump while a boy couples the empties and lubricates the cars on the empty track. This is all of the labor required in the head-house.

It is the intention of the owners to make the Dorothy mine complete in every particular. The company has purchased a Heyl & Patterson steel tipple with a complete screening equipment, including a rotary dump that will handle eight cars per minute with a minimum amount of labor involved. As stated before, construction at this plant is by no means completed, but it is expected that the plant will be put into operation about April 1 next, and it is hoped that shortly thereafter *Coal Age* will be able to print a much more complete description of this installation.

Alberta in 1919

By J. A. Richards

Inspector of Mines, Edmonton, Alta.

COMPLETE returns showing the production of coal during 1919 are not yet available. However, from Jan. 1 to Nov. 30, 1919, inclusive, the output was:

Domestic	2,122,759 short tons
Bituminous	2,043,962 short tons
Anthracite	74,859 short tons
Total	4,241,580 short tons

The estimated production for the month of December is 800,000 tons, so that the total output for the year 1919 will be approximately 5,000,000 tons.

The following table gives particulars showing the outputs for the lȧst ten years.

OUTPUT IN SHORT TONS—ALBERTA

1910	3,030,757	1915	3,434,891
1911	1,694,564	1916	4,648,604
1912	3,446,349	1917	4,863,414
1913	4,306,346	1918	6,148,620
1914	3,621,739	*1919	5,000,000

*Estimated.

The total output for the year 1918 was as follows:

Domestic	3,035,061 short tons
Bituminous	2,982,334 short tons
Anthracite	131,225 short tons
Total	6,148,620 short tons

During the last three months of the year, however, the production has been the largest on record in the province. The greatest increase toook place in the domestic coal fields where during the month of November 454,217 tons of coal were produced.

There was no coke produced during the year. The production of briquettes up to Nov. 30 was 63,033 tons, the estimate for the year being about 70,000 tons. This is a reduction of 30,000 tons from the production during 1918. At the end of November there were 11,565 men employed in the mines. There were 46 new mines opened during the year and 28 abandoned, the number at present in operation being 291.

Twenty-one fatal accidents occurred during the year, being the same number as occurred during the year 1918. There were 109 non-fatal accidents during 1919, as compared with 137 during the year 1918.

There are nine mine rescue stations in operation in the province, three of these being installed in railway cars. Two hundred and seventy six men have been trained in mine rescue work during the year at the several stations and cars, and 130 in first aid.

The use of the Edison electric cap lamp in the bituminous mines has considerably increased. There has also been an increase in the use of electric coal cutting machines in the mines in the domestic coal fields.

Alabama's Coal and Coke Output

By C. E. Bowron
Chief Engineer, Gulf States Steel Co., Birmingham, Ala.

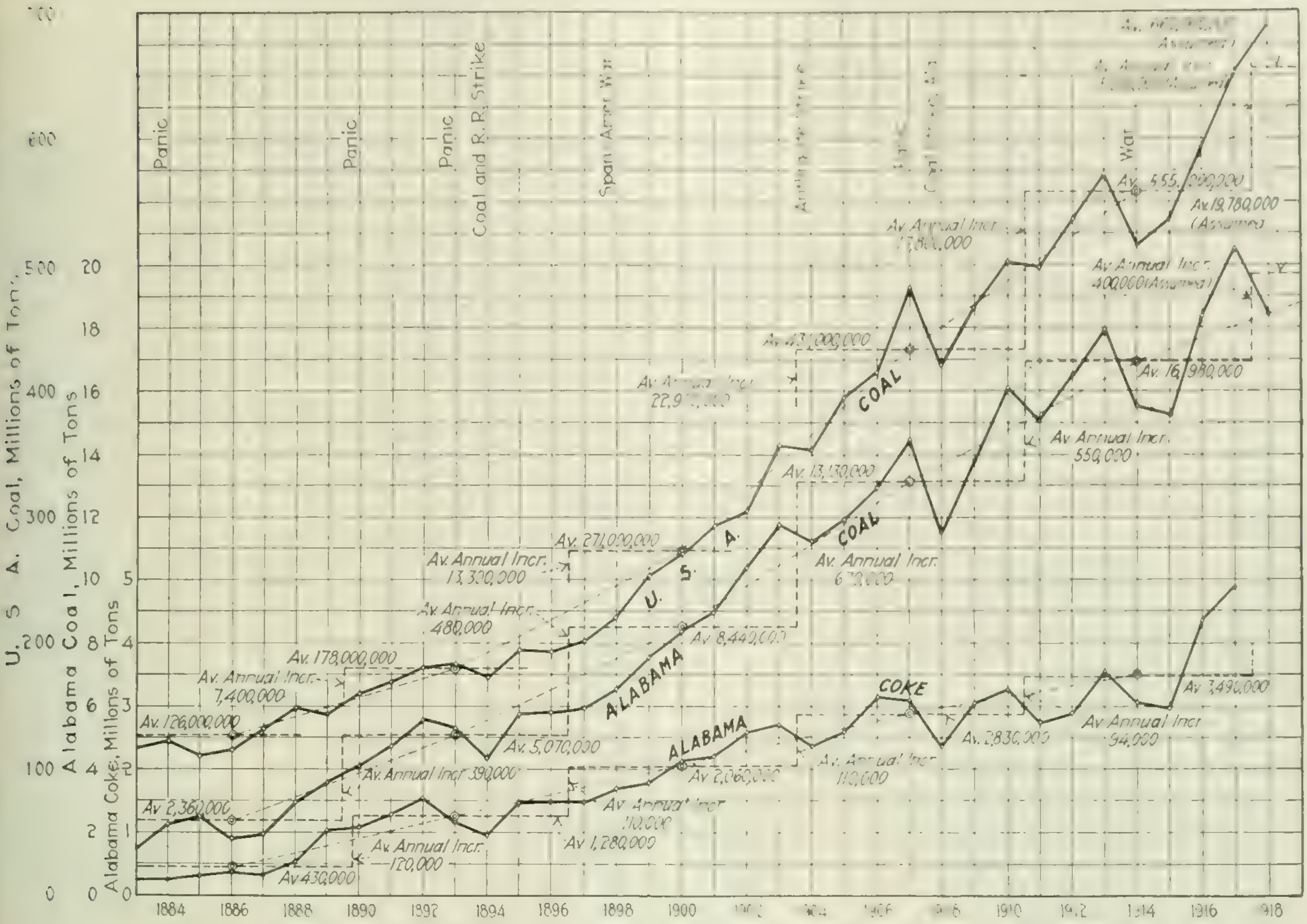

CHART SHOWS AVERAGE ANNUAL OUTPUTS AND INCREASES FOR 7-YEAR DECADES

South Dakota Is Making Plans to Mine Its Own Coal

By O. Ellerman
State Mine Inspector, Lead, S. D.

South Dakota has made provisions for engaging in the coal-mining industry. The legislature enacted laws with this in view, after the amendment to the state constitution, providing therefor had been passed at the last election. The operations under the new act are in charge of a coal commission, consisting of three members, of which the Governor is the chairman. The remaining two members are appointed. This commission is given full power to acquire, by purchase, real property in this or adjacent states; to employ engineers and geologists to make investigations; and to provide and supply equipment as may be requisite and necessary for opening, development and operation of coal mines.

Under the direction of the commission, areas in Dewey and in the northern part of Perkins counties, were tested during the past year. Should these investigations show sufficient deposits of coal it is probable that the state will operate the mines on a large scale, using steam shovels for both stripping and mining.

Lands near the railroad have been examined and, if favorable, the state will start operation early in 1920.

Fusibility of the Coal Ash from Eastern Coals—II*

By W. A. Selvig, O. C. Brown and A. C. Fieldner
Fuels Chemical Laboratory, Bureau of Mines, Washington, D. C.

In the issue of Jan. 22 appeared tables showing the fusing temperatures of the ash of coal in certain sections of the great Eastern coal province, the sections chosen being parts of Ohio, Virginia and Kentucky. The coals whose fusibility temperatures are recorded in the pages that follow are found in Maryland, Tennessee and Alabama. Up-to-date coal operators who are fortunate enough to have high fusibility temperatures for their coal quote these figures as regularly as they do those of the thermal capacity of the fuel. A coal with an ash that fuses too readily is one to be avoided and in consequence every operator is interested in knowing whether he has a coal of that variety, and, what is more important, purchasing agents are getting quite keen on securing coal of high fusibility temperature. The Maryland coals owe their high market value quite largely to the high temperature with which their ashes fuse. Fusibility tables previously published in these columns were sought from "Coal Age" so numerously that they could not be supplied.

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*Published by permission of the Director, U. S. Bureau of Mines.

TABLE OF SOFTENING TEMPERATURES OF COAL ASH FROM EASTERN COALS

Locality, Bed, Etc.			Number of Samples from Mine	Softening Temperature, Deg. F.			Average Analysis of Dry Coal, Percentage of	
				Lowest	Highest	Average	Ash	Sulphur
1			2	3	4	5	6	7
MARYLAND								
Bakerstown Bed								
County	Town	Mine						
Allegany	Barton	Moscow No. 3	1			2110	10.17	2.27
Allegany	Morrison	Gin Sang	1			2390	10.75	2.15
Garrett	Barton	Monroe No. 2	1			+3010	9.12	0.6[illegible]
Garrett	Barton	Swanton	1			2620	11.22	1.93
Garrett	Gannon's Station	Washington No. 5	1			2660	10.03	1.47
Average of mines in Bakerstown Bed			5			+2560	10.26	1.70
Bluebaugh Bed								
Allegany	Barrelville	Bond	1			2300	10.62	2.58
Allegany	Barrelville	Enrick No. 1	1			+3010	13.35	0.84
Allegany	Montell	Montell Tunnell (Merton's)	1			+3010	15.01	1.46
Average of mines in Bluebaugh Bed			3			+2770	12.99	1.63
Brush Creek Bed								
Allegany	Barrelville	Pratt	1			2470	9.61	1.26
Clarion (Parker) Bed								
Allegany	Barrellville	Parker	1			2370	5.10	1.17
Allegany	Franklin Station	Miller and Gree No. 1	1			2190	14.12	3.67
Average of mines in Clarion (Parker) Bed			2			2280	9.61	2.42
Franklin Bed								
Allegany	Lonaconing	George's Creek Test Opening	1			2410	8.48	1.36
Gallitzen Bed								
Garrett	Oakland	Leighton	1			2130	15.14	4.91
Garrett	Oakland	Tower	1			2150	10.39	2.57
Garrett	Swallow Falls	Beeghly	1			2130	10.93	2.51
Average of mines in Gallitzen Bed			3			2140	12.15	3.33
Grantsville Bed								
Garrett	Grantsville	Beachy	1	....		2490	8.23	1.22
Little Pittsburgh Bed								
Allegany	Barton	Swanton	1	....		+3010	7.95	1.18
Lower Freeport Bed								
Allegany	Mount Savage	Henry Mullaney's	1	...	....	2150	20.51	4.11
Lower Kittanning Bed								
Allegany	Luke	Devon	1			2620	11.05	1.57
Allegany	Mertens	Mertens	5	2150	2580	2410	11.81	2.72
Allegany	Montell	Montell Tunnell (Merten's)	1			2640	8.58	1.40
Allegany	Westernport	Tacoma	1			2410	10.16	1.61
Garrett	Barnum	Monroe No. 1	1			2560	10.09	1.64
Garrett	Blain Station	Hamill No. 2	1			2200	10.17	2.51
Garrett	Bloomington	Bloomington No. 7	1			2490	12.08	2.12
Garrett	Chaffee	Chaffee	1			2510	9.61	2.06
Garrett	Crellin	Guthrie	1			2560	11.02	2.12
Garrett	Dodson	Dodson	6	2280	2680	2540	11.78	2.62
Garrett	Friendsville	McCulloh	1			2190	11.84	4.11
Garrett	Harrison	Dodson No. 3	1			2530	9.53	1.84
Garrett	Hubbard	Ajax Hocking No. 1	1			2260	13.74	2.34
Garrett	Oakland	Chisholm	1			2510	[illegible].01	1.49
Garrett	Swallow Falls	Shaeffer	1			2190	11.86	3.85
Average of mines in Lower Kittanning Bed			24			2440	10.76	2.26
Mercer (Mount Savage) Bed								
Allegany	Ellerslie	Ellerslie Clay	1			2450	18.13	3.89
Allegany	Mount Savage	Union Mining No. 6	1			+3010	16.15	1.32
Garrett	Oakland	John Sines	1			2410	20.13	4.62
Average of mines in Mercer (Mount Savage) Bed			3			+2620	18.1[illegible]	3.28
Pittsburgh (Big Bed) Bed								
Allegany	Borden Shaft	Consolidation No. 12	1			3010	7.50	1.04
Allegany	Hoffman	Consolidation No. 3	1			3010	7.54	1.07
Allegany	Little Allegany	Union No. 1	1			2600	8.02	1.41
Allegany	Lord Village	Consolidation No. 7	1			2960	7.24	0.98
Allegany	Midland	Consolidation No. 8 (Tipple samples)	6	+3010	+3010	+3010	7.34	0.82
Allegany	Ocean	Consolidation No. 1	10	2710	+3010	+2980	8.36	0.87
Average of mines in Pittsburgh (Big Bed) Bed			20			+2930	7.67	1.03
Quakertown Bed								
Allegany	[illegible]	Ellerslie Clay	1			+3010	17.03	2.92
Split-six Bed								
Allegany and Garrett	[illegible] Station	Washington No. 1	1			2220	12.42	2.5[illegible]
Upper Freeport Bed								
Allegany	[illegible] Shaft Co.	George's Creek No. 1	1			2760	9.95	1.40
Garrett	[illegible]	Nethken	1			2660	10.30	1.[illegible]6
Garrett	Blaine	Peerless No. 3	1			2200	7.88	1.83
Garrett	[illegible]	Strathmore	1			2710	16.82	1.42
Garrett	[illegible]	Taylor Sines'	1			2170	8.63	3.93
Average of mines in Upper Freeport Bed			5			2500	10.72	2.03
[illegible]								
Garrett	Dodson	[illegible]	1			3010	10.27	1.04
Garrett	[illegible]	Dodson No. 5	1			[illegible]	8.72	0.68
Average of mines in [illegible]			2			[illegible]	[illegible]	0.86

TABLE OF SOFTENING TEMPERATURE OF ASH OF COAL AND ANALYSES OF EASTERN COAL

Locality, Bed, Etc.			Number of Samples from Mine	Softening Temperature, Deg. F.			Average Analysis of Dry Coal, Percentage of	
				Lowest	Highest	Average	Ash	Sulphur
1			2	3	4	5	6	7
MARYLAND—Continued								
Upper Sewickley (Tyson) Bed								
County	Town	Mine						
Allegany	Eckhart	Washington No. 2	1			3010	5.78	0.91
Allegany	Frostburg	Consolidation No. 9	1			2800	8.43	1.03
Allegany	Lonaconing	George's Creek No. 3	1			2760	5.25	1.07
Allegany	Lonaconing	Kingsland	4	2580	+3010	+2730	8.30	1.31
Allegany	Mount Savage	Tyson No. 5	1			+3010	6.16	1.01
Garrett	Lonaconing	Koontz	1			2750	5.95	1.18
Average of mines in Upper Sewickley (Tyson) Bed			9			+2840	6.65	1.09
Waynesburg Bed								
Allegany	Lonaconing	Kingsley	1			2410	13.75	2.58
TENNESSEE								
Angel Bed								
Bledsoe	Litton	Hale	1			2160	5.80	1.94
Battle Creek Bed								
Marion	Orme	Battle Creek No. 3	1			2620	8.77	1.09
Marion	Orme	Battle Creek No. 4	2	2400	2410	2410	10.59	1.94
Average of mines in Battle Creek Bed			3			2520	9.68	1.52
Billygoat Bed								
Claiborne	Bosworth	Yellow Creek No. 3	1			2600	3.26	1.12
Blue Gem Bed								
Campbell	Elk Valley	Elkhart	1			2000	2.69	1.37
Campbell	Elk Valley	Elk Valley	2	2050	2080	2060	2.39	1.03
Campbell	Elk Valley	Perkins Branch	2	1950	2130	2040	2.04	1.04
Campbell	Jellico	Black	1			2090	4.15	1.16
Campbell	Jellico	Blue Gem	3	1990	2140	2090	2.14	1.02
Campbell	Jellico	Broughton	2	2040	2130	2080	2.12	0.98
Campbell	Jellico	Evans	2	2080	2120	2100	1.98	0.88
Campbell	Jellico	Jameson Blue Gem	1			2060	2.49	0.96
Campbell	Newcomb	Italian Blue Gem	2	2090	2130	2110	2.52	0.97
Campbell	Newcomb	Washington Blue Gem	2	1970	1990	1980	1.82	0.86
Campbell	Osage	Powhatan	2	1960	2040	2000	2.00	0.88
Morgan	Blue Gem Siding	Bottomlee	1			2110	4.18	1.66
Morgan	Blue Gem Siding	Coal Cut	1			2480	4.35	1.57
Morgan	Colfield	Thornton	1			2140	11.62	4.56
Average of mines in Blue Gem Bed			23			2100	3.32	1.34
Bon Air No. 2 Bed								
Fentress	Davidson	Davidson	2	2350	2370	2360	10.54	3.14
Fentress	Davidson	Highland No. 2	4	2050	2170	2120	9.91	3.25
Fentress	Wilder	Wilder No. 3	5	2210	2250	2240	10.28	2.69
Overton	Highland Junction	Overton	3	2120	2300	2190	10.57	3.15
Overton	Obey City	Ober River	1			2150	12.60	3.90
Overton	Obey City	Peacock	1			2160	10.29	3.40
Putnam	Monterey	Monterey	1			2140	10.07	3.55
White	Bon Air	Bon Air (Lower Bench)	4	2300	2420	2350	7.87	2.47
Average of mines in Bon Air No. 2 Bed			21			2180	10.27	3.24
Castle Rock Bed								
Marion	Whiteside	Castle Rock	1			2300	10.31	2.41
Marion	Whiteside	Clements Prospect	1			2210	11.24	2.95
Average of mines in Castle Rock Bed			2			2260	10.78	2.68
Catoosa Bed								
Morgan	Catoosa	Flatrock	3	2240	2260	2250	7.11	2.59
Coal Creek Bed								
Anderson	Briceville	Cross Mountain No. 1	5	2390	3010	2670	9.37	0.89
Anderson	Coal Creek	Black Diamond No. 1	4	2180	2800	2510	5.14	1.30
Anderson	Coal Creek	Fraterville	3	2300	2600	2440	5.90	1.04
Anderson	Coal Creek	Klondike or No. 5	4	2330	2460	2400	5.81	0.84
Anderson	Coal Creek	Middle Ridge	1			2390	4.33	0.91
Anderson	Coal Creek	Tennessee	3	2350	2460	2410	8.63	1.67
Anderson	Coal Creek	Thistle	3	2210	2320	2250	6.20	1.60
Anderson	Oliver Springs	Hall	1			2150	4.11	1.63
Anderson	Oliver Springs	Piedmont	4	2000	2270	2100	4.52	1.68
Campbell	Caryville	Bear Wallow	3	2510	2610	2570	4.39	0.94
Campbell	Coal Creek	Camden	3	2350	2500	2400	3.95	0,83
Campbell	Vasper	Vasper	2	2170	2320	2240	4.24	1.19
Morgan	Coalfield	Bowling	2	2080	2170	2120	7.97	4.14
Morgan	Coalfield	Conger	3	2150	2190	2180	8.28	4.13
Morgan	Coalfield	Slip	1			2200	4.89	3.40
Morgan	Oliver Springs	Big Mountain	1			2040	6.75	4.24
Morgan	Oliver Springs	Old Mount Carbon	1			2200	3.29	1.21
Morgan	Oliver Springs	Poplar Creek	1			2040	7.16	3.97
Morgan	Oliver Springs	Prudential	4	1990	2010	2000	9.51	4.61
Morgan	Oliver Springs	Richards	2	2050	2060	2060	9.63	5.50
Morgan	Oliver Springs	Signal Mountain	1			2080	9.08	5.31
Morgan	Oliver Springs	[illegible]	1			2480	5.41	1.13
Average of mines in Coal Creek Bed			53			2260	6.30	2.37
Frozen Head Bed								
Morgan	Petros	Frozen Head	1	...	..	2580	6.92	0.92
Grassy Ridge Bed								
Morgan	Christmas Siding	Grassy Ridge	1		....	2470	3.75	1.87
Hooper Bed								
Morgan	Christmas Siding	Harriman	1	..		2330	2.58	0.69
Jellico Bed								
Campbell	Anthras	Anthras	3	2400	2430	2420	3.15	0.85
Campbell	Habersham	Davis Creek	1			2390	6.83	1.50
Campbell	Jellico	[illegible] No. 3	4	2030	2270	2160	3.14	1.38
Campbell	Morley	[illegible]	3	2160	2450	2300	5.07	1.89
Campbell	Newcomb	Marion-Anna	3	2220	2440	2310	6.13	3.21
Campbell	Newcomb	[illegible]	3	2790	2960	2890	5.10	0.87

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Locality, Bed, Etc.			Number of Samples from Mine	Softening Temperature, Deg. F.			Average Analysis of Dry Coal, Percentage of	
				Lowest	Highest	Average	Ash	Sulphur
1			2	3	4	5	6	7
TENNESSEE—Continued								
Jellico Bed —Continued								
County	Town	Mine						
Campbell	Oswego	Falls Branch	2	2270	2390	2330	2.11	0.98
Claiborne	Clairfield	King Mountain	2	2040	2460	2250	4.72	1.54
Claiborne	Clairfield	Standard	2	2110	2260	2180	3.08	0.92
Claiborne	Eagan	Buffalo	4	2110	2570	2310	3.53	1 19
Morgan	Petros	Petros No. 5	3	2330	2430	2370	7 36	2.55
Morgan	Petros	State No. 3	4	2130	2430	2300	8.30	2.72
Morgan	Stephens	Little Brushy	3	2130	2350	2210	5.14	2.68
Scott	Newland	Arch Mountain	1	....	....	2430	5.57	1.93
Average of mines in Jellico Bed			38			2350	4.95	1.87
Jordan Bed								
Campbell	Cotula	Southern	2	2080	2340	2210	3.58	1.22
Campbell	Kilsyth	Gem No. 2	2	2040	2360	2200	3.28	0.79
Campbell	Kilsyth	Gem No. 4	2	2420	2660	2540	3.13	0 70
Average of mines in Jordan Bed			6			2320	3.33	0 90
Kelley Bed								
Marion	Whiteside	New Etna No. 1	1	....	....	2660	9.70	1 29
Marion	Whiteside	New Etna No. 2	1	....	....	2400	5.56	1.36
Average of mines in Kelley Bed			2			2530	7.63	1.33
Lower Dean Bed								
Campbell	Caryville	Pee Wee	2	2240	2430	2340	3.69	0.72
Mingo Bed								
Claiborne	Bryson	Bryson Mountain No. 1	3	2460	2530	2490	4.95	1.36
Claiborne	Fork Ridge	Fork Ridge No. 1	4	2080	2570	2380	4 80	1.22
Claiborne	Hartranft	Reliance No. 1	2	2460	2470	2460	4.02	1.29
Claiborne	Hartranft	Reliance No. 2	2	2080	2400	2240	3.56	1.09
Claiborne	Pruden	High Cliff	4	2310	2600	2400	3.44	1.23
Claiborne	Pruden	Pruden	4	2060	2500	2360	4.73	1.45
Average of mines in Mingo Bed			19			2390	4.25	1.27
Monarch Bed								
Campbell	Block	Monarch	4	2060	2470	2320	11.29	2.77
Morgan Springs Bed								
Bledsoe	Pikeville	McFarland	1	....	....	2210	10.87	3.61
Cumberland	Litton	Hale	1	....	....	2310	11.23	3.31
Average of mines in Morgan Springs Bed			2			2260	11.05	3.46
Mud Slip Bed								
Scott	Robbins	Hughett	1	....	....	2640	4.21	0.92
Nelson Bed								
Rhea	Dayton	New Prospect	4	2460	2690	2600	18.46	0.49
Rhea	Graysville	Montague No. 1	2	2010	2290	2150	11.79	2.24
Rhea	Graysville	Montague No. 6	1	....	....	2280	25.95	0.59
Average of mines in Nelson Bed			7			2340	18.73	1.11
No. 4 Bed								
Scott	Bear Creek Junction	Phillips	2	2190	2590	2390	6.84	2.02
Scott	Bear Creek Junction	Wilson	3	2050	2060	2050	11.32	5.22
Average of. mines in No. 4 Bed			5			2220	9.08	3.62
No. 10 Bed								
Hamilton	Montlake	Montlake	3	1980	2280	2150	11.42	3.14
Old Eagle Bed								
Morgan	Oliver Springs	Levan	1	....	....	2290	3.57	1.39
Old Etna Bed								
Marion	Whiteside	Old Etna No. 1	1	....	....	2140	2.63	0.76
Paint Rock Bed								
Scott	Huntsville	Cross	1	....	....	2050	9.05	3 78
Scott	Jake's Tank	Jake's Branch	1	....	....	2680	4.83	0.82
Scott	Jake's Tank	Opposum Jaw	1	....	....	2050	8.33	3.47
Scott	Stanley Junction	Keaton Bros	1	....	....	2580	4.43	0.80
Scott	Stanley Junction	Pumpkin Hollow	1	....	....	2600	5.08	0.84
Scott	Stanley Junction	Sexton	1	....	....	2580	4.48	0.74
Average of mines in Paint Rock Bed			6			2420	6 03	1.74
Poplar Lick Bed								
Claiborne	Bryson	Bryson Mountain No. 2	1	....	. . .	2360	7 77	2.70
Claiborne	Fork Ridge No. 4	Fork Ridge No. 4	3	2690	2960	2790	6.58	0 82
Claiborne	Hartranft	Mingo No. 5	3	2300	2440	2370	9.56	2.87
Claiborne	Manring	Sterling	4	2850	+3010	+2930	9 54	0 96
Average of mines in Poplar Lick Bed			11			+2610	8 36	1.84
Red Ash Bed								
Campbell	Block	Pee Wee	2	2940	2970	2960	5.72	1.07
Campbell	Caryville	Caryville	4	2220	2480	2370	6 08	1 24
Campbell	Caryville	Red Ash	3	2400	2450	2420	6.48	1.02
Campbell	Caryville	Sun	4	2400	2590	2510	6 24	1 18
Average of mines in Red Ash Bed			13			2570	6 13	1.13
Rex Bed								
Campbell	La Follette	Rex No. 1	7	2120	2260	2200	5.43	1.01
Campbell	La Follette	Rex No. 2	3	2080	2450	2260	5 74	1.13
Average of mines in Rex Bed			10			2230	5 59	1.07
Richland Bed								
Bledsoe	Litton	New Opening	1		. .	2790	9 87	0 83
Bledsoe	Litton	Thurman	1	. . .		2610	7 52	0 53
Rhea	Dayton	North Pole	4	2250	2480	2380	14 21	1 40
Average of mines in Richland Bed			6			2590	10 53	0 92

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				Lowest	Highest	Average	Ash	Sulphur
1			2	3	4	5	6	7
TENNESSEE—Continued								
Rich Mountain Bed								
County	Town	Mine						
Campbell	Chaska	Chaska	1			2220	1.53	0.90
Campbell	Cotula	Wynn	3	2440	2460	2450	2.10	0.86
Campbell	Habersham	Remy	2	2440	2740	2590	2.13	0.72
Campbell	Habersham	Rich Mountain	3	2160	2330	2230	4.65	2.10
Campbell	Kimberly	Kimberly	3	2240	2480	2380	4.76	1.89
Average of mines in Rich Mountain Bed			4			2370	3.03	1.29
Sandstone Parting Bed								
Claiborne	Hartranft	Sandstone Parting	1	..	.	2380	10.34	1.26
Sewanee Bed								
Bledsoe	Atpontley	Atpontley No. 6	2	2370	2440	2400	8.47	1.06
Grundy	Coalmont	Coalmont E	1			2530	9.55	1.20
Grundy	Coalmont	Coalmont I	1		.	2630	12.61	0.90
Grundy	Coalmont	Coalmont, New A	1		.	2460	13.19	1.21
Grundy	Coalmont	Coalmont, Old A	1			2530	10.06	1.05
Grundy	Coalmont	Coalmont, S. Old Hill	1			2580	9.40	0.85
Grundy	Coalmont	Flanagan	1		.	2420	9.15	0.74
Grundy	Coalmont	Mills Creek Prospect	2	2210	2690	2450	9.54	1.84
Grundy	Tracy City	East Fork	1	.		2300	10.29	2.05
Grundy	Tracy City	East Staub	1			2500	11.22	0.62
Grundy	Tracy City	Old Clouse Hill	1			2590	9.03	0.80
Grundy	Tracy City	Old Staub	1			2390	9.18	0.57
Grundy	Tracy City	Reed Hill No. 2	1			1970	11.97	3.81
Grundy	Tracy City	West Ramsey	2	2690	2930	2810	8.18	0.62
Marion	Tracy City	Lang Ridge	1			2580	8.95	1.19
Marion	Tracy City	Pryor Ridge No. 1	4	1980	2670	2330	10.04	2.30
Marion	Whitewell	Whitewell No. 1	1			2560	8.53	0.60
Marion	Whitewell	Whitewell No. 5	3	2460	2490	2480	8.68	0.93
Rhea	Graysville	Montague No. 3	4	2070	2710	2400	12.35	1.28
Roane	McLean Siding	McLean	1			2400	9.81	0.81
Roane	McLean Siding	Rockwood	6	2250	2480	2340	9.50	0.54
Sequatchie	Dunlap	Douglas No. 2	3	2330	2460	2380	10.12	1.35
Average of mines in Sewanee Bed			40			2460	10.02	1.20
Soddy Bed								
Hamilton	Rathburn	Big Soddy	1			2420	5.17	1.67
Hamilton	Rathburn	Furman	2	2570	3010	2790	6.33	0.71
Hamilton	Rathburn	Old Bunker	1			2610	4.13	0.71
Hamilton	Rathburn	Sheephead	2	2720	2960	2840	10.48	1.43
Hamilton	Rathburn	Soddy No. 1	3	2180	2260	2220	7.79	1.28
Average of mines in Soddy Bed			9			2580	6.78	1.16
Upper Dean Bed								
Campbell	Turley	Rock Springs	3	2170	2400	2290	12.02	2.29
Walden Ridge Bed								
Morgan	Nemo	Catoosa	1		....	2430	7.49	1.33
Roane	Harriman	Walden Ridge	1	...	....	2730	8.85	0.50
Average of mines in Walden Ridge Bed			2			2580	8.17	0.92
MISCELLANEOUS (Coal Beds Not Identified) BEDS								
Anderson	Coal Creek	Smith	1		....	2320	2.99	0.87
Bledsoe	Pikeville	Unnamed	2	2600	2600	2600	7.35	0.56
Bledsoe	Pikeville	Vaughn Prospect	2	2540	2720	2630	7.94	0.84
Campbell	Vasper	Disney	1			2340	3.96	0.72
Cumberland	Litton	Hale	1		.	2850	7.81	0.59
Hamilton	Daisy	Abel	1		.	2100	8.95	1.53
Hamilton	Montlake	Montlake No. 4	1		.	2620	11.32	1.66
Morgan	Christmas Siding	Smith and Cheek	1	.	..	2590	5.54	0.80
Morgan	Coalfield	Davis	1	...	...	2390	4.65	1.47
Morgan	Lancing	Summers	1	...	.	2360	4.83	1.32
Morgan	Oliver Springs	Jackson	1	....	....	2270	2.77	1.01
Morgan	Oliver Springs	Reed	1	...	..	2300	4.25	0.72
Morgan	Stephens	Laymance	1	....	....	2070	7.26	2.80
Scott	Robbins	Clay No. 1	1	....	...	1990	9.49	3.85
Scott	Robbins	Hughett	1	....	...	2580	4.21	1.08
Scott	Robbins	Long Prospect	1	....	....	2210	4.26	1.25
Scott	Robbins	Newman Prospect	1	.	.	2500	5.71	1.08
White	Clifty	Clifty No. 1	8	1990	2090	2040	13.15	4.24
White	Ravenscroft	Ravenscroft	4	2050	2210	2140	10.78	4.19
ALABAMA								
Black Creek Bed								
Jefferson	Majestic	Majestic	4	2460	2730	2600	3.96	0.60
Jefferson	Pinson	Dixana No. 4	4	2460	2750	2560	2.73	0.82
Walker	Dora	Sipsey	4	2330	2580	2420	3.25	1.06
Average of mines in Black Creek Bed			12			2530	3.31	0.83
Clark Bed								
Bibb	Marvel	Marvel	4	2180	2500	2320	7.20	0.66
St. Clair	Coal City	Vulcan No. 4	2	2350	2400	2380	10.16	1.46
Average of mines in Clark Bed			6			2350	8.68	1.06
Coal City Bed								
St. Clair	Coal City	Coal Branch	3	2180	2330	2250	4.35	1.10
Gholson Bed								
Bibb	Marvel	Marvel	3	2180	2310	2230	9.20	0.87
Shelby	Glen Carbon	Glen Carbon	4	2150	2410	2240	4.08	0.59
Average of mines in Gholson Bed			7			2240	6.64	0.73
Harkness Bed								
St. Clair	Parsons	Acmar	2	2650	2660	2660	11.73	0.90
St. Clair	Sanie	Margaret No. 1	3	2270	2290	2280	12.62	2.01
St. Clair	Sanie	Margaret No. 2	3	2340	2660	2450	10.19	1.81
Average of mines in Harkness Bed			8			2460	11.51	1.57

TABLE OF SOFTENING TEMPERATURES OF COAL ASH FROM EASTERN COALS

Locality, Bed, Etc.			Number of Samples from Mine	Softening Temperature, Deg. F.			Average Analysis of Dry Coal, Percentage of	
				Lowest	Highest	Average	Ash	Sulphur
1			2	2	4	5	6	7
ALABAMA—Continued								
Helena Bed								
County	Town	Mine						
Shelby	Helena	Acton No. 2	3	2230	2500	2360	7.80	0.53
Shelby	Robuck	Eureka No. 2	3	2400	2610	2470	10.02	0.39
Average of mines in Helena Bed			6			2420	8.91	0.46
Jagger Bed								
Tuscaloosa	Abernant	Abernant	1	..	..	2930	9.33	0.66
Tuscaloosa	Rock Castle	Rock Castle	3	2450	2640	2550	8.90	0.66
Walker	Carbon Hill	Galloway No. 11	4	2590	2910	2600	11.19	0.69
Average of mines in Jagger Bed			8			2690	9.81	0.67
Jefferson Bed								
Jefferson	Morris	Indio	4	2060	2220	2120	7.45	2.80
Mary Lee (Big) Bed								
Jefferson	Littleton	Banner	3	2710	2860	2770	11.32	0.84
Jefferson	Palos	Bessie	6	2790	2950	2870	10.44	0.78
Jefferson	Palos	Palos	2	2870	2930	2900	7.36	0.58
Jefferson	Sayreton	Sayreton	3	2670	2850	2770	10.47	0.77
Average of mines in Mary Lee (Big) Bed			14			2830	9.90	0.74
Maylene Bed								
Shelby	Maylene	Climax	1	....		2380	8.92	0.42
Shelby	Maylene	Maylene	4	2190	2470	2320	7.66	0.48
Average of mines in Maylene Bed			5			2350	8.29	0.45
Montevallo Bed								
Shelby	Aldrich	Aldrich	4	2090	2470	2330	7.24	0.76
Nickel Plate Bed								
Jefferson	Bessemer	Virginia	5	2470	2800	2620	4.73	0.75
Pratt Bed								
Jefferson	Mulga	Mulga	7	2290	2580	2430	5.49	1.59
Thompson Bed								
Bibb	Coleanor	Coleanor	4	2060	2150	2110	8.24	0.58
Bibb	Garnsey	Garnsey	3	2370	2400	2380	11.69	0.49
Bibb	Piper	Piper No. 1	3	2130	2320	2200	6.61	0.49
Average of mines in Thompson Bed			10			2230	8.85	0.52
Upper Straven Bed								
Shelby	Straven	Straven	2	2200	2490	2340	7.45	0.88
Yellow Creek Bed								
DeKalb	Blanche	Underwood Prospect	1	..	..	2280	11.46	2.74
DeKalb	Blanch	Yellow Creek	3	2570	2700	2620	13.41	1.44
DeKalb	Fort Payne	Beeson Gap	1		..	2210	16.84	4.56
Average of mines in Yellow Creek Bed			5			2370	13.90	2.91
Youngblood Bed								
Bibb	Belle Ellen	Belle Ellen	5	2010	2220	2070	5.29	1.37
Bibb	Marvel	Daley	1			2190	11.95	0.78
Average of mines in Youngblood Bed			6			2130	8.62	1.08
MISCELLANEOUS (Coal Beds Not Identified) BEDS								
Shelby	Straven	Montevallo	2	2190	2290	2240	8.34	0.86

NOTE.—A plus sign(+)placed before a given value denotes that the true value is above that indicated.

Connellsville Coke Prices for Eighteen Years

Average Prices of Prompt Connellsville Furnace Coke, per Net Ton at Oven

	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919
January	$2.90	$5.00	$1.60	$2.46	$2.62	$3.53	$1.92	$1.59	$2.55	$1.40	$1.82	$3.88	$1.85	$1.50	$2.94	$9.50	$6.00	$5.65
February	2.50	5.00	1.52	2.56	2.14	3.50	1.86	1.59	2.12	1.45	1.78	2.52	1.85	1.50	3.38	9.62	6.00	4.44
March	2.87	5.00	1.65	2.43	2.24	3.02	1.72	1.60	2.00	1.55	2.12	2.40	1.90	1.50	3.47	9.60	6.00	4.06
April	2.50	4.20	1.60	2.07	2.45	2.72	1.57	1.60	1.77	1.59	2.39	2.15	1.86	1.50	2.41	7.38	6.00	3.65
May	2.50	3.50	1.50	1.87	2.46	2.16	1.50	1.57	1.66	1.50	2.28	2.13	1.77	1.50	2.30	7.80	6.00	3.69
June	2.65	3.00	1.45	1.82	2.32	1.89	1.55	1.52	1.65	1.42	2.02	2.11	1.75	1.56	2.49	11.25	6.00	4.00
July	3.00	2.50	1.45	1.81	2.51	2.40	1.57	1.58	1.59	1.44	2.21	2.45	1.75	1.64	2.75	12.75	6.00	4.07
August	3.87	2.25	1.45	1.80	2.76	2.62	1.50	1.66	1.57	1.46	2.21	2.50	1.70	1.50	2.80	13.60	6.00	4.31
September	5.00	2.20	1.45	2.10	2.85	2.82	1.50	2.39	1.60	1.50	2.37	2.29	1.65	1.61	2.94	11.12	6.00	4.56
October	8.00	1.90	1.47	2.61	2.84	2.85	1.53	2.76	1.59	1.50	3.41	2.98	1.60	2.03	4.88	6.00	6.00	4.52
November	6.00	1.75	2.04	2.95	3.13	2.41	1.72	2.74	1.50	1.52	3.94	1.82	1.52	2.28	6.90	6.00	6.00	5.87
December	6.00	1.62	2.12	2.79	3.52	2.06	1.82	2.67	1.44	1.60	4.00	1.75	1.50	2.64	8.38	6.00	6.00	6.12

Average Prices of Prompt Connellsville Foundry Coke, per Net Ton at Oven

	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919
January	$3.17	$6.50	$2.18	$2.38	$3.42	$4.25	$2.45	$2.00	$2.90	$1.90	$1.97	$4.40	$2.50	$2.00	$3.50	$9.75	$7.00	$6.25
February	3.50	6.50	2.10	2.68	2.65	4.00	2.39	1.95	2.70	2.10	2.09	3.25	2.50	2.00	3.50	11.00	7.00	5.00
March	3.50	6.50	2.25	2.75	2.78	3.65	2.25	1.95	2.60	2.05	2.56	3.00	2.45	2.00	3.75	11.60	7.00	4.94
April	3.12	5.50	2.15	2.70	2.95	3.31	2.22	1.86	2.45	2.00	2.69	3.00	2.40	2.00	3.56	9.13	7.00	4.30
May	3.15	4.50	2.00	2.55	2.81	3.00	2.03	1.85	2.20	1.81	2.58	2.85	2.40	2.00	3.25	8.90	7.00	4.31
June	2.87	3.50	1.90	2.40	2.65	3.00	2.00	1.80	2.17	1.76	2.40	2.80	2.32	2.00	3.25	11.72	7.00	4.56
July	3.20	3.25	1.80	2.35	2.79	3.00	2.00	2.00	2.15	1.82	2.40	2.70	2.22	2.05	3.25	13.25	7.00	5.00
August	4.25	3.00	1.75	2.25	3.00	3.08	1.92	1.95	2.15	1.85	2.40	2.90	2.25	2.00	3.30	13.20	7.00	5.25
September	6.00	2.87	1.85	2.50	3.19	3.20	1.90	2.55	2.12	1.85	2.54	2.90	2.10	2.07	3.31	11.75	7.00	5.80
October	9.00	2.87	2.00	3.00	3.31	3.25	2.10	2.90	2.10	1.81	3.65	2.81	2.00	2.35	3.88	6.00	7.00	6.25
November	7.00	2.50	2.25	3.50	4.00	2.75	2.20	3.25	2.05	1.85	4.25	2.60	1.92	2.88	7.10	7.00	7.00	7.00
December	7.00	2.25	2.35	3.50	4.12	2.50	2.25	3.20	1.97	1.90	4.50	2.50	1.90	2.95	8.63	7.00	7.00	7.00

Alabama Coal Trade in 1919

By H. B. McLaurine
Birmingham, Ala.

THE COAL industry entered the year 1919 hedged about by the restrictions of Government control, which regulated the price and also the distribution through the month of January. The demand for steam coal through this month from priority consumers and interests who were allowed a more or less restricted supply, absorbed the whole production, which was crippled by reason of the festivities of the holiday season.

Released of government control on Feb. 1, the steam market eased up considerably, only the higher grades moving easily to the trade at Government schedules, consumers buying sparingly—only in sufficient volume to take care of current needs, the tonnage taken being confined for the most part to railroads and other public utilities, and industries whose activities were not seriously crippled by the withdrawal of business incident to war conditions, all other consuming interests suffering from the unsettled conditions, and many mills and plants were either idle altogether or running on short time.

Steam users also refrained from contracting or buying in any considerable quantity, anticipating a reduction in prices, which did not materialize, due to the inability of operators to reduce labor and material costs to take care of any portion of the small margin of profit allowed in the selling prices fixed by the Fuel Administration.

Railroads Neglected to Renew Contracts Promptly

Railroad contracts which expired in April, May any June were not renewed promptly, due to much negotiation for price reduction, but were finally closed for practically the normal tonnage taken from this field, the regular schedule figures being paid in most cases, prices ranging from $2.25 per ton mines for the lower grade mine-run coal to $3.86 for Cahaba and other high grade prepared fuel. Industrial contracts were also negotiated at Government figures, the tonnage sold being relatively small. The bunker trade through the ports of Mobile and New Orleans was fairly good, and some export coal was moved to Cuban and South American ports, but this trade was restricted by a lack of bottoms, unfavorable freight rates, and inadequate loading facilities at the ports in question.

The strike of union miners throughout the country again forced government price and distribution restrictions to be reinstated on Nov. 1, but production only suffered temporarily in this district and a heavy tonnage was shipped into Western and Southwestern territory where the supply was cut off from fields where the strike was more successfully sustained. Notwithstanding this diversion the industries in Alabama territory were not handicapped seriously by a shortage in coal supply.

Little variation from government schedules in effect on Jan. 31, 1919, was made in market quotations during the year on steam fuel, and these rates are fairly representative for the twelve months and are herewith given:

	Mine-Run	Slack	Lump
Big Seam	$2.45	$2.40	$2.75
Cahaba, Black Creek, Yolande	3.45	3.10	3.75
Pratt	2.85	2.45	[illegible]
Warrior-Pratt, Harkness, Helena	2.90	2.70	3.20

A strong domestic market prevailed throughout the year and the supply of lump, nut and egg was inadequate to meet the requirements of the trade. The sluggish steam market served to prevent the producers of the domestic sizes of the medium and lower grades from supplying their normal quota of the needs, the output of the strictly domestic operations being only a small percentage of the requirements. Contracts were made as of April 1 based on the government schedules, with a provision for an increase of 10c. per ton per month through September, and by June the anticipated tonnage for the year was contracted for, and the available supply for the spot trade from time to time commanded premiums of from 25 to 75c. per ton above the September quotations.

Retail Demand Well Supplied

Retail yards carried the smallest stocks in years, but due to unusually mild weather as a whole, were able to supply the retail demand from receipts. Quotations for the various grades of coal were as follows per net ton for the year, f.o.b. mines:

	Lump and Nut
Big Seam	$2.75@$3.25
Cahaba and Black Creek	3.75@ 4.50
Corona	3.40@ 3.75
Montevalle	4.35@ 5.00

There was little accumulation of coal at any operations during the year, production being maintained on as near a parity as possible with the needs of the trade, which, with the exception of domestic sizes, necessitated only from three to four days per week as a working schedule.

South American Trade Sought

Plans are now under way for developing an extensive market for Alabama coal in South American countries and also in Cuba. Ample barge and towing facilities have been provided on the Warrior River by the Railroad Administration for the handling of a heavy tonnage to the ports of Mobile and New Orleans, and Alabama operators are negotiating for the construction of storage bins at the former point and the provision of dockage facilities with equipment for loading bunker and export coal with dispatch. The Shipping Board recently granted a differential of $1.50 per ton as against Atlantic ports to Cuban and South American points.

Mexican Coal Operators Hope to Sell Coal in United States

According to the American consul at Piedras Negras, Coahuila, Mexico, the coal mines of that district have not increased their output over past estimates owing to the lack of demand for coal by the smelters throughout the country. He says, however, that local coal companies have lately set on foot a movement by which they hope to be permitted to export coal to the United States for commercial sale. It is understood that the companies' main argument before the Mexican government is the fact that more coal can be produced than is consumed in Mexico, and by exporting coal to the United States they will be able to keep their skilled labor until the demand for coal in Mexico increases.

Jere H. Wheelwright

AN OBITUARY

JERE H. WHEELWRIGHT, one of the foremost and most esteemed of coal operators, had quite an exceptional and meteoric career. To begin with, he was, in his early days, a lawyer who had not so much as seen a coal mine, and he took up coal mining when everything seemed to point rather to his making his reputation politically. His trend was all the time away from politics. He had no taste for political preferment, and when he had an opportunity to be nominated for Governor of Maryland he resisted the importunity of his friends. Then also he is one of those who went West and did not make good, at least so he regarded it. He came back to the East, that we have been taught to regard as a place with all the opportunities staked out and settled, and in a few years he made himself a considerable fortune.

Jere H. Wheelright was born, May 15, 1867, in Westmoreland County, Virginia, the son of a country physician, Dr. Frederick Dodge Wheelright, his mother being originally Miss Eleanor Ann Hungerford. He was educated in private schools, but while still a youngster was brought to Baltimore and was placed at school there. Later he went to Washington, D. C., to what was then called Columbia University. The name of this institution of learning is now the same as that of our first President. He graduated in law with the class of 1900 at the age of 23.

He then left for Seattle with the full purpose of practicing his chosen profession. But he failed and soon returned. Soon after he arrived from the West he met U. S. Senator John M. Camden, on whom he made quite an impression. The Senator made him his secretary, but when Senator Camden was replaced by Stephen B. Elkins, Mr. Wheelwright was retained by the newly elected Senator in the same position.

Senator Camden had been largely interested in the Monongah Coal Co. and he induced his former secretary to associate himself with that concern. Coal mining and Jere Wheelwright seemed to fit together quite neatly. He soon became superintendent of the Highland Coal & Coke Co. While in this position his eye lighted on the valuable coal lands of Senator Camden along Anderson's Run into which hardly a pick had been struck. He decided to lease and operate them. This venture was successful, but the operation proved quite strenuous. As conditions were then he could only just make it pay. About this time he worked as a miner so as to get actual experience in the mining of coal. An athletic young man, he was quite equal to this test ,and it is recorded that he did not shirk his work, but put in long hours such as were customary in that day in the Fairmont region.

About this time Mr. Wheelwright joined with Clarence W. Watson to form the Fairmont Coal Co. In 1903 they purchased outright the interests of the Baltimore & Ohio R.R. in the Consolidation Coal Co. Everybody thought the sale was a mere form and Wheelwright and Watson, mere dummies, until Watson became president and Wheelwright vice-president. They acquired more coal lands, and H. Crawford Black with others backed them in their ventures. Today the interests of Watson and Black with those of the Wheelwright estate are regarded as controlling the Consolidation Coal Co. The stock has been increased from $10,250,000 to $25,000,000 and the dividends from 2 to 8 per cent. The capital of companies over which the Consolidation men have had control since 1904 are now capitalized at $40,000,000.

When Clarence Watson entered the Senate Mr. Wheelwright became president. While staying at the Plaza Hotel, New York City, he developed influenza and latter suffered from abscesses in his ears and other *sequelae* of that troublesome disease. Accordingly he gave up his position as president and took the less onerous position of chairman of the board of directors.

But Mr. Wheelwright's war record must not be overlooked. He took a strongly patriotic stand, declaring that the time was not one for profits but for patriotism and announcing that he would stand by the Fuel Administration no matter what prices it set. He formed the National Coal Association of bituminous coal producers and became its first president. His purpose was to back up the Fuel Administration.

A sudden attack of heart disease carried him off at the Hotel Grande, Paris, on Jan. 7. He had just arrived at that city. He was expecting to stay in Europe for some months and then go on to South America, but death frustrated his plans. Mr. Wheelwright was fond of sport—of hunting, fishing and horse racing. How could he fail to be a devotee of the third, coming as he did from Westmoreland County, where even farm horses are of noble strain?

His wife, née Elealon Polk Kalman, of Carroll County, Md., died on Jan. 20, 1917. Mr. Wheelwright leaves two sons and two sisters, the latter being Mrs. Mary Lee Runt, of Washington, and Miss Nellie Wheelwright, of Los Angeles, Cal.

Statistics of Pennsylvania Americanization Bureau

E. E. Bach, director of the Pennsylvania Americanization Bureau, has the following to say regarding the Americanization problem in cold figures:

> There are 13,000,000 foreign-born persons in the U. S. today; one-third of these were born in Germany or her allied countries in the recent war; ½ of these are of voting age and only 4 of every 1,000 attend school to learn the English language. There are 19,000,000 more persons in the U. S. born of foreign parentage. Together they aggregate 32,000,000, or nearly 35 per cent, or over ⅓ of the entire population of the United States is foreign-born and of foreign-born parentage.
>
> There are 85 per cent of the workmen in the slaughtering and meat-packing houses who are foreign-born; 70 per cent in the coal mines; 87½ per cent in the woolen mills; 90 per cent in the cotton mills; 50 per cent in the shoe factories; 80 per cent in the furniture factories; 50 per cent in the collar, cuff and shirt industries; 80 per cent in the leather industries; 50 per cent in the glove industries; 95 per cent in the sugar refineries; 50 per cent in the tobacco and cigar industries; 70 per cent in the iron and steel industries; 80 per cent in silk industries; 90 per cent in refining petroleum industries; 66⅔ per cent of the workmen engaged in construction and maintenance of railways; 72 per cent of the workers in the four largest clothing manufacturing houses in the United States.
>
> Pennsylvania is second in the United States in number of foreign-born. Twenty-two per cent of all immigration, previous to the war, was deflected toward this state.

The total foreign-born population....	1,438,719
The total number of illiterates.......	179,982
The total number of foreign-born illiterates	149,592
The total number naturalized........	248,827
The total number having first papers.	46,416
The total number of aliens..........	387,766
The total number of unknown.......	78,601

In the coal industry of Pennsylvania alone there are 328,505 workmen comprising 35 nationalities and languages.

A. I. M. E. to Have a Big Session

On Monday, Feb. 16, and until Thursday, Feb. 19, the American Institute of Mining and Metallurgical Engineers will hold its annual New York session—the one hundred and twenty-first meeting of the institute. The interest of the organization in the politics of the industry is shown by the program of Tuesday, Feb. 17, when at 2 p. m. the meeting will introduce: "A definite program of study and work on behalf of the better operation of the bituminous coal industry: the causes of intermittency; how and when the irregularities occur; the actual number of days worked by the men during each season of the year; a possible alteration in the wage basis; actual wages received by the workers during each season of the year; the question of storage in all its phases with relation to the use of all possible places for that storage, such as, at the mine, at the industrial plants, etc."

It is to be hoped that the secret will be kept that the engineers hope to canvass this whole subject in less than an afternoon session, because the operators are protesting that the matter is so large that it cannot be presented to the Bituminous Coal Commission in two months. But conferences of this kind are ever bold in their programs, often settling the whole labor question in a half a working day, and so the institute hopes to find time to consume and discuss two other morsels of information in the same afternoon—"Low Temperature Carbonization of Coal," by S. M. Parr and T. E. Layng and "Demonstration Coal Mines," by J. J. Rutledge and such other papers probably as may stroll in later.

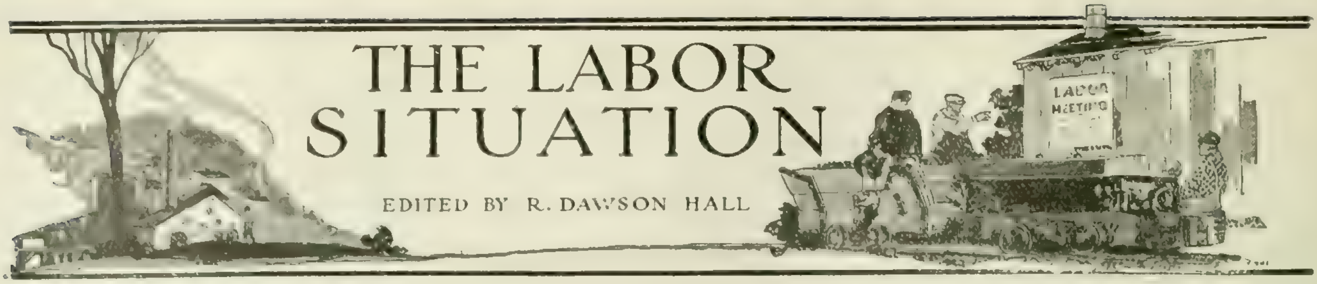
The Open Forum on Mine Taxation will be held in the morning of the same day and will be probably of no little interest, as most of the members have by this time arrived at no little maturity of judgment on the matter.

Oil takes four sessions—two on Monday and one on Tuesday. Non-Ferrous Metallurgy of the Institute of Metals Division meets on Tuesday morning. A Geology and Mining Session meets on Wednesday morning and discusses among other matters "Unwatering a Mine by Air-Lift," by S. F. Shaw, "The Contract Wage System for Miners," by A. K. Knickerbocker and "Earth and Rock Pressures," by H. C. Moulton.

Iron and Steel Session Meets Feb. 18

Also on Wednesday the Iron and Steel Session meets to continue its discussions in the afternoon, while the Alloy Steel Sessions have a meeting in that same half day. At another meeting in the afternoon the reports of the subcommittees of the Committees on Industrial Organization will be made.

Now for the entertainment. There will be a buffet lunch on each of the first three days at 12:30 p.m., a smoker on Monday evening and an excursion on Thursday to the Bush Terminal, Brooklyn by sight-seeing automobiles from the Engineering Societies' Building. The ladies hold an afternoon tea on Monday at the home of Mrs. Mark L. Requa; the same evening they meet again at the Societies' Building. On Tuesday they have afternoon tea at Senator W. A. Clark's residence, and on Wednesday they attend a matinee performance of "Monsieur Beaucaire." On Tuesday, for both sexes, is the big banquet. A large attendance is expected as the New York sessions never fail to bring together an aggregation of the leading men of the mining industry located in New York city and throughout the country.



THE LABOR SITUATION

EDITED BY R. DAWSON HALL

Coal Miners Better Paid Than Other Classes of Labor, President's Commission Expected to Report

The facts bearing on conditions among the miners which the public does not generally know will be brought out in testimony before the President's Commission now investigating the bituminous coal industry, according to J. W. Dawson, former government expert, who has testified at previous investigations.

Mr. Dawson was production manager for West Virginia under Fuel Administrator Garfield, and had occasion to visit and investigate every coal field of the country for the Fuel Administration. In the course of his investigations he said he encountered facts tending to show that the miner gets higher wages than men in many other occupations, and that he does not suffer from unemployment, since he makes of mining only a seasonal occupation.

"The award of the Bituminous Coal Commission," said Mr. Dawson, "will doubtless show that the coal miners earned, even before the Garfield fourteen per cent advance, higher wages than many other classes of labor.

"The evidence given to the commission, I think, will prove conclusively that the miners have not suffered on account of the coal mines not working every day, for the reason that the miners did not work more than about sixty-two per cent of the days the coal mines operated. Had they worked every day they would have earned about thirty per cent more than they did earn and still have had a reasonable number of leisure days.

Miners Paid Far More Than School Teachers

"The evidence will likewise show that the miner, even working as little as he does, can earn from $150 to $300 a month, which compares very favorably with other earnings in the mining fields. For instance, against these earnings of the miner, school teachers in the same district receive from $60 to $75 a month; bank clerks, from $75 to $125 a month; store clerks, from $60 to $90 a month—less than one-half what the miner can make, with heavier living expenses, as the fixed expenses of the coal miner, such as rent, fuel, light and water, have not advanced materially during the period of ten or twelve years, these items being supplied by his employer at a nominal rate.

"Another thing the importance of which is not generally understood by the public, is that many coal miners use the coal mines as a byproduct for labor and earnings, which accounts to a large extent for their not working regularly. They have small farms on which they grow crops, working them during the spring and fall, and working at the coal mines when not otherwise employed. Their earnings at the coal mines, therefore, are net profit over and above what the regular small farmer would make, as they engage in mining at such seasons of the year as find other farmers practically idle."

During the course of the hearings on Jan. 19, T. W. Guthrie reviewed the history of miners' lamps, in which he showed that it always has been customary to recognize the lamp as part of a miner's equipment. It has been furnished as it has been customary to furnish picks, shovels and drills. "In fixing his wage and working conditions," said Mr. Guthrie, "this expense has always been considered. The electric cap lamp has been introduced to aid in the safety of the mine worker and to add to his convenience and efficiency. It increases his earning power. The operator in purchasing electric cap lamps has departed from the old system because of the high initial cost of the electric lamp over the old style lamp.

The present scale in the Pittsburgh district requires the miner to pay 5c. a day for the use, upkeep, and care of this lamp. The miner has the great advantage of a better light, clean apparatus and a lamp contributing greatly to his safety in the mine. The sum charged the miner for the use of the lamp does not begin to compensate the operator for the expense incurred in providing and maintaining it. We deny the allegation that the earnings of the miners have been lessened by the introduction of the electric lamp. This demand is but another attempt on the part of the miner to procure an additional advantage, which, in its final analysis, has the same effect as a wage increase."

Ohio Miners Can Produce Big Coal Tonnages

C. E. Maurer, in the course of his remarks before the commission, said: "There is not a state in the Union with the exception of Utah, where in the five foot seams of coal the production of so many tons per man is as high as in Ohio. From a productive standpoint Ohio, where 50 per cent of her production is in the five foot seams of coal, does better than any of the neighboring fields. Therefore, the earning capacity of the miners must be at least the equivalent of the miners in the other states. I contend the miners of Ohio are not bearing an undue burden, notwithstanding the competitive relationship Ohio bears to the other states.

"The miners are getting the highest wages in the history of the industry. The war is over and yet their wages have been increased. Competition is coming again just as certain as we are here. The 250,000,000 tons of coal, where labor is sold under the law of supply and demand, is still in the market. I want the commission to bear that in mind in dealing with this question."

P. H. Penna told the commission that he agrees with the miners in that the fourteen per cent increase should be figured on the regular scale of prices plus any bonus that was paid prior to the fourteen per cent increase.

With regard to the allegation by the miners that the operators in Indiana are violating a weekly payday law, Mr. Penna explained that the legislature passed a law stating that the miners may demand a weekly payday. The bill, he said, was the work of demagogic politicians. The law conferred no additional right since the miners always have had the privilege of requesting a weekly payday. Employers were not directed to established weekly paydays.

"Two-Men-to-Three-Places" Rule Opposed

The practice in a considerable portion of the Indiana field of providing three working places for two miners met the objection of Mr. Penna who declared that it worked a hardship on the operators because it meant the maintenance of one-third more development than was actually needed.

In his statement, Thomas T. Brewster said, "The effect of such a violation of economic law as the six hour day, five days a week, would be to restrict the opportunity of a majority of men for the purpose of dividing such lost opportunities with men and mines which are now so situated that they do not average 1,560 hours of work per year. A proposition to restrict individual output and divide the business is one in which the operators cannot enter into legally. It is impossible from a practicable standpoint even if it were legal."

The demand for time and half or double time caused Mr. Brewster to say that under this proposition, as expressed, is veiled the purpose to prevent the employment of any man outside of the regular working shift hours, notwithstanding the fact that such work may be necessary or advantageous. If such work were not done at those times it would impede the operation of the mine and result to the disadvantage of a great majority of employees, he asserted. The principal motive of this demand, he said, is for the purpose of abolishing night machine work.

"The mining wages now being paid the men employed in the thin veined mines of northern Illinois," asserted Mr. Brewster, "are controlled by economic necessity. It is plain that any further increase in the rate of wages there, which would widen the differential in the cost of producing coal in northern Illinois above the cost of production in the rest of the state, would cause the abandonment of the mining business in northern Illinois, a district in which production has been declining rapidly for many years." At a later point in his statement, Mr. Brewster urged the commission to restore the 7c. differential which had existed prior to 1910 when the miners after six months strike forced a compromise which reduced the differential to 4c., the present differential which the miners are asking to be removed. In regard to the differential between pick- and machine-mined coal, Mr. Brewster explained that many operators installed machines to take advantage of a 10c. differential. Disputes resulted but an agreement finally was reached to submit the whole matter to arbitration. This arbitration has been defeated, he pointed out, by the refusal of the miners to agree upon the third and independent person who was to be on the Commission. As a result a great many mines are still being operated without machines.

William Mitch, speaking of the situation in Indiana for the miners, asserted that the office force of every coal company operating in Indiana is paid exclusively with money collected from the men on what is known as the flicker system where men are compelled, he said, because of their economic conditions, to draw their pay before payday. The companies, he declared deduct 10c. on the dollar. "That is the real reason, in my opinion, why the operators do not want to grant a weekly payday," Mr. Mitch stated to the commission. Mr. Penna's rebuttal to the statement was an additional payday would add materially to administrative expense which would not have to be met by companies with which they had to compete. Anyway, he said, it is not necessary and it is not advantageous.

Philip Murray, of the Pittsburgh district, speaking of the thick-vein differential, said in part: "It is a selfish business proposition with the thick-vein operators. They are anxious to retain the extra profits which they are making over their competitors and at the same time retain for themselves a distinct advantage by reason of lower production costs, as well as having more days to operate than their competitors.

During the hearing on Jan. 20, Mr. Farrington made the following statement with regard to clean coal: "I never knew of a miner's official who had any desire whatever to protect men who willfully loaded impurities in their coal. Every intelligent officer knows that with the overdevelopment within the industry there is a desperate competition for business. The mine producing the cleanest coal is going to get the market as against the mine allowing an output of dirty coal. It is to our advantage to have clean coal produced and loaded."

Operators Discuss Differentials at Commission Hearing

With the opening of the second week of the sessions of the President's Coal Commission the operators completed their replies to various of the claims of unfairness made by the miners. Tracy L. Guthrie, representing the Pittsburgh district; C. E. Maurer, of the Ohio field; P. H. Penna, of the Indiana district; and T. T. Brewster, representing the Illinois operators, went into the technical points brought out by the miners.

HENRY M. ROBINSON, REMBRANDT PEALE, WILLIAM B. WILSON, AND JOHN P. WHITE

Robinson, a prominent lawyer of the Far West, represents the public. He was formerly a member of the U. S. Shipping Board, and took part in the Paris Peace Commission. He is still a member of the Second Industrial Commission.

Peale, representing the operators, is a member of the New York firm of Peale, Peacock & Kerr. He was head of the Tidewater Coal Exchange during the war, and later a member of the Fuel Administration, associated with Mr. White in the settlement of labor disputes.

William B. Wilson is Secretary of Labor and was formerly secretary-treasurer of the United Mine Workers of America.

White, representing the mine workers, was formerly president of the U. M. W. of A.

It was pointed out to the commission that to destroy the differentials between the thick-seam and thin-seam coal veins would have the effect of closing many mines. The Geological Survey was given as authority for the opinion that the mines in West Virginia and Kentucky normally can undersell Ohio coal. It was pointed out that the differential had been in use satisfactorily for thirty years.

The commission was told that it is entirely unfair to the coal operators for the miners to state that they are not being paid for the slate which they remove. Evidence was filed to show that this was taken into consideration when the scale of wages was formulated. It also declared that the cost of lamps and of explosives also were taken care of in the scale now in force. It was stated that the old-style oil lamps would cost more to operate under present conditions than the special electric lamps.

The situation with regard to the use of permissible explosives called forth considerable explanation. It was shown that it always has been customary for the miner to furnish his own explosives and while permissible explosives cost more per pound than black powder, it is more efficient and there is also the element of safety involved. Attention also was called to the fact that the price of permissible explosives has not advanced since 1917.

Mr. Maurer introduced documentary evidence to show that from 16 to 20 per cent of the men are idle every day when work is available. "If the commission should approve a price of 10c. per in. on draw slate it would add $1,500,000," said Mr. Maurer, "to the cost of mining in Ohio and would wipe out the entire Hocking Valley district where there is over 18 in. of slate."

Continuing, he said: "If so many men are now employed in the industry that a wage must be paid which will enable them to live for six days on three days' work, so that all may be employed, they will come back next year and ask for an advance so that two days' work will cover expenses." He pointed out that under those conditions the industry would continue to attract a great number of laborers from other occupations.

Mr. Penna, discussing the matter of drivers taking mules to and from the stable, pointed out that this was covered by an arrangement made in 1898 and that no attempt had been made to change it at any interstate conference.

Edward Stewart, president of the Indiana Mine Workers' Union, charged that certain Indiana operators were loading bone coal. He gave the names of five Indiana operators whom he charged with that practice. At Mr. Penna's suggestion those operators will appear before the commission. Mr. Penna said Mr. Stewart's charge was a bad one, and loosely made.

Want Flat Increase in District 17

The coal commission appointed by the President will be called upon to settle two labor disputes arising in District 17 of West Virginia. One of them is in connection with the application of the 14 per cent wage increase in District 17. The officials of the United Mine Workers of America claim that the increase should be computed on the basis of wages paid in the Central Competitive territory. Should the increase be applied through that method it would amount to about 20 per cent. The operators of District 17, which embraces the Kanawha and northern West Virginia fields, insist that the increase should be computed on the basis of wages now paid in District 17, or, in other words, that the increase should be computed by adding a straight 14 per cent to present payroll figures. To do otherwise would be to wipe out the differentials between the Central competitive states and West Virginia—differentials which were established for the purpose of equalizing freight charges.

The other question which is to be submitted to the coal commission is that involving recognition of the union by the Penn Mary Coal Co., a subsidiary of the Bethlehem Steel corporation, operating in the Monongalia and Preston County fields of West Virginia, the company having announced that it proposed to operate its mines on an open-shop basis in the future. Officials of District 17 are waging a battle to prevent the Penn Mary Coal Co. from carrying out its program. Officials of the District in question went to Washington on the night of Jan. 11 for the purpose of submitting the questions in disagreements already outlined, to the coal commission.

Miners Like Co-operative Stores

A total business of $150,000 was done in December of last year by the Central States Co-operative Society, 612 Missouri Ave., East St. Louis. The coal-mine workers, who have a large place in this society, found it quite helpful during the strike, for it extended credit to them and to those who were laid idle by their strike, whether members or non-members of the association. This policy made it extremely popular with the mine workers and caused them to give it a large amount of trade, thus largely accounting for its big business turnover. Only workmen having stock in the society are permitted under normal conditions to purchase at its stores.

Indiana's Causeless Strikes

Stampede strikes, as unauthorized suspensions are called in the coal industry, are interfering with production in the Indiana field, according to reports at Terre Haute, workers in the Jewel mine near Linton, Ind., having quit work because of a disagreement as to a method of weighing coal that has been in use at that mine since its operation began several years ago. The tipple is not of sufficient height to permit the use of weighing pans such as are in operation at the majority of mines in that region. At mines where the tipple is of sufficient height the coal is emptied into the weigh pans as it comes from the mines and before it goes to the screens.

At the Jewel mine the coal is weighed in the cars in which it comes from the mines, the weight of the car being deducted from the total weight shown. This plan has heretofore satisfied the men employed, but now the men demand that the coal be weighed separately. When it was explained to them that such a plan was impossible, they went on strike. At another mine near Wheatland, it is reported that the men are on strike because of their claim that the mules used in the mines were not properly curried and cared for.

During the last two weeks in December when almost every coal mine in the Linton district was working steadily George Walls, a loader at Spring Valley mine, earned $199.25 for two weeks' work, and Steve Patrola, who loads at the same mine, received $208. However, these are exceptional cases and it is a new mine, the coal being high and easily dug. The day men at the same mine will receive $68.40 for the two weeks' work. The average pay of miners in this field will be about $70 for the two weeks. The miners point out that the mines were exceedingly busy during the last two weeks of December, making up for time lost during the strike, and that their average for the year will give them only a reasonable living.

Kansas Mines Again on Rampage

Four hundred Kansas miners went on strike on the morning of Jan. 26 because of the passage of the Industrial Court bill. A mine of the Western Coal and Mining Co. at Franklin and a mine of the Wear Coal Co. at Dunkirk are idle.

The strike of 400 miners means an immediate test of the new Industrial Relations Court law, Governor H. J. Allen declared today. Although the court has not yet been organized to operate, it became legally established with the publication of the new law in the official State paper Saturday.

Governor Allen and members of the court went into conference on Monday morning, and later Governor Allen in a formal statement said that he had asked Attorney General Hopkins to go at once to the mining district to assist local authorities "in a vigorous prosecution under the criminal remedies provided by the court."

"I deplore the spirit which brings any union into open defiance of the laws of this State," he added. "There is no question involved of the right of any individual miner to cease employment, but if investigation discloses that this is a concerted movement to defy the law, the State of Kansas will assert its sovereignty. On the other hand, if these striking miners desire to quit mining in Kansas because they do not approve of the Industrial Court law, they have that privilege, but they must not interfere in any way with anybody else who wants to work in these mines.

"The law is intended to give the miners a just tribunal in which a fair and impartial adjustment of their grievances may be had under the guarantee of the State. I feel that every fair-minded citizen of Kansas will regret the refusal of the miners to give this court and the new law decent consideration and a fair trial."

Miners in Sydney Get 14 Per Cent

The Dominion Coal Co. and the United Mine Workers of America have agreed that an increase of wage of 14 per cent shall be given the mine workers of the coal company.

Some of the highly paid men will get no increases and some who are lowest in the scale, which has about 300 different classifications, will get approximately 29 per cent. The contract will be for one year, but every four months a readjustment may be made if unusual costs of living occur or if large increases of wages above the 14 per cent are granted elsewhere.

If the United States mine workers should get 31 per cent as they hope and as Secretary of Labor Wilson has advocated, then the Sydney men would feel that under their contract they were entitled to seek a part at least of the increase conceded to the workers in United States mines. This is the interpretation put on the agreement by J. B. McLachlin, the secretary-treasurer of District 26.

Miners Earn $10 to $12 Per Day

Many of the miners have plenty of opportunity to work, but prefer to be idle a large part of the time, is a statement made by the bituminous operators of the Central Competitive field. A statement by the operators says that they purpose to make an effort to convince the commission that the miners have plenty of opportunity to work, but that many of them prefer to be idle a large part of the time; that their wages are high and that the cost of living to them has not gone up to the high figures which their officers have given.

"The operators have maintained," says the statement, "that the differential and similar issues raised by the miners have been dragged in in an attempt to befog the real issue, which, they say, is purely one of the straight wage advance. These other issues interjected by the miners have been characterized by the operators as attempts to obtain what amounts to an additional wage increase by a subterfuge.

"Payroll evidence will be offered by the central competitive operators to show that the miners, in most fields, can make from $10 to $12 a day, and that $15 a day can be earned readily in the richer mining districts, which operate from 250 to 275 days a year. It will be shown that comparatively few of the men in the field work steadily, and that if they did their yearly earnings would be increased by from 15 to 20 per cent. This, they will show, would not add to the present cost of producing coal.

"The cost of living in mining communities will be presented to refute the assertion of miners' representatives that the cost of living in mining centers increased as much as 125 per cent during the war. The operators will show that in no mining communities have rent and fuel increased at all, while the cost to miners for food and clothes has not been such as to create any such advance in living cost as the miners have maintained before the commission."

No Check-Off in New River District

The Bituminous Coal Commission, at Washington, will be called upon to decide among other matters on the question whether the check-off is to be restored in District 29—the New River field. The new contract in that field which became effective Sept. 1 provided for the "check-off" or "closed shop." It also provided against a strike of the miners. When the miners of the New River field struck on Nov. 1, operators claimed that the contract of Sept. 1 was automatically abrogated and that the check-off became automatically abolished, and that since Nov. 15 no check-off system has been in effect.

Officials of District 29 have been endeavoring since the strike was terminated to secure the restoration of the check-off and have appealed to the Attorney General of the United States for his assistance in having the "status quo" of Oct. 31 restored.

During the Columbus convention of the United Mine Workers, Lawrence Dwyer, an official of District 29, received the following telegram from the Attorney General:

"Replying to yours of Dec. 24, I wired the New River Coal Operators' Association from Indianapolis on Dec. 10:

"'Because of the National situation, I have not heretofore acted upon your offer to reinstate the contract effective on Oct. 31, but in view of the return of the miners, and the general agreement under which they are returning, I now avail myself of your offer and request your association to reinstate the contract of Sept 1.'

"Since then I have seen personally representatives of this association and have renewed the request. I insist that the status quo of Oct. 31 must be restored."

It is true that representatives of the association have conferred with the Attorney General, but it may be stated that a decision on the part of the operators is still pending. The operators feel that the miners themselves do not want the check-off restored and that inasmuch as the contract providing for the check-off was broken they ought not to be asked to restore it. As to whether the coal commission has any authority to reinstate the contract in District 29 is also another question, the miners and not the operators having submitted the check-off question to the commission.

Miners' Wages Fair, Says Garfield

Dr. Garfield, former Fuel Administrator, in an article written for *Farm and Home*, declares the compromise that ended the coal strike to be "unsound in principle and a menace to our institutions." Dr. Garfield says:

"The wages now paid to mine workers are sufficient. The opportunity that should be the mine workers' cannot be secured merely by an increase in wages."

In proof Dr. Garfield cites the average of $950 per annum earned by the lowest paid miners working 180 days in the year, while for 200 days' work the average miner in the bituminous field of Pennsylvania, Ohio, Indiana and Illinois earned $1,660 in 1918 and $1,300 last year. This, says the article, is "more by a considerable sum than the average net receipts of the farmer and many others who may or may not work 300 days or more in the year."

"The public ought not to be asked to pay more for coal," emphasizes the ex-Fuel Administrator. "It is impossible to increase the wage of the mine workers without inciting the workers in every other industry, including, of course, agriculture, to demand an increase in wages. This would send the cost of living upward in a vicious spiral, which will in the end prove hurtful to the workingman. The purchasing power of the dollar and not the number of dollars received is the important factor.

"The public is the chief sufferer when capital and labor engaged in the production of commodities necessary to the support of life fall a-fighting," continued Dr. Garfield. "In these cases certainly the interest of the public is vital and, therefore, paramount. We may admit the right to strike on the part of labor, and the right of capital to boycott, but in each case the right of the public to live is paramount and will be asserted.

"We now are called upon to contemplate an arrangement with a group opposing the government which, however it terminates, is unsound in principle and a menace to our institutions."

To guard against affairs reaching the strike stage, Dr. Garfield in the same article urges that a permanent fuel administration be established so that it can serve as a consultive and advisory tribunal and head off difficulties before they come to a head.

Personnel at Coal Commission

The official list of the operators appearing before the Presidential Coal Commission is as follows:

Pennsylvania—J. M. Armstrong, J. A. Donaldson, W. K. Field, T. W. Guthrie, W. M. Henderson, John Mahoney, W. L. Robison, Don Rose.

Illinois—H. C. Adams, T. T. Brewster, D. W. Buchanan, George B. Harrington, Rice Miller, Herman C. Perry, E. C. Searls, William J. Spencer.

Ohio—A. A. Augustus, Michael Gallagher, W. H. Haskins, George M. Jones, C. E. Maurer, Joseph Pursglove, S. H. Robbins, C. A. Weitzel.

Indiana—W. J. Freeman, M. L. Gould, David Ingle, J. C. Kolsem, E. D. Logsden, Alfred M. Ogle, P. H. Penna, Hugh Shirkie.

The official list of the miners' committee is as follows:

Western Pennsylvania—District 5—Philip Murray, Robert R. Gibbons, William Hargest, John O'Leary, Patrick T. Fagan, John McWee, Frank Leithold, William C. Cavanaugh, James Flood, Thomas Hughes, Fred Gulick, William Haynes, William Teare, John Vogel, Harry Crawley, Andy Fassen, Michael Eagan, Clyde Jordan.

Ohio—District 6—John Moore, Lee Hall, G. W. Savage, William Robinnett, George Cecil, Thomas J. Price, John Saxton, William Roy, Will C. Thompson.

Illinois—District 12—Frank Farrington, Harry Fishwick, Walter Nesbit, William J. Snead, Charles Grace, Robert T. McAllister, Ben Williams, J. T. Yearsley.

Indiana—District 11—Edward Stewart, W. H. Raney, William Mitch, John Hessler, Harry Sutch, Harry Lentz, Charles Fettinger, U. G. Hall.

In addition, there were the national officers of the Mine Workers: John L. Lewis, William Green, Percy Tetlow, and Van A. Bittner.

News From the Capitol

By Paul Wooton

Army Seeks Fuel for 1920

Preparations are now being made to cover the fuel requirement of the U. S. Army for the fiscal year 1920-1921. The thirteen Zone Supply officers were requested by the Fuel Section of the Raw Materials and Paints Branch, Office Quartermaster-General, to notify the various camps, posts, etc., within their jurisdiction to prepare estimates of their requirements.

The preparation of specifications, proposals, bid sheets and contracts which would be satisfactory to both the Government and to the operators who are to furnish the fuel, presented an unusually difficult question, owing to the critical situation between the operators and the miners at the present time, especially in regard to an amicable adjustment of the wage scale, many operators refusing to enter into contract for supplying fuel until this question is satisfactorily settled. Contracts in effect for the fiscal year of 1919-1920 were governed by the following clause:

> In the event that labor disputes shall arise directly affecting the performance of this contract, and causing or likely to cause any delay in making the deliveries, and the Secretary of War, or his representative, shall have requested the contractor to submit such disputes for settlement, the contractor shall have the right to submit such disputes to the Secretary of War, for settlement. The Secretary of War, may thereupon settle or cause to be settled such disputes, and the parties hereto agree to accede to and to comply with all the terms of such settlement.
>
> If the contractor is thereby required to pay labor costs higher than those prevailing in the performance of this contract immediately prior to such settlement, the Secretary of War, or such representative, in making such settlement and as a part thereof may direct that a fair and just addition to the contract price shall be made therefor; provided, however, that the Secretary of War or his representative shall certify that the contractor has in all respects lived up to the terms and conditions of the contract or shall waive in writing for this purpose only any breach that may have occurred.
>
> If such settlement reduces such labor cost to the contractor, the Secretary of War or his representative may direct that a fair and just deduction be made from the contract price.
>
> No claim for addition shall be made unless the increase was ordered in writing by the Secretary of War or his duly authorized representative and such addition to the contract price was directed as part of the settlement.
>
> Every decision or determination made under this article by the Secretary of War or his duly authorized representative shall be final and binding upon the parties thereto.

NEW RULING AS REGARDS TO PRICE

After careful consideration it has been decided to eliminate this clause in the proposals and specifications for the fiscal year 1920-21, replacing it by the following:

> Prices submitted shall be on the recognized scale of wages for the district in which the mine or mines from which the coal is to be furnished may be located. It is agreed that if at any time during the continuance of the contract the wages so paid for the particular district are increased or decreased the prices agreed upon and provided for in the contract shall be increased or decreased accordingly.

The Fuels Section has sent out circulars to approximately 3,500 leading coal operators throughout the United States, whose names are on its revised mailing-list, requesting that they notify this section if they intend to submit bids for furnishing fuel for the army during the fiscal year 1920-21, and upon which post they intend to bid. Prospective bidders who have not received similar notifications from the Government should communicate with the Fuels Section immediately. This information is requested in order that proposals may be sent only to those who desire to bid, so that unnecessary expenditure of time and money involved in sending proposals to non-bidders may be obviated. A very large number of replies are being received to this circular signifying the intention of the operators to submit bids. These replies are confidential and so kept by the Government. It is estimated that contracts and proposals, together with requirement sheets, will be ready for mailing to prospective bidders about the first of March. In the event that a reply is not received to a circular, it will be considered that the operator does not desire to submit a bid, and proposals and bid sheets will not be sent him.

BIDS WILL BE OPENED ON APRIL 30

All bids received will be held until April 30, when, at 10 a. m., they will be publicly opened and read in the Fuels Section in conformity with advertisements appearing in the newspapers and coal-trade periodicals during the preceding four weeks. Each bidder shall have the right to be present at the opening either in person or by attorney. The awarding of contracts will be based on the lowest calorific value of the coal as determined by chemical analysis, consideration also being given to delivered price.

New Apparatus Approved by Bureau of Mines

Two American-built self-contained mine-rescue breathing apparatus have been approved by the Bureau of Mines. The development of American apparatus which is even more satisfactory than that developed abroad has resulted largely from the fostering of experimentation to this end by the Bureau. Those approved are the "Paul" and "Gibbs" types, of which there are many now in use.

Bill Prohibiting Coal Exportation Presented in Congress

Exportation of all coal in the United States for a term of five years would be prohibited if Congress should adopt a bill introduced by Representative Dyer of Missouri. The bill, referred to the Interstate and Foreign Commerce Committee, provides a fine of $10,000 and imprisonment for 5 years for any person who delivers or attempts to deliver coal for export. It is expected that this bill will be pigeon-holed.

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What Is a Man's Work Worth?

NOTHING is more disturbing than the fact that the miners, through their spokesman, John L. Lewis, are not disposed to have the basis of their wages fixed on the rate of return received by them in 1913. They are inclined to believe that their status was always below their deserts, and that it will continue to be so, so long as the increases in the wages paid are no greater than the increases in the cost of living.

It is indeed a herculean problem that faces the Bituminous Coal Commission if it is to decide just what any man's work is worth. The miner is advancing the claim that his work is unusually hazardous, which is true; that he is subject to occupational diseases, which is not true; that his work is laborious and unpleasant, and that therefore he should be more largely compensated. On the other hand, there are many who contend that those industries which require more intelligence, even if less brawn, should be the better paid. If the work in such industries is admitted to be pleasant, it is said that there are offsets in the way of expenditures for the maintenance of a proper appearance and that the office work is confining and unhealthy.

The arguments on both sides are not without their merit, and he would be indeed a bold man who would evaluate them. The old way of supply and demand is the better method of arriving at an answer to such problems. If the work is really so extremely desirable, men will flock to it and the rates of wage will fall, and if it is undesirable, then it will be necessary to raise the wage in order to make up for that undesirability. If the work requires a high order of intelligence, then the price must be raised in order to secure the men of the necessary mentality. If, however, the work is pleasant and can be conducted without any great degree of mental alertness, then there will be an unusual number of men who will desire to avail themselves of the opportunity to earn a clean and comfortable living in a pseudo-intellectual pursuit.

The quarrel between the white shirt and the blue jeans solves itself by the simple law of supply and demand. When, however, union activity tries by coercion to secure increases in wage, then surely we will have to base the returns in the industry on the values which have been set on labor by supply and demand, as modified, however, by the increased cost of living.

It is amazing how many people believe that they can set the right compensation for any given class of work, and when one is wondering at their temerity, the difficulty of explaining their boldness clears up, because it is immediately found that these people believe that the particular industry in which they are engaged demands qualities which should command the largest salary that the market pays.

Frequently *Coal Age* is importuned to urge that those having a good education, or having fitted themselves in some way for leadership in the coal industry, should be in the receipt of larger wages. It is unfortunate that when a man has expended a great deal of money and much time on his education that he should not receive what appears to be an adequate return for his work, but if the work is not needed, or if the return on his expenditures and his labor is not worth to his employer a big salary, it should not be paid.

In many cases we believe that the employer is too willing to accept inferior services in order to save a few dollars which could be well expended in engaging better men. Yet on the whole, the best results are obtained when the price of an article is based on what we can be induced, in open market, to pay for it. There are a number of men who, by their application or experience, have attained a certain equipment for their work, but as they do not have the genius without which their education is worthless or at least less valuable, they are compelled to accept wages which are based on the glut of such men in the market which naturally arises where an office is one of dignity and importance in the public eye and at the same time reasonably easy in its demands on the comfort and skill of the individual filling it.

How the Railways Might Back Prosperity

ESTIMATES of the *Railway Age* show that a modest forecast of the needs of the railroads in the next three years will be six billion dollars. That seems a stupendous sum, but James J. Hill several years ago estimated the amount of railroad betterment demanded at a billion dollars a year, and two billions now would buy about as much as a billion then. So a cautious and conservative estimator might be inclined to argue that not only two billions of dollars a year for three years is necessary but two billions yearly thereafter. The railroads are unable to finance such large borrowings, but if success in operation were granted them they would expend in development about two billions of money every year.

It would be well to grant them such freedom as would make it easy for them to re-establish their credit and enable them to borrow every cent of that sum. No one can doubt that the expenditure of it would stimulate all industry, the coal trade among others, and the public generally seeing the advantage of replacing a live industry for one that is moribund should do all that it can to put the railroad industry on its feet.

For the coming year appropriations for the building of $633,000,000 worth of good roads have been made. It seems probable that only about two-thirds of the mileage contemplated can be constructed because the railroads are inadequate to transport the broken rock, the sand, the cement and the brick, in adequate volume. We must be content to do what we can and not what we will, because the railroads limit our activity.

In fact until we cure the evils of transportation no industry can run without hindrance. Speed is often more important than price, steadiness of operation is usually more essential than a low freight rate, especially when all competitors are obliged to pay more for transportation and when, accordingly, the prices in the market are, on the whole, sure to be adequate to meet all expenditures on the carriage of the goods.

The public is keeping down railroad rates fearing that an increase will raise the cost of living, whereas if we do not better our railroads we shall have to lie idle a part of every year and the cost of living will soar. The nation is like the man who was so penurious he feared to buy a meal and found his strength so sapped that he lost more in decreased activity than he gained by his abstention

Official Indifference

IRRESPONSIBILITY seems to be the trade mark of the Federal Railroad Administration. Coal operators are trying to find what has happened to cars that were shipped to their customers and were confiscated by the railroads. Within a period of about six weeks, on an order of six cars of coal for an important state institution fifteen cars were shipped. Only four reached their destination and for the rest no account has been rendered. Railroads took high-grade, low-sulphur, sized coal intended for certain highly specialized work and in lieu of it furnished low-grade, high-sulphur, run-of-mine coal wholly unsuited to the work demanded.

Yet the administration is not prepared to apologize for its many breaches of common courtesy and consideration, but it is spending its time in writing laudations of its policies and practices. When it has unfavorable records of coal shortage it cleverly disguises that fact. Fortunately, the U. S. Geological Survey tallies the days which an inadequate supply of cars causes to be wasted at the mines. Thus to a certain extent the essentials of Government as recited by Aristotle are maintained, the administrative, the legislative and the judicial he would keep separate. The U. S. Geological Survey with its records is not so much administrative as judicial and the Railroad Administration tried by that judiciary is found guilty on nearly every weekly exhibit of tonnage.

So great is the home market for slack as the result of extensive campaigns for the use of fuel of that kind that operators are looking to Europe as a means of disdisposing of their sized coal, where the use of small sizes is as yet not so far advanced as in the United States.

Mine Workers' Complaints

IN GREAT BRITAIN it is quite the general practice to charge for everything received by the hotel guest—his towels, his lights, service, everything, whereas, here, we have but one charge regardless of whether towels are many, lights one or plentiful, and the service good or bad. The guest knows when he enters a hotel how much accommodation he is likely to receive. The price is fixed for all the paraphernalia as part of the cost of the room for the day.

Likewise in British mines it is customary to pay the miner for everything he does. He does not turn a hand without pay. Every binder must be measured, every clay vein evaluated and the work of making a payroll is an endless job. But here in America we have scales based on the general conditions, and the practice has not been to pay for everything—but only for unusual and unduly harassing difficulties and labor.

Why should it be otherwise? The miners have to erect props, so many to the hundred tons, therefore, why make a separate charge? In some regions more props are needed than others. That is taken care of in the local scale for the mining of the coal. All the work that goes with mining must have been considered when the scale for mining was written just as all that goes with room occupation is figured in the price of the hotel room, whenever rates are made. The lights are paid for in the room rate, so are the towels and the other services, the use of the furniture and the rugs, the bedstead and the coverlets. Thus it is with the miner; his incidentals have been always provided by him as part of his contract—the roof he rips, the draw slate he stows, the bottom he lifts, the prop he sets, and the track he lays. Shall he be granted extra for these items when he has always considered them part of the price? Now he wants pay for the light on his head, for the shovel in his hand, for the explosives he uses and for all the details incidental to mining, which hitherto he has always accepted as part of the regular mining cost.

The more itemized the scale the more trouble there will be in settling the account. With an infinity of surcharges based on matters of judgment as much as on matters of fact will come endless disputes. But were there no trouble from disagreements, what a gigantic system of accounting would result if payment were made for every trifling service? The time and labor of recording is apt to exceed the time and labor of executing the work and watching the record may well be more trying and even expensive than going without. Only a man with a distaste for work and a dislike for results is happy in finding a statement in the office as long as a mine prop, and as puzzling as a legal document. The short pay sheet is as desirable as the shorter ballot.

New Cases of Influenza

2,361 in New York
1,808 in Chicago
161 in and around Boston

It is an advantage to live in a small mining or other village if the fact is properly made use of, for, in such smaller places, we frequently have a chance to learn what contagious diseases are on the move and are liable to visit us soon and take precautions accordingly. In the last epidemic of the grip some mining villages were not reached for some months after the cities were affected and the people in those towns could have taken warning.

Washing one's hands before eating is one of the best rules for the avoidance of influenza. Using one's own towel, glass, dipper or cup, sleeping on a pillow that no one else has used are other good rules. Beware of anything that touches anyone's mouth, nose or hands. The hands readily get germs from the mouth and nose. Cleanliness is the surest guard against infection. The rules of good housekeeping and of etiquette are the surest preventives against the spread of influenza and, for that matter, against common colds.

DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

Electric Mine Haulage

Letter No. 3—Referring to the inquiry of Charles F. Sherman, regarding an electric mine-haulage problem, which appeared in *Coal Age*, Nov. 27, p. 861, I assume that Mr. Sherman did not intend to convey the idea that the leading drivers of the locomotive were actually raised off the rails. Probably the action that he observed was, the weight being relieved on the springs of the leading drivers, the wheels slipped on the rails and showed a tendency to spin.

What I judge Mr. Sherman actually desired to express was the condition of operation, which is caused by what is technically known as "weight transfer." When a locomotive is hauling a trip on level track there could be no trouble that would lift the head drivers off the rails; but trouble could be caused by the weight transfer from the leading drivers to the trailing drivers when hauling upgrade, and this may reduce the weight on the leading drivers to such an extent as to cause the front wheels to spin, transferring the work to the trailing drivers, as stated in the reply to this inquiry.

Weight transfer is directly proportional to the height of the drawbar or coupling above the top of the rail and inversely proportional to the length of the locomotive wheelbase.

Let w = weight transfer (lb.);
h = height of drawbar above top of rail (in.);
b = length of locomotive wheelbase (in.);
P = drawbar pull (lb.).

Then, by the principle of moments:

$$wb = Ph; \text{ and } w = \frac{Ph}{b}$$

The inquiry does not give sufficient data to enable an exact analysis to be made. However, assuming the locomotive to be of the two-axle type with double-motor equipment, and the haulage to be on level tangent track, the following analysis may be suggestive and helpful:

Calling the total weight of the locomotive, in pounds, W, and assuming an adhesion factor $c = 0.20$, for cast-iron wheels; or $c = 0.25$, for steel-tired wheels, the tractive force exerted by the leading drivers is

$$c\left(\frac{W}{2} - w\right); \text{ or } c\left(\frac{W}{2} - \frac{Ph}{b}\right)$$

But, the drawbar pull (P) being limited by the effective weight on the leading drivers, we write, considering the leading drivers as exerting half the pull.

$$\tfrac{1}{2}P = c\left(\frac{W}{2} - \frac{Ph}{b}\right)$$

$$Pb = c(Wb - 2Ph)$$

$$P = \frac{cWb}{b - 2ch}$$

Again, in haulage the drawbar pull (P) is equal to the track resistance (R) of the trailing load (L), in pounds per ton. For mine cars with plain bearings, we assume $R = 30$ lb. per ton of load; and for mine cars with roller bearings, $R = 15$ to 20 lb. per ton of load. Expressing this equality, $RL = P$, gives, finally,

$$L = \frac{cWb}{R\,(b - 2ch)}$$

In general, in mine haulage, the ratio of the height of the coupling above the top of rail to the length of locomotive wheelbase is such as to warrant disregarding the question of weight transfer. It would appear that the operator, in this case, is attempting to haul trailing loads in excess of the capacity of his locomotive, the weight transfer from the leading drivers being such as to cause insufficient adhesive weight on the leading drivers, with the result that those drivers spin. Perhaps this condition of excess load is accentuated by a relatively high drawbar or coupling and short wheelbase.

I would also suggest that the control resistance be checked to ascertain if it be correctly proportioned, as a resistance improperly proportioned might be partly the cause of the trouble, by tending to accelerate the speed of the locomotive too rapidly.

J. G. CARROLL, General Engineer,
Westinghouse Elec. & Mfg. Co.
East Pittsburgh, Pa.

Letter No. 4—In connection with the question asked by Charles F. Sherman, *Coal Age*, Nov. 27, p. 861, regarding the tendency of a mine locomotive to lift at the front end when hauling a loaded trip, the following may be of interest to Mr. Sherman and others, for the trouble mentioned is not an uncommon one:

Some years ago, when designing mine locomotives for a large manufacturing concern, I found this same trouble occurred in double-motor machines when the motors were center-hung, that is when both motors were hung between the axles. If we analyze the forces acting on the frame from each motor we find that one of these forces tends to lift the frame while the other acts to push it down. The result is unequal traction and motor load. This is particularly noticeable when the motors are connected in series. In those days we used to provide an independent switch to connect the motors in series for the light return trip. Some makers still use such a switch.

The unbalanced traction of the two-motor locomotives led me to the design of the three-motor, six-wheel machine, which is now so popular in building mine locomotives for heavy duty. The first machine of that design was built in 1897 and delivered to the Wheeling & Lake Erie Co., at Dillonvale, Ohio, in 1898. A patent was issued to me on the suspension and frame a year or two after; but the manufacturers, who were my employers, never went after the imitators.

It caused me some amusement, not long ago, when the mechanical engineer, at a mine I was visiting, showed me, with much pride, a 20-ton machine of this type and claimed that he had invented the three-motor machine some years before. I did not care to dissuade him as he was proud of the achievement and was experiencing what was an old story to me.

Let me say, in closing, that the best way to solve his problem is to ask Mr. Sherman for a sketch of the motor locations, which will show whether my reasoning is correct or not. ENGINEER.

———, Ohio.

Co-operation Among Mine Officials

Letter No. 2—Having read with with interest the recent articles written on this subject in *Coal Age*, I am reminded of a few points that may prove most effectual in analyzing the true meaning of the expression "to co-operate."

Co-operation, which is so necessary to any successful undertaking, requires patience and extreme flexibility as a part of the makeup of a man's personal character. This does not refer to an official only, but should extend from the president down through the entire organization to the trapper boy. Co-operation is meaningless, except it applies to all concerned in an undertaking; and then not for merely a short period of time only, but extended indefinitely.

Just as the directors of a company organize to produce a certain necessity, say particularly coal, for a period of years, they unquestionably arrange the minutest details from a *financial* standpoint, to insure the security of the organization even under the most trying circumstances. Why then should they not at the same time arrange for a working basis that will insure an efficient and co-operative system of procedure.

FLEXIBILITY NEEDED IN ORGANIZATION TO INSURE A MAXIMUM OF EFFICIENCY

Present-day undertakings are marked with a flexibility and a co-operative nature that develop efficiency in the organization. Today it is impossible for the president of a large company to visit the different plants, except at stated intervals many months apart; but this is not the case in a small company where official inspections are more frequent. Co-operation is more strikingly effective where the president and other high officials can visit the men at the working faces and talk to them in their "own language."

It will be understood that I refer here to officials who appreciate honest toil, and who, if errors are observed, possess a character that reveals the spirit of a co-worker and shows no personal pride or feelings by reason of his position. No man with personal inclinations and a selfish character has any business near a plant. In a town where the operation is productive, it is seldom that one finds an official whose attitude toward humanity would allow him to pass the time of day with one of his employees, or his wife or children. Such a man, on making one visit to his plant, would quickly be known, from one end of the town to the other, as miners are only human and do not hesitate to express their feelings toward such a person.

It is plain that every wheel in a train of gears and every cog in each wheel must co-operate or the machine cannot produce. If a single cog in the main driver is cracked the effect is to weaken and destroy the power and efficiency of the whole machine. So it is with the co-operative feeling in "an organization. It is necessary for the men "higher up" to do their share of co-operating to insure success in operation. My thought is that the president or his assistants, the general manager, manager or general superintendent should mingle occasionally with their men, and manifest a real interest in their welfare.

Considering a large company the logical man for specific co-operative plans and work is one of the three last mentioned. It is through these men that efficient co-operative plans are made effectual and results can be expected. At first each written or verbal order given will be questioned, as the men naturally have a disposition to find out how much the boss knows. It does not take long generally for the men working directly under a boss to feel the pulse of that official.

This may seem to many a very strong statement; but I dare say it will be understood by men who have worked about the mines many years, and such, after a little close consideration, will agree that I am right. Mining men as a class are very instinctive and have a faculty of finding out by many methods what others know. Indeed, it is true that an official who makes an error soon finds that the majority of his men know all about it. This being the case, an official who shows an indifferent, characteristic attitude toward the workers under him makes a mistake that leaves a bad impression on the minds of the men for a long time to come. A few such errors will surely show an indifference on the part of the men that is unexplainable.

DISREGARD OF MEN'S PHYSICAL ENDURANCE

I recall a visit made to a plant, some time ago, by a disinterested party. The superintendent with some eight men had been working on a particular job for about thirty-five hours. The men had eaten their last lunch fourteen hours prior to my friend's visit. Two of the higher officials of the company appeared at that time. The men were sullen, very indifferent and wore a characteristic "I-don't-care" expression on their faces. They talked to the visitors, with whom they were well acquainted, and told them of things that were no doubt true from all that could be seen there. The men were disgusted and had a right to be.

Any man in charge of an operation, who would treat his men in that manner did not deserve the chance of a possible promotion or even have the right to be an official. These men did not eat for at least three hours after the visitors first reached the place, and only then was opportunity given them to eat, after they had told the superintendent that they were going home. The higher officials must have known the circumstances, but had nothing to say. It was not a case where food could not have been gotten easily, but a merely inhuman treatment of the men by the officials in charge.

What can you expect from men who receive such treatment? Could you expect co-operation in any form? Co-operation means working together and identifying the interest of all concerned.

Recollections are still fresh, in my mind, of expressions I overheard about certain mine officials, as given by the workers under them. The men claimed that the officials were firm in their orders and meant all they said. At the same time, they recognized that these same officials were ever ready to retract an order made in error and willing to co-operate with the men. These officials were also known by their hearty, "Well, John, how goes it today?" or "How's the turn running today?" and such similar expressions of good fellowship. Then, while carrying on witty conversations, the official would carefully examine the place and, if time permitted, sit down for a few minutes and talk on general subjects, before going on to the next place.

By such co-operative methods as these, the workers would naturally become affected with the same "disease" and, in that manner, one always found a most efficient organization and one that produced a little more coal then the other fellow whose methods were more lax. In a Pennsylvania mine I have often seen an official where a certain tonnage was reached, have a cigar for each man as he came out of the mine.

Therefore, to co-operate under this heading means a great deal, much more than can be expressed in this short paper; but if an idea can be extracted, for effectual application by the many readers of this magazine, and make the mine workers, officials and others, more efficient and co-operative, then I consider the time has been well spent. "BEN."

Thomas, W. Va.

Letter No. 3—The letter of James Touhey, *Coal Age*, Dec. 11, p. 900, interested me deeply. I have often wondered if it would not be impossible to accomplish anything without proper co-operation on the part of helpers and those holding subordinate positions.

For example, the President of the United States must have the co-operation of his cabinet and they in turn must have the co-operation of their department employees, and so on down the line.

In coal mining the president or general manager of the company may lay out the best plans, but without the co-operation of the engineer in systematizing the work, and the superintendent and under bosses in seeing that the details of the plan are fully carried out, the scheme will fail.

What will be the use of a superintendent telling his mine foreman certain things to be done in the mine if the foreman does not co-operate to carry out his plans and the men fail to do their part?

CO-OPERATION MUST BE MUTUAL TO SUCCEED

The great trouble is that the most of us want to run the whole concern and do not trust any of the details to the man who should have charge of a portion of the work and be made, in part, responsible for the execution of the work. This lack of trust on the part of the superintendent or foreman is largely to blame for the lack of co-operation he receives. A workman who knows he is not trusted to carry out the plans of the boss becomes discouraged and shows his lack of interest by his actions.

To obtain co-operation we must co-operate ourselves. The boss must co-operate with his men if they are to co-operate with him. There must be trust and confidence each in the other. If the foreman needs material or equipment in the mine, the superintendent and manager must do what they can to supply that want. Where men need tools to do their work properly it is up to the foreman to get them. This is co-operation and will bring results.

Let mine foremen remember that where men observe the willingness of bosses to help them in carrying out the work they will respond with equal willingness in its performance. If there is difficulty in a section of the mine in charge of an assistant let the foreman go with him and share his responsibility, not saying, "He is paid for that work, let him attend to it and not bother me."

EFFORTS IN CO-OPERATION ALWAYS BRING RETURNS ONE-HUNDRED-FOLD

A foreman that co-operates with his men, and the superintendent that does likewise with his foremen will find their efforts will return a hundred-fold and the results will show on the costsheet at the end of the month.

It is true there are some men who will not respond to fair treatment but will take advantage of their privileges. However, these are comparatively few and the experiment is well worth the trying. I have often found to my surprise in how short a time a man can be changed by kindness from an objector and a hindrance to a helpful worker. We are all prone to make the mistake of wanting everyone to co-operate with us, while we do not feel like throwing in our lot with them and assisting by word and deed to make their burdens lighter. The word co-operation has a great meaning and it is the one word that spells success.

THOMAS HOGARTH,
McIntyre, Pa. Supt. Coal Run Mines.

Finding a Mine Door Set Open

Letter No. 17—The letters that have been written on this subject are interesting, as they give different opinions and no doubt enlighten many readers. However, I would suggest referring to the little book of mine laws and see what it says about doors.

We find that the Anthracite Mine Law requires two main doors in a crosscut, so that one door will always be shut when the other is open, and the current will not be broken by men passing through the doors. The law also requires a third door hung and set open ready for use in case one of the other doors is broken. A single door would indicate that the area or section of the mine it controls is not large.

In all my experience as fireboss I have never found a main door open in a mine and do not think this would happen if the fireboss is on his job. Let me say here that a good fireboss can detect trouble very soon when making his rounds. His experience enables him to do this naturally.

WATER-GAGE READING AN INDEX OF THE MINE

The writer of letter No. 11, *Coal Age*, Dec. 11, p. 896, claims that he can detect an open door by the reading of the water gage. In my opinion, he is wrong; as long as the speed of the fan is the same, the water gage will be the same, even if the return airway was walled off.

In firebossing our practice has always been to go first to the fanhouse and register our names and time of arrival. We then gave everything a "once over" before going into the mine. My section consisted of roads breasts, sheet-iron breasts, running breasts and straight pitches. I had 3½ hr. to complete my rounds. I would follow the air, in most instances, but would frequently use a shortcut, traveling against the air to save time.

Experience has taught me that firebossing is a hard job that a man must learn. At times, the fireboss must carry water on both shoulders if he is to please the foreman and satisfy the inspector. In other words, he must be a diplomat.

Beginning life in the mine, first as a breakerboy and then doorboy, I advanced to surveyor, fireboss, mine foreman and then mining engineer. My belief is that a fireboss employed in a properly organized mine need hardly expect to encounter the trouble mentioned in this discussion. It would be rare indeed to find a door set open and the circulation cut off from a section of the mine a fireboss is about to examine.

Nanticoke, Pa. MINING ENGINEER.

Letter No. 18—I was much interested in reading the letter of R. Z. Virgin, *Coal Age*, Nov. 6. p. 759, and agree with him that it would be dangerous to start the examination of a mine on the return end of a section.

Referring to the plan of the section to which this inquiry relates, let me suggest that the fireboss, on finding the door standing open at the mouth of his section and the current short circuited, would do well to leave the door as he found it, until he has examined one or two rooms to ascertain their condition.

Assuming that he finds gas in the first two rooms as stated in the inquiry, let him then come back to the entry and go to the mouth of room 7, where the air is returning from the faces of these rooms. At this point let him test the temperature with a pocket thermometer. Comparing this with the temperature of the air at the intake end of his section would tell him if there is any fire burning in that section, and he can then close the door with safety.

Of course, if the thermometer shows that fire is burning in the section, he must take steps to put it out as quickly as possible without disturbing the gas he found in the first two rooms of the section.

Rawdon, Quebec, Canada. C. MCMANIMAN.

[The discussion "Finding a Mine Door Set Open" will close with Letter No. 20, now on hand.—EDITOR.]

Tamping Dynamite

Letter No. 1—Referring to a question answered in *Coal Age*, Dec. 25, p. 941, in which it is stated that it is not necessary to tamp a charge of dynamite owing to the detonation of this explosive being instantaneous and its force radiated equally in every direction, permit me to say that this does not agree with my experience and practice.

For a long period of time when employed in blasting and using dynamite of various strength, from a 4 or 5 per cent to as high as a 70 per cent dynamite, my practice was to tamp each charge with clay or sand slightly moistened. My opinion is that tamping is necessary in order to get the full benefit of the detonation.

In France, it was our custom to use the lower percentage of the glycerine in the dynamite when working in a new territory. In all cases the holes were tamped with the moistened drillings made into little sticks. We had a little book of rules and, if I remember correctly, it read: "For a cartridge of 100 grams (3½ oz.) only, tamp for a distance of not less than 20 cm. (7.8 in.) and, for each additional stick add 10 cm. (3.9 in.) more of tamping." For example, a charge of 1 lb. (454 g.) would require 2 ft. (61 cm.) of tamping. We were instructed, however, to tamp the charge to the mouth of the hole.

In my opinion, it is a great mistake to say that dynamite need not be tamped, except to exclude the air or confine the explosive in the hole. It is true that dynamite laid on a large bolder will break the rock by the force of its explosion and this fact has suggested to the miner that it is unnecessary to tamp a dynamite charge in a hole. Whatever is said, however, I shall continue to tamp a charge of dynamite, having often proved to miners in our mine that with a minimum charge well tamped it is possible to double the effect by tamping the hole.

In charging a hole, I push the cartridge gently home, then insert a small plug of clay and push that down on the charge, continuing the stemming with clay or rock dust, tamping lightly at first and then harder, using a wooden tamping bar. The tamping should reach the mouth of the hole.

The full tamping of a dynamite charge should be recommended if only for the purpose of stopping the practice of miners who use a short fuse, light and shove it into the hole and then run like the devil to get out of the way. It is a pity that a practical miner will use so little judgment. GASTON F. LIBIEZ.

Peru, Ill.

Entering Mine with Open Light

Letter No. 1—In reading the article describing the death, from blackdamp, of two men who with a third entered an abandoned slope carrying only a flashlight, I was surprised to think that the leader of the party, who it is stated was a practical miner, would attempt to enter an abandoned place without a good safety lamp.

Believing that the statements made in the closing paragraphs of the article, *Coal Age*, Dec. 11, p. 886, are misleading in respect to the danger to be encountered in going into an idle or an abandoned mine, I feel that this matter should be discussed thoroughly.

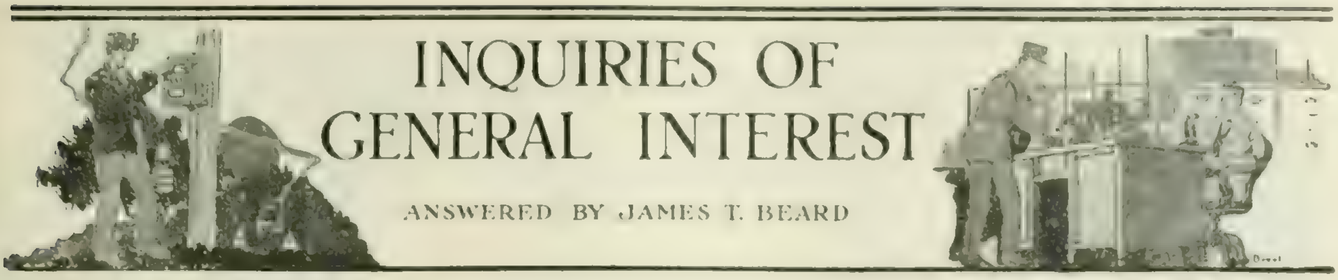
The writer of the article states, "It would be unjust to criticize too severely the action of Mr. Stott and Mr. Caldwell (the two men killed) in entering the slope without an open lamp for detecting the nature of the air." Again, the writer states: "In entering an abandoned slope or shaft an open lamp should be held in advance and at a level lower than the head."

To my mind, it is most important to correct these statements and emphasize the fact that it is *never safe to enter an abandoned place without a safety lamp.* The writer of the article probably had in mind only the presence of blackdamp. But one never knows but that methane or marsh gas is present and the use of an open light in such a case would be dangerous. Hence, a good type of safety lamp should always be used and never an "open light."

I recall an instance of an old shaft that gave off large quantities of marsh gas. Gas was also coming from different parts of the field. It was a common occurrence for persons crossing the field and throwing a match to the ground after lighting a pipe or cigar to see the gas ignite and burn.

In closing, let me say that it is strange to what an extent men of practical experience, working in and about mines, are subjected to danger from the reckless acts of men whose experience should have taught them better, or from the ignorance of untrained men who have no practical experience in mining.

Nanticoke, Pa. MINING ENGINEER.



INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD

Fan Ventilation in Winter

As a reader of *Coal Age*, I take the liberty of asking its opinion regarding a condition observed in our mines this year, about the time cold weather set in. The case is as follows:

The mine is ventilated by a centrifugal fan, which is producing 103,000 cu.ft. of air per minute, against a water gage of 2.6 in. This was the common result, under normal working conditions throughout the summer season. When the cold weather set in, the yield of the fan suddenly jumped to 123,000 cu.ft. per min., while the water-gage reading fell 0.4 in.

It seemed to me that this was contrary to what would naturally be expected in fan ventilation. In the winter season when the fan is operating on cold air, its efficiency is undoubtedly higher and its yield greater. But it would seem that the increased quantity should be accompanied by an increase in the water-gage reading, instead of the gage dropping as just stated.

Studying over the matter, I concluded that the circulation of a larger air volume under a lower water gage could only be due to some change having taken place in the mine; and, as we had made no change in the air splits, I was led to examine more closely to ascertain the cause of the observed phenomena. In this mine there are about seventy entries. Most of these contain canvas checks or curtains for deflecting the air into the rooms, besides brattices for conducting the current to the faces of headings.

My investigation soon revealed the fact that, in the summertime, these canvas checks and brattice cloths were so saturated with water absorbed from the air current that they were very heavy and hung almost straight from the bar at the roof down to the floor, which was a common condition throughout the summer.

Now, in the winter season, I noticed that all of the canvas was very dry and, as a result, it did not serve the same purpose as in the summertime when wet. More air was blowing through the curtains and leaking at the brattices, although measurements taken at the face showed that there was still sufficient air deflected into the rooms and circulating at the head of the entries. There was about the same quantity though a less proportion of air sweeping the working faces, owing to more air passing through the dry canvas checks, many of which were blown or lifted slightly by the force of the current.

This conclusion appealed to me as the condition that made it possible for the mine to pass a larger quantity of air under a reduced water gage. However, I want to ask for the opinion of *Coal Age* and others who may have had similar experiences. **J. Parker.**

Renton, Pa.

The instance cited by this correspondent is interesting in the practice of mine ventilation. His conclusion that the dry condition of the air checks in the winter season, as compared with the wet condition of the canvas in the summertime, was the cause of the mine passing more air under a lower water gage in winter than in summer is correct.

The summer water gage of 2.6 in. is said to have dropped 0.4 in., making the winter gage 2.2 in. It is interesting to note that the power on the air indicated by these data is practically the same in winter as in summer, which confirms the rule that, for the same power on the air, the quantity of air in circulation varies inversely as the pressure or water gage; thus,

Summer, $103{,}000(2.6 \times 5.2) = 1{,}394{,}620$ *ft.-lb. per min.*, or 42.26 *hp.*

Winter, $123{,}000(2.2 \times 5.2) = 1{,}407{,}120$ *ft.-lb. per min.*, or 42.64 *hp.*

Widening an Airway

The following question was given in a recent examination and I want to ask help in its solution:

> Given two airways, each 6 x 8 ft. in section, 900 and 3600 ft. long respectively. What will be the required width of the longer airway to cause each to pass the same quantity of air under the same pressure?

Writing the formula for unit pressure in terms of the airway and the quantity of air passing, $p = ksq^2/a^3$, it is plain that, the pressure and quantity being the same in each airway, the expression s/a^3 has the same value for each airway. Thus, calling the required width w,

$$\frac{2\,(6 + 8)\,900}{48^3} = \frac{2\,(6 + w)\,3600}{(6w)^3}$$

Is it possible to solve this equation and find the value of w directly? If so, please explain how it is done.

Donora, Pa. **Student.**

In algebra this equation has the form

$$w^3 - a\,w = b$$

and the value of w is

$$w = \sqrt[3]{\tfrac{1}{2}b + \sqrt{(\tfrac{1}{2}b)^2 - (\tfrac{1}{3}a)^3}} + \sqrt[3]{\tfrac{1}{2}b - \sqrt{(\tfrac{1}{2}b)^2 - (\tfrac{1}{3}a)^3}}$$

The first step is to simplify the equation given by "Student," and find the values of $\tfrac{1}{3}a$ and $\tfrac{1}{2}b$; thus, by cancellation and transposition, we have

$$w^3 - \frac{1024}{7}\,w = 6\left(\frac{1024}{7}\right)$$

Therefore, $\tfrac{1}{3}a = \tfrac{1}{3}(1024 \div 7) = 48.76$; and $\tfrac{1}{2}b = 3(1024 \div 7) = 438.86$; and substituting these values in the formula gives, finally, for the value of w,

$$w = \sqrt[3]{438.86 + \sqrt{438.86^2 - 48.76^3}} + \sqrt[3]{438.86 - \sqrt{438.86^2 - 48.76^3}}$$

$$w = \sqrt[3]{438.86 + 276.91} + \sqrt[3]{438.86 - 276.91}$$

$$w = \sqrt[3]{715.77} + \sqrt[3]{161.95} = 8.95 + 5.45 = 14.4\ \textit{ft.}$$

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Miscellaneous Questions

(*Answered by Request*)

Ques.—The large hand on the anemometer makes 4½ r.p.m., the airway is 6 ft. high and 12 ft. wide; allowing 3 per cent for friction, what would be the velocity of the air current and what quantity would there be passing in the airway?

Ans.—Each revolution of the large hand of a Biram anemometer that is properly calibrated corresponds to 100 ft. of air-travel, and 4½ r.p.m. would indicate an air-travel of 450 ft. per min. Then, allowing 3 per cent of this amount for loss by friction would make the assumed velocity of the air current 450 (100 + 3) ÷ 100 = 463.5 ft. per min.

The quantity of air passing is found by multiplying the sectional area of the airway, in square feet, by the average velocity of the air current, in cubic feet per minute. The sectional area of this airway is 6 × 12 = 72 sq.ft. Then, assuming the reading of the anemometer has been properly taken and represents an average velocity for the entire area of the airway, the quantity of air passing is 72 × 463.5 = 33.372 cu.ft. per min.

Ques.—State fully, how, when and where should a mine foreman measure the air. When and how should he make reports of air measurements to the mine inspector.

Ans.—The air is measured with an anemometer that must be in good condition. First, a place is selected in the airway where the air is traveling in a straight course and not influenced by bends or unduly obstructed by jutting timbers. The sectional area of the airway is measured at this point in such a manner as to give a fair estimate of the clear sectional area, in square feet. This being done, the anemometer is exposed to the air current at that point, for exactly one minute, noting its reading before and after exposure. The instrument must be held at arm's length, as far as practicable, and moved from point to point in the airway so as to give an average reading of the velocity of the current. The difference between the two readings of the instrument multiplied by the sectional area of the airway will give the quantity of air passing, in cubic feet per minute.

The Anthracite Mine Law (Art. 10, Sec. 15) requires that the air shall be measured once every week, at the inlet and outlet airways, also at or near the face of each gangway and at the nearest cross-heading to the face of the inside and outside chamber or breast where men are employed. These measurements must be recorded in a book kept for that purpose.

A report of these air measurements shall be sent to the inspector before the twelfth day of each month, for the preceding month, together with a statement of the number of persons employed in each district. of the mine. (Sec. 16.)

It is the further duty of the mine foreman to see that all dangers are promptly removed and that no one is permitted to enter any places until they are made safe for work.

Ques.—A slope 14 ft. wide and 7 ft. high has been driven for a distance of 1,000 ft. The elevation at the top of the slope is +742.3, and at the bottom of the slope +537.4 ft. (a) If this slope is allowed to fill with water, what will be the pressure of the water, in pounds per square foot, at the face? (b) What precaution does the mine law require to be taken when driving toward abandoned places filled with water?

Ans.—(a) This slope has a fall of 742.3 — 537.4 = 204.9 ft., in 1,000 ft., which is the pressure head when the slope has been allowed to fill with water. Since the pressure due to 1 ft. head of water is 0.434 lb. per sq.in., the pressure per square foot due to the actual head is 204.9 × 0.434 × 144 = 12,796 + lb. per sq.ft.

(*b*) Rule 15, Art. 12, of the Anthracite Mine Law of Pennsylvania requires that any place approaching a dangerous accumulation of water shall not exceed 12 ft. in width and at least one borehole shall be kept constantly 20 ft. in advance near the center of the face, together with sufficient flank boreholes on each side of the heading.

Correction

Attention has kindly been drawn to a misstatement in the answer to the second question on page 152 of the issue, Jan. 15, 1920. Following is the question and the correct answer:

Ques.—How will a current of 100,000 cu.ft. of air per minute, passing in the main air-course of a mine, divide between the following three splits:

Split A, 6 x 6 ft., 2,000 ft. long;
Split B, 6 x 6 ft., 4,000 ft. long;
Split C, 6 x 6 ft., 6,000 ft. long.

Find the quantity of air that will pass in each split, supposing the pressure on all the splits to be the same?

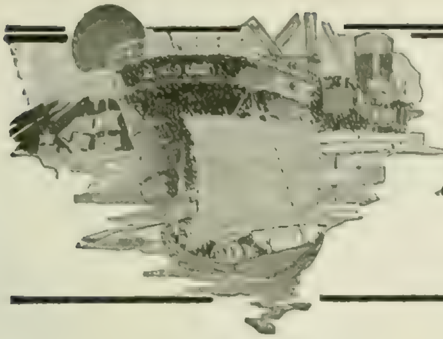
Ans.—These splits, having the same cross-section and being under the same unit pressure, the quantity of air passing in each will be *inversely* proportional to the square root of the length of the airway. Since the relative lengths of the splits are 2, 4, 6, the calculation is as follows:

$$A,\ \frac{1}{\sqrt{2}} = 0.707;\ \frac{0.707}{1.615} \times 100{,}000 = 43{,}780\ \textit{cu. ft. per min.}$$

$$B,\ \frac{1}{\sqrt{4}} = 0.500;\ \frac{0.500}{1.615} \times 100{,}000 = 30{,}960\ \textit{cu. ft. per min.}$$

$$C,\ \frac{1}{\sqrt{6}} = 0.408;\ \frac{0.408}{1.615} \times 100{,}000 = 25{,}260\ \textit{cu. ft. per min.}$$

$$\textit{Totals}\quad 1.615 \qquad 100{,}000\ \textit{cu. ft. per min.}$$



FOREIGN MARKETS AND EXPORT NEWS

New Freight Cars Built in November

A total of 173 new freight cars were constructed in railroad shops during November, according to a summary issued by the U. S. Railroad Administration. They included 151 box, and 3 hopper cars.

Coal Mining in Prussia

According to the *Vossische Zeitung*, of Berlin, which was translated by the Research Division, Bureau of Foreign and Domestic Commerce, there were 292 coal mines in operation in Prussia during the first nine months of 1919, as against 286 mines during the corresponding period of 1918. In the period specified the production of coal declined from 120,392,675 metric tons to 81,186,135 tons. The shipments were reduced from 122,681,129 to 80,675,350 metric tons while the number of workers not including the prisoners of war, had increased from 566,102 to 648,861. It will be seen that production decreased 32.68 per cent and shipments 34.24 per cent.

During the same period of 1919 there were 309 lignite mines in operation as against 307 in 1918. Their combined production amounted to 55,721,098 metric tons, as against 56,003,605 tons in 1918, and the shipments were 55,720,045 tons, as against 56,007,929 tons in 1918. The number of workers, not including prisoners of war, increased from 56,858 to 99,799. These figures show that in the first nine months of 1919, as compared with the same period of 1918, production decreased 14.28 and shipments 14.29 per cent, while the number of miners increased 42,941.

American Coal for Madeira

Consul William L. Jenkins, Funchal, Madeira, on Dec. 6, 1919, reported to the Department of Commerce that the first shipment for many years of American coal to Madeira arrived here in the latter part of November. It was purchased by a British shipping and coaling company and transported from Baltimore in a British steamer. This company and the one other coaling company now operating in Madeira supply coal to steamers at the equivalent of from $26 to $27 a ton. The imports of American coal were due to the disturbed mining conditions in England, and it is expected that as soon as the situation there becomes more normal the trade will fall back to its long-established channels.

The total importations of coal according to customhouse statistics amounted to 143,228 tons in 1913, 61,453 tons in 1914, and 61,417 tons in 1915. By far the largest part was supplied to ships. Owing to the mild climate none is needed for heating purposes, and only small quantities are used by the few factories operating here.

There were formerly three British coaling companies and are German here, but two of the British are now consolidated and the German company has been closed since Portugal entered the war. It imported 89,088 tons in 1912, and 74,786 tons in 1913.

Imports of Coal into Venice

Consul John S. Armstrong, Jr., Venice, Italy, announced that the direct imports of coal into Venice during the month of October, as shown by ships' manifests, amounted to 80,681 metric tons, of which 47,484 tons came from the United States and 33,197 tons from the United Kingdom, according to a report published in the Commerce Reports. This is the second month during 1919 in which the imports of coal from the United States exceeded the quantity received from the United Kingdom, the imports from the United States in September having been 20,470 metric tons, as compared to 11,372 from Great Britain.

The nationality of vessels bringing coal to this port in October may be judged from the following figures:

Nationality of vessels.	Number	Coal transported. Metric tons.
British	11	60,234
Interallied	2	9,896
American	1	5,011
Greek	1	5,540
Total	15	80,681

The total quantity of coal imported into Venice from all sources during the 10 months ended October, 1919, as shown by ships' manifests was as follows: From United Kingdom, 317,166 tons; United States, 136,228 tons; Dalmatia and Istria, 26,089 tons; Antwerp, 5,485 tons, making a total of 484,968 tons.

France Grants German Coal to Belgium

The Foreign Trade Department of the Guaranty Trust Co., of New York City has received word that an agreement was concluded in Paris between M. Loucheur, President of the Commission on Reparations, and the Belgian delegates to this Commission. France consents to place at the disposal of Belgium a monthly quantity of 150,000 long tons of German coal, of which 80,000 tons will be for blast furnaces, and 35,000 tons for gas factories.

See Lower Prices for Coal in China

Messrs. Wheelock & Co. report that in regard to Japanese coal, negotiations for 1920 contracts have not yet been started, but with the extremely favorable exchange they expect to see lower prices than this year. Fu Shun coal: No change. Kaiping coal: Very little new business has been transacted, although arrivals and sales under existing contracts have been well maintained. The large demand for coal all over the East has tested loading facilities at Chinwangtao to the utmost, and coal is now sent to Dalny, Tsingtao, and other ports where coal was previously exported. The northern market is also strengthened by short supplies in Japan.

India Produced 20,000,000 Tons in 1918

An abstract of the annual report of the Chief Inspector of Mines in British India (Mr. Adams) was given in an issue of Oct. 10, supplying particulars of the output of coal, etc., in India in 1918, which states that there was an increase of over 2½ million tons in the output of coal. With the exception of Assam and Hyderabad, where the output decreased by about 7,000 and 21,000 tons respectively, all Indian provinces shared in this increase. Pit's mouth value increased largely everywhere, except in the northwest Frontier Province, where it fell from 18s. 8d. to 5s. 4d. (at Rs.15 to the £) per ton, but as the output in the latter province was only 240 tons the figure has no statistical value. In the fields of Bengal and Bihar and Orissa the rates of increase were respectively 1s. $3\frac{9}{16}$d. and $8\frac{5}{16}$d. per ton. The following table shows the output of coal in the various provinces in 1917 and 1918:

Province	1917 Tons	1918 Tons
Assam	301,480	294,484
Baluchistan	40,785	43,125
Bengal	4,631,571	5,302,295
Bihar and Orissa	11,932,419	13,679,080
Central India	198,407	199,975
Central Provinces	371,498	481,470
Hyderabad	680,629	659,122
Northwest Frontier Province	215	240
Punjab	49,869	50,418
Rajputana	6,045	11,334
Total	18,212,918	20,721,543

Exports of coal fell from 407,078 tons in 1917 to 74,335 tons in 1918. Imports of coal, coke, etc., on the other hand, rose from 46,455 tons to 67,441 tons.

The average number of persons employed daily in the coalfields increased by 24,000, or more than 14 per cent. The average output per person employed was practically the same as in the preceeding year, viz., 103.30 tons, as against 108.88. The total number of fatal accidents was 212, corresponding to a death rate of 1.11 per thousand.

English Production Increased

While production is maintained at somewhere about the same higher level that has been recorded since the middle of October, says the *Iron & Coal Trades Review*, and still shows a tendency to rise, distribution has been thrown entirely out of alignment by the arrangement whereby all fuel used for household and domestic purposes is subject to an allowance of 10s. per ton. If collieries had been assured they would be refunded, whatever amounts were deducted each month, it would, of course, have made no difference in distribution, but owing to the great uncertainty that exists at present many collieries are making their position as secure as possible by sending as large a tonnage as they can for industrial consumption.

So far as the position of house coals is concerned, many merchants are hopelessly in arrear with deliveries, and even if larger supplies are obtained before the holidays it will be impossible for them to deal with the orders already on their books.

English Exports for 1918 and 1919 Compared

	Cargo		Bunker	
	1918 Tons	1919 Tons	1918 Tons	1919 Tons
Bristol Channel ports	1,274,701	1,581,508	204,350	234,342
Northwestern ports	59,240	2,806	251,194	119,040
Northeastern ports	767,828	863,571	94,165	144,131
Humber ports	133,144	48,151	53,783	21,743
Other ports on East Coast	3,423	3,301	74,882	152,620
Other English ports	50	201	10,855	36,535
Ports on the East Coast of Scotland	57,303	189,388	22,916	29,866
Ports on the West Coast of Scotland	120,276	58,550	28,008	57,250
Irish ports	..	.. ....	12,800	150
Total United Kingdom	2,415,965	2,747,476	752,953	795,677

Foreign Freight Rates

	Rate	Tons of Displacement
Genoa Leghorn	$26 50	1000
Spezia Savona	26 50	1000
Piraeus	28 50	1000
Trieste/Venice	31.00	800
Algiers	26.00	800
Cadiz Bilbao	23.50	1000
Barcelona	26 00	1000
Antwerp/Rotterdam	22.50	1000
Lisbon	22 50	1000
Gothenburg	24 00	1000
Marseilles	26.00	1000
Stockholm	26 00	800
Hamburg	25 00	1000
Rouen	23 00	1000
Malmo	25.00	800
Pernambuco	16.00	500
Bahia	16.00	500
Rio	17 00	1000
Santos	18.50	600
Rio Grande do Sul	10.50	500
Buenos Aires or	16.00	1000
La Plata or Montevideo	17.50	750
Rosario	19.00	750
Bahia Blanca	17.50	1000
Havana	7.50	600
Carienas or Sagus	9.00	300
Cienfuegos	9.00	500
Caibarien	9 50	300
Guantanamo	9.50	300
	9.00	400
Manzanillo	9.50	300
Bermuda	9.00	300
Bermuda p. c. and dis. free		
Kingston	9.50	400
St. Lucia	11.00	500
Barbados	11 00	500
Santiago	8 50	500
	9 00	400
Port of Spain, Trinidad	11.00	500
Curacao	10.50	500
Free p. c. Curacao		
Demerara	13 00	400
St. Thomas	10 00	500
Nitrate Range	12.00	

All above rates gross from charter.

Need of Industrial Coal in Belgium

The reviving industries of Belgium continue to be greatly embarrassed by lack of fuel supplies, according to Trade Commissioner C. E. Herring at Brussels. Practically no foreign coal is arriving except the shipments from Germany stipulated by the Peace Conference, and these are said to be irregular and insufficient. Belgium is, of course, a large producer of coal, but much of it is unsuitable for industrial purposes. Furthermore, production of the Belgian mines is hampered on account of the shorter working day with the greatly increased compensation which has become general, and railway con[illegible]

Coal is one of the chief products relied upon by Belgium to diminish its adverse trade balance, and during the first nine months of this year, exports amounted to 233,586,611 francs. Stipulated deliveries of Belgian coal are now being made to certain foreign countries, Switzerland receiving 30,000 tons, Holland 10,000, Rumania, Argentina and Italy 50,000, and France 320,000 tons per month. These heavy exports of course occasion a shortage and advance the price in the domestic market. During the first eight months of 1919 exports of coal amounted to 2,650,000 tons, while September exports totaled 320,000 tons. In 1913 coal exports for the first eight months amounted to 3,300,000 tons.

Foreign Trade Analyzed

The annual report of Philip B. Kennedy, Director of the Bureau of Foreign and Domestic Commerce, issued last week, analyzes the foreign trade situation, and declares that the excess of American exports over imports has grown out of bounds. The report states:

There is no question about the demand for American goods abroad, and Europe is still experiencing an acute shortage of food, raw materials, and all kinds of manufactured goods. Lacking imports to balance our exports, the pertinent question is the extent to which we can safely take future promises to pay. Whatever one's views about the proper nature of the peace settlement, all may readily see and agree that foreign credit arrangements are being delayed awaiting a more stabilized condition. Unless certain reasonably adequate credits are soon made to foreign countries, our exports may be expected to fall off on account of depreciated foreign exchange.

American export firms should realize that now is the time to lay foundations for permanent foreign trade. At this time, when the pulse of foreign business conditions is uncertain and subject to rapid changes, a policy must be formulated on the basis of most recent and authentic information. World trade adjustment is going on. It is often difficult, however, to distinguish real developments from unfounded rumors. Many ambitious projects have little behind them. American firms should test every proposition for trade development very carefully.

The character of our foreign business to-day will determine our opportunities of to-morrow. If American exports are made to assist in restoring essential production abroad and lead to sound world economic conditions, the resulting security will enable trade to then go ahead with confidence. The United States is at present the world's principal producer. It is especially important that we face the general question of our export trade in a farsighted business manner. We have a big stake in the stability of world economic conditions. Our future as an exporting nation depends to a large degree upon our policy in the immediate crisis.

The report points out that while the United States shipped 4,500,000 tons less of coal in 1919 than in 1918, it exported 5,000,000 tons more of wheat and cotton and meat and miscellaneous goods.

Coal in Poland

American Consul McBride at Warsaw, Poland, has transmitted to the Department of Commerce the following information concerning the needs and supplies of coal in Poland as furnished during a recent conference at the Ministry of Industry and Commerce of that country:

The Government of Poland actually requires at the present time considerably more than 1,000,000 tons of coal per month.

In detailing the coal requirements of the country, it is stated that the railway service needs some 210,000 tons; the provisioning of the Army, 45,000 tons; municipal enterprises, including gas works, 70,000 tons; operation of agricultural machinery, 40,000 tons; coal industry, 45,000 tons; mines and foundries, 10,000 tons, and salt mines and refineries, 12,000 tons—a total of 432,000 tons per month for these purposes alone. To fulfill the needs of other industries, about 375,000 tons is required; for the needs of private consumers, 305,000 tons, and for compensatory exportation 20,000 tons.

The Government is now doing all in its power to increase the production of the mines, and its afforts have been successful to a large extent, thanks to the coöperation of the laborers and to the inauguration of a more intensive system of exploitation, employing three instead of two shifts of workmen. It is encourageing to note that, owing to these measures, the mines of the Dombrowa coal basin are now producing fully 75 per cent of their pre-war output.

Furthermore, efforts are being made to impress upon coal consumers the necessity of saving that fuel as far as possible by the substitution of wood, peat, and other combustibles, which till recently have been little used. It is stated that the reserve supply of wood in Poland could replace 600,000 tons of coal, but the present difficulties in railway transportation make delivery impossible. In addition, there is lignite, of which not more than 15,000 tons per month is mined in Poland.

Britain Raises Railroad Freight Rates

An increase in British railroad freight rates, effective Jan. 15, in order to make the roads self-supporting, is announced in a cablegram to the Department of Commerce from the American Embassy at London. Later a complete revision of the rates will be undertaken.

The new coal, coke and patent fuel schedule provides for a 25 per cent increase in and a flat rate addition of 3d. per ton (irrespective of distance), to the existing tolls, rates, charges, subject to a minimum addition of 6d. per ton and a maximum addition of 2s. per ton.

U. S. Coal Strike Stimulates Canada's Mines

Unofficial, though reliable, information received, from a report of the *Weekly Digest* dated Jan. 21, in Washington from Canada is to the effect that fears of a coal shortage in that country on account of the American coal strike has given a great impetus to coal production in its coal areas. Arthur V. White, consulting engineer for the Dominion Commission of Conservation, is in British Columbia now investigating conditions. The situation at present is that Britain needs her own coal, United States production cannot be absolutely depended upon, and Canada must therefore provide the necessary fuel for herself.

It is expected that in the not distant future coal will be shipped from British Columbia mines via ship to Panama to the Atlantic, and thence up to Montreal and for Eastern manufacturing and domestic consumption. It is felt that Uuited States coal producers, even could one be assured of steady operation of the mines, will prefer shipping to Europe and reaping somewhat larger profits in comparison to the prices paid by Canadian interests.

Belgian State Railways Ask Bids for Coal Cars

A cable to the Department of Commerce from the American consulate at Brussels, Belgium, states that the State Railways of Belgium have opened bids for 15,000 coal cars of sheet iron construction and having 20 tons capacity.

EXPORTS OF DOMESTIC MERCHANDISE, BY ARTICLES AND PRINCIPAL COUNTRIES

	November				Eleven Months Ending November					
	1918		1919		1917		1918		1919	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Coal—										
[illegible]	430,369	2,938,196	320,719	2,828,372	4,822,003	27,604,821	4,143,529	27,060,359	4,097,989	33,642,750
Bituminous, tons	1,616,914	6,475,188	724,650	3,718,316	19,670,321	73,402,498	18,815,554	73,891,006	17,629,900	82,114,435
[illegible]										
[illegible]			45,933	306,081	553,423	2,049,654	9,994	47,710	1,621,955	9,919,845
[illegible]	1,384,147	5,010,059	336,641	1,347,532	14,935,035	51,977,302	15,288,154	53,845,125	10,461,799	39,179,969
[illegible]	3,188	12,752	8,482	51,183	552,879	1,984,932	498,129	2,100,085	55,797	283,958
[illegible]	9,475	54,067	8,932	50,269	159,189	785,032	152,795	707,358	93,190	517,713
[illegible]	99,679	604,223	59,835	406,677	1,312,097	5,845,545	1,350,678	7,929,553	913,921	5,558,739
[illegible] West Indies	21,028	135,561	10,345	76,113	374,246	1,723,389	233,262	1,363,963	254,878	1,563,338
[illegible]	1,168	7,634	19,954	137,530	303,447	1,568,123	178,899	1,050,717	483,389	2,930,797
[illegible]	59,247	383,163	24,699	56,291	631,121	3,263,537	537,125	3,340,867	639,519	3,771,250
[illegible]	25,335	182,346	..	..	..	..	284,241	1,798,673	89,392	559,805
[illegible]	10,321	63,913	17,653	120,853	49,564	289,572	187,601	1,136,363	194,997	1,279,705
Other countries ..	3,326	21,470	192,176	1,165,787	799,320	3,915,412	94,676	570,592	2,821,063	16,549,316
Coke [illegible]	146,647	1,180,532	66,873	540,234	1,093,534	7,322,858	1,413,886	11,086,397	596,819	4,761,483

COAL AND COKE NEWS

Charleston, W. Va.

Car shortage, inadequate motive power and embargoes cause mines to operate about one-third time. Western gateways choked with unloaded coal. Sidings from Cincinnati to Newport News congested. Why embargo exports with so much coal undistributed? Kanawha production one-third normal. New River mines work about one-half time.

Production was cut to the very quick in Kanawha and New River valleys during the week ended Jan. 17, through a car shortage, inadequate motive power and embargoes, a suspension of operation being forced on many mines served by the Chesapeake & Ohio R.R. The shortage of cars was as acute as it has been at any time during the last twelve months with the exception of a few weeks in August when railroad shopmen were on strike. While the first day's supply was nearly sufficient, as the week progressed, the supply grew worse, dropping to 70, then to 60 and finally to 45 per cent on the seventeenth. It is doubtful if any mine in this section was operated during more than a third of the week at the most.

In railroad circles it was said that there did not appear to be any prospect of immediate improvement. Reports indicate that certain Western gateways are literally choked with coal loads in addition to the large number of loads which were being held at the time the strike ended and which are still being held. It is stated by eye-witnesses, that sidings all the way from Cincinnati to Newport News are congested with long strings of coal loads.

Producers generally diagnose that condition as one of the reasons for a car shortage and at the same time cannot understand why the Central Coal Committee should continue to embargo export shipments, when there is so much coal undistributed; the holding of so much coal in reserve only making it necessary to embargo domestic shipments which cannot be moved owing to the crowded condition of sidings. Railroad motive power is proving entirely inadequate in this section and that has further contributed to the congestion on many lines.

While shipments from some of the regions along the Chesapeake & Ohio to Eastern points were under the ban, yet gas coal was still being diverted it was understood, this contributing to the generally chaotic conditions prevailing at the producing end of the mining industry.

The change in the Kanawha field, during the weekly working period ended Jan. 17, in transportation facilities afforded, was for the worse. On Monday alone was the supply of empties at all adequate. During the remaining five days of the week the supply was at no time over 60 per cent and during the last three days it was approximately 45 per cent. Under such conditions it was of course impossible for mines to produce even half their normal capacity owing to disorganization of working forces. It was estimated that Kanawna production was only about one-third of normal.

Small as well as large mines were affected. Some of the largest operations on Cabin Creek suffered from the shortage and the same was true on Coal River. The situation with reference to the shipment of coal from this and other regions is growing deplorable. In putting a stop to export shipments rolling stock is forced out of its natural route of travel and is not so soon available again for loading.

An embargo shut Kanawha operators off from Eastern business, and they were informed that the Toledo gateway was so congested that it was impossible to ship coal through to the Northwest, and points in that part of the country were embargoed

Production in the New River field was sliced even further between Jan. 12 and Jan. 17 with empties even more scarce than they had been during the previous week. Taking the week as a whole, it is extremely doubtful if mines as a rule were in operation more than half the time; that of course resulted in a suspension of operations in many instances.

Efforts made by operators in the New River and other smokeless fields during the week, to have the restrictions on exports removed proved to be futile. The Central Coal Committee claimed that the coal was needed in domestic markets, although smokeless producers declare that there is enough coal on sidings alone to supply the country until the first of April. With export restrictions still in force, it is claimed that some of the larger exporting agencies have not so far been able to ship any coal to foreign markets during January in the face of an insistent demand and with plenty of vessels at port.

Operators in the New River field have taken no action leading to the restoration of the check-off, so far, although pressure has been brought to bear. However, the fact that the check-off has not been restored, has not and is not affecting production, miners as a general rule appearing to be indifferent as to whether the check-off is restored or not.

Bluefield, W. Va.

Continued car shortage develops into most serious car situation in history of Norfolk & Western. Export restrictions reported to protect domestic markets. Production in the Gulf field less than 50 per cent; Tug River about 75 per cent; Pocahontas situation most acute. Remittances for coal still seriously delayed.

The entire southern region of West Virginia was so seriously affected by a car shortage during the last half of the week ended Jan. 17, that it is estimated that the production of coal was limited to about 20 per cent of capacity, and on Thursday only 847 cars were loaded in the southern West Virginia fields. With full man power available, cars in the various fields at the outset of the week were soon exhausted, and when they were gone the Norfolk & Western was unable to furnish additional cars. As a matter of fact it is stated that the road just mentioned is facing one of the most serious car shortages in the history of the system, and no means have been found by officials of the road of coping with the situation which has arisen, officials in fact being extremely pessimistic as to the immediate future.

Producers in the southern part of the state are not surprised at reports that there is not sufficient coal at tidewater points for cargoes and that as a result of such a condition vessels are accumulating. The scarcity of coal at tidewater is attributed by operators to the continuance of export restrictions and to the car shortage. Where cars are available it has been found impossible to secure permission to export coal, and where permits have been issued cars are not available, so that between the two, export shipments from southern West Virginia have been at a minimum. Operators in the southern part of the state, in common with other smokeless producers, have been trying to have the export regulations removed but have been met with the statement that restrictions cannot be modified owing to the necessity of protecting domestic markets.

Remittances for coal diverted continue to reach Pocahontas and other producers, but settlement is still being delayed in many cases and operators are not hopeful of being able to secure complete settlement until well toward the end of the present year.

Conditions in the Winding Gulf field went from bad to worse during the week ending the seventeenth, cars becoming even more scarce than was true during the previous week, the inevitable consequence of which was that mines in many instances were forced to mark time and production was less than half of capacity. At the same time export restrictions were still in force and that, too, served to demoralize industrial conditions. Even where it was possible to load coal, motive power was proving to be totally inadequate for the movement of coal trains with any degree of promptness or for the delivery of empties.

During the wek ended Jan. 17 the Tug River field loaded 71,450 net tons which is only about 75% of normal under a full car supply. Many mines in this field are complaining bitterly of the shortage of cars, some of these mines working less than half the time during the ten days ending Jan. 21. The number of empty cars received from the west has been extremely meager, and it appears that the Railroad Administration and the Fuel Administration are still holding unloaded thousands of cars diverted during the coal strike. It is rumored that in and around Chicago 9,000 loads were still being held up untl Jan. 17 at least, the complaint being made that the railroads were still moving large tonnages from union coal fields in Indiana and Illinois.

While there had been a steady decrease in the number of cars furnished the Pocahontas region after the first week in January, the transportation situation became most serious during the last half of the week ended Jan. 17, in this region. On the fifteenth cars were so scarce that the United States Coal & Coke Co., largest producer in the Pocahontas region, was compelled to stop operations for the day. It was estimated that production from the fifteenth to the seventeenth inclusive was only 20 per cent of normal as a result of transportation disabilities, making it impossible to secure a production much in excess of that for the holiday week, the lowest of the year. Of course the limitations on exports are responsible in part for the car shortage inasmuch as it is not now possible to unload and return cars quickly.

Huntington, W. Va.

Guyan field loses half of capacity production due solely to car shortage. Cars from the West have to be cleaned at much expense. Logan representative spends week in Washington to secure relief from car shortage. Embargo on eastbound shipments lifted.

Half of the capacity production of the Guyan district was lost, during the week ended Jan. 17, simply because of a car shortage. The shortage was much more pronounced even than during the preceding week, running 30,000 tons higher, bringing the total loss fram a car shortage alone up to 194,000 tons, or 20,000 tons in excess of the output of the field for the week. The total output was only 174,000 tons, a loss of 8,000 tons as compared with the previous week. During the period mentioned, the daily average of cars furnished was only 582. At the outset of the following week, or the week beginning Jan. 19, the supply of cars was only about 400 a day. In short, on Wednesday the twenty-first, there were only a little over 400 cars in the entire Guyan field.

Guyan operators were informed that an effort was being made to relieve the acute car shortage by giving empty cars from the West right of way over everything except perishable freight, even to the extent of embargoes on general freight. Such cars as were coming from the West, however, were exceedingly dirty and that of course has been a factor in retarding loading because it has been necessary to clean such cars at considerable expense.

The car situation has become so bad, the shortage of cars is so chronic, that a representative of the Logan operators spent virtually all the week, ending the seventeenth, in Washington in an effort to secure some relief, and also to prevent further preferential car supplies for mines producing railroad fuel.

Some relief was experienced in the district when the embargo on eastbound shipments was lifted, but Logan producers were still greatly limited in the zones into which they can ship. Of course under prevailing transportation conditions, it has been next to impossible for Logan shippers to keep pace with contract requirements or even to think of taking on much new business

More coal was handled on the Chesapeake & Ohio system as a whole, during the week ended Jan. 17, than during the week ended the tenth, the increase amounting to about 27,000 tons or the difference between 545,700 tons and 572,700 tons. Losses in production were sustained in three large districts. Gains were scored in two of the larger districts and three small fields

Fairmont, W. Va.

Many idle mines as result of serious car shortage in northern West Virginia. Dirty cars cause much expense and loss of time. General indignation over ruling of Central Coal Committee regarding diverted coal. Embargo on exports curtails supply of cars. Many loads on sidings.

The car shortage was again experienced to a very material extent in northern West Virginia regions, particularly during the last four days of the week ended Jan. 17. While the supply was adequate for the first day's loading it soon underwent a decrease and by Thursday there had been a sharp decline in the number of cars furnished in the Fairmont and other northern West Virginia regions. In the first named region on Thursday, for instance, only 756 cars were furnished as against 1796 ordered, and as an inevitable consequence 62 mines were idle. On the day following the supply had dropped to 48 per cent, and by Saturday the supply was down to 36 per cent, only 532 cars being furnished as against 1511 ordered. On the Monongahela R.R. there was only a 28 per cent supply on the seventeenth.

Similar conditions prevailed throughout the entire northern part of the state. With cars so scarce there were 110 mines on the Monongah division alone of the Baltimore & Ohio idle on the seventeenth, production throughout other regions in West Virginia being also limited to a similar extent. Even where cars were furnished, many of them were so dirty—covered in frequent instances with a foot or more of frozen slag and cinders—that loading was seriously retarded while the cars were being cleaned. Not only was much time lost because of the unclean condition of empties, but the necessity for cleaning the cars also added much to the cost of production; it cost about $7.00 per car to remove the debris before empties could be loaded.

While payments from the railroads for coal diverted during the strike are becoming more numerous, yet in nearly every instance the railroads are refusing (in making settlement) to make any allowance for the 14 per cent increase granted miners, which the operators add to the price of coal, or for the difference between domestic prices and exports prices in settling for export coal [illegible]

General indignation has been aroused in northern West Virginia over the ruling of the Central Coal Committee. Even though coal consigned to tidewater for export had been diverted under Government orders for the benefit of gas companies and others, the export price would not be allowed, because export coal could not be considered [illegible] it was actually loaded on boats. This ruling was characterized as ridiculous, especially in view of the fact that coal for export has been shipped only by special permit from the Central Coal Committee. [illegible] would be sustained [illegible] West Virginia producers, if the [illegible] of the Central Coal Committee [illegible]

One effect of the order debarring further exports of gas coal and other bituminous coal [illegible] curtail the supply of cars, since cars cannot be re-[illegible] [illegible] exports should be either restricted or shut off when side tracks of [illegible] [illegible] will be to cause a material increase in all-rail shipments. All-rail shipments to New England [illegible] round trip.

Louisville, Ky.

Bill introduced in Kentucky Legislature to create Miners' Examining Board to examine persons seeking employment as miners. Similar to Pennsylvania anthracite provision. Examinations to be held in English language and be of a practical nature.

J. S. Webb recently introduced a bill in the Kentucky Legislature whose object, it has been stated, was to provide for the safety of persons employed in and about coal mines and to provide for the examination of such persons in order that only competent miners may be employed. Furthermore a board of examiners is to be created to hold examinations according to the stipulations of the proposed bill.

Should this bill become law, hereafter no person shall be employed or engaged as a miner in any coal mine in the state, without first having obtained a certificate of competency from the Miners' Examining Board of Kentucky—to be created by this bill. Miners now employed are to be entitled to certificates, under the provision of this act, without being required to pay the fee specified for men seeking employment in the mines after July 1, 1920.

After July 1, 1920, it is proposed that all men seeking employment in the coal mines of Kentucky shall appear before the proper board and answer questions prepared by the board in the English language; upon satisfactory examination a certificate of competency shall be issued to the applicant, provided he has had at least two years' experience as a coal miner previous to the time of his examination. It is provided, however, that a certified miner may have one person working with him and under his direction as an apprentice for the purpose of learning the business of mining, and, becoming qualified, to obtain a certificate in conformity with the provisions of this act.

The bill provides that the Miners' Examining Board shall be composed of three men two of whom shall be practical coal miners, employed in the mines at the time of their appointment, and the third member to be a coal operator doing business in the state. This board shall hold examinations once in each calandar month in each county of the state where coal mines are in operation. Each applicant for a miner's certificate shall pay a fee of $2 to the board. All examinations are specified to be conducted in the English language and shall be of a practical nature, and in each case an applicant must appear in person before the board and orally answer intelligently and correctly at least 12 questions pertaining to practical mining.

No person shall engage as a miner in any coal mine of Kentucky without having obtained a certificate of qualification, nor shall any person, firm or corporation employ as a miner in his, their or its mine in this state any person who does not hold such certificate, nor shall any mine foreman, overseer, or superintendent permit any person to be employed under him or in any mine under his charge as a miner in any mine in this state, except as provided, who does not hold such certificate of qualification. Any person, firm or corporation who shall violate or fail to comply with the provisions of this act shall be fined in any sum not less than $100 and not more than $500, or shall be imprisoned in the county jail for a term of not less than 30 days, nor to exceed six months, at the discretion of the court.

The only state having an operative law similar to the one just outlined is Pennsylvania, applicable only to the anthracite coal field where unusual conditions are met with in mining. It is stated by a party conversant with Kentucky affairs, that this bill will not be enacted into law.

Ashland, Ky.

Production 59 per cent of capacity in northeast Kentucky field. Loss practically due to car shortage. Strong domestic and byproduct demand. Adequate car supply alone stands in way of increasing production. Chesapeake & Ohio prorates railroad fuel among all mines of the district. Export agencies active in the field.

While production was slightly improved in the northeastern Kentucky field, during the week ended Jan. 17, yet it was still far below capacity, only 135,990 tons being produced as against a possible production of 230,050 tons; the output, therefore was limited to 59 per cent of capacity. That left a 41 per cent loss, of which 33 per cent was directly attributable to a shortage of cars, the loss from such a source amounting to 76,100 tons, with mine disability figuring in the loss to the extent of 11,160 tons, or about five per cent.

During the same period of 1919 there was an output of 147,000 tons. However, up until Jan. 17, 1920, production was running behind that of 1919 to the extent of 10,000 tons. In the past year, on the other hand, the possible production of northeast Kentucky mines has been increased at least to the extent of 15 per cent through development work and the enlargement of operations.

The present car stringency operates seriously to the disadvantage of northeast Kentucky operators inasmuch as there is a strong domestic demand and an unusually good demand for byproduct coals, yet producers find it next to impossible either to take care of their contract obligations or to make any arrangements to accept contract business in increasingly large quantities. Development work in the district during the last year has made it possible to utilize more man power and such additional man power has migrated to the district; so that were conditions propitious, producers of this district would be in quite an advantageous position to materially augment production over 1918 and 1919. The only thing that stands in the way of a gradually increasing production from month to month is an adequate car supply, as physical conditions are conducive to large production.

Instead of continuing to confiscate coal for railroad use and to give mines supplying railroad fuel the preference, the Chesapeake & Ohio has asked producers to provide a supply of fuel sufficient for the needs of the road by prorating the tonnage to be supplied among the various mines in the district.

Exporting agencies have been negotiating for a large tonnage from the northeast Kentucky field during recent weeks, shipments to cover a period of five years. Negotiations have not, however, been closed, so far, for such contracts.

PENNSYLVANIA

Anthracite

Carbondale—The Murrin Coal Co., at this place plans to build a breaker, the contract having been awarded to the George A. Westcott Co., of Scranton, Pa., for $106,000. The breaker will be 86 ft. high and have a ground area of 60 x 170 ft. and be electrically operated. George A. Westcott, of Scranton is the engineer for the Murrin Company.

Mocanaqua—The West End Coal Co., operating at this place, in Luzerne County, during 1919 produced virtually 500,000 tons of anthracite without having a single fatality among miners or laborers at the working face. Most of the mining is done on a heavy pitch, which makes the record all the more noteworthy. Superintendent J. W. Jones, in a letter which went to each employe, congratulated the men on the record made and urged each employe to continue "safety first" as the motto for this year.

Pottsville—Fire at the Wadesville colliery, one of the important operations of the Philadelphia & Reading Coal & Iron Co. was discovered to be still raging recently after a week's fighting against the flames. The fire is in the south basin with many important lower workings, and to flood it would entail great damage to other parts of the mine. Energetic steps have been taken to shut off all air from the flames, and it is believed the gases thrown off by the fire will effectually smother the blaze. Were the mine flooded, the greater part of the 900 employees would be thrown out of work for months.

Hazleton — Coal mining was hampered in this region during the week ended the seventeenth by extremely cold and snowy weather. Collieries having long overland hauls were compelled to shut down for a day or more. One colliery, however, the Lattimer, No. 5, operation of Pardee Bros. & Co., Inc., produced a record tonnage on the coldest day, dumping 805 tons of coal on the breaker and preparing it for market in eight hours.

Electric installations are going steadily on among the various companies and the coming summer should be a big one in this line in this part of the field.

At some plants, loose flights on conveyor lines make a noise which can be heard above all other colliery sounds. Old rubber belting, can be used to stop this.

When the flights are put on, a layer of belting is placed between the flights and the flight attachment, making a firm job which does not allow the bolts to wear loose quickly and prevents the noisy rattling found in lines where this method is not followed.

Bituminous

Waynesburg — Challen W. Waycoff, of this city, has purchased several tracts of coal in Perry Township, Green County, for a consideration of $13,733.17. The purchase was made from the First National Bank of Grafton, W. Va. Two tracts in Jefferson Township recently changed hands. The first tract was sold to the Cleveland-Cliffs Coal. Co. and the second to the Stelco Coal Co.

Connellsville—The following officers were elected at a recent meeting of the stock holders of the Southern Connellsville Coke Co.: Charles Detwiler, president; J. Fred Kurtz, vice president; J. R. Davidson, treasurer and J. L. Schick, secretary. These men (with the exception of Mr. Schick), W. D. McGinnis and F. E. Markell compose the board of directors. The company recently spent over $30,000 in improving the plant and are said to be negotiating for another coal tract.

Uniontown—Coal property in the Lower Connellsville region continues to change hands. Deeds recorded here show the completion of two new deals with an aggregate of 320 acres for $550,000. The Republic Connellsville Coke Co., by its president W. H. Clingerman, sold 210.8 acres, in Redstone Township, to the Connellsville Central Coke Co., for a consideration of $454,000. The other deal was in Nicholson and German townships, the Consolidated Coke Company selling 110 acres to J. H. Hillman, Jr., for $99,000.

WEST VIRGINIA

Logan—Employees of the Logan Mining Co. have been the recipients of a bonus from the company in the shape of an extra one-half month's pay, the bonus having been presented to the employees at the time they were the guests of the company at a banquet held during the week ended Jan. 17.

Charleston—The Cabin Creek Coal Mining Association was organized during the week ended Jan. 17 at a meeting of about 50 of the superintendents, mine foremen, fire bosses and other mine officials of upper Cabin Creek, held at the Y. M. C. A. auditorium at Decota. The meeting was called by District Mine Inspector L. B. Holliday who addressed the assembled officials as did V. E. Sullivan another district inspector. It is the purpose of the association to hold frequent meetings for the discussion of mining topics.

Martins Ferry—The fire in the Laughlin mine near here is practically all out, except a few smoldering spots, and the work of clearing away the slate-falls is being rapidly pushed. It is expected it will be possible to resume work in the mine in the near future. Deputy State Mine Inspector Lot Jenkins, of this district and who has been in charge of the fire-fighting since the evening of its discovery, has been on the ground practically every minute since and the success of the fighting is the result largely of his efforts. Although no official statement has been made by the inspectors, the belief that the fire was of incendiary origin continues. Local firemen who were on the ground at the start of the fire are firm in this conviction.

Fairmont—With the organization of the Fairmont Mining Institute, here, on the night of Jan. 17, an important forward step was taken and is believed that one of the benefits which will accrue will be improved safety methods and increased production through higher efficiency. The enrollment at the organization of the institute included 86 superintendents, assistant superintendents, mine foremen and fire bosses of the region.

There is a move on foot to extend the line of the Morgantown & Wheeling R.R., now operating in the Scott's Run mine field of Monongahela County, W. Va., between Morgantown and Blacksville, into Fairmont over the tracks of the Monongahela Valley Traction Co. from Mannington to Barrackville and thence by tunnel through from Barrackville. Full plans of the company contemplate a shorter route to Pittsburgh and a shorter route to the Lakes.

Beckley—The machine shop and motor barn of the Mead-Tolliver Coal Co. at Killarney, W. Va., was destroyed by fire on Jan. 12, entailing a loss of about $75,000. One of the serious features attending this fire was the destruction of six gathering locomotives. By strenuous efforts the company was able to [illegible] the day following the fire. Immediate steps were taken to secure locomotives from other points and by the twentieth the company was able to produce coal on a scale somewhat approaching normal. The fire at the Mead-Tolliver plant was the second one of a similar nature in the Winding Gulf district within a period of 90 days, the Winding Gulf Colliery Co. having sustained a loss of $60,000 early in November when the large machine shop and other buildings were destroyed by fire. The fact that the two fires have come within so short a period has led to the belief that both were of incendiary origin.

Berkeley Springs—Diamond drill holes just completed, says *News* of Cumberland, Md., show that anthracite coal exists in Morgan County, W. Va., back of Cherry Run on the Baltimore & Ohio Railroad, in considerable quantities. Nearly 30 years ago, John Stauffer, a farmer, sunk a shaft on his farm and mined coal, hoisting it to the surface by a windlass. At that time the discovery attracted considerable attention. The recent drilling was directed by C. P. Cooke, for the West Virginia Anthracite Coal Syndicate, which is financing (under option) the operations. Mr. Cooke says there is considerable coal on the property "The question whether the seams will be workable commercially depends entirely upon their extent and condition," says Mr. Cooke. At present about 20 men are at work, and so far 11 holes have been drilled; it is expected that four more holes will complete the proving of the property and that they will be complete within the next month. The land, which is optioned by a Buffalo syndicate, is owned by a Pittsburgh bank. The present work is the first that the Buffalo syndicate has attempted in the coal field. The land lies within several miles of Cherry Run and is mostly covered with timber. John M. Rayburn, a mining engineer of Pittsburgh, has been in direct charge of the drilling. The property being worked now was formerly owned by James M. Guffey, of Pittsburgh, who set up hoists and other equipment, but failed before he could complete his work. The property was then sold under chancery proceedings and most of it was bought by the Farmer's National Bank, of Pittsburgh, to cover some of its loans and was leased to the present operators.

KENTUCKY

Ashland—The Northeast Kentucky Coal Association at its annual meeting held here on Jan. 20, largely attended by members from all parts of the district, elected the following officers: President, Charles W. Connor, manager Elkhorn & Shelby Creek Coal Co., Esco, Ky.; first vice president, Garner Fletcher, manager Elkhorn Piney Coal Mining Co., Huntington, W. Va.; second vice president, Henry Laviers, manager North East Coal Co., Paintsville, Ky.; treasurer, N. M. White, manager Colonial Coal & Coke Co., Prestonburg, Ky. The board of directors consists of the officers of the association together with J. G. Smythe; manager Elkhorn division, Consolidation Coal Co., Jenkins; J. E. Buckingham, president Wells-Elkhorn Coal Co., Paintsville, Ky.; A. J. Johnson, manager Standard Elkhorn Coal Co. C. M. Roehrig was re-elected secretary.

Louisville—S. M. Bennett recently introduced the following bill in the Kentucky House of Representatives, applicable to the mine inspection service: "Hereafter no person shall be appointed to the office of assistant inspector of mines in this Commonwealth, unless and until such person is endorsed, in writing, by a majority of all the men actually engaged in mining and loading coal or other mineral in the inspector's district for which he is or may be appointed, and has otherwise complied with all the requirements and conditions now prescribed by law. Whereas, assistant mine inspectors are soon to be appointed; and, Whereas, heretofore many assistant inspectors have been appointed, some of whom are now serving, who were and are antagonistic to the best interests of those who work inside the mines; Therefore, an emergency is declared to exist, and this act shall take effect and be in force from and after its passage and signature by the governor. All laws and parts of laws in conflict with this act are hereby repealed."

The bill was ordered to be printed and referred to the Committee on Mines and Mining. It is stated that it will probably be reported to the House shortly.

ALABAMA

Montgomery—Constitutionality of the state law imposing a tax of 3c. per ton on iron ore and [illegible] per ton on coal [illegible] in Alabama was upheld on Jan. 6 by Judge William Logan Martin in Montgomery Circuit Court in the suit brought by the Republic Iron & Steel Co. of Jefferson County. Assistant Attorney General Lawrence Brown after the decision was handed down said the case in all probability would be carried to the United States Supreme Court. The state law was attacked on four principal points; that it is discriminatory in that it does not apply to coal loaded on wagons at mine tipples; that it is a tax on property not assessed in connection with the ad valorem realty tax, but upon the product derived from the land; that it is not based upon the fluctuating price of coal, but upon the quantity mined, and that it is a violation of the constitution of the United States.

INDIANA

Bicknell—The American No. 1 mine here which was sealed Nov. 7, because of a fire of mysterious origin has renewed operations and is hoisting coal. The mine was closed Nov. 1 by the strike of miners, and the fire a week later has never been explained. Bureau of Mines officials and officers of the company never deemed the fire out and the mine safe until quite recently. Many falls of slate block the entries and had to be removed. This mine is one of the country's big producers; all the entries will be operated as soon as they can be cleared of slate falls, it is said.

ILLINOIS

Hartland—With the opening of a new mine near Hartland, the French Coal Mining Co. expects to be able to materially increase its output. Coal from the No. 5 Block seam is being worked at the new mine. The company is under the management of R. M. French, general manager.

Linton—Fire at the North Linton mine, one mile north of the city, destroyed the engine room and machinery. The property is owned by the United Fourth Vein Coal Co., which estimates the loss at not less than $10,000. The fire started under the high speed engine. Machinery may be moved from Jasonville to replace that destroyed and may be several weeks before the mine is in operation. About 180 men are enployed.

Duquoin—Mining conditions in this district are becoming more and more perplexing as the car shortage grows more acute. The mines which are affected the most are at Duquoin, Dowell, Hallidayboro and Desoto, these being wholly dependent upon the single line of the Illinois Central for car supply. The mines in Williamson, Franklin and Saline counties are not in so bad a position as there are several roads which furnish transportation to the plants in the latter section. The four big mines at Duquoin, the Security, Majestic, Paradise and Kathleen are now working from three to five days a week with no better outlook in sight within the next two months. Severe weather conditions during the first part of the month has greatly increased the difficulty of moving the cars.

The entire properties of the Soper Coal Co., located at Cutler, west of here, was recently sold by the owners, Gus and Dan Blair, of Murphysboro, to a group of Chicago and St. Louis mining men. During the past year the mines under this management have been increased in output 50 per cent and at the time the deal was made both mines were running at capacity. The deal is said to have involved a consideration of over $80,000. It is expected that the new owners will continue to operate the mines. The output of the mines is taken care of by the Wabash, Chester & Western R.R. a short line connecting with the Illinois Central and Mobile & Ohio railroads.

Considerable improvements have been made and are still being made at the two mines at Royalton, 12 miles south east of here. The north mine has been equipped with a new steel tipple, several larger boilers and other machinery which will increase the output 25 per cent, while at the south mine new electrical machinery is being installed and many new miners' houses are being built.

Herrin—The U. M. W. of this place are planning to invest $150,000 in a new building. With the surplus now on hand and a small tax on each member, they can build without going into debt it is said.

The Sunnyside Mining Co. is the first mine of this district to contest the income tax and excess-profits tax. J. B. Malone, an income-tax lawyer from Springfield, Ohio, is looking after the legal end; the engineering features are handled by the firm of Pfeiffer & Mallams, consulting engineers with headquarters here.

The Hafer mine, between here and Carterville started cleaning up falls in the mine on Jan. 15. The tipple and most of the buildings near the shaft were destroyed by fire last summer.

The Pond Creek mine, three miles north of here, was sold last spring to the Freeman Coal Mining Co. The mine may be a small producer yet it is now one of the best. The Orient mine, a few miles further north, has the world's record for tons of coal hoisted in one day, but on the basis of tons per man, this mine averages 33 per cent more than the Orient; eight tons a day for every man underground (including bosses) is common. One reason of this high efficiency is that every room and entry is kept on sights. For years ahead the location of all entries and lengths of all rooms have already been worked out, which leaves the bosses free to keep the coal moving.

COLORADO

Walsenburg—The coal mine at Rouse, one of the properties of the Colorado Fuel & Iron Co., ten miles south of here, has temporarily ceased operation because of tapping an underground watercourse, which flooded the workings. The miners, 100 in number, are now working in the Lester mine near by. Although the Rouse property produces coal of a fine grade, it has always been difficult to operate because of water, according to company officials. It is not known how soon the mine will resume production.

Foreign News

Brussels, Belgium—The U. S. Council of National Defense states that it is announced from Brussels that Belgium is contemplating a plan of centralizing the coal output and controlling its distribution in order to obviate the effects of the present crisis. According to the plan, groups would be organized in each province for every branch of industry. These groups would centralize the orders which would be forwarded to a special organization connected with the Ministry of Economic Affairs. This ministry would allocate coal among provincial groups in proportion to quantity available, and these provincial groups would handle distribution.

Industrial News

Chicago, Ill. — The Louden Coal Mines Co., of southern Illinois (Pinckneyville) has increased its capital from $100,000 to $500,000.

Whitesburg, Ky.—The Elkhorn Hazard Coal Co. is understood to be arranging plans for the construction of a new coal tipple at its properties at Sandlick, Ky.

Blairsville, Pa.—The Hicks Coal Co. is opening a new coal mine between Apollo and Avonmore on the Armstrong County side of the Conemaugh River, opposite Truxall station.

Harmarville, Pa.—The Consumers Mining Co. is building a new tipple and pumphouse in connection with its new mining development at this place. The company is a subsidiary of the LaBelle Steel Co.

Charleroi, Pa.—John R. Kuntz and others, of Washington, Pa., sold the Pittsburgh seam under three tracts of land to S. U. Ross, of Library, Pa. The combined acreage involved in the deal is 481.17 and the price paid was $168,409.50, or $350 an acre.

Charleston, W. Va.—The Old Dominion Coal Corp. has been incorporated with a capital of $[illegible] to engage in coal mining operations in the Charleston district. W. R. Zimmerman, William K. Bridges, and Harrison B. Smith are the incorporators.

Morgantown, W. Va.—The Producers Fuel Co. recently organized with a capital of $[illegible] [illegible] A. Q. [illegible] president and F. H. [illegible] general manager of the company. Both were formerly [illegible] with the [illegible] Coal & Coke Co.

Crockett, Ark.—G. W. Wilkinson and associates are arranging plans for the installation of machinery and equipment for the development of coal properties at Crockett this place. Complete equipment for all features of operation will be installed.

New Lexington, Ohio—A suit involving $20,000,000 in coal lands in Perry, Athens and Hocking counties, Ohio, is being tried here in Common Pleas Court. The Buckeye Coal & Iron Co. is seeking to invalidate a mortgage given the Central Union Trust Company of New York.

New Philadelphia, Ohio—The Macksburg Coal Co., of which Dr. S. B. McGuire is president, and Mayor Walter H. Scheu, Dover, is secretary, is planning to electrify the mine at a cost of $50,000. John Snyder, New Philadelphia, is interested. The company is capitalized at $100,000.

Middlesboro, Ky.—Rogan Brothers and the Kentucky Mine Supply Co., have been merged under the name, Kentucky Mine Supply Co., with a capitalization of $200,000. The incorporators are: J. M. Rogan, H. A. McCamey, J. McCamey, P. T. Colgan, C. A. Blackburn and R. W. Baker.

Charleston, W. Va.—The American Fuel Co. with the principal chief operations in Webster and Braxton counties, has incorporated, with a capital stock $1,500,000; incorporators, H. C. Johnson, John E. Bassett, Randall F. Collins, H. S. Glazier, all of Philadelphia and William P. Cubberllye, Trenton, N. J.

Charleston, W. Va.—The Harlan-Cumberland Coal Land Co., Inc., of Northfork, W. Va., has been incorporated to operate in Harlan County, Ky.; capital stock $200,000; incorporators, Harry Totz, of Northfork; Abe Foman, of Kimball, W. Va.; M. O. Litz, J. N. Harman and B. H. Gray, of Welch, W. Va.

Charleston, W. Va.—The Nellis Coal Co. of Charleston, with chief operations planned to be located in the Peytona district, Boone County, has incorporated with a capital stock of $200,000. The incorporators are: C. G. Peters, D. W. Dunbar, L. A. Thornhill, I. L. Duffield, and T. K. Morobray, all of Charleston.

Birmingham, Ala.—Birmingham capitalists are said to have gained control of the Oak Leaf coal mines, one mile north of Cordova, and to have already begun their development. The new owners are said to be Walter Moore and Charles Rice. These mines have been operated by the Diamond Coal Co.

Washington, Pa.—The Ontario Gas Coal Co. will erect a modern steel tipple in connection with their new operation at Cokeburg, southeast of here. The tipple will be complete with weigh hoppers, Marcus screens, and refuse disposal macinery. The contract was placed with the Roberts & Schaefer Co. at Chicago.

Benton, Ill.—About 15,000 acres of coal land in Hamilton County, Ill., have been blocked for drilling and work will be started within the next 30 days, it is stated. The land is owned by a number of Springfield, Ill., coal men and it is said to be their intention to have a coal mine in operation within the next year.

Clarksburg, W. Va.—For $90,000 cash the Westmoreland-Fayette Coal & Coke Co. of Greensburg, Pa., has taken over the Pittsburgh-Franklin Coal Co. in Braxton County, it was announced here recently. The property includes the Knight and Hefner mining plants near Gilmer station, both of which are to be enlarged and equipped at once.

Williamson, W. Va.—John Malta and associates, recent purchasers of the Himler Coal Co. have organized the company into what is to be known as the Malta Co-operative Coal Co., with a capital stock of $250,000. The following, in addition to Mr. Malta are incorporators: Martin Himler, E. J. Lang, William and Claude Clark, all of Himler.

Brownsville, Pa.—Homer Sherrick, assistant superintendent of the Denbo Coal Co., has purchased the Brownsville Engineering Co. of this city. The consideration was not announced but the company is one of the largest in the Monongahela Valley and does extensive mine surveying and engineering work. Mr. Sherrick was formerly identified with Connellsville.

Charleston, W. Va.—The United Hydro-Carbon Co. will operate in Kanawha County, this being a new concern organized shortly after the first of the year by Charleston people, for the most part. Those active in the preliminary organization plans of the company are: Samuel Butter, J. C. Blair, Horace Butter, Alex Clarke and Harrison B. Smith, all of Charleston.

Beckley, W. Va.—C. H. Mead, a Winding Gulf operator and interested in several large operations, has organized the C. H. Mead Coal Co., with a capital of $60,000. The company will develop a tract in Slab Fork district of Raleigh County. Associated with Mr. Mead in the organization of the new company were: J. F. Nowlin and R. A. Loucks of Beckley; John W. Smith, Ingram Branch; W. B. Parks, Killarney, W. Va.

Bluefield, W. Va.—Further consideration was given by the Newberry Coal & Land Co. to plans looking to the development of holdings in Logan County, W. Va., at a meeting of the directors of the company held here on Jan. 17. Those present were, W. A. and L. M. Newberry, of Bland, Va.; Wm. E. Perry, and W. O. Barnes, of Tazewell, Va.; Judge Samuel W. Williams, of Roanoke, Va. The company has matured plans to begin development work in the near future.

Sassafras, Ky.—The Wisconsin Coal Corp., Lexington, Ky., is arranging plans for the installation of mining machinery and equipment for the development of a total of about 200 acres of coal properties in the Sassafras district, to have a capacity of about 1,000 tons daily. The company recently incorporated with a capital of $200,000, with A. G. Hill, president, and M. A. Jacobs, secretary, both of Beaver Dam, Wis.; J. J. Bowling, Lexington, manager and consulting engineer.

Chicago, Ill.—The Sullivan Machinery Co., of this place, announces the following appointments: Arthur E. Blackwood, formerly manager at New York City, to be vice president in charge of finance and accounting; Howard T. Walsh, vice president, in charge of sales; Gilbert K. Wilson, assistant secretary, in charge of cost accounting; Nathaniel H. Blatchford, Jr., assistant treasurer; Emil A. Krevis, general auditor; Frederick W. Copeland, manager of foreign sales.

Beckley, W. Va.—A selling agency is about to be organized in this city, it is learneed from reliable sources with a capital of $2,000,000, this new selling organization representing a consolidation of existing selling companies. According to tentative plans the new company proposes to acquire its own lake dock for the purpose of handling a large lake trade and at the same time it proposes to handle coal for export and bunkering. It is also stated that it will handle in the neighborhood of 2,000,000 tons of smokeless coal during 1920.

Sutton, W. Va.—The Westmoreland-Fayette Coal & Coke Co., Greensburg, Pa., has completed negotiations for the purchase of the property of the Pittsburgh-Franklin Coal Co., located in Braxton County, W. Va., near Gilmer Station. The operation comprises the Heffer and Knight mines, and the consideration is stated to be about $90,000. It is understood that the new owner is arranging for extensive improvements at the plants, including the installation of a large quantity of new equipment, to provide for increased operations; the work being estimated to cost about $150,000. E. W. Hett is manager.

Newark, N. J.—The Burnrite Coal Briquette Co., 543 New Jersey Railroad Ave., manufacturer of coal briquetts under a special process, has preliminary plans under way for the construction of a new manufacturing plant at Perth Amboy, N. J. A site of waterfront property aggregating about 15 acres of land has been acquired in Perth Amboy, and it is proposed to build a 5-unit plant, the different units to be constructed at various intervals. The factory, when completed, will have a total capacity of about 500,000 tons of material a year, and the new works will be known as Plant No. 2. F. M. Crossman is general manager.

Sergent, Ky.—The properties of The Whitley Elkhorn Coal Co. at this place, consisting of a modern, electrically-equipped plant, was purchased Jan. 17, by The Superior Colliery Co. with offices in Detroit and New York—U. S. Morris, a leading coal operator of the Jackson district of Ohio, closing the deal which has been pending for some time. The consideration, known to be large, was not announced. The new purchasers will take charge of the plant at once. It is planned to add new areas to the property rights, open new mines and make extensions that will double the present capacity of 80 tons daily. They will open the No. 1 seam which is said to be equal to the Elkhorn seam in this section.

MARKET DEPARTMENT

Weekly Review

Production Is Large, But Many Complaints of Car Shortage Are Still Heard. No Acute Suffering Has Occurred Over Any Large Area, But This May Not Be the Case If Cold Weather Continues.

THE production of bituminous coal for the week ended Jan. 17 was the largest for any one week since the declaration of the strike on Nov. 1, and the biggest for any January week for the past three years. The total production for the week in question is estimated at 11,655,000 net tons. The significant fact about this figure is that it is well above what the past three years have shown to be normal requirements.

In various sections complaints are heard of a more or less severe car shortage. This condition is apparently most acute in Ohio and Illinois with Indiana and Pennsylvania as close seconds. Only in the West and South is the shortage of transportation unfelt or of such slight proportions as to be negligible. It would thus appear that the coal cars, scattered far afield on account of the recent strike, are gradually being returned to their normal territories.

The railroads are still commandeering coal, to such an extent that some wholesalers are utterly unable to get any cars through to destination and are thus threatened with financial ruin. Some are already closing shop.

The domestic fuel problem is acute in some localities and fuel committees have been formed to insure the equitable distribution of such supplies of coal and wood as are available. Little actual suffering is as yet reported, but it is feared that if wholesale commandeering by the railroads continues on the scale that it has been and still is practiced some one will be going cold before long, unless of course the present weather conditions moderate decidedly.

The coking industry is not running to capacity because of a lack of cars. This is particularly true of byproduct coking. The big plants near Pittsburgh are short of coal and unless conditions improve materially they will be in hard straits before long. The beehive region also is handicapped by a scarcity of coke cars in which to ship the product.

WEEKLY PRODUCTION

An increase of 185,000 tons carried the output of bituminous coal during the week ended Jan. 17 to the largest total attained in any week since the strike. Indeed the production was the largest in any week of January during the past three years, the period over which the Geological Survey's records of weekly production extend.

The total output for the week (including lignite and coal made into coke) is estimated at 11,650,000 net tons. Compared with the preceding week this was an increase of 1.6 per cent. Compared with the corresponding week last year it represented an increase of 1,772,000 tons, or nearly 18 per cent.

The year 1920 thus opens with production at a rate well above that of either 1917, 1918 or 1919. The total output since Jan. 1 now amounts to 27,925,000 tons, an increase over last year of more than 4,000,000 tons attained in fourteen and a third working days.

Shipments of anthracite, during the week of Jan. 17, were almost exactly the same as those of the preceding week, 34,996 cars as compared with 34,971. The total output, including consumption for mine fuel and sales to the local trade, is estimated at 1,797,000 net tons. Cumulative production since the beginning of the coal year now amounts to 72,758,000 tons, a decrease of 6,222,000 tons when compared with the year before.

The beehive coke market continues to report an active demand, attributable in part to the gradual resumption of full-time operation in the steel industry, in part to the depletion of the reserves held by consumers which occurred during the coal strike.

The strength of the market is shown by the reported willingness of blast furnace operators to pay the extra dollar fixed by the government price on 72-hour coke. The demand, however, is largely counteracted by a shortage of coke cars, particularly in the Connellsville region.

Production during the week ended Jan. 17 is estimated at 435,000 tons, an increase of 8,000 tons or 1.9 per cent.

Atlantic Seaboard

BOSTON

Railroads show alarm over light receipts of fuel. Weather conditions most unfavorable. Comparatively light inquiry from commercial users. No permits for export from New York and Philadelphia. Certain piers embargoed because of harbor tug tie-up. Hampton Roads situation serious. Pressure to get domestic sizes continues. Signs of renewed demand for steam sizes.

Bituminous—Certain New England railroads are in a near-panic over fuel supply. Coal has been confiscated in transit all the way from mines to destination, in most cases regardless of where or how the cars are consigned, and even the re-handling factors at ports like Providence have had so much coal commandeered for railroad purposes recently that they are reluctant to load the cars furnished.

The Boston & Albany was at one time thus dependent upon the arrival of steamers for its supply beyond a few days and doubtless another week will see cars taken in transit for this company's requirements. The Boston & Maine R.R., on the other hand, is in comfortable position and is releasing water coal to roads farther East.

Another heavy snow-fall at this writing only adds to the uneasiness felt by some of the smaller steam users. Not only are the railroads having difficulty moving the coal offered them but output is affected and cars at this end are slow unloading. By water there have been very serious interruptions. Harbors like Salem, Plymouth, Quincy Bay, and others are ice-embargoed, and Vineyard Sound as well as the Cape Cod Canal have been practically impassable for several days. The Delaware River is also hard to navigate because of floating ice and unless we have milder weather soon there will be cases of real distress here and there along the coast.

In the face of all these adverse conditions there is nothing like the broad market that might be expected. The various industries are for the most part well supplied and current inquiries are only scattering. Shippers are able to make spot sales only on the Government basis, and for this reason there is much less canvassing than would otherwise be the case. Certain of the railroads are suffering because so large a proportion of their contract coal is at prices far below the Government figure, even with wage increase added. How this will be adjusted remains to be seen. Meanwhile, trade conditions are certainly in a state of turmoil.

It is understood that no permits are now granted for export via the New York and Philadelphia piers. Even at Hampton Roads permits for exports are required and no bunker coal is furnished to foreign bottoms except to proceed to the nearest foreign port. There is a current rumor that coastwise steamers are to be refused bunker fuel except on permit, and new complications may be looked for in another week unless there is notable improvement in conditions.

The exclusion from New York of coal for export was counted upon to throw an extra volume all-rail, but except in a few instances this has hardly been the case. In some districts shipments were on a 30 per cent basis and on this heavy inroads were made by the railroads. The trade is beginning to get anxious for some decision by the commission now at work on the cost of mining.

Anthracite—The severe weather has continued the steady pressure for domestic sizes, especially for stove and chestnut. The retailers in the cities are getting refill orders and with the hard delivery conditions there is more concern over supply for the next 60 days than would appear on the surface. At the same time, there are one or two companies who seem to be trying hard to make spot sales. The apparent contradiction is due to an effort by most of the retail dealers to confine their purchases to those shippers who succeeded in giving good service during the summer and fall.

NEW YORK

Season for high premiums on anthracite sizes apparently over. Strong demand being exercised for stove and chestnut but slackening perceptible. Cold weather conditions reviving demand for buckwheat. Tug strike materially interfering with dumpings at piers. Piers congested with barges and embargoes placed. Small stocks of bituminous at tidewater with spot business dead.

Anthracite—It is seldom now that one hears of extra large premiums being placed for prompt shipments of the choice prepared sizes. The supply is catching up with the demand and dealers are being offered more free coal, and the tendency is for lower prices. However, dealers have sufficient business on hand to take all coal offering up to and including the 75c. premium.

Boat deliveries to river yards have been handicapped this week because of a tug strike. Some 500 tugs are reported to be out of commission due to the men striking for an increase in pay. So few boats can be towed from the piers that it has been found necessary to place an embargo on boats reporting for loading. Dealers' yards on the average are about half stocked but coal is moving out somewhat rapidly and supplies are urgently needed.

The best demand for coal in this territory is centering on stove. This is a great favorite and the supply is short. Consumers are being persuaded to take egg of which there is an abundant supply. Chestnut is popular for range purposes, and this size, together with stove, are expected to continue to be the leaders for some time. Egg coal has been easing up and it is reported that a few sales have been made by independents at slight concessions, but this is not general. Pea coal has been in heavy demand for steam purposes, and has been well bought. Also bituminous consumers, in view of the soft coal shortage, are good buyers of this size.

The steam sizes are holding well, but there is no shortage of them. Buckwheat No. 1 is in excellent demand, such demand coming about through weather conditions During the tug strike cargoes of this size have been sold at small premiums. This applies only to the better qualities. Rice is easy but is holding around the circular of $2 75, while barley is being offered freely and is selling at $1.25 up.

Current quotations for company coals per gross ton at the mines and f.o.b. tidewater at the lower ports are as follows:

	Mine	Tidewater
Broken	$5.95	7.80
Egg	6.35	8.20
Stove	6.60	8 45
Chestnut	6.70	8.55
Pea	5.30	7.05
Buckwheat	3.40	5.15
Rice	2.75	4.50
Barley	2.25	4.00
Boiler	2.50	4.25

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—The bituminous movement at tidewater has been considerably delayed because of the tug strike this week. The strike is not so complete as it was some two months ago, but enough tugs are out to interfere with the regular movement of soft-coal cargoes. This situation has created a bad condition at the piers, and some boats that have already waited their turn for from ten days to two weeks for cargoes, face the probability of waiting that much longer again.

There is a healthy demand from the line trade for coal All-rail contracts are being favored with better shipments, but there is no spot coal being offered Nothing is being talked of regarding contracts for the coming year. Not until an agreement is reached by the price fixing commission will the subject of contracts be broached. Shippers of the better coals to tidewater are able to secure the full premium of $1 35 for their coals going into the bunker business Many shippers are after this business, and those with loaded boats have no trouble in quickly disposing of their contents.

No recent sales have been recorded below the government's maximum prices and those at the present time for certain grades of bituminous are:

	Mine Run	Prepared	Slack
Central Pennsylvania	$2 95	$2 95	$2 95
Western Pennsylvania	2 35	2 60	2 35
Fairmont (Gas)	2 50	2.75	2 25
George's Creek, Upper Cumberland and Piedmont Fields	2.75	3 00	2 50

PHILADELPHIA

Anthracite demand heavy. Wintry weather continues. Snow and cold hamper deliveries. Pea situation grows critical. Egg also becomes heavy. Individuals disposed to make concessions, especially on pea. Dealers report business not so profitable. Some price-cutting at retail. Buckwheat only active steam size. Bituminous dominated by car supply. Tide embargo still effective. Active coke market.

Anthracite—With winter weather of the most pronounced type upon the city the demand for coal is still heavy. There has been snow-fall on three different days, always conducive to active buying, although it has made deliveries more difficult for the retailers. In addition for the first time this year the weather has hampered deliveries from the mines, as for two days the ice-storm prevailed, which is always a serious drawback to the operation of trains. As a result the dealers are clamoring for the popular sizes—stove and nut—and getting very little, especially of the latter. The companies claim to be making good consignments into the city of all sizes, but operating conditions have been such recently that prompt deliveries have not been possible.

The retail trade is greatly upset by the public's persistent demand for stove and nut, and really, if anything, this demand is slowly becoming centered on chestnut alone, as more than one dealer has told his shipper if they can send him any size, just to let it be nut. As proof of this change in demand the slowly increasing stocks of stove in the yards are all the evidence that is needed. As to egg, this size is slowly drifting into the same class with pea coal, and the dealers right and left have sent stop orders to their shippers on this size. Some dealers have the bin room allotted to this size completely filled and claim there is but the slightest demand for it at all.

Pea, though, is the real troublemaker in this market and the retailers are almost overwhelmed with it, and while they are moving an increasing tonnage of it from the yards, the influx is even greater. It should be remembered that at this time last year all of the big operating companies were sending a heavy tonnage of pea into their storage yards, but instead of doing that this year the dealers' yards are taking the place of the company storage yards.

Of course last year the demand had fallen off on all sizes and dealers had held their orders generally, but now with the demand on stove and nut the shippers are in position to insist that the retailers take pea coal with those sizes. Some of the retailers are also insisting on customers who want chestnut that they take a proportion of pea with it. They feel that as the operators insist on this with them it is only fair that the public help them out in the same way, and it is working in a majority of the cases. It is believed that this practice will grow from this time forward.

If anything the problem of pea coal is the uppermost topic in the trade and if anything more were needed to win adherents to the two-size proposition, the present crisis in pea coal has done the trick. We know of some dealers whose stock of pea is so heavy that they have actually borrowed money to carry it. The dealers have generally come to the belief that they will not likely meet with any loss on whatever pea they may carry into spring, but the chief objection is that they are not able to move it now and turn their money over.

The individual shippers are experiencing a great deal of trouble in moving pea, and numerous reports are that they are offering to meet company prices on this size Another inducement held out by them is to offer shipment of the more desirable sizes with a proportion of pea to go with them While egg is also burdensome to the individual shippers, most of them are still insisting on getting the premium price for this size. How long they will be able to do this is a question.

Among the producing interests there seems to be a feeling that the present surplus of pea and egg among the dealers will right itself very shortly. They lean to the opinion that with the extremely heavy coal burning that has been going on, the summer stocks of the early buyers will soon be in such a condition that the trade will take any size, even pea Even some of the dealers are inclined in this direction and think that by the beginning of February the demand for coal will be extremely heavy, regardless of size. Yet all this is speculation and should a mild spell of weather arrive, and it would certainly seem that one were due, all forecasts will be in the discard

Despite the fact that there is a tendency of some sizes to accumulate there has been but the least tendency to shade retail prices. The nearest approach to price-cutting developed in the Sedgeley Ave. territory this week, where one dealer snt out a notice by card of a price of $9.00 per gross ton for pea coal. This is a cut of about 50c. from the regular pea coal price. Fortunately the other dealers in the same territory maintained their balance and simply ignored the cut, for they are of the opinion that it will take a much heavier price cut than that to interest the public to the extent of buying.

The steam coals are really unchanged, with buckwheat, as usual, the leader, and due to the slow rail movement recently there has been something of urgency connected with the calls for this size. Outside of the buckwheat demand, there is no particular call for steam sizes, and rice.

Bituminous—In the soft coal trade chief interest is centered around the inability of the producers to get sufficient cars to load.

Reports of idleness at the mines are common and some operations have been closed from two to three days each week. Naturally such coal as is coming out is being applied on contract business, leaving nothing at all for the spot market. At this juncture, the line trade has been considerably assisted by the tide embargo, which has released quite a little coal to be applied in the immediate future. This has particularly affected the coal from the Fairmont region, and also on trade and on domestic business. With unfavorable weather conditions prevailing no relief from the present car shortage is expected.

There is a strong demand for coal, although no one is reported as being actually without supplies, and this is shown by frequent inquiries of consumers who wanting to be assured of a good grade of coal often express a willingness to wait several weeks. The railroads of course continue to require a large share of the production for motive power.

Coke—In general coke is affected by the same conditions as to car supply and sonsumers find it somewhat difficult to place orders for prompt shipment. This is particularly the case with furnace coke. There is considerable byproduct coke to be had for domestic use originating in this territory and due to the scarcity of certain anthracite sizes coke of nut size is moving in fair volume.

BALTIMORE

Practically complete embargo on exports has failed to throw any considerable government-price coal on the market so far. Bunker restrictions due. Some over-shipment on contracts probably being made. Car supply again dwindles and movement falls off. Anthracite scarce.

Bituminous—While the Central Coal Committee in Washington announced on the twentieth a further tightening of the embargo on export rules which had been in force since Jan. 6, and this has almost brought to an end the issuance of permits in this territory, there is no considerable amount of government price coal in sight. There are some offerings at the price, it is true, but they are practically all of undesirable grades to the majority of consumers.

In seeking for a cause it must be remembered that that between the first export resumption clearance on Jan. 6 and Jan. 25 there was recorded an export cargo loading at Baltimore alone of about 125,000 tons, while the vessels took on an additional 25,000 tons for bunker use. At present the loadings continue heavy on the existing mass of permits issued before the ban became really strict and the few permits in special cases allowed since, and will probably run for a couple of weeks more in that fashion, as permits now out call for shipments of several hundred thousand tons on export and bunker account It must also be remembered that the government allows operators to ship coal on existing contracts much above the government price, and there is probably even a decided over-shipment on these accounts to bridge over the show down in export period.

Operators can not be expected to accept the government price, after paying the 14 per cent increase in wages to miners besides, while any chance of the other outlets exists. There is talk now, however, of curtailing the amount of bunker coal. If the present government plan of complete shut down on export of certain lines of gas coals, which it is claimed are badly needed at home by certain lighting companies, and a very searching inquiry before permits are given on other gas coals and steam coals, is carried out, the delivery on high contracts may soon become burdensome, and good coals be thrown on the open market at the government price.

A very early result of that kind is being impeded, however, by the poor run of car supply. On the division which intersects Baltimore — Monongahela, Maryland & Pennsylvania, Connellsville and western Maryland—the loadings daily have dropped to between 2,500 and 2,600 cars, as against about a thousand better a week or ten days before. The car supply recently has only been running between 40 and 50 per cent and great difficulty has been experienced with prompt movement because of frozen coal. At Curtis Bay here the daily reserve has improved, however, and at this writing the supply there is between 1,000 and 1,200 cars, with daily dumpings of between 125 to 250. There is little or no export coal noted at Canton pier.

Anthracite—Sleet and snow have been the portion of this section for some days, and the receipts of anthracite have slowed up to a great extent. This drop off in receipts came at a time when the call is steadily increasing for the winter fill-in business. Some of the dealers are beginning to apportion coal instead of filling orders completely.

Lake Markets

PITTSBURGH

Car supplies only slightly increased. Local consumers object to export sales. By-product coke ovens very short of coal.

Car supplies at mines have increased only slightly, and are still altogether inadequate to the requirements. The condition is all the more disturbing in view of the fact that the weather has been relatively favorable, so that there are chances of a great decrease in available transportation at any time when a spell of really bad winter weather occurs.

Consumers of coal, and particularly the steel mills, object to the extra price allowed to be charged for export coal, asserting that there is a great deal of coal going for export, on account of the price, which otherwise would be offered in the open market. The attitude of the steel mills is that they are losing this quantity of coal, by reason of the regulations, although they are not particularly critical of the coal operaors for selling their coal in the better market.

On the whole the coal supplies to the ordinary line trade are not far from adequate, but consumers have to run from hand to mouth when in winter they much prefer to have some reserves. Supplies to the byproduct coke ovens, while they have been increasing somewhat of late, are still far below requirements, which are increased now that there are more favorable labor conditions in the iron and steel industry, and practically all the blast furnaces could operate, if they were supplied with coke.

Very little coal is moving in the open market, but there are occasional transactions, and at Government limits: Slack, $2.10; mine-run, $2.35; screened, $2.60, per net ton at mine, Pittsburgh district, with a 15c. brokerage allowance in some instances, paid by the consumer.

BUFFALO

Continual complaint of coal confiscation. Some jobbers giving up business till it is over, as they can get nothing to destination. Car shortage increases. Big consumption of anthracite.

Bituminous—There is still nothing to be heard in the shipping offices but complaints of the taking of the cars in transit by the railroads for their own use. Some shippers are so exasperated over the state of things that they are sending in few or no orders, for they say it queers their trade to announce to customers that there is coal on the way for them and then receive a notice that it has been taken for railroad use. From the fact that every jobber in this trade is making the same complaint it appears that either cars are growing scarce fast or the roads are laying in stocks of coal.

It is a fact that the car supply is growing smaller every week. All branches of business agree as to that. There were wanted at the beginning of this week more than 2,000 grain cars here for seaboard service, but only about 50 were to be had. Coal cars are not as scarce as that, but they are so scarce that the roads are cutting each other out of them when it comes convenient. A large number of cars are at the Bridgeburg station across the river in Canada, waiting to be taken to the mines, but as they are to be loaded with rail coal and returned the roads on this side refuse to take them.

It is time that some sort of authority is exercised over the traffic, such as will insist on a more uniform distribution of the coal. Otherwise the private consumers will soon be out of coal and the roads will have a surplus. It is a fact that all sorts of consumers have used a much larger amount of coal this winter than ever before, for the weather has averaged colder than that of two years ago, which was a record breaker. We are in line for a let-up next month, though. It came on Feb. 6 two years ago, after which the season was mild. Spite of apparent needs the demand for coal is still moderate.

Anthracite—The consumption of coal in this territory was never so great as during this winter. The cold weather set in a week or more before the end of November and it has been below freezing except of now and then part of a day ever since and often close to zero. For that reason it has been impossible for the mines to keep up with the consumption and the city distribution shows it. While the shippers are not running much behind the retailers are complaining and a short time will see the consumers again teasing for coal, as they did when it was the popular idea that there was not enough to go around. At the same time a return of soft weather with sun or rain would entirely change the state of the demand. Consumers are of the idea that coal is too high and they will not buy more than they need unless they fear that the supply will run down.

A return of mild days next month, as is expected, is sure to cut down the anthracite demand materially. The independent operators and jobbers are aware of this and they do not hesitate to offer their coal at practically circular prices, being satisfied if they get a few cents over. Conditions will remain thus unless the cold weather lasts longer than is expected.

So it appears that the shippers do not look to see the winter continue severe long enough to increase the demand very much and it is to be hoped that they are right, for the consumption is likely to be large enough otherwise to use up all the anthracite that was shipped to Upper-Lake ports and it would be difficult to make up a deficiency there by rail. The amount put into that territory was large and it ought to last through to May under anything short of record conditions. Prices are unchanged by the standard companies.

COLUMBUS

Reduced production, due to car shortage is still the principal factor in the Ohio coal trade. Demand for all grades, but more especially for domestic is strong. There is a growing coke shortage reported.

The reduced car supply, which is now less than 50 per cent in most of the mining sections of Ohio has reduced production to a dangerpoint. With extreme cold weather continuing there is an unusually strong demand for coal, and while there is no especial suffering at this time, unless conditions are remedied it is believed that some suffering may result. Low temperatures have prevailed for the greater part of January, and according to the weather reports there is no relief in sight. As a result of this state of affairs, there is an unusually strong demand for all domestic grades. Retail stocks are low and in many instances entirely exhausted.

Householders are placing orders for immediate delivery. Some of the dealers have been compelled to apportion their available supplies to many customers. The icy streets have also interfered with prompt deliveries. Retail prices are firm at the levels which have prevailed for some time. Hocking lump sells at $6.25, and mine-run at $6. West Virginia lump is quoted at $7 and Pocahontas lump, when obtainable at $8. There is some Pocahontas mine-run on the market but little lump. Pomeroy lump sells at $6.50 while mine-run is quoted at $6.25. Some Jackson lump is coming at around $7 delivered.

Steam demand remains good in all sections, but this is not attracting the attention of domestic grades. Steam users are buying liberally and many are trying to accumulate reserves to guard against emergencies. Iron and steel plants are buying well. Rubber concerns are probably the best buyers at this time. Manufacturers generally are rather anxious of their fuel supply and are placing larger orders than usual. Generally speaking the steam business is strong but does not show the strength as is exhibited in domestic sizes.

Reports from various Ohio fields show that the car supply is now 50 per cent and often less. In the Hocking Valley field the production has been about 45 per cent of normal. Eastern Ohio, with a short car supply on all roads reports about 40 per cent output. Pomeroy Bend is credited with an output of 40 to 50 per cent while other fields, such as Massillon, Crooksville, Cambridge and Jackson have an output from 40 to 50 per cent.

CLEVELAND

Just enough steam coal is coming through to meet immediate requirements. Dealers are taking all domestic orders subject to indefinite delivery. Revision of anthracite, Pocahontas and domestic bituminous prices has resulted in a slight decrease.

Bituminous—Car shortage, which is cutting down receipts to almost an irreducible minimum, is also working a benefit to the trade. Steam-coal users, unable to get any cars in which to ship their products, have been forced to curtail operations, and demand for steam coal has been decreased opportunely. So, even while receipts of steam coal are not more than a third of normal—on some days not more than a quarter—shipments are sufficient to blame curtailed schedules to car shortage, and not coal shortage. However, demand exists for every ton operators could get through, for most plants are planning to throw down a record-breaking tonnage of coal.

The brightest ray of hope to shine on the local trade in many day is the news from Washington that after Jan. 27 the $1.35 additional allowed operators on coal for export will be taken off. This, dealers state, will result in a much larger percentage of contract coal coming through, as $3.70 for mine-run and slack and $3.95 for prepared sizes has looked much larger than $2.35@$2.60, respectively.

No more domestic bituminous than steam coal is being received. Shipments come through spasmodically, and dealers are making all orders subject to indefinite delivery. Domestic stocks are good and no real inconvenience has yet resulted despite extremely cold weather. No. 8 Pittsburgh has droppd from $7.80, delivered, to a spread of $7@$7.40 Massillon lump, which was $8@$8.10, now can be had for $7.65. Coshocton lump has decreased from $8.10 to $7.15.

Car replacement at eastern and southern Ohio mines ranges from 10 to 70 per cent, with about 30 per cent more near the average.

Pocahontas and anthracite—Although the embargo on Pocahontas has been lifted a week now, practically none is coming through. Like anthracite, receipts are about 10 per cent of normal. Demand has fallen off, but only because dealers specify indefinite delivery in taking business. The minimum on egg and grate anthracite each has been reduced to $12.20. No forked Pocahontas at all is available. Shoveled lump is down to $9@$9.25 and mine-run to $8@$8.25.

Lake trade—It is estimated that close to 1,500,000 tons of bituminous coal have been covered for the 1920 season, with the rate subject to future negotiation. One Cleveland vessel owner has taken 550,000 tons for Lake Superior and 250,000 tons for Lake Michigan. More coal tonnage has been offered vessel men than has been accepted. Fixing of the carrying rate will be delayed almost to the beginning of the season, it is believed.

Prices of coal per net ton delivered in Cleveland are:

Anthracite—Egg, $12.20@12.40; chestnut, $12.50@$12.70; grate, $12.20@$12.40; and stove, $12.40@$12.60.

Pocahontas — Forked (nom.) $10.50@$11.00; shoveled lump; $9.00@$9.25; and mine-run, $8.00@$8.25.

Domestic bituminous—West Virginia splint, $8.30; No. 8 Pittsburgh, $7.00@$7.40; Massillon lump, $7.65; Cannel lump, $11.00; and Coshocton lump, $7.15.

Steam coal—No. 6 slack, $5.25@$5.50; No. 8 slack, $5.20@$5.50; Youghiogheny slack, $5.25@$5.50; No. 8¾"—$6.00@$6.25; No. 6 mine-run, $5.25@$5.50; and No. 8 mine-run, $5.85@$6.00.

CINCINNATI

The coal situation in Cincinnati while not alarming is worse than it was during the coal miners' strike and is much worse than during the strike in some other places within a radius of one hundred miles of Cincinnati.

These conditions were revealed during an inquiry in to coal on hand, that coming in, and prospects of more arrivals. During the strike there were large reserves of coal in this vicinity most of the time. When the strike ended these reserves were by no means exhausted, the question now is what has become of the large reserve supply.

Now there is practically no industrial reserve here. Virtually all estimates of the coal situation are confined to industrial conditions because it is impossible to say what coal is held in the homes. The domestic supply is about as it was during the strike. The demand for domestic sizes and byproducts has been rather strong during the past two weeks.

Coal men say it has been impossible to build up reserves depleted by the strike. During the past week the Coal Distribution Committee has been confiscating and diverting large quantities of commercial coal in transit mainly for other points in the Ohio-Indiana District under its control.

The severe car shortage which has existed since the strike ended is regarded as the chief cause of the present trouble. Coal dealers here, though, blame it on lack of normal production, and a Government regulation which makes export shipments more profitable. The regulation permitting to charge $1.35 more for export coal than for domestic makes the Middle West suffer while coal goes to Europe.

Shippers have been utilizing box cars for shipping purposes, but have received complaints from customers that they are very unhandy to unload, and cause the employment of more men and for that reason desire the discontinuance of that practice.

The severe weather during the past week was another factor that hindered the rapid movement of coal cars. Prices of all grades remain unchanged, with Government restrictions still in evidence. Production is but about 30 per cent of normal due to car scarcity, indifference of labor and price conditions. Car scarcity at the mines is due to the fact that about 40,000 to 50,000 cars stand loaded in the West.

The price conditions are due to the belief on the part of many operators that the government price must still be observed and they can not mine at that price and pay the wages the Government has fixed for labor. Many mines have their money tied up in diverted coal which has not yet been paid for and they cannot operate satisfactorily until they are in funds. Money, however, is coming in in better shape.

DETROIT

Bituminous coal is coming into Detroit only in limited amount owing to shortage of cars and the railroad embargo.

Bituminous—With quite an active inquiry for both steam and domestic forms of bituminous coal, Detroit wholesalers and jobbers are encountering considerable difficulty in obtaining stock to fill orders promptly. The curtailment of shipments from many of the mining districts, resulting from inadequate supply of transportation facilities at the mines, is emphasized by the restrictions of a railroad embargo against nearly all forms of freight consigned to Detroit in carload shipments through Toledo.

While it is possible to obtain a permit from the Railroad Administration for the movement of specified shipments on giving a promise that the cars will be promptly unloaded, the delays experienced in obtaining permits and in getting the cars into the city render this an unsatisfactory way of doing business, the jobbers say.

There is said to be no "free" coal on tracks in or around Detroit and jobbers assert that the coal arriving is all sold before it reaches the local terminal. It is apparently conceded that no substantial improvement in car supply may be expected during the present coal year and that car shortage is likely to remain indefinitely as one of the problems affecting coal supply.

Among some of the jobbers and wholesalers the Fuel Administration's limitation of brokers' commission to 15c. a ton is being criticised as an injustice. Considerable stress is placed on the fact that the 15c. margin has been rendered wholly inadequate during the period the coal administration was not functioning.

Anthracite—Household demand for anthracite has been greatly stimulated by the long period of very cold weather. Some of the retailers are still able to fill orders but others have very little in stock, and are having much trouble in the delivery of shipments. It is necessary sometimes to substitute bituminous on urgent orders.

BIRMINGHAM

Local market conditions favorable, with good inquiry for all steam grades, though a little easier than last week. Volume of business offered is more than sufficient to absorb the output, which was crippled the past week by car shortage at Louisville & Nashville mines. Warm weather slightly relieves the pressure for domestic sizes.

There is a good, steady inquiry for all grades of steam fuel, and while slightly less insistent than a week ago, brokers and distributors have more business than the mines can take care of at present, and coal is moving in large volume as the supply will permit. The output at mines on the Louisville & Nashville was held down considerably by a very pronounced shortage of cars on that line, the supply ranging from 50 to 60 per cent of requirements. Little delay was experienced for lack of equipment on other coal-carrying lines.

Domestic inquiry eased up to some extent on account of continued warm weather, but the supply has not been improved, and the mines are not able to produce sufficient tonnage to take care of the business offered.

Production for the week ending Jan. 17, will be approximately 350,000 net tons, or about 10,000 tons less than the previous week. Labor conditions are good, barring the natural shortage, which affects all operations to a more or less degree. Mine workers continue to lose a great deal of time following pay days and the first of estimates.

Middle Western

ST. LOUIS

Car supply unusually bad. Seasonable weather retards movement of equipment. Hopper cars causing enormous losses. Steam and domestic demand good locally. Country district still short of fuel.

Locally the situation is in pretty fair shape. While the car supply averages from two to three days per week at the mines in the Standard and Mt. Olive fields and the carriers other than the short line coal roads are making poor time in deliveries, there is plenty of steam and domestic coal for the local call. There is no surplus of any kind. Domestic demand is good; better than was expected, on account of the uniform cold weather, which at the same time has not been excessive.

The Mt. Olive and Standard business shows up better because of the very small tonnage of Carterville and Franklin County available. In the country there is still in many places a scarcity of coal. This is easing up some in western Missouri where the tonnage of Missouri and Kansas coal is increasing since the miners have called off all of their strikes.

In the northern part of the state, as well as in Iowa on the north, coal is so scarce that fuel committees to govern the distribution of wood have been found necessary.

The steam demand from the country is fair and is being taken care of on small sizes. The batle-ship hopper cars of eastern roads is causing untold losses in revenue to both operators and consignees. It costs from ten to twenty times as much to unload a hopper car of domestic coal in the Middle West as it does a flat bottom car.

Labor conditions are apparently good, but the shortage of miners keeps the production down and the shortage of cars and increase of idle days is discouraging to many miners; They leave for other callings at every opportunity. In the Carterville field of Williamson and Franklin Counties and in the Duquoin and Murphysboro fields the car shortage is felt with the same effects as in the other districts.

The demand of all sizes from these fields far exceeds the supply, although very little of the Franklin County product is coming to St. Louis. The Devoy & Kuhn Coal & Coke Co. has brought legal action against the Chicago, Wilmington & Franklin Coal Co. of Chicago for failure to ship at the government price on an open market order calling for "price prevailing at time of shipment to govern."

Several other suits may come later. In a general way the dealers and steam trade are off of this coal until the Government brings these "Coal Reds" into line. Somewhat similar conditions are reported from some of the Kansas districts.

The St. Louis, and St. Louis County retailers with those of East St. Louis, Madison and Granite City, Ill., sent E. J. Wallace, formerly with the St. Louis Fuel Committee to Washington on Jan. 22 to present the case to the Department of Justice through the Attorney-General's office.

	Williamson and Franklin Counties	Mt. Olive and Staunton	Standard
Prepared sizes (lump, egg, nut, etc.).	2 55@2 70	2 55@2 70	2 55@2 70
Mine Run	2 35@2 50	2 35@2 50	2.35@2 50
Screenings	2 05@2.20	2 05@2.20	2.05@2 20

Williamson-Franklin rate to St. Louis is 1.07½, other rates 0.92½.

MILWAUKEE

Coal stocks fast becoming exhausted. Market must soon depend upon rail supplies. Prices unchanged.

Everything is serene in coal circles at Milwaukee, notwithstanding the steady drain on insufficient stocks due to sharp, winter weather. All eastern coal will soon be exhausted and in the course of a month or six weeks, with continued cold spells, the market will have to depend upon rail supplies of the standard grades of coal. Screened Pocahontas is very scarce, but mine-run is still being delivered freely. West Virginia splint is completely sold out. Steam coal is in fair supply as yet. Illinois coal is being received daily and in increasing volume. Prices of all coal remain unchanged.

Coke

CONNELLSVILLE

Coke production increases very slowly and is much below requirements. Re-arranging of invoice prices on account of Government control.

While coke production in the past three or four weeks has been fully up to the previous normal, the blast furnace requirements are greatly increased, and thus there is as noteworthy a shortage of coke as there has been at almost any time. Production has been increasing at only one or two per cent a week. The limiting factor in production is the car supply for loading coke. The railroads seem to be moderately well satisfied with their performance in furnishing cars, but they are comparing present car placements with the average of a few weeks or months past, instead of taking into the reckoning the greatly increased demands of the blast furnaces.

Very little coke indeed has been coming into the open market, and what is offered is usually of relatively inferior grade, though the full Government limit price is always asked. Apparently practically all shipments have been against contracts. Some of these contracts are merely general understandings that coke will be shipped at as good a rate as possible and invoiced at the prevailing market, which just now is of course the Government limit.

There are some contracts extant, however, which are written with a flat price above the Government limit or are on a ratio basis, relative to pig iron, involving a settlement price, by reason of the present high price of pig iron, well above the Government limit. At first it was the common impression that such contracts were not affected by the Government control, but later interpretations seem to have shown that the regulations suspend the operation of such contracts as regards the price, and in a number of cases adjustments are being made to bring the billing price down to the Government limit. The market remains quotable at $6 for furnace, and $7 for foundry, per net ton at Connellsville ovens.

The *Courier* reports production in the Connellsville and Lower Connellsville regions in the week ended Jan. 17 at 241,490 tons, an increase of 900 tons.

BUFFALO

Coke—The situation does not change much. Prices are steady on the basis of $9.60 for 72-hour Connellsville foundry, $8.60 for 48-hour furnace and $7 for off grades, with domestic sizes $8, breeze not selling. The Buffalo furnaces are now running at full blast, as is shown by the second vote taken by the strikers. They first voted to continue the strike and then reversed the vote. When they applied for their old jobs most of them were rejected on the ground that all places were filled.

Of the 6,000 men who struck only about 1,500 had remained out. So it appears that about a quarter of the strikers have been without occupation for several months and for their pains they can now look up something else to do from that to which they were used.

COAL AGE

Volume 17 New York, February 5, 1920 Number 6

A Little Hard to Understand

By R. Dawson Hall

INTO the hands of many people, for the document is being widely circulated, will fall a leaflet entitled, "A Memorial by the National Shippers' Conference to the Joint Conference Committee of the Congress of the United States Having Under Consideration Pending Railroad Legislation." It is signed quite numerously by influential organizations, manufacturers and distributers and producers of raw materials.

Among the latter may be noted the American Mining Congress, the National Coal Association, the Illinois Coal Traffic Bureau, the Indiana Coal Trade Bureau, the Knox County Coal Operators Association and the Southern Indiana Coal Bureau. The names of mining organizations are specifically mentioned because this appeal is made to them, a coal paper being a natural vehicle for approaching such persons.

Let us first inquire what has been the general line of argument relative to metal prices put forward by the producers of mineral products especially copper, lead and zinc, tungsten and the precious metals. It has commonly been said that mining is a hazardous business, that money invested in a new proposition even when it looks good and is properly conducted by honest and capable persons, is quite likely to be a failure. The metal men point to the failures of many highly reputable ventures. They assert that the chances in an investment are so great that unless great profits are allowed to the successful ventures capital will refuse to enter the business and if it does enter will be lost because the losses which are unlimited would surmount and negative the profit which, under government regulation, would be strictly controlled.

Who shall deny that there is warrant for this belief but who also will deny the fact that there is no longer any element of gamble in the great mineral-producing properties? Could we not, for instance, put a price on copper that would pay 5½ or 6 per cent on the original capitalization just as surely as we can put a price on transportation that would net the same? With the variation in demand for copper, it cannot be done in the copper mines with a certainty of success, nor, with a variation in demand for transportation, can it be done in the railroad business.

There is no reason why a Cummins Bill should not be enacted for the mineral industry. We could readily forget that the risks of the mineral industry had already ruined many small and large aggregations of capital and had largely reduced the accumulations of others. We could say that all the successful ventures should be strictly regulated by some board so as to return only a reasonable profit on the original investment. We can well imagine, nevertheless, what complaint would be made by the mineral industry at this unquestionable injustice.

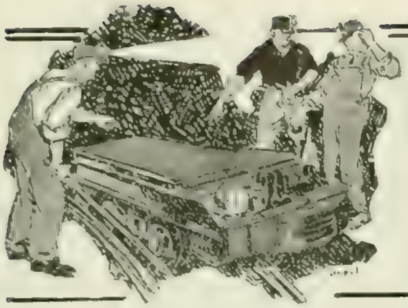
We could call for an Interstate Commerce Commission to keep profits down and bring all mines down to a "cost plus" basis with the plus somewhere around 5 or 6 per cent. It would be unjust of course, but it would resemble what the shippers, who signed this memorial, would like to apply to the railroads.

The shippers do not give the Cummins Bill their support, but what they object to is not the closeness and unfairness of the control but those elements in the control that mitigate and make bearable the unnatural restraint of the railroad industry, for when railroads were first built there were all the elements of uncertainty that beset mining ventures. Some mining plants pay almost from the first, the United Verde, for instance, but few if any railroads remain in the hands of those whose capital built them.

Having accepted the risks the railroads which win through at much peril and privation are asked to be content with a profit no larger than is paid on municipal bonds which are rated among the safest of investments.

A guarantee of such a return seems, to the National Shippers' Conference, unfair and socialistic, but surely to regulate the returns as the Interstate Commerce Commission has done is even more unfair and socialistic. The railroads found their difficulties so insuperable under that rule that only Government control made possible their continued operation, and only to the Government was the Commission willing to allow increased rates of any degree of adequacy.

Let us hope that the public will never be so blind and so injudicial as to use the mining public and the long list of shippers who venture boldly to put their name to this document in like manner to the way in which they would use the railroad industry. If some day the public treats the mining industry as it has used the railroads, no one will be justified in saying a word of defense.



IDEAS AND SUGGESTIONS

PRACTICAL SCHEMES THAT MAKE THE DAY'S WORK EASIER

Rack for Rolled Drawings*

By M. C. Ross
St. Louis, Mo.

WHILE an open-construction "rack for holding rolled drawings" may be satisfactory for certain applications, it has some disadvantages, which experience over a long term of years with different varieties of filing cases for drawings has disclosed.

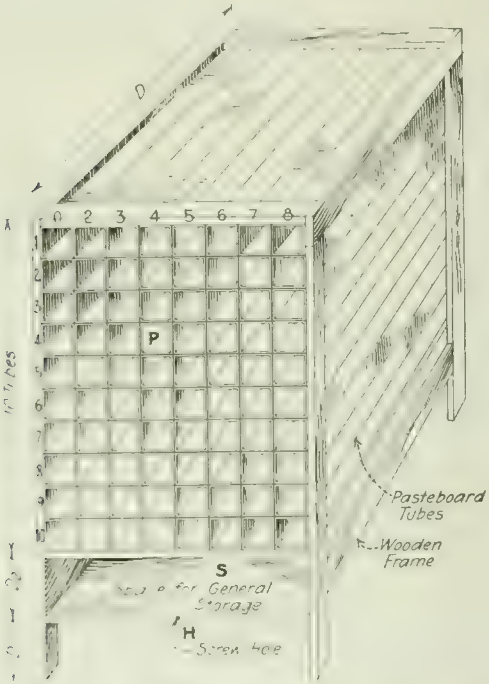


FIG. I

GENERAL VIEW OF RACK, WHEN COMPLETED

The first disadvantage is that, with an open rack, the drawings are exposed to dirt and dust and will therefore, sooner or later, become permanently soiled. Furthermore, each time one of the rolled drawings is pulled from the rack, it must be dusted before a man can work over it, otherwise he will rub the dust into the sheet.

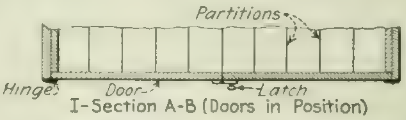
The second disadvantage is that short, rolled drawings, those that are not long enough to span the distance between two of the bents, will fall down between them and may thereby be out of place when they are required.

The third disadvantage is that, in pushing the rolls into the skeleton rack indicated, the end of the roll often strikes one of the vertical or horizontal supporting pieces, and this may make creases all along one of the edges of the rolled drawing. The drawings in such an arrangement may be protected from dirt by enclosing the rack in an oil cloth or wooden casing and by arranging a curtain to drop down over the front. But this expedient does not correct the other two disadvantages.

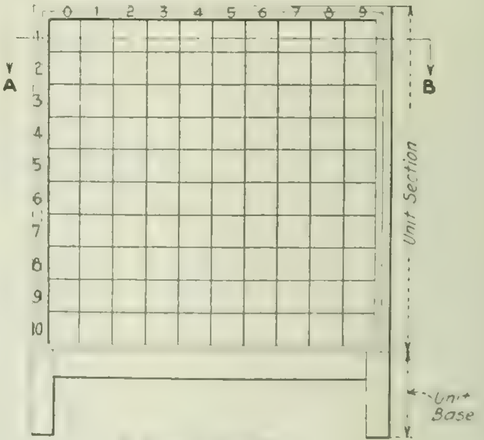
After trying out a number of different schemes for filing rolled drawings, I have found that a rack composed of tubes or pigeon holes (Figs. 1 and 2) is, by all odds, the most desirable arrangement. Therefore, how such racks may be constructed at low cost for temporary use, and for permanent installation in an office will be described.

For a cheap improvised rack the design detailed in Fig. 1 has been found well adapted. In this, each pigeon hole comprises a pasteboard tube. All of the pasteboard tubes are held in the frame, which may be quickly constructed of boxing stock. Pasteboard tubes such as those illustrated may be obtained at low cost and made to any reasonable dimensions required by the buyer, from any pasteboard box factory. Where it is the intention to use the rack only once in a given location and to ultimately discard it, the tubes may be provided with one pasteboard end and may be bound with paper.

But if the rack is to be assembled in one location and there used and then knocked down and moved to another location, both ends should be omitted from the tubes and they should be bound with a cheap binders' cloth at the ends as suggested in Figs. 3 and 4. When thus bound, providing "hinge" corners are used, the tubes, when removed from the rack for transportation, can be compressed so that in shipping each one comprises little more than a flat sheet, as shown. The wooden frame holds the collapsible tubes so that their sections are square when they are mounted therein.



I-Section A-B (Doors in Position)



II - Front Elevation (Doors Removed)

FIG. 2

DIAGRAM OF RACK FRONT

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In order that the rolled drawings or tracings which are filed in the different pigeon holes of a rack like that of Fig. 1 may be located in a minimum of time, a systematic scheme of numbering the pigeon holes should be adopted. To this end it has been found that it is always desirable to make each stack of pigeon holes ten holes high. The stack may be any desirable number of pigeon holes wide. Where this "decimal" arrangement is adopted the numbers 1 to 10 should be marked along the left hand (Fig. 1) edge of the rack opposite the center of the horizontal row of pigeon holes to which that number corresponds (see Fig. 1).

Then along the top piece of the rack the vertical rows are numbered as detailed in the illustration, the number over the first vertical row being zero. Where this method is adopted it is easy to find pigeon hole No. 44, for example by reading the "abscissa" and the "ordinate" of the desired drawing and following with the eye to the pigeon hole where they intersect.

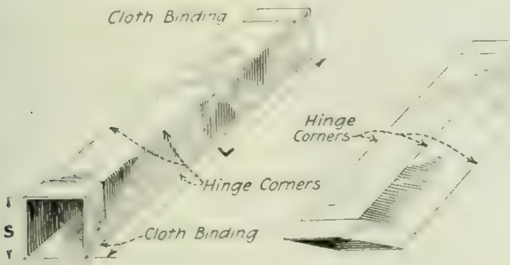


FIG. 3 FIG. 4

COLLAPSIBLE CONTAINER

In order that the pigeon holes will be sufficiently raised from the floor that it will not be necessary to stoop over too far to pull drawings out and to insure that sweeping will not drive too much dirt into the rack, a space (*S* Fig. 1) for general storage may be provided in the lower portion. If open end collapsable tubes are used, a piece of oilcloth or sheet of card board should be tacked over the rear end of the rack to prevent the entrance of dust. If tubes with one closed end are employed, that end, obviously, prevents the entrance of dirt from the rear. In any case, a curtain should be provided to cover the front. A window shade and roller answers admirably for thus inclosing the forward end of the case. A screw hook (*H* Fig 1) can be driven into the bottom cross piece to engage the ring in the shade stick to prevent the shade from raising when it should not.

As to the proportions of the pigeon holes these should preferably be square. Where the diameters of the rolled drawings to be filed are about the average, 6 x 6 in. pigeon holes are quite satisfactory. In certain infrequent instances where the diameters of the rolls are large, 8 x 8 in. pigeon holes may be desirable. Where the rolls are quite small, 4 x 4 in. containers may be utilized.

In Fig. 2 is suggested, in a general way, a desirable construction for a permanent pigeon hole case such as can be made by a carpenter. This design is based on the unit principle. The leg base is a separate member and may be removed. The pigeon hole section fits over it. Each one of these unit sections should always be 10 pigeon holes deep but may be 4, 5 or 10 or more pigeon holes wide as occasion demands. The section *A-B* (Fig. 2) shows how the doors should close against a rabbet to prevent, insofar as possible, the entrance of dust. The rear end should be closed with tongued-and-grooved boards or by panels.

In a permanent filing case, the pigeon-hole construction may be of any one of a number of different types, two of which are detailed in Fig. 5. With that designated as *I*, the vertical members are composed of soft wood boards about ⅜ in. thick. Into these saw-slots to accommodate the tinned sheet metal shelves are cut. An all-metal pigeon-hole construction can be arranged (Fig. 5, II and III). Such construction has, of course, the advantages of non-combustibility and space economy. The vertical members comprise sheets of tinned iron from which lips are bent out to support the strips which constitute the horizontal shelves. This metal construction, when mounted within a suitable wooden or metallic casing, is quite rigid.

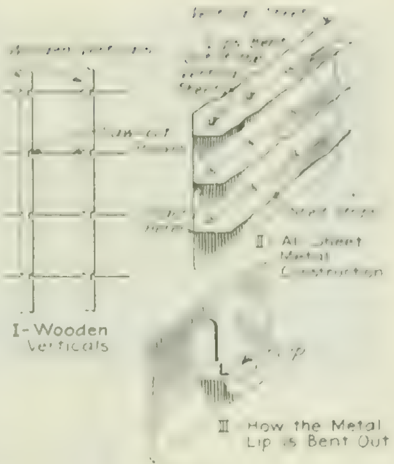

I-Wooden Verticals
II All Sheet Metal Construction
L
III How the Metal Lip is Bent Out

FIG. 5

DETAIL OF STEEL CONSTRUCTION

Gripping Devices for Ropes

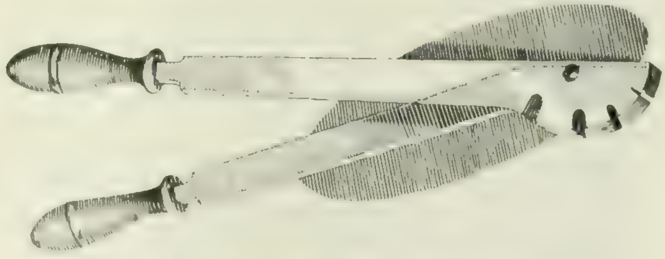
According to the invention recently patented in England says the *Colliery Guardian*, a pin or the like is inserted through the rope at the place to be connected, to restrain the part of the rope at this place by a junction member so shaped that the portion of the rope displaced outwards by the pin engages in a recess of a wedge or double-wedged shape, in the junction member, whereby should either one or both such portions of the rope slip, these portions become more firmly held by being forced into a narrow part of the wedged recesses, as the rope in the forward movement tends to unstrand.

Efficient Wire Shear

By Charles H. Willey

Concord, N. H.

With two old flat files in a little spare time the mine-shop mechanic can make a practical and efficient wire-cutting tool as shown in the accompanying illustration.



WIRE SHEAR, WHEN COMPLETED

The files are each annealed and forged to the shapes indicated. A hole is drilled as shown in each part. The two parts are then bolted together and the slots for the various sizes of wire are filed in each jaw. The bolt is then removed and each part is tempered. A rivet is used in place of the bolt when the tool is assembled for use.

Rotary Mine-Car Dumpers

By Sheldon Smillie
Pittsburgh, Pa.

SYNOPSIS — *The rotary dump for discharging the contents of mine cars has many advantages over other devices employed for the same purpose. Such a dump permits the use of a "solid," that is a gateless door, allows any number of cars to be emptied at once and requires much less labor in operation than do other types of car dischargers*

RECENTLY, in talking to the superintendent of one of the large coal companies, about rotary mine-car dumps, he remarked: "Fourteen years ago I would have gone down on my knees to the man who would make a dump for cars without end gates." He can now readily obtain such a device.

End gates in cars have been one of the big sources of trouble to mine operators, not to mention that nightmare the bottom-dump car. Little improvement seemed possible and managers have endured them as a necessary evil, many burying the cost of repairs in miscellaneous charges. One operator, realizing he had a number of men constantly at work on his cars, kept an account for one year and found that each gate cost him $5 per annum to keep in repair. This was exclusive of the other repairs the car had to undergo because of its being weakened through having but one solid end.

Use of the Slanting Flare on Sides of Cars

Few users of mine cars know that the slanting flare on the sides of their cars is for the purpose of keeping the weight of the coal from crushing down the side of the car near the gate, and to give it a tendency to spread instead, which tendency can be counteracted by the rod above the gate. With solid-end cars, the ends act as a beam that will hold the square shape of the "mourners bench" type of car, which has considerably more capacity than the standard types, with the same over-all dimensions. It is also possible to build these cars with greater width for a given gage of track than the other style, although this is not always advisable.

The leaky car is one of the most potent factors in creating a dusty and consequently explosive condition in a mine. Coal falling from the tops of cars is usually in lump form and rolls to the rib without much breakage, but the coal from the leaky or carelessly-closed gate falls directly on or between the rails, and is ground by the many wheels passing over it to an impalpable powder which floats in the air and settles everywhere. In a wet mine, this dust gathers at the sides of the rail and draws water by capillary attraction, reducing the tractive effort of the locomotive. To overcome it, the motorman sands the rail. This serves its purpose for the moment, but the ground sand joins the dirt along the rail and does its bit toward making matters worse.

Use of Modern Dumps Greatly Increased

Readers of *Coal Age* well know that from time to time, there have appeared descriptions of installations of rotary dumps. Some operators have attempted to utilize devices of this kind, but few realize that the use of these dumps is becoming general practice and that a rapidly increasing number are being installed every year. One large steel company is putting in devices of this kind to the exclusion of all others for discharging coal cars. Many of the earlier installations were cumbersome, expensive and broke the coal because of their large diameters. As there were formerly no specialists making these machines in quantity, some parts were of weak design, while others were unnecessarily heavy. Modern dumps are of careful design, nicely balanced on roller bearings, and various simple devices are employed to prevent the coal from leaving the dump until the car is completely overturned.

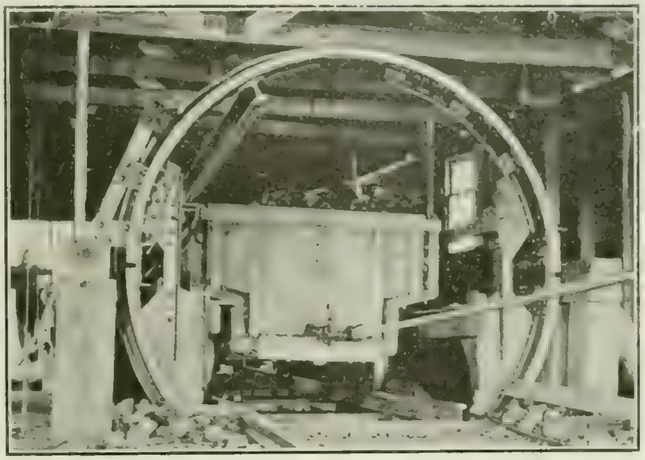
Dumps Can Be Made with Varied Length

These dumps are usually built as a cylindrical skeleton not much larger than a car, but they may be made long enough to contain any number of mine cars desirable to discharge at one time. The H. C. Frick Coke Co. has one dump long enough for 18 cars at its Lamont No. 2 mine near Uniontown Pa. Five- and six-car dumps are quite common, and one to take 28 cars is under construction.

There are several devices for holding the cars in the dumps, one consists of horns which close over the wheels like those of self-dumping cages, but the simplest appliance for this purpose is an angle in such a position that the wheels of the car run under it. Cars equipped with brakes offer an obstacle to this, but where new cars are to be purchased, they can be designed with brakes working upward instead of downward. This is really the logical direction in which a brake should operate. When brakes which interfere with this method of holding the car are employed, an angle or tee may be riveted along the side of the car. This is tapered off at the ends to prevent catching in clothing and servês the double purpose of a ledge whereby the car may be held on the dump, and a stiffener.

Some operators object to this angle, and where such is the case, a simple inexpensive alteration in the brake can be made, which will permit it to clear the holding-down angle of the dump.

The old-style dump was usually arranged to operate by gravity, but this has been found unsatisfactory for large capacities and a positive drive of some kind has been generally substituted. A cheap dump for small capacities, however, has been successfully developed by employing a simple device which prevents the load from losing its effective weight until the last moment.



SHOWING SLOPE MINE HOISTING IN BALANCE
Note two ropes—Slack rope on trip at bottom

The best and most reliable dumps are driven by means of air or steam working in a long cylinder connected to the circumference of the dump frame by means of ropes. This type of machine is extremely rugged and reliable. It has but few moving parts to get out of order, and there is nothing that can happen to it to prevent it even when partially disabled from completing any given shift when full repairs can be made. There are no gears or clutches to get out of order or break, and the cushion of air or steam is well adapted to starting a heavy load smoothly without strain. All the large dumps are operated in this manner, as well as those where conditions require an "over and back" motion. It is the type best adapted to shaft-bottom installations, where conditions are unsuitable for motors. The air necessary for their operation can also be made to actuate the skip-loading gates, and pneumatic-car hauls. These latter are greatly superior to the chain haul, as no pits are required. The pneumatic-car haul has few wearing parts, and the device hesitates a moment after striking the lug or axle while sufficient pressure gathers behind the piston to move the car forward with a gradual acceleration. The tendency of the chain haul is to jar the car into motion equal to the constant speed of the chain. This overloads the motor and is the cause of frequent armature burnouts. Pneumatic-car hauls are now made to be double acting and employ the air or steam expansively, so that they economize power.

Where air or steam is not available, a small electric air-brake type of compressor may be located near the dump. There is thus little transmission loss, and the motor is stopped when there is plenty of air in the receiver. The receiver acts as a storage and gives out sufficient power to do the work without imposing peak loads on the motor. Large dumps, operated intermittantly, can be actuated by quite small motors that build up the air supply between dumpings.

Another class of rotary dump is the direct electric driven. These are designed for high-speed, sustained operation, where there are no long intervals of idleness. The earlier types were driven by motor, working through suitable gear reductions to a main gear encircling the dump. This type is slow turning and requires a hand on the controller all the time that the dump is in motion. It needs care and practice to stop the dump with the rails in alignment, and the power requirements in starting are high.

More recent designs have a revolving shaft that moves constantly. These dumps require a clutch of some kind to throw them into and out of action. They are generally equipped with some sort of braking device and a stop which insures exact alignment of the rails when the dump has completed its revolution. The brakes formerly were generally located at some point under the dump, and if not nicely adjusted, stopped the machine too soon, or else allowed it to bang with considerable force against the top. Continual adjustment was needed, and it was difficult to get at the braking device so as to alter its setting.

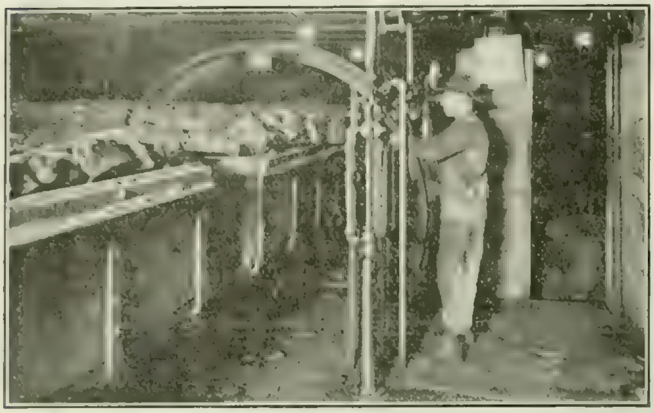
The latest type of dump employs the same variety of shaft drive, but the adjustments are all brought back to the operating lever. Here a quick alteration of the limit of travel controls the breaking effect and makes adjustment convenient. The stops are regulated by a spring cushion upon which they float, and which absorbs all unnecessary jar. With these dumps, all the operator has to do is push a lever forward and the dump starts turning, the lever drops back and the dump stops itself automatically.

The third class of rotary dumps include the gravity types referred to before. They are intended for use where a light dump of small capacity will do the required work. They are naturally much cheaper, require no power and will accomplish the same general results, as the more expensive types. They are good for production up to 750 tons in eight hours, and for discharging rock cars at some point remote from the main dump.

Control of the cars within the dump is accomplished usually by means of horns so set as to accurately spot the cars in the proper position. These open and close automatically with each revolution. A similar pair of horns placed at the entrance of the dump work in unison with them, holding the loaded car back until the dump has reached the proper position for the empty to proceed on its way.

Most dumps of the rotary type have merely replaced the old crossover dump, the cars being uncoupled and after discharge being either pulled back out of the dump or proceeding to a kick back beyond. It has been found, however, that by so arranging the layout, that the empties pass to storage tracks beyond the dump, and that by equipping the cars with swivel links (in size and shape the same as ordinary links) that one man can take the cars from the loaded track pass them through the dump, and deliver them to the empty track without uncoupling. This is a distinct saving, obviating the services of several men. As the cars do not travel singly, there is no violent bumping in their passage either in or out of the dump, and it is unnecessary to use brakes or sprags. By increasing the number of cars discharged at a time, one man is capable of handling an enormous tonnage.

Weighing can be done on track scales so spaced that one car is standing on them while one is dumping. For this arrangement horns should be properly spaced to allow the coupling to be slack and the car being weighed to be free of the others. However, operators are more and more turning to the weigh-basket under the dump as a means of getting away from the variable tare of the car and troubles with the Union.



ROTARY DUMP (600 TON) AT UNION COLLIERY CO., DU QUOIN, ILL.

I don't know who first adapted skip hoisting from metal mines to coal mines, but its advantages have only recently been realized. A good many years ago, Clarence R. Claghorn installed rotary dumps in the bottom of the Wehrum No. 3 shaft of the Lackawanna Coal Co. to be used in connection with hoisting in skips. Unfortunately, however, for some reason not connected with the equipment, it was never put in service.

Probably the first successful use of the skip was in the Ziegler mine of Bell & Zollar in Illinois. Bottom-discharge cars dropped the coal into a pocket which fed to skips through gates some distance below the coal bed. These cars proved so troublesome on account of leakage and accidental opening, that a rotary dump was installed over the pocket and the equipment which has been now in service for some time, is giving excellent satisfaction.

Another pioneer in the use of skips is the Maryland Coal Co. The St. Michaels Shaft near South Fork, Pa., was originally equipped with triple deck cages, but these were abandoned in favor of an inside dump and skip hoisting.

Skip hoisting has now been adopted by many of the large operators in laying out their new mines. Two of the most up-to-date shaft mines in Illinois, planning to hoist upwards of 5,000 tons per day, are being equipped with rotary dumps in connection with skips. Several similar installations are under construction in western Pennsylvania and projected in the anthracite field.

One of the chief advantages to be obtained by the use of skips, is a decrease in power consumption for hoisting. This may be as much as one-third where two car loads are hoisted in one skip. It arises from the decreased speed and dead weight to be accelerated, which power is lost in breaking. Another large advantage is that an engine smaller by about two-thirds is necessary since the peak load required for rapid acceleration is reduced by the square root of the velocity and the hoisting operation is spread over the period formerly required for the caging of the extra car, since a skip can be completely filled with two cars of coal in the time required for caging one car.

The reduction of peak loads are of particular importance where the hoisting is done electrically, and the power purchased. The motor in this case costs considerably less while peak loads increase the cost per kilowatt hour.

Breakage of coal only occurs while filling the first foot at the bottom of the skip, and even this may be reduced by special forms of rounded bottom, which are only struck a glancing blow. This breakage is not nearly as great as that on the coal projected from rapidly dumped cages which throw the lumps over the gate and down the chute or into the weigh-basket.

At mines using self-dumping cages and putting out a large tonnage, it is as much as a man's life is worth to stand around or under the dumps. Self-dumping cages also require an attendant at the top, and time is lost in extra signalling required from this point. Skips require three times the height of hoist to dump in, that cages require, giving the engineer better control of the hoist. The coal pours out smoothly like sugar out of a scoop and requires no attendant at the top.

Rotary dumps are also well adapted to slopes and inclines. By running a rope through the dump, any number of cars may be hauled up a slope to the top of a tipple or breaker, and turned over either all at once, or one or two at a time, without disconnecting from the rope. All this may be done by one man who can act as hoisting engineer and dumper combined.

In the coke regions, the long dump has been arranged for discharging the entire trip over the long bins, peculiar to that district, and from which the charging larries draw their loads by passing in rotation to numerous gates in the bottom.

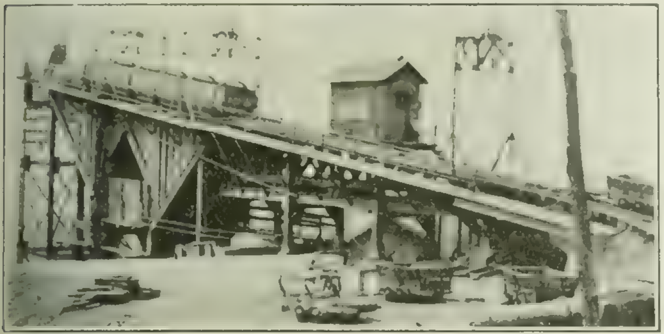
SHOWING IMPROVEMENTS IN CONTRACTORS' CARS BY REMOVING PEDESTAL AT AN OHIO STRIP MINE

The H. C. Frick Coke Co., as previously stated, has one dump accommodating 18 cars at its Lemont No. 2 mine. Another built for six cars is installed at Beatty, Pa., while another for 28 cars is under construction. It is also possible to hoist trips in balance with two ropes running through the dump. Such a plant is in operation at the mine of the A. J. Morgan Coal Co., Pipe Creek, Ohio.

In the anthracite field, the George F. Lee Coal Co. has a rotary dump at its Plymouth breaker. Cars are hauled up a slope and dumped in the top of the breaker, making an intermediate handling of the coal unnecessary, and reducing the number of men previously required.

Inclines are merely the reverse of slopes. Cars are here lowered down the incline, into the dump, and discharged without disconnecting from the rope.

These arrangements make in addition to the savings secured by solid cars a considerable reduction in the cost of a tipple, as such a structure need only be one track wide instead of the two tracks required for the crossover dump. Furthermore the slow uncoupling and tramming of single cars to the dump is eliminated with a saving of several men, and much time. This latter is important when the haul is long, and the dumping time must be short in order to secure the desired capacity.



FIVE-CAR SLOPE AND DUMP USED IN ALABAMA

Speed in dumping frequently eliminates an entire trip of cars, since the same cars can be returned to the mine without having a standing empty trip waiting for the locomotive.

The largest tipple in the world, that of the United States Coal & Coke Co. at Lynch, Ky., is being equipped with rotary dumps.

A new field which the rotary dump has recently entered, is in connection with coal stripping. The R. L. Culbertson Coal Co. near Cadiz, Ohio, has a dumper for discharging the coal from the cars into which it has been loaded by the shovel. Where coal is not loaded directly into railroad cars, but is picked, screened, or otherwise prepared for market, the usual practice has been to load it into contractors cars for hauling to the tipple. These cars are high, do not ride the track well, and require considerable time and the labor of several men to dump.

By discharging them in a rotary car dumper, the car can be lowered by taking out the high center pedestal, and bolting the box firmly to the trucks. The cars will then ride the track better, withstand the severe usage under the shovel, since they have no side doors, and only one man is required to turn them over at a rate considerably faster than could be attained by the old method. This permits of the more rapid movement of trains, and consequently fewer cars are required. Everyone who has seen the Culbertson car, remarks on its graceful lines, if such can be said to exist in any coal car.

O. B. U. Still Strong in Canada

THE One Big Union does not appear to be dead among the coal miners of eastern British Columbia and the Province of Alberta. Recently the O. B. U. forces of Alberta met at Calgary and forwarded a resolution to the Minister of Labor, Ottawa, saying that they were willing to accept the 14 per cent increase in wages awarded them, pending further negotiations on which they are insistent, and absolutely opposing the order of the Fuel Commissioner that the United Mine Workers of America shall be the workers' organization to receive recognition. It is hoped that this resolution will meet with the approval of the Minister of Labor and immediate action soon taken.

On Jan. 14 the mine workers at Coal Creek, Crow's Nest Pass Coal Co., refused to enter the mines because the President of the Fernie local of the One Big Union was ordered off the miners' train for refusing to pay his fare. They were idle for a day and no further information is available as to further developments. As to the situation in the Province of Alberta a letter written by one of the O. B. U. officials on Jan. 8 is interesting. He states that at the Western Gem, Monarch, and Brulé Mines the operators have withdrawn the check-off. He also asserts that everywhere the O. B. U. is making headway against the forces of the United Mine Workers of America. How far this statement may be accepted cannot be said, but there can be no doubt that the miners are divided in their union affiliations, and that counter propagandists are energetically at work. Meanwhile, the mines are on a productive basis with the assurance that there will be plenty of coal available for the imperative needs of the winter.

Fatalities in Ohio in 1919

By Jerome Watson
Chief Deputy and Safety Commissioner of Mines, Columbus, Ohio

IN ALL, there were 141 fatalities during the year. Of this number, 77, or 55 per cent were caused by falls of roof. This compares favorably with 1918 when 91 deaths, or 62 per cent of the entire number, were attributable to this cause. There were 13 deaths caused by mine cars; 9 by explosives; 5 by motors; 3 by electricity, 3 by mining machines, 2 by railroad cars, 2 by gas explosion, 6 by miscellaneous causes; 1 by a shot blowing through the rib and 20 by mine fire. Belmont County showed a marked improvement, reporting 30 fatal accidents as compared with 43 in 1918. Jefferson County showed an increase of 14, reporting in all 36. All of the additional larger coal-producing counties showed decreases in the number of fatal accidents.

In addition to the Amsterdam mine fire, there were numerous smaller mine fires with which to contend. Five such fires started during the year—all in small mines. None of these, however, jeopardized the lives of miners. Some of these mines it was necessary to entirely seal up, and as yet they have not been reopened.

On March 26, 1919, the General Assembly of Ohio enacted a law requiring every owner, operator, lessee or agent of a coal mine, where five or more persons are employed, to provide and keep in repair a wash room, convenient to the principal mine entrance adequate for the accommodation of the employees, for the purpose of washing their persons and changing their clothes when entering and returning from the mine. Such a wash room must be properly lighted and heated.

It is hoped that the operators in Ohio will follow the law as closely as possible.

Care of Storage-Battery Locomotives

By Humphrey D. Smith
Elkhorn, W. Va.

Paper read before West Virginia Mining Institute, Huntington, W. Va., Dec. 1919. Mr. Smith is assistant manager of the Crozer Coal & Coke Co. and Upland Coal & Coke Co., Elkhorn, W. Va.

THE wide differences that exist in local conditions at the various plants of West Virginia cause a different treatment to be put in force in one mine from that used in another in regard to storage-battery locomotives. The subject has already been discussed at more or less length, but we shall be satisfied in giving it further attention, for many of these machines have since been purchased and put into operation throughout the country, and such progress has been made that I now believe they have passed the experimental stage.

The fundamental principle in charging the storage battery is to pass through the cell in a direction opposite to that of discharge an amount of current equivalent in ampere-hours to that taken out on discharge, plus a certain excess to make up for losses.

Excessive Charging Rate Causes Gassing

With the lead-acid battery, if the charging rate in amperes is kept below a certain value, practically all the current is useful in restoring the active materials to their normal-charge state. If the charging rate is increased, a point will be reached where the oxygen and hydrogen formed at the surface of the plates by the decomposition of the water of the electrolyte will produce what is technically known as "gassing," the rate of gassing increasing with every increase in the charging rate. The decomposition absorbs an amount of current proportionate to the amount of gas produced, and this current is wasted, that is, it produces no useful effect in charging. High-charging rates that produce violent gassing mean not only a waste of electric energy, but tend to dislodge active materials, producing an excessive rise in temperature, thereby shortening materially the life of the plates.

In general it is permissible to charge a lead battery at any rate which does not produce excessive gassing or a cell temperature exceeding 110 deg. F.

The charging rate at which appreciable gassing begins depends on several factors, such as the state of the charge, the temperature, specific gravity of electrolyte, type of plate, etc., the principal factor being the state of the charge.

Slacken Up As You Near the Goal

Any charged battery will produce gassing, and when a battery is nearly charged the rate may be reduced. In this way the amount of gas formed will be immensely reduced. This safe rate is what is known as the finishing rate, and a rough rule for determining its value is to add one to the total number of plates in the cell and regard the number so obtained as the number of amperes required. Thus in the case of a 19-plate battery the finishing rate would be 19 plus 1, or 20 amperes, a simple computation.

Don't Gain Time By Crowding Battery Feed

When a battery is partly discharged, the charging rate may be several times the rate allowed for finishing, and it will not produce violent gassing. The more completely the battery has been discharged, the higher the charging rate may be made without causing the battery to gas excessively. It is found that if the rate throughout the charge period is constantly adjusted to a value equal in amperes to the number of ampere-hours of the battery at each particular instant, violent gassing and excessive rise of temperature will be avoided. Any rate of charge not exceeding the ampere-hour capacity at any given instant will be satisfactory, so far as the battery itself is concerned. However, it is not necessary to reduce the rate below the finishing rate. If in conforming to these rules the charge is maintained at the highest possible rate, the charge can be completed in the shortest possible time, whereas if the rate is increased above the gassing point, the charging of the battery is not appreciably hastened.

It is found that the constant diminution of the charging current throughout the charge in accordance with the rules specified above results in the voltage across the battery terminals remaining substantially constant, therefore if a constant voltage is applied and maintained at the battery terminals throughout the charge a diminishing current will result.

Under suitable conditions this voltage will be 2.3 volts per cell. It may however vary between 2.15 and 2.4 volts per cell, depending on the age of the battery, the condition of the electrolyte, the temperature, etc. This method of charging is what is known as the "constant-potential method" and in a given time returns a maximum amount of energy to the battery. However, its practical application has objections for the following principal reasons:

SOME OBJECTIONS TO THE CONSTANT POTENTIAL METHOD

(1) The initial current peak is so great as to require the capacity of the charging equipment to be considerably in excess of the average load. (2) Toward the completion of the charge it is usually desirable to maintain the current at the finishing rate by increasing the voltage. (3) Variations of cell temperature, specific gravity of electrolyte or slight fluctuations of bus voltage produce undesirable variations in the charging current.

The "constant-potential" method has its disadvantages because of the initial peak, because toward the close of the charge the voltage must be increased, and because the potential that is desirable varies with the temperature and the gravity of the electrolyte. If the voltage is not constant, as desired with this method, the charging may be unprofitably slow. In cold weather a higher voltage must be used.

These objections can be overcome by maintaining a slightly higher but constant voltage on the bus and inserting a fixed resistance in the charging circuit of the battery or of each battery if more than one is involved. This procedure is known as the "modified constant-potential" method, and is recommended by the battery manufacturers wherever conditions permit its adoption. For the constant voltage bus, a value equivalent to 2.6 per cell will be found generally satisfactory, although during the summer months a slightly lower voltage may be desirable in order to avoid excess of temperature and during the winter months a slightly higher voltage if the time available for charging is limited.

If the bus voltage cannot be altered, the resistance in the charging circuit may be increased in summer, and reduced in winter, to accomplish the desired results. In order to secure equalization of the charge in cold weather, means should be provided for increasing the bus voltage to 2.65 volts per cell. As a general rule the equalizing charge is taken to be one-half the finishing rate.

SELF-DISCONNECTING BATTERY UNSATISFACTORY

In regard to the automatic termination of a battery charge, attempts have been made to devise apparatus which will disconnect the battery from the power supply circuit upon the completion of the charge. In a great many cases these devices have depended upon battery voltage or upon charging current for the functioning of the automatic cut-out. However, neither of these methods have proved satisfactory because of the wide range of the final voltage that a fully charged battery with varying conditions of temperature, aging of plates, specific gravity of electrolyte, etc., may carry. Likewise the final current with a fixed charging voltage varies widely and cannot be depended upon for the proper functioning of an automatic cutout.

The ampere-hour meter used in conjunction with a shunt-trip circuit breaker or a low-voltage release mechanism has proved to be the only reliable means of automatically terminating the charge of the battery upon its completion. The ampere-hour meter must be connected in the battery circuit at all times so as to register the state of charge of the battery.

In order to provide the proper overcharge the meter is arranged to run slower on charge than on discharge. In the case of the Edison battery this instrument is so set as to provide from 20 to 25 per cent overcharge, and in the case of the lead-acid types of batteries, from 10 to 15 per cent overcharge. With the proper setting an ampere-hour meter so arranged as to disconnect the battery when the meter hand returns to zero on the dial will give satisfactory results, and is to be recommended wherever practicable. In using a fixed resistance in series with the battery to bring the power supply voltage down to that required by the battery there is a considerable loss in power, this being on 250-volt circuits an amount equal to the charge, and with 500-volt supply circuits an amount approximately equal to three times the charge. This loss in itself is enough to warrant using a motor-generator set for charging purposes.

The question is frequently asked whether it is possible to charge two or more sets of batteries in series from a given source of power using a fixed resistance, or a variable resistance in series with the batteries. If all the batteries are in the same state of charge this means of charging may be employed. However, if they are not in approximately the same state of charge, means must be provided for cutting out any battery that becomes fully charged in advance of the others, and substituting for the battery cut out a resistance which will produce a voltage-drop equivalent to the voltage in the battery disconnected. The charging of a number of sets of batteries in series entails careful attendance, and as a general rule I do not care to recommend such a procedure, as it is my opinion that improper charging will be inevitable.

CAPACITY TO BE MEASURED IN KILOWATT-HOURS

In regard to the capacities of accumulators, many people interested in storage-battery locomotives think of the battery capacity strictly in terms of ampere-hours. This is erroneous, as work cannot be measured in terms of ampere-hours, but must be measured in terms of kilowatt-hours. One cell of a given battery has as great an ampere-hour capacity as 100 or more cells of the same particular size, so that defining a battery in ampere-hours capacity does not definitely fix the capacity of the accumulator, unless the number of cells or the voltage of the battery is specified.

With the Edison battery the importance of charging correctly is probably not so great as with batteries of the lead-acid type, inasmuch as no harm will be done to the cells in charging if the temperature of the electrolyte is kept below 115 deg. F. In the case of the lead-acid type, excessive gassing might occur with a temperature of electrolyte below the allowable limit of 110 deg. F. Such gassing particularly in the plain-plate battery would result in the shedding of active materials, especially if the gassing should be very violent.

I understand that in some cases the Edison battery seems to become discharged very quickly in service, although according to record the battery has been given a complete charge previous to such discharge. This sluggishness is most frequently encountered in the case of a battery that is not discharged to complete exhaustion during each day's operation. It is observed that toward the end of the day's work after a given period of operation the battery gets sluggish. In such a case the battery should be discharged to complete exhaustion and then given an overcharge upon completion of the regular charge at the normal rate. In some cases this method of charging does not bring the battery back to normal condition, so that it is often quite helpful to reverse the cells of the battery after short-circuiting at the completion of the discharge, and then charge the battery for approximately a 12-hour period at the normal charging rate.

In order to prevent excessive gassing do not let temperature rise too high or let the input of electric energy be too rapid. However, with the Edison battery the charging rate should not be too slow as it will reduce the speed of the locomotive on the discharge that follows. Author describes care to be taken by the crew and by the watchman when stabling and removing the locomotive.

The sluggish condition is apparently the result of the use of a sodium hydrate instead of a potassium-hydrate solution, as the former seems to have a slightly higher internal resistance than the latter. I have not received any information from the Edison Storage Battery Co. that this is the case, but from some reports that have reached me, apparently the substitution of the sodium hydrate for the potassium-hydrate solution, because of the scarcity of potash during the war period, is responsible for the sluggish operation of the Edison accumulator toward the completion of the discharge.

Times may arise when it is desirable to double-shift a locomotive and obtain a part charge in a short time. This may be done by giving a boosting charge at rates of from two to five times normal discharge rate for short periods, but care must be exercised to see that violent gassing does not occur and that the temperature does not rise above 110 deg. F., according to the type of battery used.

Do Not Use Excessively Slow Charging Rate

In charging the Edison battery either the constant-potential or constant-current methods can be employed. With this type of battery it is recommended to charge at the normal rate from start to finish with the constant-current method, and if the constant-potential method is used, start charging at 50 per cent above normal rate and diminish to the finishing rate, so that the average will be normal. Low charging rates are not recommended although they will not do any permanent injury to the cells, but will reduce the speed and mileage of the locomotive on the discharge immediately following.

In reference to the second division of this subject, namely, attendance at the charging station, the desired results may be accomplished by manual attendance or by an automatic switchboard which is practically foolproof. There is not much to say concerning manual attendance. It is not necessary to have an experienced electrician to watch the charging of these locomotives, for almost anyone can be taught to read the ampere-hour meter on the locomotive and note when it shows a full charge or when the hand on the meter comes back to zero. When this happens the shunt-trip circuit breaker should go out, and then the attendant can shut down the charging outfit. The automatic switchboard can be arranged for any number of locomotives, so that as each one receives its full charge it will kick off from the charging set but will allow the set to run until the last battery has received its full charge. This done, the board is arranged to cut out the charging set from the main supply circuit and thus everything will be shut down.

Such an automatic board also takes care of conditions when the main-supply circuit fails, or the voltage becomes too low for proper operation of the charging set. Under such conditions it will shut down the set, disconnect the batteries so that they will not tend to discharge through the set, and when the power-supply returns the set is automatically started, and charging continues. At the plant with which I am connected we have such an outfit in operation and we have not had a regular night attendant in three years to look after the charging. There are many plants that have night watchmen, or men who have other duties to perform and who work in the vicinity of the charging station. Such watchmen can come around occasionally and see that everything is working properly. Such an arrangement saves part of the expense of having a regular attendant for this purpose.

In most cases it has been found advisable to make the motormen and brakemen who operate locomotives responsible for the care of the locomotives. This should be systematized to a certain extent, and the following few rules are suggested:

(1) When the locomotive is brought in and before the lid, or top plate, is removed from over the battery compartment, see that all lamps are extinguished and no open flame around the locomotive. (2) Wipe the tops of the cells off with clean waste or rags if they have accumulated dust and dirt, and in cases where the electrolyte has worked out of the containers it also should be wiped off with clean waste or rags. Cells should be kept dry. Dirt and dampness are likely to cause leaks, which may result in serious injury to the cells. (3) All filling plugs should be removed. (4) Distilled water should be added to all cells requiring it until the liquid reaches the right level. (5) Replace all filling plugs. (6) Plug in charging receptacle plug and shunt-trip connection in locomotive and throw in line switch to the automatic switchboard. (7) Inspect the bolts and nuts of the locomotive and if any trouble of a minor character has developed during the day, repair it before going off duty. In case any repair is needed that would take more

than a half-hour to one hour, report it to the head electrician who will have the work done either then or on a later shift of his men. (8) In the morning before taking out the locomotive read the ampere-hour meter to determine the state of charge and disconnect the charging plugs from the locomotive. (9) Oil up the locomotive and replace the battery cover.

By making these men responsible for their own locomotive, its condition becomes solely their concern and when inspected they cannot shift the blame for any shortcoming on some one else. This has been found to be the case when they did not have these duties to perform.

In filling the cells I would like to bring out the necessity of using distilled water only. If other water is used when it is impossible to obtain distilled water a sample should be sent to the battery manufacturer who will analyze it free of charge and advise whether it would be safe to use it or not. A small amount of impurity in the water will be harmful, as it will always remain in the cell, and as more is added from day to day will in time cause some damage to the plates or other parts.

Use only distilled water for filling up the cells when the water becomes low and keep the cells clean of incrustations and dirt. Overloading wastes good current and should be avoided. Coasting may cause the armatures to burst. Care should be taken to give the locomotive a firm well-ironed track which will not jar either locomotive or battery. Keep a record of cell condition and work performed.

There are times when it is necessary to clean batteries of the Edison variety all over, when they become excessively dirty. When this is the case the cells should be removed from the battery compartment. A jet of dry steam or an air blast is satisfactory in most cases, but must not be used while the cell is in the battery compartment. Incrustations may be easily removed if first moistened with warm water. All cells should be thoroughly dry before being replaced in the compartment.

And now a word as to the proper care to be taken in the operation of the locomotive during the day's shift. This problem must be worked out by the mine foreman and the men at each individual mine and in each place where a locomotive operates. By this I have particular reference to the number of cars handled on a certain grade. I have found motormen, when they could only push, say, four cars up a certain grade when using a reasonable amount of sand, repeatedly try to push up 5, 6 and even 7 cars. They would pull away, take slack, buck up against the cars, turn on full sand supply, and stand and spin the wheels for a considerable period of time. It is needless to say that this is a heavy drain on the batteries, often pulling excessive discharge rates from the accumulator, and yet it does absolutely no good. This procedure furthermore wastes available charge in the battery, which might cause it to be fully discharged before the day's shift is over. Each mine foreman should watch each locomotive on a particular haul and instruct the motorman never to try to pull more than so many cars, empties or loads as the case may be, over his haul. By so doing a great number of cars can be placed on the parting in a given time with far better results from the locomotive itself.

Another practice that should be watched is the overspeeding of the locomotive when traveling on down grades with heavy trips behind it. The storage-battery locomotive is intended mainly for gathering work and is usually designed to operate at a speed of from 3 to 4 miles per hour, under full load and on level track. The motors employed are usually fairly high speed, and in coasting down a hill these locomotives will, if uncontrolled, attain a speed up to 10 or more miles per hour. This will run the armatures of the motors from three to four times faster than the speed for which they were designed, and this may result in the breaking of armature bands or in the coils flying out of their slots, as well as other troubles. The men should be instructed against this practice and watched carefully, as this is a common cause of trouble.

The care of the locomotive during the day's shift is not entirely the concern of the motorman. A bad track will do more harm to the locomotive than almost anything else. Many mines have purchased locomotives to replace mules. A mule, if lucky, can travel over almost any kind of a track; a storage-battery locomotive cannot. In the majority of cases where mule gathering has been in use, and because of the short wheel-base of the mine cars, short-radius curves have been laid from the cross entries into the rooms or from the rooms into breakthroughs or pockets in the pillars. The locomotive is then put to work on these same curves, with resulting trouble from wrecks which not only cause delays and a decrease in the number of cars handled, but give the locomotive severe jars which are bad for arc, bad for both machine and battery.

In many mines fish plates are not placed on the rails on room tracks when mules are used, but when locomotives are employed this should be done since the locomotives are usually heavier than the loaded mine cars and tend to turn over the rail and wreck at the joints. I believe that a storage-battery locomotive will have its overall life increased approximately 25 per cent by operation on a well-laid track. This applies to the battery as well as to the mechanical parts of the machine.

Constant inspection of the locomotive by the mine foreman and his assistants will do much to make the motorman more careful of his machine and cause him to take pride in keeping it in good shape, all of which helps in the upkeep of the equipment.

Keep Records of Condition and Performance

Daily records should be made by the operator of the locomotive of work done as well as of the condition of charge and discharge of the battery. I would state that these records are made to serve two purposes. First, they give operating information, which should be valuable to the company from a cost standpoint, and second, they serve as a notice to the motorman that the officials are finding out each day the amount of work he has accomplished and the condition of his machine.

In these reports space should be given for the ampere-hour meter reading at the start of the shift or after charging, giving the time when meter is read. Space should also be provided for the meter reading when the locomotive is brought in after the day's shift is over, and the time of the reading; spaces for the work done, that is, the number of empty cars placed at the working face from the parting; number of loads handled from the face to the parting; number of water cars hauled; timber trucks, slate cars, and several spaces for miscellaneous work. The particular entry or haulway where the machine operates should also be noted on this report, while space should be provided for noting repairs that are needed and for repairs made in the shop. The report, when properly filled, should be signed by the motorman and turned over to the head electrician who will note any additional repairs needed or O.K. those already made and forward it to the office.

We instituted this system at the mines where I am employed, and at first met with considerable opposition from the men affected, but when they saw what we were driving at, they "came around" and the plan is now working without difficulty. These men claimed at first that they would not have time to keep track of all the so-called "red tape" if they were going to haul any coal. By giving them each a piece of chalk they tally the cars handled, on a plate on the front of the locomotive, and then count up the tally in the evening when they come in and place the total on the daily report.

Hydrometer and temperature readings should be taken at regular intervals, but this applies mainly to the lead-acid battery. With the lead-acid type of accumulator, the surest way to tell the state of charge is by taking hydrometer readings. These not only show the state of charge but also reveal any cells that are not up to the average of all the cells in the battery. A record sheet should be made at least once each week, giving the reading of each cell in the battery when fully charged.

A sheet may be made up with squares ruled upon it, having the number of squares equal to the number of cells in the battery. The reading of each cell can then be placed in the corresponding square on the sheet, and anyone looking at the sheet could go to the battery and pick out any cell that is not in proper condition.

In taking these readings, if any number of cells is found not coming up on charge with the majority of the cells they should be read every night for awhile, until it is determined that they are not going to revive. When these cells refuse to build up, there is of course a reason, and it can generally be attributed to either a cracked jar, which has let the electrolyte gradually leak out, or to trouble in the plates. In the case of a cracked jar, with the regular addition of distilled water each day if needed, the electrolyte will become lower and lower in specific gravity. This will establish the fact that one of the containers is ruptured.

ORDER CELLS BEFORE REPLACEMENT IS NEEDED

Cells should be inspected at regular intervals, either by a factory representative or by some competent man whenever the battery shows that it is failing. This should not be necessary until about the time of the expiration of the manufacturer's guarantee. In this inspection a few cells should be pulled, selecting those of lowest gravity, taking out the plates and determining the amount of sediment accumulated in the bottom of the jar, as well as the general appearance of the plates. From this an idea can be gained of the approximate life left in the battery so that a new battery can be ordered in sufficient time to be on hand before the old one fails completely.

This condition should be watched with both types of cells, for it is often impossible where locomotives have once been used to temporarily substitute mules or other types of haulage without considerable expense and a decline in output from the section where the storage-battery machine has been in use.

The keeping of records, both of operation and of charging is I believe vital to the proper care of any storage-battery locomotive.

To sum up all the foregoing, the one word "care" will cover everything. It is constant care, week in and week out, month in and month out, that prolongs the life and cuts down delays from all causes with storage-battery locomotives. Care saves loss in tonnage when machines are out of commission, and makes them a good investment for the plant that has them installed.

There are many points concerning the care of batteries that are brought out by the battery manufacturers for their own particular accumulator. These instructions should be carefully read and compliance made therewith by the attendants of these machines. The rules thus formulated are well considered since every battery manufacturer naturally desires his product to stand up well in service. The builders of these machines have therefore promulgated rules which if followed will give maximum life under existing conditions.

Recent New York Events

By R. W. Morris

LOCAL trade interests put in a busy twelve months in 1919. During the year there were two strikes of marine workers which tied up, in various degrees, the shipping in this harbor and resulted in a heavy loss to numerous business interests other than the local coal industry, especially those dealers who make a specialty of the export trade.

The substituting of oil for coal was also a subject for serious thought and in October the Wholesale Coal Trade Association summoned the coal men to a conference at which after a long discussion, a committee was appointed to investigate the entire matter. This committee has already made some valuable investigations and reports which show they are tendering the trade an invaluable service.

Oil consumption cannot yet be said to have secured a firm hold upon local consumers, although several industrial concerns, office buildings and hotels have either made the substitution or have filed applications with the proper City Departments for permission to make the change. To meet these conditions a set of rules and regulations governing the storage of fuel oil has been adopted by the Fire Department.

As it had done in the Liberty Loan campaigns, the trade took an active part in the Victory Bond compaign early in the year and raised $9,500,000, making a total of $62,500,000 in the last four Liberty Loan campaigns, to which should be added a liberal subscription to the first loan which was, however, not recorded with respect to the industry as such. In addition the industry in New York contributed over $300,000 to the Red Cross and United War Work campaigns.

The complaint filed through the Wholesale Coal Trade Association of New York with the Interstate Commerce Commission regarding the tidewater demurrage question in this city was an important step taken to protect the interests of the industry doing business at tidewater points. The prosecution of the complaint, including the examination of many of the witnesses, largely devolved upon Charles S. Allen, secretary of the Association. No decision has yet been rendered.

Reconstruction of a Burned Tipple

By R. W. Mayer
California, Pa.

THE steel tipple at the Crescent mine of the Pittsburgh Coal Co., located on the Monongahela River near California and about 50 miles from Pittsburgh, burned on the night of Dec. 17, 1919. This tipple serves one of the largest mines of the company by which it is owned, ships coal by both river and rail, and the daily output is about 6,000 tons when the mine is running at capacity.

This tipple rests upon three concrete piers. One of these is located between the five railroad tracks which pass under the structure. A second is at the edge of deep water in the river, and the third, or outside pier, is built up in the deep water of the river. The tipple overhangs or extends beyond the end of the third pier and two barges may be placed side by side between the outer and the middle piers.

The framework of the structure is of steel and the sides and roof are of corrugated or sheet iron. The floor was, however, of planking spiked to wooden stringers bolted to the steel I-beams of the framework. This flooring together with the window frames and the sashes was the only portion of the structure which was built of wood.

A combined river-and-railroad steel tipple with wooden floor was gutted by fire probably caused by a short circuit. Reconstruction was immediately begun and rushed with all speed. As a portion of the burned structure spanned main-line railroad tracks, this had to be rebuilt without interfering with train schedules. This was however accomplished without difficulty.

As may be judged from the above description, the major portion of the tipple structure lies over the river. At this point there is only a narrow bench of land between the water's edge and the foot of the high hill which rises abruptly from the inner side of the bench. The Monongahela branch of the Pennsylvania R.R. occupies most of this narrow river flat with its double tracked line. The balance of the space under the tipple is taken up by the three sidetracks for loading coal from the tipple to railroad cars. The opening of the mine which this tipple serves is in the side of the hill above the railroad and a bridge or extension of the tipple structure connects the opening to the tipple proper. The coal bed lies considerably lower than the water level of the river, and a slope or incline leads from the mine opening to it. This is several hundred feet long and the loaded cars are pulled upward by means of a heavy chain haul, while the empties are lowered on a second track by a similar means. The mine opening is, however, somewhat lower than the dumping floor of the tipple, and a chain haul pulls the cars over the bridge to the tipple where they are landed at the mine scales and weighed. From this point they gravitate to the various crossover dumps in the tipple.

The railroad company has a watchman's shanty near the tipple, and a man is stationed at this point at all hours to keep watch and give warning of any landslides which may occur on the side hill above the railroad track. The hillside is here quite steep and slides are always liable to occur. The watchman has a good view up and down the track for a considerable distance.

This watchman was the first to discover the tipple fire on the night of Dec. 17. This started about ten minutes before midnight, its probable cause being a short-circuit in electrical conductors or wires in some way damaged. The fire started at the inside or shore end of the tipple next to the bridge, and the bridge was the first portion of the structure to be completely burned. The fire then moved toward the water end of the tipple. The bridge was consumed in about an hour or by 1 o'clock on the morning of Dec. 18. The mine cars were oiled at the inner or tipple end of the bridge near the place where the fire started. Considerable oil was here spilled over the floor and some barrels were stored here. These exploded and scattered their burning contents.

Trains on the railroad were held up while the tipple was burning. The heat from the fire was, as might be expected, most intense, on the bridge, and the steel of the structure was badly twisted and warped out of shape. All of the woodwork in the tipple proper was destroyed, but the structural steel was not materially damaged.

A considerable quantity of coal dust was scattered over the floor of the tipple and had settled upon the walls. There was some coal, also, in the chutes, and the machinery, with which the tipple was well supplied. This coal was burned and possibly accounts for some of the intense heat generated, as the actual amount of woodwork in the tipple structure was small.

Railroad wrecking crews with the aid of derricks cut down the bridge across the tracks and removed the debris, throwing it on a side track next to the river. The tipple itself was gutted. Looking upward through the building after the fire, the steel cars could be seen standing on the crossover dumps near the top of the building. The machinery which was fastened to the steelwork was still in place, but that which was attached to the floor feel down into the river.

Reconstruction was begun at once. Structural steel for the bridge was not immediately available, and this delayed the work somewhat. A steamboat was tied up at the tipple and used as living quarters for such of the workmen as could not obtain accommodations in California. Lumber from a barge was hoisted to the outer end of the tipple from the river, and the work of replacing the floors and stairways preparatory to reinstalling the machinery was begun. A scow dredge having an orange-peel bucket was employed to fish the machinery out of the river under the tipple and to remove the coal and other debris so that the channel would be deep enough to allow the free passage of loaded barges. The steel bridge across the railroad tracks was constructed as soon as structural shapes for the purpose could be obtained. One of the accompanying illustrations shows the bridge framework completed but not yet roofed over. It also shows the end of the tipple which had to be repaired, the steel work is finished but not yet roofed. This picture also shows the derrick which a 70-ft. boom mounted on railroad-car trucks which was used to hoist the material into place on the bridge and tipple.

GENERAL VIEW OF TIPPLE
Showing construction boom on car truck.

The oxyacetylene torch or blowpipe was extensively employed to cut the material for the bridge. It was also used in cutting up the scrap steel for loading onto railroad cars for shipment. The bridge had to be so constructed as to not interfere with train schedules as the trains pass underneath the tipple at frequent intervals. While this work was being done, two watchmen were employed, one above and the other below the tipple to signal the trains and workmen on the structure.

DAMAGED END OF TIPPLE EXTENDING OVER RAILROAD TRACK

It was expected that the bridge and inner end of the tipple would be sufficiently complete to run coal some time during the week of Jan. 12. This coal would, of course, go to railroad cars. It will require a somewhat longer period before the outer end of the tipple is completed and the necessary machinery installed for loading river barges. The ice formed in the river during the cold spell early in January did not interfere with dredging, neither did it seriously delay the reconstruction of the tipple, although it somewhat hampered the work. Great care had to be taken by the men in order that no accident might happen because of the large number of trains that passed by during the day.

More Details of A. I. M. E. Discussion

The secretary of the American Institute of Mining and Metallurgical Engineers, 29 West 39th St., New York City, informs *Coal Age* that President Horace V. Winchell, who retires at the annual meeting in February, and Herbert Hoover, who succeeds him, have definite plans for a discussion regarding what they feel is the most vital matter of professional interest now before the public—the irregularity in the operation of coal mines.

They believe that this discussion will materially help to solve the problem, and the time to be devoted to it is to be extended so that it will take three whole sessions at the forthcoming annual meeting, Feb. 16 to 19. Each session will be followed by an open forum. The review to be presented by Mr. Hoover will cover the causes, nature and cure of intermittency in the operation of coal mines.

The following speakers and their papers will cover the fundamentals of the problem:

"Problems of the Coal Industry," by Van H. Manning. An introductory statement outlining the problem under discussion and indicating its relative significance as compared to other problems of the coal industry.

"Fluctuation in Production of Coal—Its Causes and Effects," by George Otis Smith. A statistical analysis of the rate of output over a period of years, indicating the relative effect of shortage of transportation, shortage of labor, lack of market and other factors in producing intermittency in the operation of coal mines.

"Storage of Bituminous Coal and Its Possibilities as a Means of Stabilizing the Industry," by H. H. Stoek. Storage of bituminous coal (a) at the point of production; (b) at centers of distribution; (c) by the consumer. Capital cost and operating cost of storage; breakage; loss in weight, loss in heating value, spontaneous combustion.

"Transportation as a Factor in the Irregularity of Coal-Mine Operation," by G. W. Reed. Exact data as to the real effect transportation facilitates have on coal production; use of cars for storage; effect of more equipment and its cost to the railroads, effect of lower rates in spring and summer, reduction of cross hauling, long hauls by the railroads of their own coal. This topic should be presented from the viewpoint of what the railroads may reasonably be expected to do, rather than what would most benefit the mining industry.

"Stabilizing the Market," by Eugene McAuliffe. Variations in the market demand for coal; possibilities of a sliding scale of prices that will produce regularity of buying. Effect of varying freight rates on the market. Relation between the total demand and the productive capacity. How to provide markets for present productive capacity.

The Institute cordially urges all coal people to attend this convention and participate in these sessions.

Coal Age Index for Last Half of 1919

The index to *Coal Age*, Volume 16, covering the last half of 1919 is now ready for distribution, and will be sent free to anyone addressing a request to the subscription department of *Coal Age*, New York City.

Dangers of the Oil Room

By R. S. Rickard
Fort Wayne, Ind.

IN CONSIDERING the dangers attendant upon the storage and handling of oils, we are apt to think only of gasoline and naphtha. This is a great mistake, as every oil carries with it a menace to life and property and its handling should be safeguarded in every possible manner. Until this fact is universally recognized and all oils are handled in fireproof, evaporation-proof steel storage tanks, we must expect to pay an enormous fire loss due to the careless handling of these products. It is true that the danger in handling gasoline is greater than in handling other oils. This danger is, however, well known,

All petroleum products, including lubricating oils, produce an explosive vapor. The danger from lubricating oils, however, is chiefly from spontaneous combustion where waste, sawdust or shavings are used to absorb the oils spilled on the floor. Many fires in factories and oil rooms have been traced directly to this cause, as it is a common practice to neglect the accumulated refuse, which in time, bursts into flames.

The gravest danger that confronts the consumer of oils aside from the gasoline menace is, however, from the paint oils, such as linseed oil and turpentine. A piece of cotton waste saturated lightly with equal parts of linseed oil and turpentine will, if left in a closed room, such as an oil house or storeroom for the night, burn from spontaneous combustion in three hours' time. Instances are not even lacking of fires being started in this manner when the water or oil-soaked cloth was left in the open air. The property loss arising from such spontaneous fires is appalling, but who can estimate the value of lives sacrificed annually to the mistaken policy of "economy" in equipping an oil room?

Increased Oil Price Demands Proper Storage

The increasing prices of all kinds of oil and general economic requirements, demand the proper storage and distribution of these liquids. Millions of dollars are lost annually through the deterioration of the quality and waste in handling of improperly stored oils. Hot and cut bearings, prematurely worn machinery are frequently due to deteriorated or contaminated oil. This enormous loss is usually never traced to the right source—poor oil storage. The same criticism can be made of improperly stored paint oils, varnishes, dryers,, etc. Competition in practically all lines demands economical production and this means elimination of waste so far as possible in every department of industry.

Oils, and similar products can be "checked in" as they are received and accurately recorded as they are used. Exactly as accurate records may be kept of oils as tools.

Modern storage equipment for handling liquids is really divided into two general types. One for handling volatile liquids, such as gasoline, naphthas, paint oils and varnishes and the other for handling non-volatile liquids such as lubricating oils.

The first of the two general types requires underground storage tanks for gasoline or naphtha and above-ground storage for the paint oils and varnishes. This arrangement usually meets with the demands of the various state laws governing this type of storage. Where underground tanks are required they should be cylindrical in form. If made of galvanized steel all seams and riveted joints should be carefully made and then soldered inside and out. If heavy metal is employed $\frac{3}{16}$-in. steel or heavier as conditions or the capacity of the tank make necessary, all seams and rivets should be carefully caulked. Storage tanks for volatile liquids require special care in construction. A tank may hold water or steam pressure but be entirely unfit for volatile liquid storage purposes.

Above-Ground Tanks Are Usually Rectangular

If above-ground tanks are essential these are made in rectangular shapes. For convenience the height and length may remain constant and the width vary according to capacity desired. This arrangement permits the addition of other individual units to the system and does not destroy the uniformity of the battery of storage equipment. Rectangular tanks should be made with the same care as the cylindrical designs.

Specially designed pumps of either measuring or nonmeasuring type may be connected by pipe lines to tanks buried underground or inserted in the top of tanks for above-ground use. Accurate devices are provided on the measuring pumps for the delivery of desired quantities of liquid. Gear-driven meters may be added for the purpose of checking consumption. Locks may be fitted to both types of tanks and on the pumps as well. This prevents unauthorized usage and theft.

Barrel Drainers Used With Batteries

Where a battery of individual units is employed barrel track and barrel drainers are used in connection with small chain hoists. This makes it easy to handle the barrels and drain them completely into the tanks. This saves labor, time and liquid and prevents the loss arising from the return of liquids in barrels which have not been properly drained by the old-style spigot method. Furthermore, dirt, dust and sediment are kept from the liquids, fire danger is reduced, storage space is saved, labor is lessened, and the cost and consumption may be easily calculated.

New Operators in Montana

Taking mining conditions as a whole in Montana I am satisfied that there is an upward trend. It is true that in some of the mines things are not what we would wish them to be, and it is also true that there are a few mine officials who do not realize the necessity of doing all they can toward ventilating their mines properly, yet taking the mine operators as a whole they are doing good work along this line, and some spare neither time nor money to keep their properties in first class shape. Much credit is due them for so doing.

Operations have commenced to open up in some new coal fields in this state, and as soon as the strike is settled we can look forward with a good deal of optimism so far as the coal trade is concerned. The quality of our coal is satisfactory.

Shots Fired By Lightning Discharges*

By M. Ferey

London, England

Current in the conductors used for firing shots in the mine induced from lightning discharges during a thunderstorm was responsible for the ignition of certain charges of explosives in place and connected ready for firing. Several successive steps or alteration of firing equipment were necessary before this danger was overcome.

IT SEEMS that outbursts of gas sometimes occur in Rochebelle and Fontanes mines, and special precautions are taken to prevent injury to workmen. In the headings, coal is shot from the solid electrically after the workmen have left; shots are fired from points as far distant as possible from the face or from a higher level.

As it was found impossible to be sure of the firing of 30 to 50 shots distributed over the workings at a distance of 1¼ miles or more, it was decided to use 120-volt direct current from the lighting circuit.

As this system was originally installed, connections were made at the top of the shaft. A separate wire led to each section where a group of shots were to be fired and the current was switched into these wires as desired, return being made through the ground. The conductors in the shafts were galvanized iron supported on porcelain insulators; in the roadways old cables or bell wires were employed and in the vicinity of the workings galvanized iron wires, about 1¼ in. in diameter. The detonators in each working place were connected just before the workmen left.

On June 10, 1905, during a storm, shots went off in two places at about 4 p.m. after the workmen had gone. These places were 1,600 yd. and 1,540 yd. respectively from the firing station. As no connection to the dynamo had yet been made, it was evident that the ignition of the shots arose from electric disturbance and not to current from the lighting system. After this the lines were cut at the bottom of the shaft and switches installed. These were closed just before the shots were to be fired, and later opened by the men examining the mine after the firing was complete.

In spite of this, another accident occurred on Aug. 25, 1905, when six shots exploded about 10 p.m. at a distance of 1.430 yd. from the firing station. It was found that the wire had been properly disconnected near the shaft bottom. After this, when the firing circuit was disconnected from the lighting circuit at the surface it was grounded in such a way that a gap of slightly over 3 ft. was left between the terminals of the lighting and the shot-firing circuits.

In 1906 Wires Replaced Cables

About the end of 1906 the bare wires in the shafts were replaced by armored cables and the firing station was somewhat changed. A switchboard was provided to which the wires forming the lighting circuit were led. These wires were connected through a lamp that glowed when the current was switched on at the lighting station. There was also a double-pole switch, which connected one side to the ground, and the other to a series of six telegraph keys or single-pole switches. These lines were provided with fuses, and there was also an ammeter in circuit.

When the operator is ready to fire shots and the glowing of the lamp indicates the connection of the circuit, he closes the two-pole switch. The ammeter should read zero. He then presses the keys in any desired order, and as he closes each one, observes the ammeter. If the meter moves slightly and indicates less than 2 amperes, the shots are fired properly but if it shows a larger current a short circuit is indicated. The examiners do not enter the mine until 10 min. after the shots have been fired. Two men are assigned to each section and are equipped with three lamps, one of which is electric.

Apparently this arrangement was perfectly satisfactory and authority was obtained to dispense with the return wire, but on Oct. 2, 1913, at 2 p.m., three shots went off during a storm. This occurred in a wet rise working under nearly horizontal roof. It happened 5 minutes after the workmen had connected the detonators and left the workings. In two neighboring rooms, the men had not yet charged their shots.

In this case it was found that the shaft conductors had been properly grounded. After this a second gap was established, similar to that at the shaft bottom, at about 110 yd. from each of the workings. An examination showed that the working place in which these shots had been fired was the one nearest to the station on a horizontal projection, nearly 1,370 yd., at an average depth of 660 ft. below the surface. The actual length of cable was 2,780 yd. The circuit served these workings only and was in an extremley damp part of the mine. No sparking was noticed at the time. The two cables serving this section followed the line of an air main up to a point 1,640 yd. from the shaft. Their distance from this main was 7¾ in. and in some cases less, and it is impossible to say positively that sparking did not occur between the main and the cables. Such sparking has been observed during the progress of storms on several occasions in the shafts as well as in the roadways.

Lightning seems to have caused the explosion on June 10, 1905, having passed by way of the iron guides to the bare cables, and this may have been true of the other occurrences, if a spark or slow discharge was produced in a damp atmosphere. However, no deterioration of the cables or any of the shot-firing appliances was noticed. These incidents have always occurred at a distance from the shaft while a direct discharge at the surface would have found an excellent ground. Therefore it is probable that the cause was induction from atmospheric discharges. Only a feeble current is required to discharge detonators. Each line having a resistance of .62 ohm and requiring a current of .7

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*The firing of shots by currents induced in the underground conductors by electric storms at the surface has been described in a paper by M. Ferey contributed to the Société de l'Industrie and published some time ago in the *Colliery Guardian* ampere with a pressure of 1.5 volts is capable of firing three detonators in series.

After this last explosion it was decided to break each branch line by a gap placed at the entry of the section served by it and as near to the workings as possible, as it was feared that a discharge might occur at the moment when the shots were being connected and that besides injuring one or two men an outburst of gas might be precipitated which would perhaps cause the death of others. Since this last gap has been installed the disconnection is made, and the wire is grounded by men carrying out the examination, while the connection necessary for firing the shots is made at the end of the shift by the last workmen to go out. The effect is to diminish the capacity of the wires and the inductive influence of the atmosphere.

A return wire is required by the mining regulations and the wires in this case will be completely insulated. Armored-insulated cables will be installed in the main roadways similar to those in the shaft but the gap retained both at the shaft bottom and near the faces. Each cable will contain two conductors and will be buried in the haulageway at a mean depth of 4 in. so as to be protected from falls or derailed cars. They are designed to allow the firing of 20 to 30 shots in series, in three or four equal groups by means of branches at a distance from the firing station up to 2 to 2½ miles. The gap near the shaft bottom will be about 3 ft. in length to avoid the direct effect of lightning, while those near the workings will consist of double-pole switches. From these switches bare wires will lead in pairs to the circuits as there is less possibility of induction in these short spans.

Welfare Work in Wyoming in 1919

By Robert T. Sneddon

State Coal Mine Inspector, District No. 1, Diamondville, Wyo.

Wyoming's State Board of Education has recently undertaken the organization of evening school classes where mining subjects may be taught. A few classes were organized during the fall and others will be opened during the current winter. The courses given in these classes include mathematics, mine ventilation, mine gases, timbering, drainage and such other subjects as will be of assistance to the men in their daily work and will help to prepare them to pass the state mine examinations.

This work is organized under the provisions of a Federal law known as the Smith-Hughes Act, which was passed by Congress three years ago. This act provides funds for each state to use in promoting various forms of trade and industrial education, including work in evening schools. There is also a small amount of state money available for such work. The state board does not expect to dictate as to just what work is to be given, but rather expects to try to offer a course in any subject for which there is a demand. Under the provisions of the Federal act the funds available may be used for instruction in any subjects which "are supplementary to the daily employment" of the men in the class, and there are no restrictions as to the course of study or the length of the course.

The usual practice is to organize "unit" courses, dealing with a single subject, such as mine ventilation. Classes will meet about twice a week for two hours at a time. Each course will extend over a few weeks, depending on the nature of the work, and when that course is completed a second "unit" is taken up dealing with some other subject. A teacher is secured who is thoroughly acquainted with mine work, and assistance is given him in organizing his work and in teaching the classes.

This project should be welcomed by the operators and workmen alike and every assistance ought to be given the State Board of Education to make the scheme a success. It is only by the co-operation of all concerned that results can be obtained.

Estimated 1919 Coal Production, by States

On Jan. 5, 1920, the Geological Survey published the bituminous-coal output to be 458,063,000 tons.

State estimates, like that for the country as a whole, are based on weekly reports of cars loaded by the 137 principal bituminous carriers, furnished the Geological Survey through the courtesy of the U. S. Railroad Administration. Past experience indicates that the error in the estimate of total production for the country probably does not exceed one per cent. In the case of the individual states, however, the error may be greater. When a carrier originates coal in more than one state it is sometimes necessary to apportion its tonnage arbitrarily, a task exceptionally difficult for the last two months of 1919 when the strike made conditions everywhere abnormal.

ESTIMATED PRODUCTION OF BITUMINOUS COAL IN 1919, BY STATES, WITH COMPARATIVE FIGURES FOR 1917 AND 1918
(Net tons)

State	1917	1918	1919 (Estimates)
Alabama	20,068,074	19,184,962	15,230,000
Alaska	53,955	75,606	53,000
Arkansas	2,143,579	2,227,369	1,680,000
Colorado	12,483,336	12,407,571	10,100,000a
Illinois	86,199,387	89,291,105	64,600,000
Indiana	26,539,329	30,678,634	20,500,000
Iowa	8,965,830	8,192,195	6,300,000
Kansas	7,184,975	7,561,947	5,750,000
Kentucky	27,807,971	31,612,617	28,500,000
Maryland	4,745,924	4,497,297	2,970,000
Michigan	1,374,805	1,464,818	930,000b
Missouri	5,670,549	5,667,730	4,060,000
Montana	4,226,689	4,532,505	3,300,000
New Mexico	4,000,527	4,023,239	3,170,000
North Dakota	790,548	719,733	750,000c
Ohio	40,748,734	45,812,943	35,050,000
Oklahoma	4,386,844	4,813,447	3,200,000
Pennsylvania (bituminous)	172,448,142	178,550,741	145,300,000d
Tennessee	6,194,221	6,831,048	5,150,000
Texas	2,355,815	2,261,135	1,600,000a
Utah	4,125,230	5,136,825	4,570,000e
Virginia	10,087,091	10,289,808	9,500,000
Washington	4,009,902	4,082,212	3,100,000
West Virginia	86,441,667	89,935,839	75,500,000
Wyoming	8,575,619	9,438,688	7,100,000
Other States	161,820	95,806	100,000
Total bituminous	551,790,563	579,385,820	458,063,000
Pennsylvania (anthracite)	99,611,811	98,826,084	86,200,000
Grand total	651,402,374	678,211,904	544,263,000

(*a*) Estimate of State Mine Inspector, modiod to exclude washery refuse..

(*b*) Based on reports of State Department of Labor for first eleven months with estimate for December.

(*c*) Estimated from report of State Mine Inspector for year ended October 31.

(*d*) Exceeds tonnage reported by State Department of Mines, which, however, does not include wagon mines.

(*e*) As reported by State Mine Inspector.

(*f*) California, Georgia, Idaho, North Carolina, Oregon and South Dakota.

Glancing over the table it will be noted that the amount of coal produced during 1919 has fallen considerably below the two years of 1917 and 1918. There have been some changes in the position in the rank of the states due to their output, but these are only minor, the large producers still holding their own. The grand total of 544,263,000 tons is a decrease of 133,948,904 for 1918 and 107,139,374 tons as compared with 1917.

The entire table is subject to revision, as reports on the year's operations are received from the mines themselves.

Deal Squarely with the Railroads

No Republic Is Secure That Does Not Use All Its Citizens Justly

By R. Dawson Hall

IT HAS been so customary to find fault with the railroads that it is now hard to try their case without prejudice. And yet it should not be difficult to be just to our transportation systems, because they have done more than any other single agency to build up the country and even to save it from famine and distress.

When the railroads were introduced every region that had no iron tracks had frequent meetings of the citizens to discover ways and means to induce railroad promoters to undertake the risk of making the necessary cuts and fills and of laying the rails that would put the region in touch with the market and so build up its trade. Every town and village was using all its powers, financial, political, and personal, to induce the laying of the railroad line where it could get the benefit. The railroads quite generally failed to make dividends and went bankrupt, but the towns through which they passed became prosperous, and the citizens enjoyed luxuries they had never experienced before. We too often forget the long fights that were waged between community and community to get possession first of the priceless benefits of rail transportation. After a while however, after the railroads had made our country the wonder of the world, after they had created strings of thriving towns, made possible the opening of many mines, given markets to the farming sections, the people in general forgot about the losses incurred by the railroad investors and the gains the public had made through the advent of the roads and they began to demand of the railroads low freight rates and the Interstate Commerce Commission was appointed to regulate all transportation charges.

HON. ALBERT H. CUMMINS
Chairman, Joint Conference Committee, H. R. 10453
U. S. Senate, Washington, D. C.

Dear Sir:

I have before me the Memorial of the National Shippers' Conference and side with a few of its suggestions, but I do not agree with its disapproval of the guaranteed return to the railroads, for if to give that assurance is socialistic, so are all the other regulatory measures already passed.

The railroads are entitled to the benefits of socialism equally with its disadvantages. They have been milked by socialism, let them at least be fed by it.

If the guaranteed return costs the shipper \$150,000,000 a year, that is only the price of one good or fairly good meal (\$1.20) once a year from every person in the United States. We can surely endure this if we can only make our railroads sufficiently prosperous to conduct the business of the country efficiently.

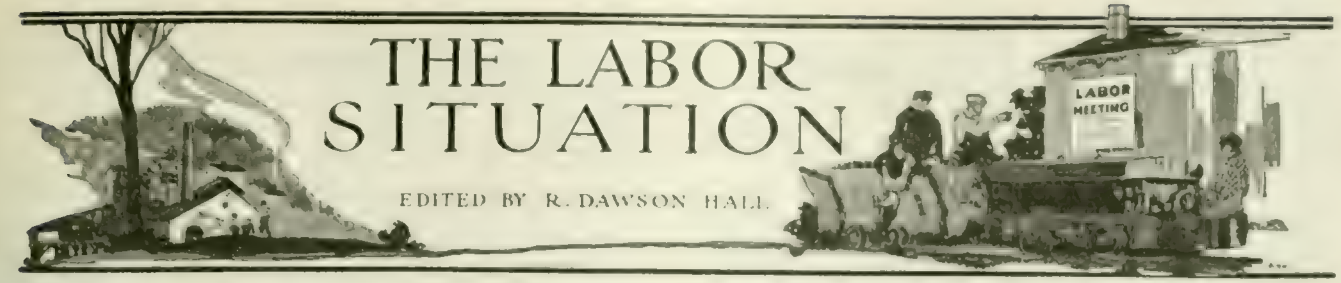
I am not opposed to the idea of having some more satisfactory board than the Interstate Commerce Commission (which wrecked the railroads) pass on railroad rates. In fact, I believe the I. C. C. has so deserved of the public that its dismissal should be demanded. The Memorial of the shippers states: "The Interstate Commerce Commission merits the continued confidence, support and respect of the people of the United States; and its power should remain unabated and should be added to, so as to enable it to effectually deal with our national transportation problems."

I would accept all this if it were liberally sprinkled with "nots."

Very truly yours,
R. DAWSON HALL,
Managing Editor, *Coal Age*

In 1914 the Division of Valuation of that Commission was formed to find out what was the real value of the railroads, that is the cost at which they could be replaced with and without allowance for depreciation. Reports have been made on 55 roads, and 50 more reports are tentatively completed. The *Railway Age* recently declared that it is too early to draw final conclusions, but the total cost of reproduction exceeds the investment carried on the railroads' books in all but nine of the first 52 valuations completed. It is too soon perhaps to base an argument on the showings, for the reports on the largest railroads are still not delivered, but if the valuations are based on the present post-war costs of everything used on railroads and on post-war labor costs it will be found in all probability that the investment account is too low and that the net capitalization, which is lower than the investment, is far lower than the replacement value. This has come about by the squeezing out of water, the ploughing in of returns and the enhancement of values. The public has no legitimate quarrel with the railroads, rather it is the other way about. An open letter to Senator Cummins is printed herewith. Many people disapprove of the Cummins bill for good reasons, but it has one great merit in that it shows a realization that the public which is making a demand that the railroads operate for a low rate of profit (such as the smaller class of cities and the Governments of Europe are paying as interest on their gilt-edged bonds) shall assure the railroads of at least that minimum, whether the freight rates ordered permit the making of that interest rate or do not.

It remains to be seen how Senator Cummins' arrangements differ from Government ownership. What the railroads can decide for themselves seems limited mainly to a choice of the color of the paint on their car bodies and even these artistic joys may be taken away by the zeal of the Nation's constituted authorities, whose wisdom fails to be exhibited in their railroad control.



THE LABOR SITUATION

EDITED BY R. DAWSON HALL

Miners' Demands Un-American

Upon the resumption of the hearings on Jan. 27, before the commission of three, appointed by the President to investigate the bituminous coal industry, Don Rose, an attorney of Pittsburgh, representing the operators of the Freeport district, denounced the demands of the miners for a 60-per cent wage increase along with a 6-hour day and a 5-day week as "unthinkable and un-American."

Mr. Rose told the commission that the operators could not believe that the miners' organization seriously advocated the 6-hour day with a 5-day week, and he declared that such a proposition meant "industrial chaos for the nation."

"As we view it," said Mr. Rose, "the miner's demand for a 6-hour day and a 5-day week, coupled with his demand for time and a half for overtime and double time for Sundays and holidays, seeks to achieve two results: first, an indirect increased wage; and second, limitation upon production. Under the Lever law both these propositions are illegal. We believe them to be un-American. We regard them as an attempt to make of the miner a favored class."

Acting-President John L. Lewis of the United Mine Workers, upon the conclusion of Mr. Rose's statement, protested against the characterization of the miners' demands as un-American. "We do not understand that the Americanism of the miners is on trial," said Mr. Lewis.

At the outset of the hearing Chairman Henry M. Robinson announced that the commission would go into the manner in which the recent 14 per cent wage increase to the miners had been applied. Miners' representatives had charged before the commission that some of the oprators were passing this advance on to the public, instead of absorbing it. The operators' representatives have informed the commission that the 14 per cent advance, so far as they know, has been met by the industry.

In his announcement, Chairman Robinson said: "Requests from several districts have been presented to the commission for its determination of questions arising out of the application of the 14 per cent average advance.

"It is fair to assume that the President expected that the 14 per cent average increase would be applied by the operators and miners in a manner to stabilize the industry pending the survey and final award of the commission. In making its final award the commission will consider and determine the application of the 14 per cent average wage increase."

The miners began today submitting statistical data before the commission in support of their demands for an advance in wages, shorter working hours, and other points in controversy. The operators' data, to back up their opposition to miners' demands, will be put before the commission later in the week.

HOOVER ADVOCATES 6-HOUR DAY

In the presentation of the miners' data, Van H. Bittner, of Pittsburgh, urging the 6-hour day, declared that Herbert Hoover, former Food Administrator, had, as manager for the Durham Coal Mines in Northumberland, Eng., said he would not work men in the mines in shifts over six hours "if he had the opportunity." He cited this, he said, to show that Mr. Hoover was an advocate of the 6-hour day for the miner.

Along with the presentation of the statistical data by Mr. Bittner, the miners prepared a statement summarizing the grounds on which their demands for a wage increase, with punitive overtime payments, were based. The miners declared that all their wage increases, received during the war period, including the 14 per cent increase, do not equal the increase in the cost of living and that the present wage is "even more inadequate than the pre-war wage."

Working Days, Employees, Tonnage per Man, Strike Activity and Hours Worked in 1918

State	Average Number of Days Worked	Number of Employees	Average Tonnage per Man		Strikes in 1918			Length of Established Working Day in 1918						
			Per Year	Per Day	Number of Men on Strike	Total Days Lost	Average Days Lost per Man	8 Hours Mines	8 Hours Men	9 Hours Mines	9 Hours Men	10 Hours Mines	10 Hours Men	All Others Men
Alabama	278	26,221	732	2.63	1,952	3,259	2	235	24,129	3	72	8	872	1,148
Arkansas	204	3,978	560	2.75	1,207	4,292	4	74	3,416	1	8	1	13	541
Colorado	255	14,483	857	3.36	464	2,318	5	169	13,741	1	99	1	2	641
Georgia	258	190			230	1,610	7							
Illinois	238	85,965	1,039	4.37	10,251	74,850	7	454	85,320	3	33			612
Indiana	227	30,376	1,010	4.45	8,083	51,015	6	235	28,612	1	15			1,749
Iowa	245	13,328	615	2.51	997	4,774	5	125	12,242	1	12			1,074
Kansas	234	10,665	709	3.03	4,675	25,047	5	141	9,672					993
Kentucky	230	39,342	804	3.50	1,226	15,318	12	376	26,601	93	5,271	55	4,363	3,107
Maryland	261	5,568	808	3.10	2,517	5,402	2	85	5,334					234
Michigan	237	2,558	573	2.42	1,367	18,194	13	21	2,526					32
Missouri	235	9,590	591	2.51	1,191	5,800	5	149	8,685	5	99	2	31	775
Montana	264	4,559	994	3.77	218	218	1	44	4,470			2	8	81
New Mexico	301	4,095	982	3.26				32	4,023	1	34			38
North Dakota	229	828	869	3.79	22	166	8	16	464	1	15	9	142	207
Ohio	223	48,450	946	4.24	4,993	44,837	9	635	46,184	9	242	15	645	1,379
Oklahoma	228	8,451	570	2.50	630	12,294	20	109	7,777	2	109	1	10	555
Oregon	292	40						1	30					10
Pennsylvania (bituminous)	269	174,306	1,024	3.81	12,852	112,929	9	1,698	151,586	146	7,439	52	4,198	11,083
Tennessee	265	10,694	639	2.41	835	2,454	3	109	8,380	5	422	2	849	1,043
Texas	262	3,936	574	2.19	55	550	10	16	2,074	15	855	6	577	430
Utah	258	4,160	1,235	4.79	30	30	1	26	4,111	1	5			44
Virginia	277	11,004	935	3.38	523	10,241	20	84	8,916	16	1,034	8	514	540
Washington	275	5,109	799	2.91	75	1,275	17	51	5,070					39
West Virginia	238	89,530	1,005	4.22	5,712	42,009	7	915	58,782	263	23,540	54	3,385	3,823
Wyoming	268	7,554	1,249	4.66				51	7,194					360
Other States		325												
Total bituminous	249	615,305	942	3.78	60,105	438,882	7	5,871	529,339	567	39,304	216	15,609	30,538
Pennsylvania (anthracite)	293	147,121	672	2.29	19,290	69,644	4	362	147,121					

*U. S. Geological Survey, Department of the Interior. This table was released last week

The miners alleged that wage increases had not kept pace with those in other industries. They said they were entitled to a "living wage" and that "regularity and continuity of employment constitute an economic right," and that punitive overtime wage rates would tend to a more strict observance of the standard work day and for more uniform employment.

It was also alleged by the miners that the increase in the cost of coal to the consumer has been due to "excessive profits" of the coal industry rather than to wage increases; that earnings and profits have been out of proportion to increased costs of production and that the 14 per cent wage increase has been passed on to the public.

President Philip Murray, of the Pennsylvania bituminous miners, at the beginning of the day's hearing, submitted new demands of the miners for the abolition of the differential between the thick and thin vein mines of the Freeport district and also demands for pay for removal of "bone coal," and free supply of powder and electric cap lamps.

Mr. Rose, representing the operators of the Freeport district, analyzing the demands as put forth by Mr. Murray, declared that there was actually only one issue before the commission, and that was the wage scale. The demand of the miners for the abolition of the differential and the other technical demands, he said, all were aimed, in an indirect way, at getting an increase of wages, although the miners had sought to cover the real intent.

Mr. Rose explained that the basic purpose of the differential, which he said the miners had assisted for years in establishing, was to assure an equal earning capacity of the miners in the various districts. "We believe that equality of potential earning power on the part of the miner to be the proper criterion for determining the fairness and advisability of this differential," said Mr. Rose.

The handling of the cars, provision for powder, and the charge for use of the cap lights were said by Mr. Rose to be incidental to the miner's end of the industry, long established by custom and already accounted for in the established wage scales. "The increases contended for are of an indirect nature," said Mr. Rose, "increases which the miner thinks perhaps he can obtain concealed from public view. We submit that there is no justification for putting upon the public the extra burden of expense which would result from the granting of these demands."

OPERATORS AGREE WITH MR. LEWIS

Mr. Rose informed the commission that as to the general demands advocated by Mr. Lewis, the position of the Freeport district operators coincided with that already taken by the operators of the four States of the Central Competitive District.

"We cannot believe that the miners' organization seriously advocates a 6-hour day with a 5-day week," said Mr. Rose. "It is an un-American proposition. If it is good for the miner, it is good for the man in other walks of life. The clerk who works in a dingy office, over a desk, with artificial light, is in more need of a 6-hour day than the man who toils.

"We do not believe that the miner is sincere in this demand. We believe that he does not seek a 6-hour day unless there is coupled with it time and a half for overtime, in which he will work eight or ten hours, as the case may be, and thus convert the grant of the demand into a wage increase.

"The inconsistency of the two demands, insofar as workdays are concerned is self-evident. The demand that double-shift of work on coal for commercial tonnage be abolished is a direct attempt to limit production.

"We submit that the demands for a 60 per cent increase, if granted, together with the 6-hour day, a 5-day week, and time and half for overtime, *would put a price upon the cost of coal that would stagger even the American people;* that it would create of the miner a favored class, enjoying a wage and working condition and hours of leisure far above any other class of American labor."

In objecting to the statement that the miners' demands were "un-American," Acting President Lewis of the miners said that the miners yielded to no one in their allegiance to the American flag, the government, and the traditions of the country. "We do not propose to be tried as to our allegiance to those principles and ideals, at the whim of every individual who may disagree," said Mr. Lewis.

Commenting on the moderation displayed by both sides during the hearings, Chairman Robinson said: "We ask that both sides refrain, as much as possible, from injecting anything into the discussion that is personal or temperamental, if I may say it, as distinguished from impersonal facts."

Mr. Bittner, in presenting statistical data for the miners, said the demand for a 60 per cent wage advance was figured so as to include losses sustained by the miners during the period from November, 1917, to December, 1919, when they had no wage increases, yet had to meet a constantly rising cost of living. If this loss was spread over the next 24 months and raises granted to bring wages up to present living requirements, he said, it would amount to 60 per cent computed on a tonnage basis.

Average wages in the mining industries had not increased in the same proportion as in other basic industries, said Mr. Bittner, who quoted figures tending to show that the average increases for most of the miners was 50 per cent over the 1914 scale, whereas in the iron and steel industry they had risen, for most men, up to 125 per cent, and in the railroads about 75 per cent.

Commission Reconvenes To Consider Statistical Data

With the reconvening of the Presidential Coal Commission's hearing on Jan. 27, the more important part of the proceeding was reached. Prior to that date all matters heard by the commission were of a preliminary nature. Each side made its claims and the "talk fest" portions of the proceedings were over. Heretofore in coal negotiations, the "talk fest" has constituted the more important part of the procedure with statistics and proofs forming an incidental and incomplete portion of the record. The commission has let it be known that the order is to be reversed at this time. All claims must be substantiated by adequate proof. That the parties to the controversy realize this is indicated by the strenuous efforts that are being made by both the operators and the miners to compile the requisite statistics to back up assertions which have been made.

The miners' representatives have engaged a private statistical bureau and force of accountants to work up their figures. In like manner, the National Coal Association is engaged in compiling the most complete statistics that have ever been gathered by the coal industry. A large plant containing tabulating and punching machines and other statistical paraphernalia have been installed under the direction of C. E. Lesher. Every available bookkeeper in town has been engaged for night and Sunday work. The Washington papers of Sunday, Jan. 25, carried large advertisements of the National Coal Association offering inducements to bookkeepers and accountants to assist in the statistical work in which the association is engaged.

Pressure is being brought on the Coal Commission to set coal prices just as did the Fuel Administration. The Commission shows evidence of not wanting to do this. Many are of the opinion that a continuance of price control at this time is leading to much the same demoralization as accompanied the effort to continue in peace time the war-time control of sugar prices. The Central Coal Committee of the Railroad Administration is still exercising its authority as to distribution. Troubles have been coming thick and fast to that committee during the past two weeks as a result of the wholesale confiscation of coal. During that period weather conditions, so far as transportation is concerned, have been fully as bad as they were in the winter of 1917-1918. As result of these confiscations of fuel it seems probable that the difficulties which followed the carrying out of a similar policy in 1917-1918 by the Fuel Administration will be paralleled by the Central Coal Committee.

Obviously the Coal Commission is considering the entire question as of Nov. 1. While it is not believed that they will attempt to make their award retroactive it is belived that their policy is such that would permit a finding which will disagree with that of Dr. Garfield as to the 14 per cent advance in wages. Neither the 14 per cent advance nor the 20 per cent offer made by the operators is likely to be given consideration, it is believed.

All Coal Fields To Be Represented

Announcement was made on Jan. 23 by the Coal Commission that, beginning Wednesday, Feb. 4, it will take up an investigation into the "outlying coal fields." Up to this time the inquiry has been confined to the Central Competitive field, involving western Pennsylvania, Ohio, Indiana and Illinois. This phase of the investigation will proceed until Feb. 4.

Between now and Feb. 4, representatives of the operators and the miners will offer statistical data touching upon the various points brought into the controvery by both sides. This data will relate to the scale of wages paid the miners, the number of days worked in the mines, working conditions in the mines, operators' profits and a maze of statistics dealing with differentials and other technical questions, the latter of which have been brought into the inquiry.

In the data to be submitted by the operators, their contention that the 14 per cent advance in wages, which went into effect last month, has almost entirely wiped out the operators' profits, will be emphasized. They will maintain that the miners' wages, before the 14 per cent advance was granted, were entirely adequate to meet the increased cost of living.

OUTLINE OF INVESTIGATION

Letters were sent out by the Bituminous Coal Commission today to secretaries of operators' associations and miners' representatives throughout the outlying fields, informing them of the purpose of the commission to conduct its investigation into those fields. The commission has fixed this schedule for the appearance of representatives of the outlying operators and miners:

Feb. 4, (Wednesday)	District
Michigan	24
Iowa	13
Kansas	14
Missouri	21
Arkansas, Oklahoma, Texas	21

Feb. 9, (Monday)	District
Colorado	15
Wyoming	22
Montana	27
Washington	10

Feb. 11, (Wednesday)	District
Kentucky-Tennessee	19
Western Kentucky	23
Alabama	20

Feb. 13, (Friday)	District
West Virginia	17
West Virginia	29
Maryland	16
Central Pennsylvania	2

The commission's letter which is signed by Herbert N. Shenton, as executive secretary, says in part:

"You are hereby notified that the hearing of such matters (in controversy between the United Mine Workers of America and the operators having joint relations with them) will begin at 9:30 a.m. in the Assembly Room, American Red Cross Building, Washington, and that you and your official colleagues will be heard, and that you should come prepared to present your position.

"In order that the work of the commission may be completed within the time limit of sixty days suggested in the President's memorandum of Dec. 6, 1919, it is necessary that the question should be reduced to the minimum, and the commission hopes that the operators and the mine workers' scale committees, representing the districts in question, will endeavor to agree upon a statement of particular matters to be submitted to the commission and that no unnecessary subjects be included."

Anthracite Parley Opens Feb. 15

Officials of the United Mine Workers announced at Hazelton, Pa., on Jan. 28 that conferences probably will start with the anthracite coal operators the week of Feb. 15, either in Philadelphia or New York. A new agreement will be negotiated. The present contracts expire March 31.

Strike for Restoration of Checkoff

On Saturday morning, Jan. 24, all the mine workers at one of the mines of the New River Co., the largest company in the New River field, laid down their tools and went on strike demanding that the check-off and "closed-shop" abrogated by them when they went on strike on Nov. 1 be restored. Their action was taken in the face of the fact that the whole check-off matter is now in the hands of the Bituminous Coal Commission and that a temporary restraining order is still in effect.

Operators are rather curious to see just what action the Department of Justice will take to force a compliance with the Indianapolis agreement. On Monday, Jan. 26, the strike had spread to another operation of the same company. When the matter was brought to the attention of J. R. Gilmore, president of District 29, of the United Mine Workers of America, he said he had no knowledge of the strike but would take steps to get the miners back to work.

The strike of the mine workers of the New River Co. at its Cranberry operations and of the Elkhorn Piney Mining Co. at its Stanaford operation, on Thursday, Jan. 29, had not only not been settled but had spread throughout nearly the entire New River field, the miners demanding the restoration of the check-off. The only operations not affected were those of the New River Collieries Co. and the New River and Pocahontas Consolidated Coal & Coke Co., where, it is said, the companies have agreed to reestablish the check-off and the closed shop. Further trouble was also feared at the mines of the Willis Branch Coal Co., where on Jan. 20 working miners were attacked by strikers and some of the party of workers badly injured. The temporary restraining order enjoining the miners from striking is still in effect, but is being disobeyed by the miners. It had been anticipated at first that the officers of District 29 would be able to induce the strikers to return to work, but the situation seems now to have gone beyond their control.

Van Bittner Makes Large Demands

Voluminous statistical material was presented to the President's Coal Commission by the representatives of the miners at the hearings on Jan. 27 and Jan. 28. An extended argument in connection with the figures was made by Van Bittner.

Exhibit No. 1, presented by Mr. Bittner, gave figures with regard to the increase in living costs 1914-1920. Mr. Bittner placed important stress on the living-cost figures. The operators announced that they would pay little attention to statistics on living costs because figures covering this subject are available to the commission from Government sources. Mr. Bittner drew the following conclusions from his tabulations:

1. The cost of living in coal-mining towns as a group did not increase as rapidly as in the highest stimulated shipbuilding and munition centers, where the increase was about 90 per cent.

2. In all probability the increase in the mining towns was more analagous to the average for the country after the exclusion of the ship-building centers—namely 80 per cent.

3. In the absence of precise information to support the probability just mentioned the only practical assumption is that the increase of mining towns has been about the same as for the country as a whole—namely 85 per cent.

"It is our belief," declared Mr. Bittner, "based on our experience and the data which we have collected that the cost of living in mining towns has increased to a greater extent than in other industrial towns." Pending further investigation, however, we are accepting for the purpose of this discussion that the advance in living cost during the period 1914-1920 has been practically the same in mining communities as in other localities. The following list of Mr. Bittner's subject-heads gives a good idea of the trend of his argument:

No hope of prices declining; a wage increase corresponding to the increased cost of living is unacceptable;

the old theory of wages; the present theory of wages; the principles of the National War Labor Board; labor guarantees of the peace treaty; fundamental justice and general sanction of the living wage; bituminous mine workers have not received and are not at present receiving living wage; an adequate standard of living prior to the war; inadequacy of pre-war rates of pay and earnings of bituminous coal miners; the inadequacy of increased rates of compensation granted during the war; present rates of pay are even more inadequate than pre-war rates; definition of a living wage; cost of the minimum of subsistence; a minimum standard of health and reasonable comfort; relation of increased wage payments to total cost of production, profits, and prices; relation of wage advances to total costs, prices, and profits; relationship between labor and production; operators' profit; operators have not absorbed the 14 per cent advance in wages; irregularity in operation and employment.

Dr. Garfield's analysis: increases in compensation to mine workers as compared with wage increases in other industries during the war; punitive overtime; overtime building of National War Labor Board; overtime by law; overtime under minimum wage legislation; overtime in foreign labor legislation; occupational hazard of bituminous coal miners; present rates of pay are not adequate even under regular working conditions to yield a living wage; the six-hour day in England; company housing in the bituminous coal region; payroll on a uniform basis.

EMPHASIS PLACED ON A FAMILY BUDGET

Mr. Bittner placed great emphasis on a family budget prepared for the miner workers by Professor Ogburn of Columbia University. A summary of the budget is as follows:

1	Food		$801.38
2	Clothing:		
	Husband	$146.81	
	Wife	130.92	
	Boy (11 years)	77.40	
	Girl (5 years)	66.13	
	Boy (2 years)	34.00	
			455.26
3	Housing, fuel and light		286.00
4	Miscellaneous		576.30
	Total		$2,118.94
	Average saving on garden and chickens		15.00
			$2,103.94
	Explosives, smithing, etc		140.00
	Total		$2,243.94

Great stress was laid upon operators' profits by Mr. Bittner. "The causes of increased prices to the consumer," he declared, "are not to be found in added labor cost growing out of the wage advances allowed the miners but in the excessive profit of the coal operators and the wholesale and retail coal dealers." Mr. Bittner used Federal Trade Commission figures to back up his assertion that "the distributive share of labor actually decreased from 66 cents in 1916 to 55 cents in 1918, or 16.7 per cent, while the distributive share of the operator increased during the same period from 6c. to 25c. or 316.7 per cent. This was used to show a diminishing share of labor in the division of each dollar paid for coal.

Mr. Bittner made frequent use of Senate Document 259 which is a compilation by the Treasury Department of the incomes of corporations. From that report he pointed out that 335 companies made a profit of 15 per cent; 311 made a profit of 20 per cent; 295 made a profit of 25 per cent; 270 made a profit of 30 per cent; 232 made a profit of 40 per cent; 197 made a profit of 50 per cent; 105 made a profit of 100 per cent; and 8 companies made a profit of over 1,000 per cent in 1917.

Mr. Penna at the hearing on Jan. 28 introduced several affidavits denying charges by representatives of the mine workers that certain operators in Indiana had permitted without docking the loading of impurities with the coal.

At the Wednesday hearing the operators explained that they had a very large force, working night and day, compiling the data which the operators wished to introduce but that it would not be ready until Monday.

It very evidently is the intent of the commission to make its award within the time limit specified by the President. In that case the findings of the commission will be available by March 15. The impression is very general that the commission will not make any retroactive application of its findings.

Nova Scotia Miners Enraged

A 14 per cent increase does not satisfy the mine workers of Nova Scotia even when accompanied by an adjustment to accord with changed living costs made three times a year. They do not like the decision of the McKinnon Arbitration Board that settled the wage dispute between the Dominion Coal Co. and its employees. The members of the Caledonia and Phalen locals have referred the decision back to the executives of the United Mine Workers of America.

In some labor quarters there is a disposition to try to delay any decision in Nova Scotia until the Bituminous Coal Commission has rendered its verdict. James B. MacLachlan, the secretary-treasurer of the Nova Scotia District No. 26, is today quite an unpopular man. Until the present moment no one could speak too highly of him.

Alabama's Labor Difficulties

Attorney General Palmer recently telegraphed to the Alabama coal operators asking them to appoint six men to meet six appointees of the mine workers, and adjust the difficulties existing regarding the re-employment of those men, said to be about a thousand in number, who are alleged to have been dropped because they gave leading co-operation in the recent nation-wide strike. The umpire was to be appointed by Judge W. J. Grubb.

The operators have refused to nominate the six men to look after their interests, saying that they have no difficulty to settle, and that the Alabama Coal Operators' Association has no authority, as an association, to deal with labor. They add that during the week ended Jan. 13 the mines produced 400,000 tons, which is a record production. The men they have refused to employ are professional "agitators" and "trouble makers."

The operators say that these men made trouble during the war and by discharging them they are automatically rewarding those who during the war stood by the nation and increased the Alabama record for production per man. They declare they have no sympathy with the union men who in the recent strike broke their contract inexcusably.

Promises Made Only To Be Broken

Resolutions have been adopted by a number of the locals in District 29, United Mine Workers, demanding a restoration of the check-off, these resolutions having been submitted to the Bituminous Coal Commission. In each of the resolutions so adopted the miners pledge themselves to abide by their contract, but inasmuch as they broke their contract when the first opportunity presented itself, operators generally regard the miners' pledge to stand by their contract as worthless. It is significant that in all the resolutions adopted no reference is made to the fact that the contract has already been broken.

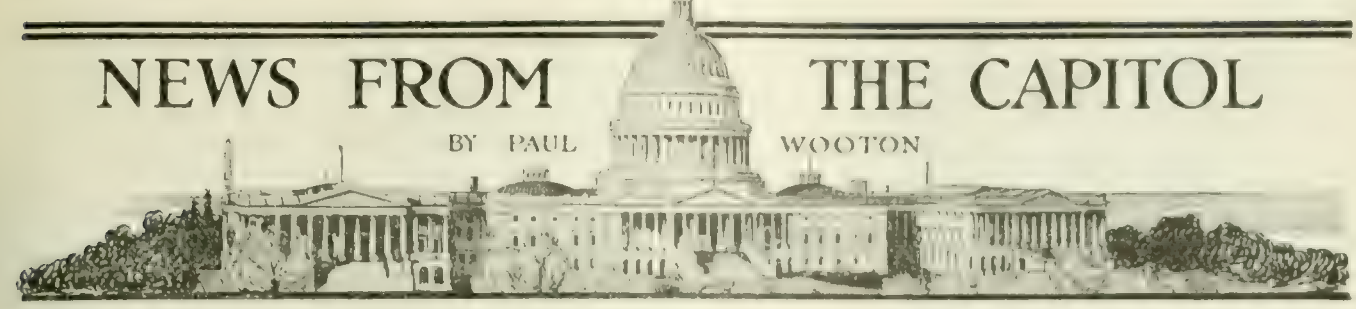
Everyone Knows Monday Is a Holiday

It was only because Monday—"Blue Monday"—is quite often observed as a holiday by mine workers that the Kansas men laid off on Jan. 26. They "just didn't feel like working." The Sunday quiet had settled over their souls and they felt the appeal of home with its coal stove and hot meals. It was no "conspiracy," they explained.

They did not quit work to protest against the Industrial Court Law or any other law, federal or state. Days of indolence in Kansas are institutions quite generally observed, especially after a big Saturday's "pay."

NEWS FROM THE CAPITOL

BY PAUL WOOTON



Railroads Refuse to Pay for Diverted Coal

The following wire has just been received by C. S. Allen, secretary Wholesale Coal Trade Association, from Mr. Cushing of Washington, D. C., on Jan. 27, 1920, of the American Wholesale Coal Association:

"In the conference with the Coal Committee and Railroad Administration yesterday evening they refused to pay for diverted coal other than on basis of Phillippe's letter of Dec. 6, to promise any relief from diversions, to waive the right of the railroads to supply themselves by diverting coal or to join us in a request to the President to either lift price restrictions or in any other way to bring relief.

"They virtually told us they were looking out for their own interests and suggested that we do the same. Judge Elliott appealed to the Director-General without hope for relief. A suit apparently is our only recourse and you may expect to hear of an injunction at once."

Operators' Profits Discussed in the Senate

Senator Harris, of Georgia, is continuing his efforts to have the tax returns of the coal operators thrown open to the public. The discussion in the Senate on Jan. 21 was particularly to the point.

A motion was agreed to, and the Senate proceeded to consider the resolution which proposes to direct the Secretary of the Treasury to furnish the Senate certain detailed information secured from income and profits tax returns of the taxable year 1918 as to relative incomes of all corporations engaged in mining coal.

An amendment to the resolution reads as follows:

Be it further resolved, That the Secretary of the Treasury be, and he hereby is, directed to furnish the Senate, from the income-tax returns for the taxable year 1918, a list of all miners and mine workers employed at lignite and bituminous-coal mines, together with the gross income of each of said miners and mine workers, the income tax paid by them and each of them, and the net income of the same.

After much other discussion Mr. Frelinghuysen made the following speech in the Senate: "Mr. President, if I am in order, I should like to say to the Senator from Georgia that at the present time there is a Senate committee investigating the coal question, and they intend to procure from the operators themselves, from their books, the profits that they are making.

I desire, further, to say that the committee also intend to procure information regarding the wages that are now being paid. I have no sypmpathy with any coal operator who is making an unfair profit, but I seriously object to the effort that is now being made to raise the miners' wages 14 per cent and give publicity to the fact that that 14 per cent will be taken out of the operators, when it will not. When that 14 per cent is to be imposed on the consumer, as it has been in my State, increasing the expense to the public service corporations $500,000 in the cost of their coal and indirectly increasing the cost to the consumer, it is time to call a halt.

The motive of the resolution, which, I strongly suspect, is to show that the operators are making an unusual profit in order that a still further advance may be made in the miners' wages and that it can then be imposed upon the operators, which is not possible under the contracts that prevail now between the operators and the large consumers of coal.

For that reason I offered my amendment to show that the miners of the country are now earning a wage far beyond what skilled workmen in other employments are making. I want the whole question shown up, if the committee are not to be intrusted with the further duty of procuring the information."

Blocked in his efforts to have the Commissioner of Internal Revenue make public the profits of the coal operators, Senator Harris has introduced a joint resolution providing that the Secretary of the Treasury be directed to furnish the Senate the following information from the 1918 income and profits tax returns: Capital stock; invested capital; net income; tax income; excess profits; per cent of total tax to net income; net income after deducting tax; per cent of net income to capital stock; per cent of net income to invested capital; per cent of net income after deducting tax; to capital stock; per cent of net income after deducting tax, to invested capital; capital stock 1917; net income 1917; per cent of net income to capital stock 1917; excess of the per cent of net income to capital stock for 1918 above the percentage for 1917.

It is stated at the National Coal Association that the Senate and the general public is to be furnished with the exact truth of the earnings of coal operators. These figures are now being compiled and will be given to the public unreservedly.

Anthracite Report Made Public

The Federal Trade Commission's report on the cost of producing anthracite coal in Pennsylvania was made public on Jan. 14. According to the report the total f.o.b. mine cost of fresh-mined coal increased 82 per cent (from $2.66 to $4.84 per gross ton) from the first of 1917 to the end of 1918. The sales realization increased 58 per cent (from $3.29 to $5.20 per gross ton). Margin decreased 43 per cent (from 63 to 36c. per gross ton. The report presents in detail statistics showing separately the results of the group of railroad coal companies, and of independent operators.

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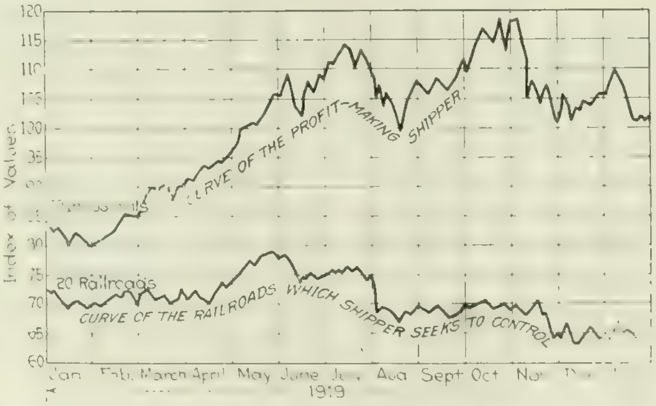
Neither King Nor Kingmaker

IN THE bituminous-coal industry it is often asserted that there is no leader—no king nor kingmaker. Many have regretted that there is no one in the coal industry to fill the great rôle of Judge Gary in the steel trade. That there is none is undoubtedly true and, in consequence, there are divided councils, and the operators back and fill. Now they will, now they won't.

The operators are not organized. Hastily, whenever there is a contract to be made, an organization, as loose as it is temporary, is formed. Individual expression is not suppressed or discouraged, and the vote varies, as it does in Congress and in our state legislative halls. Now the extremists and now the conservatives carry the day. At one time the high-price mines compel attention to their needs and at another time the well-established mines overrule the weak, and compromise is apt to be the order of that brief day. Those whose fortunes are imperiled will rally and then a new policy seems favored. At such time the needs of certain hardly beset regions are again considered and a somewhat different plan follows. After all there is something exceedingly democratic and American about the clash of interests and of views, and the public is quite disposed to be favorably impressed by the fact that there is neither king nor kingmaker in the whole aggregation.

Pity the Poor Shipper



The value of 30 industrial stocks, according to this chart adopted from the New York *Tribune*, has risen in the last year from 85 to 102. Meanwhile the value of 20 railroad stocks has fallen from 72 to 64. Yet the industrial concerns—the shippers—claim that they cannot afford to do the railroads justice

The mine workers may enforce a certain amount of regularity in their ranks, for is not one, John L. Lewis, the duly elected heretoga of their tribes? Still Howat clashes with Lewis, and Green with Farrington, and all is not peace. There is a chance for each to lead if only a following large enough can be secured.

No one can foretell, either among operators or men, who will lead, for a Homeric battle for leadership is waged in the union and another quieter but not less Homeric battle for principles rather than leaders is fought among the operators.

No outstanding figure among 500 loosely knit operators can be found. No one in the ranks of these mine owners has such mastery as has Judge Gary in the steel industry. It must be remembered that Gary represents, and in a degree controls, nearly half the national output of steel. While not underrating the titanic skill and courage of that steelmaster, one cannot forget that it is not so much these qualities as the output of the United States Steel Corporation that determines quietly and surely the issue of contending interests.

There are, however, fragments of the coal industry which are dominated. Thus in the Connellsville region the H. C. Frick Coke Co. rules not alone by reason of its wonderful output but because of its great coke-purchasing power. What wages it is willing to pay others are obliged to pay and feel they can afford to pay. Besides, as the H. C. Frick Coke Co. is willing to buy coke on a cost-plus basis, the price of coke is almost sure to follow the cost of coal production.

The coke company mentioned never hesitates to meet the increased wage with a similar increase in its coke price. Hence it is that when it posts a new wage, always somewhat higher than the last, every coke company, however small or large, posts, on the following day, the same scale, and the leadership of the H. C. Frick Coke Co. is never questioned. Nor is it feared, for its dealings are as fair as they are generous.

But the mines in the Connellsville region are non-union and therefore the H. C. Frick Coke Co., not entering the union operators' counsels, has no power to control in union-mine affairs. The Connellsville region has its own little millpond. It has little immediate competition and it stands alone, without much influence in national coal counsels but a unit in its own. As this regards the bituminous operators only, nothing need be said of the anthracite operators with their almost complete organization. They have little direct influence on the bituminous operators but follow along behind, fixing their scale revisions, however, with some reference to the concessions already given by the coal-mine operators of the bituminous region. There is no head in bituminous mine affairs. T. T. Brewster, chairman of the Scale Committee in the present dispute, is respected, not for his economic power, for that he does not possess, but for personal qualities and for individual magnetism. He is beloved, but he cannot order. He is the mouthpiece of the operators, not their master. They will have none. The public, perhaps, respects—it certainly should—the operators for their intensely human, markedly American characteristics.

As for Mr. Brewster, he is not a big-output operator; perhaps the mine owners would not accept him if he were; but, because he represents a section of Illinois that has much at issue, and because his is a good American type and he is a safe man to have in his present position, they have let him hold the post of prominence that the productive volume of his mines would not indicate.

The mine operators do not have a master. It is a safe guess to declare that they never will. Something of the conflict ever incident to democracy will always afflict yet defend them when in council.

Putting Business Into Engineering Students

AFTER a loud cry went out that engineering students did not have any business ability, it was decided by many of the college faculties that the desideratum could be supplied by teaching mine accounting and allied subjects. Doubtless these subjects will be useful, for accounting is an extremely valuable accomplishment, yet the big certified accountants are seldom placed in charge of affairs and never in control of big business.

Rarely is a good accountant a first-class executive, and rarely is a good historian a leading statesman. A knowledge of accounting is a valuable asset but what students need on leaving college is a quality of manhood. They usually and quite naturally lack all the rounding influence of affairs. Some may emphasize the lack of manners, others the need for the quality of concentration, some may deplore most the absence of a power for sustained effort in the newly arrived student, but these matters are one and all needed. Working one's way through college will supply many of the qualities desired. Work before entering will supply them also, while careful selection before entry will assure that the student will have qualities that no training can ever supply.

One of the leading troubles with some students is that they do not want to fill the specifications for a valuable employee. They resent being cast into a utilitarian mold. They dislike the acquirement of manners, concentration and effort. They regard these as mere servilities and go to college with the hope that they may vault over the heads of others and escape what they claim are menial occupations. Engineering to them is visualized as riding around in a high-powered automobile and issuing orders. If the prexy cannot promise them at least an approximation to such a vault into the saddle they are not satisfied.

A Tight Fit

THE CLOTHES OF 1914 NO LONGER FIT YOUR UNCLE SAMUEL

Middle Class Union

PROSPEROUS indeed seems the Middle Class Union of Great Britain. It practically is an organization of the ununionized, for it declares itself, with apologies for its name, as an association of those who are neither members of manual unions nor members of the employing class.

There are dangers in such a union. The founders of it recognize that fact and so apparently do the members. They are not declaring their belief that what are commonly regarded as intellectual pursuits should be better paid than manual tasks. All they assert is that the manual workers should not be allowed by combination to make the toilers at the desk, and in the office pay them larger wages than supply and demand would indicate.

They are opposed to any persons arraying themselves in financial battle against others who refrain from such action. They are not seeking to fight for themselves but to repel those who would fight against them. They are against extortion and greed on the part of any persons, who combine themselves against the public interest and so are able to make living difficult for the middle class or would be able to do so if it had no organization for self protection.

It is a negative and unselfish creed and weak for that reason. But after all "Defense" is a good rallying cry and appeals strongly to the best men everywhere. The new union needs watching, of course. It may at any time develop aggressive tendencies. It may in an unguarded moment vote itself into favoring desk- as against bench-work as the more worthy and therefore entitled to the higher award. But the action and success of the Middle Class Union in combating the British transport strike is an evidence of its value when properly directed.

Many members of Parliament have entered its ranks. It immediately obtained political power. If it goes on as it has commenced it will be a wholesome factor in public life, a rallying point for those who believe that the co-operative bargain may be, and often is, a labor-trust weapon every bit as dangerous as the gentlemen's agreement or capital trust.

The faults of the bourgeois are matters not to be denied but on the whole the bourgeois tries to be fair, to live and let live. May the Middle Class Union exemplify the boast that the middle class is one of the bulwarks of the nation.

Still, there are clouds which threaten rain. The labor unions are catering already to this new union—the salariat as it is called in opposition to the proletariat. A meeting is to be held to determine on what is to be the relation between the two classes of employees. So far the Middle Class Union has stood for sanity. It has opposed those unions which by mass action tried to carry everything before them regardless of the national welfare, or which sought ends not based in any way on the necessities which readjustment visited on them. If it continues fair and courageous it will deserve well of the public. If it sinks into the slough of union politics it will lose its membership and its present ability to act as the balance weight of the state.

Let's Go!

THE AMERICAN Institute of Mining and Metallurgical Engineers announces a fuels conference which strikes a new note in the coal business. The stabilization of the coal industry is one of our ambitions, of course, and here seems to be a most promising effort toward this end.

A program backed by this association, which does things, and led by a man of the high standing and clear vision of Dr. Van H. Manning, Director of the Bureau of Mines, would at any time command our attention. Just now it is particularly timely.

If the coal business is to have a hand in recommending the means to this desirable end, the coal operator should attend ready to participate in this discussion and we are assured that the coal man will be welcome.

DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

Electric Mine Haulage

Letter No. 5—It will not be surprising if this discussion brings out the fact that there are many mines experiencing the same difficulty as that to which attention is drawn by Charles F. Sherman, Coal Age, Nov. 27, p. 861; namely, the tendency of electric locomotives to tilt or lift the front end of the locomotive frame when starting, or when pulling a loaded trip up a heavy grade.

This is especially observable in the use of a six-ton motor that is overloaded or nearly so. This tendency of the front end of the frame to rise, unquestionably, throws the burden of the load on the controller-end armature, which results in its overheating and causing other armature troubles, while the resistance-end armature is practically free from these troubles.

In my practice, I have seen and used a number of General Electric, six-ton locomotives; and, in my opinion, it would be difficult to throw most of the weight on the front end by reversing the machine, or turning it end-for-end. Even taking the controller and the operator into account as a factor in the weight, the bulk of the frame weight would still be on the resistance end.

The locomotives I have seen are apparently designed so that most of the weight is on the resistance or front end. Still, when these motors have very much of a load the front end of the frame will lift. The question of equalizing the load and work of the two armatures appears to me to be an important feature that is much overlooked in the design and manufacture of these machines.

Manufacturers' Estimate of Hauling Capacity

According to statistics compiled by different manufacturers of mine locomotives, relative to their hauling capacity when operating on clean, dry, sanded rails, a six-ton locomotive equipped with steel-tired wheels, will start a load of 127 tons, on a level track, with a frictional resistance of 30 lb. per ton; or 30-ton load, on a four per cent grade. The hauling capacity of the same machine when running is 94 tons, on a level track, or 24 tons on a four per cent grade.

As grades, generally, in well engineered mines, are in favor of the loads, the overloading of mine locomotives is well safeguarded; and, theoretically, we should be able to push a large number of empty cars, say ten or twelve, up a five or six per cent grade. I have seen this number of empty cars, weighing about a ton each, handled in this manner, with the best results, where the tendency of the front end of the locomotive to lift was minimized.

At times, it was even necessary to place a band over the bumper, above and below the coupling pocket of the locomotive, in order that the locomotive frame would not ride the bumpers of the mine cars when starting to push a trip.

The practice of pushing the load ahead of the locomotive appears to me to minimize the evil effect of throwing all the load on the controller-end motor. It is not possible, in all mine conditions, to do this; but, as a six-ton locomotive is primarily a gathering locomotive, it is always possible not to overload them, if the haulages, side tracks, layoffs, etc., are provided at suitable points in the mine.

However, until a different idea of construction and design enters into the manufacture of the locomotives, it will not be possible to fully eliminate the armature troubles in the controller end of double-armature locomotives, by reason of the tendency of the front end of the frame to lift under a heavy load. Such a load does not necessarily mean more than that allowed by the manufacturers' tables.

It does not seem practicable that a locomotive can be built, for general use, to overcome this widely recognized difficulty; nor does it seem practicable, especially on a General Electric, six-ton gathering locomotive, that more frame weight can be employed than that already provided, without tilting or raising the rear end of the locomotive. An armature of greater horsepower might be used to advantage in the controller end to take care of the added work required. Like the editor and Mr. Sherman, I would be glad to hear from others on this subject.

Thomas, W. Va. W. H. Noone.

Guarantee of Mining Equipment

Letter No. 1—In the issue of *Coal Age*, Jan. 8, p. 63, there appeared an inquiry regarding the guarantee of the performance of mine fans, by the manufacturer of such equipment, and I was pleased to read the inquiry and reply.

The subject of the guarantee made by the manufacturer to the purchaser of any equipment has always been one that has interested me, and I have often wondered how such guarantees worked out. We are all familiar with the guarantee of automobile tiremakers who specify a certain mileage for their tires. But the guarantee practice in many lines of manufacture seems to be going out to a considerable extent. I believe this is particularly true in coal mining.

The man who takes good care of his tires is made to pay, on his bill, some of the replacement cost of the man who abuses his. The same is true, I think, of any kind of equipment. It is understood that, in purchasing equipment, reasonable care will be taken or is expected to be taken when that equipment is installed and used.

It has been my experience that the guarantee, nowadays, does not cut much ice, though perhaps in a few cases a written guarantee all "dolled up" on a paper that does not look unlike an oil-stock certificate, does play its part in the sale of the equipment.

I have heard it said that a product that is good enough to be guaranteed generally least needs a guarantee to sell it. No amount of word decorating can, in my opinion, add to the recognized quality of an article. The service record of any equipment indicates, beyond the shadow of a doubt, that if the same care in installation is used in the future, as in the past, there is no call for a written promise or guarantee.

WHAT A MANUFACTURER'S GUARANTEE OF MINE EQUIPMENT MEANS

A guarantee does not and should not mean that the customer will get five years of care-free service; but it does mean that should the equipment give trouble it will be repaired or replaced, as far as the equipment is concerned, by the manufacturer.

But the buyer of equipment will do well to remember that the time and labor lost while the manufacturer is making good cannot be reckoned exactly. The concern giving such a guarantee figures the probable amount of defective material that will have to be replaced, and includes the cost of this extra material and labor in the original price of the equipment. How bad must a piece of equipment become, may I ask, before it is unserviceable?

The best possible kind of guarantee that a purchaser can get is the good-faith guarantee of a reliable company. He knows the company is not in business for this year only and that, unless its product is dependable and delivers the proper service, the active life of the company is indeed limited. L. S. YOUNGLING.

Pittsburgh, Pa.

Authority of Shotfirers

Letter No. 1—The question raised by "Shotfirer," *Coal Age*, Jan. 1, p. 26, is one of paramount importance wherever coal is blasted by the use of explosives of any kind. In one Iowa mine, there have been three premature explosions of black powder, caused by ignition from a spark when the loose powder was being worked to the back of the hole with an iron scraper. The results are three men dead and one made almost totally blind by flying coal.

The inestimable services rendered by shotfirers are often either too lightly esteemed, or estimated by their assumed worth in cold cash. In support of this statement I would like to give some facts that may prove beneficial to the many readers of *Coal Age*.

Following a disastrous dust explosion that occurred in an Iowa mine in 1914 and which completely wrecked the mine causing its permanent abandonment; the mine inspection department realizing that something must be done to eliminate, if possible, the recurrence of such accidents, formulated a set of rules, revoked all the certificates previously granted to shotfirers and compelled them to come in person and subscribe to, and thenceforth rigidly observe the following rules:

1. To prohibit the charging and firing of all shots that are drilled into the solid.
2. To prohibit the charging and firing of one shot following another, and depending upon the success of the first shot, unless the dependent shot cannot be fired until the first shot is known to have done its work properly. (This rule included all sumpers.)
3. To prohibit the charging and firing of any shot that has blown out the tamping, or, any shot that is placed too near old holes, cracks or fissures made by previous shots.
4. To prohibit the charging and firing of more than three coal shots in rooms or pillars; or more than two coal shots in entries or rooms turning. Provided further, that when making break-[illegible] the [illegible] be allowed one extra coal shot [illegible] of three coal shots in entries and breakthroughs.
5. [illegible]
6. [illegible] tamped with [illegible] (In Iowa [illegible].)
7. To prohibit the charging and firing of shots in [illegible] Sections 24 and 25 of the State Mining Laws of Iowa are faithfully observed. (These sections apply to the lawful tamping of shots and the sprinkling of dusty roads.)
8. To observe the time (to be mutually agreed upon hereafter) to commence the firing of shots in the mine where I am employed as shotfirer, which in no case shall commence until every person (except the shotfirers) are out of the mine.
9. To devote ample time to the examining of shots and their surroundings. To make sure that conditions are reasonably safe in the firing zone to light shots; and to light them no faster than safe practice will permit.
10. To prohibit the charging and firing of any shot where explosives are stored or kept in the mine, either by operator or miner, in violation of Section 2, Chapter 130, of the Iowa State Mining Laws.

In addition to these rules we have since requested that in mines where shotfirers are employed there must be the following provision made for them, the first winter the mine is opened:

> A place of refuge shall be made for the shotfirers in the solid coal with a heavy door so arranged that it can be securely barred from the inside. The shotfirers must only light a few shots at a time, then retreat to the place of refuge, close and fasten the door and remain inside until all the shots that were lighted have gone off. This is to be repeated until all the shots in the mine are fired.

This ruling has saved lives on different occasions. The following data, compiled before and after these rules were made obligatory, will prove their sterling value in preventing casualties to shotfirers: From January 1, 1902, to December 31, 1913, inclusive there were 23 shotfirers killed, and these casualties may be classified as follows: From explosions or blownout shots, 13; from flying coal, 8; from falls of roof, 2. On the other hand, since the rules went into effect in May, 1914, until December 31, 1919, there have occurred only two deaths of shotfirers, one by a windy shot and one by flying coal.

The Iowa State Mining Law gives the shotfirer the authority to protect himself by allowing him "to prohibit the charging and firing of any shot which in his judgment is unsafe." And if this right is in any way abridged or abrogated, I want to ask, where is the shotfirer's protection?

FIRM CHARACTER OF A TRUE FIREBOSS

I believe that above everything else the shotfirer should be a thoroughly practical, careful and reliable man and have enough moral stamina to execute his duties without fear or favor. He should strenuously resist any encroachment upon his judgment in determining the practicability of shots.

Eternal vigilance will be absolutely necessary as a part of the shotfirer's equipment, as each day brings dangers and difficulties of such magnitude and intricacy that make their safe solution, at all times, an exceedingly difficult problem. In dealing with these he will often be compelled to rely largely on his own practical experience and prudence.

However, the shotfirer should, under all circumstances, give himself (and thereby those dependent on him) the benefit of the doubt, and require as large a margin of safety in all things as it is possible to exact from everyone employed in and around the mine. It will be better for a shotfirer to be a living monument to the courage of his convictions, than to become a corpse as the result of the mistaken or misapplied judgment of some one else.

In closing allow me to state my conclusion of the whole matter by saying, that whenever a shotfirer is denied the absolute and inalienable right to exercise his practical judgment, for his own personal protection and safety, under any and all circumstances (the committee and others with their views and opinions to the contrary notwithstanding), he is thereby stripped of all qualifications and ambition, loses his identity as a rational intelligent being and simply becomes a traveling target worth only whatever unscrupulous men are willing to pay for such perfunctory services.

W. E. HOLLAND,
Albia, Iowa. State Mine Inspector.

Analysis of Mine Water

Letter No. 1—In the issue of *Coal Age*, Sept. 11, p. 434, Donald J. Baker, discussing the drainage problem of the Edna No. 2 mine, of the Hillman Coal & Coke Co., Wendel, Penn., gives what he says is the result of a recent analysis of the mine water, the several ingredients being expressed as contained in 100,000 parts of the water.

Mr. Baker then states the quantities of "lime (90 per cent) and soda ash (95 per cent)" required, per 1000 gal., in treatment of this water for boiler use:

There is already a great deal of misunderstanding or ignorance, among practical mining men, as to just what mine water is; and the analysis presented by Mr. Baker, which is a very strange one to say the least, does not help to improve this condition but rather makes matters worse.

In the first place, it is quite unusual to calculate the "free acid as sulphur," in giving the results of a chemical analysis of water. This is a small matter, however, as compared with the more important fact that this analysis would make it appear that the water contains not only a high percentage of free acid and acid salt (iron sulphate and aluminum sulphate), but a considerable quantity of calcium carbonate and some magnesium carbonate besides.

IMPORTANCE OF CORRECT CHEMICAL ANALYSIS

A chemist, of course, would recognize at a glance that the analysis as given must be incorrect; but the practical mining man, not having the same knowledge of the relation of chemical ingredients, would be misled as to the actual condition of the water he must handle in draining the mine, or its effect if used in the boilers for the production of steam.

Inasmuch as Mr. Baker states that this water is corrosive in its action, and the analysis given shows a high acid content and considerable calcium carbonate, which is a substance more or less opposite in its nature to an acid, it would be interesting to have an explanation of the analysis he gives. In other words, let me ask, How can a water contain both free acid and calcium carbonate, since these two ingredients would neutralize each other and result in the formation of a calcium salt (calcium sulphate).

Judging, as best one can, from the analysis given, it would appear difficult to treat this water in a way that would make it suitable for boiler use. It will be of interest to learn just how the proportionate amounts of the reagents (lime and soda ash), which he gives as being required to treat this water, were calculated. It will be further interesting to *Coal Age* readers to know just what results were obtained in the use of this water in steam boilers.

A. G. BLAKELEY, Chief Chemist,
Philadelphia & Reading Coal & Iron Co.
Pottsville, Penn.

Finding a Mine Door Set Open

Letter No. 19—The question in regard to how a fireboss should proceed in his examination of a mine or section, after finding a door standing open and not knowing how long it has been open has caused considerable argument, some of the writers claiming that the safest course to pursue is to leave the door as it was found, while others claim that there would be less danger in closing the door and proceeding to make the examination with caution, taking it for granted that nothing is wrong in the section.

There seems to be much difference of opinion also in regard to starting the examination on the intake end and following the air current, or beginning at the return end and proceeding against the air.

These are important questions in firebossing. My own preference is to close the door and give time for the circulation to be restored in the section. In any well-managed mine where shots are fired at night or after the men have left the mine, there are fire-runners employed to see that no feeders have been ignited by the shots. In smaller mines where the miners fire their own shots, the law usually requires every man to examine his place to see that no gas is burning.

The fireboss is warranted in assuming that there is no gas feeder burning in his section. Anything else would point to bad management in the operation of the mine. My opinion, therefore, is that he should close the door and wait a sufficient time for the circulation to be restored in the section and then proceed with the examination. It is not to be supposed that, finding gas in the first one or two rooms, a fireboss would attempt to go further, as he would be sure to get into trouble before he had proceeded far. If the workings are advancing to the rise he would expect to find more and more gas as he proceeds. If he has not closed the door before he would now be compelled to go back and close the door.

Again, it is reasonable to suppose that even with the door standing open there would be sufficient air circulating at the face of the rooms to carry the gas forward. In that case, had there been a feeder burning in the section, the explosion of the gas would have taken place before this. Reasoning thus the fireboss feels more than ever that he is safe in closing the door.

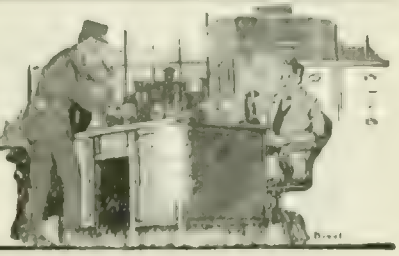
Let me say in closing that a fireboss proceeding to make an examination of a section where the circulation is cut off by an open door is in danger of being overcome with gas. Should that happen, few men would attempt his rescue before closing the door, knowing that they would be overcome quickly, as was the man they tried to rescue. In regard to starting an examination of a section at the return end, it is my firm conviction that such a course is pure foolishness and I can not conceive of a trained fireboss doing such a trick.

Mohrland, Utah. ALEX HARRISON.

[The discussion "Finding a Mine Door Set Open" will close with letter No. 20, now on hand.—EDITOR.]

INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD



Roof Falls in Airways

We have been troubled, of late, with an insufficient supply of air in the mine workings, which is thought to be the result of numerous falls in the main air-course. The expense of clearing up this air-course will be considerable, and we are led to ask what effect it will have in reducing the power required for the ventilation of the mine.

For example, assume an airway 6 x 12 ft. in section, and 5,000 ft. long, passing, say, 35,000 cu.ft. of air per minute, under a 2-in. water gage, and suppose that the main airway is partly blocked by falls, for a distance of 1,000 ft., so that its cross-section is reduced to an average of 4 x 12 ft., while, in a few places, the section may not measure more than 3 x 10 ft. My question is, What percentage of power will be saved by clearing up the 1,000 ft. of this airway, so as to restore the original circulation. MINE MANAGER.

Centralia, Ill.

Without more specific data it is impossible to give more than an approximate estimate of the result of the roof falls in this air-course as affecting the general circulation of air in the mine.

It is stated that the sectional area of the airway has been reduced to an average of 4 × 12 = 48 sq. ft., the original area being 6 × 12 = 72 sq.ft. It is further stated that the area, in places, may not exceed 3 × 10 = 30 sq.ft.

We will first assume that the power producing the circulation, in the fallen state of the air-course, is the same as what was required to pass the original volume of air before the roof started to fall. Then, taking the length of the original airway as 5,000 ft., including the return, and assuming 1,000 ft. of the air-course is partly blocked with falls as stated, there remains 4,000 ft. of airway having the original cross-section.

Now, in order to calculate the amount the circulation is reduced, the power on the air remaining constant, it is necessary to calculate the relative, part potentials, first, of the original 5,000 ft. of airway and return, and then of the 1,000 ft. of the blocked return air-course and the remaining 4,000 ft. of airway and return having the full sectional area undisturbed.

The lengths of these three sections being 5,000, 1,000 and 4,000 ft., respectively, their relative lengths are 5, 1, 4. The original perimeter of the air-course being 2(6 + 12) = 36 ft. and the perimeter of the blocked portion 2(4 + 12) = 32 ft., the relative perimeters of the three sections are 9, 8, 9. In like manner, the areas of the sections being 72, 48, 72, the relative areas are 3, 2, 3, respectively.

Then, calling the original and the reduced circulations, Q_0 and Q_1, respectively, the potential of the original airway X_0 and that of the blocked section and the remaining 4,000-ft. of original airway X_1 and X_2, respectively; remembering that the power on the air is $U = Q^3 \div X^3$ and, for a constant power on the air, the quantity is proportional to the potential, or the quantity ratio is equal to the potential ratio, we write,

$$\frac{Q_0}{Q_1} = \sqrt[3]{\frac{X_0{}^3}{X_1{}^3} \times \frac{X_0{}^3}{X_2{}^3}}$$

The required relative potentials are then found as follows:

$$X_0{}^3 = \frac{a^3}{lo} = \frac{72^3}{5000 \times 36} = \frac{3^3}{5 \times 9} = 0.60$$

$$X_1{}^3 = \frac{48^3}{1000 \times 32} = \frac{2^3}{1 \times 8} = 1.00$$

$$X_2{}^3 = \frac{72^3}{4000 \times 36} = \frac{3^3}{4 \times 9} = 0.75$$

Now substituting these values in the first equation given above, since $Q_0 = 35{,}000$, we have,

$$\frac{35{,}000}{Q_1} = \sqrt[3]{\frac{0.6}{1} \times \frac{0.6}{0.75}} = \sqrt[3]{1.4} = 1.1187$$

$Q_1 = 35{,}000 \div 1.1187 = 31{,}286$ *cu.ft. per min.*

Now, to restore the original circulation, without cleaning up the airway, will require an increase of power on the air in proportion to the cube of the quantity; or, in this case, 1.4 times the original power. Hence, cleaning up the airway can be considered as a saving in power equal to (1.4 — 1) 100 ÷ 1 = 40 per cent of the original power.

The power required to circulate 35,000 cu.ft. per min. against a 2-in. water gage is (35,000 × 2 × 5.2) ÷ 33,000 = 11 hp., and the saving by cleaning up the airway may be estimated, therefore, in this case, as 11 × 0.4 = 4.4 hp.

Taking Water-Gage Readings

Please explain where water-gage readings should be taken to show correctly the resistance of the mine?

Bellaire, Ohio. MINE FOREMAN.

In order to measure correctly the pressure producing the circulation in a mine, including the shaft, the gage should be placed on the fan drift, at a sufficient distance from the fan to enable a steady reading of the gage to be obtained. If the reading of the gage is multiplied by 5.2, and that result by the sectional area of the fan drift where the reading is taken, the product obtained will represent the mine resistance plus the resistance of the shaft, in pounds.

If the gage reading, however, is taken in the crosscut between the main intake and return airways, at the shaft bottom, the result obtained by multiplying by 5.2 and the sectional area of the air-course expressed in square feet, will be the mine resistance, in pounds, or the pressure producing the circulation in the mine, exclusive of the shafts.

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Miscellaneous Questions

(Answered by Request)

Ques.—If, with 8 hp., a quantity of 70,000 cu.ft. of air per minute was obtained, what quantity should be gotten with 24 hp.?

Ans.—In the same mine or airway, the quantity of air in circulation varies as the cube root of the horsepower on the air. In other words, the quantity ratio is equal to the cube root of the power ratio, and we write, calling the required quantity x,

$$\frac{x}{70{,}000} = \sqrt[3]{\frac{24}{8}} \quad \sqrt[3]{3} = 1.442$$

$$x = 70{,}000 \times 1.442 = 100{,}940 \textit{ cu.ft. per min.}$$

Ques.—What horsepower will be required to drive a double-acting steam pump if the vertical distance between the point of suction and the point of discharge is 150 ft., the diameter of the pump cylinder, 9 in., the stroke, 12 in., and the number of strokes per minute, 80, adding 25 per cent for friction?

Ans.—The sectional area of the pump cylinder is $0.7854 \times 9^2 = 63.617$ sq.in. For a discharge head of 150 ft., adding 25 per cent for friction, the pressure head against which this pump must operate is $1.25(150 \times 0.434) = 81.375$ lb. per sq.in. The length of stroke being 12 in., or 1 ft., and the pump making 80 strokes per minute, the piston speed is 80 ft. per min. Therefore, the horsepower required to drive this pump, under the assumed conditions, is

$$H = \frac{81.375 \times 63.617 \times 80}{33{,}000} = 12.55 \textit{ hp.}$$

Ques.—If the ratio of the diameter of a plunger to the diameter of the piston of a pump is 1:2, what steam pressure will be required in the cylinder of the pump to lift water 300 ft., assuming an efficiency of 85 per cent in the water-end and 75 per cent in the steam-end of the pump?

Ans.—Calling the diameter of the steam cylinder of the pump D and the diameter of the plunger or water cylinder, d, the height of the lift, in feet, h, and the steam pressure in the cylinder, in pounds per square inch, p, we have the following:

$$p = 0.49\ h\left(\frac{d}{D}\right)^2 = 0.49 \times 300\left(\frac{1}{2}\right)^2 = 36\tfrac{3}{4} \textit{ lb. per sq. in.}$$

Ques.—Which is the most difficult of the mine gases to remove, and why?

Ans.—Carbon dioxide, accumulated at the foot of a slope or incline or at the face of dip workings or in other low places, will generally prove to be the most difficult gas to drive out, owing to the greater density of the gas which prevents it from rising and makes it necessary to employ a strong air current to drive it out from its lodgment.

Methane or marsh gas, accumulated at the head of a steep pitch or at the face of rise workings or on top of a high fall, is also difficult of removal because of its low density, which causes it to seek the roof and other high places in the mine. The relative temperature of these gases will generally determine which is the harder to remove.

Ques.—With a water gage of 4 in., a fan running at a speed of 80 r.p.m. produces 35,000 cu.ft. of air per minute; what volume of air will this fan produce when running at the same speed, against a water gage of 8 in.?

Ans.—Disregarding any slight change in the efficiency of the fan when operating against the higher gage, it may be assumed that the power on the air is the same, for the same speed of fan. That being true, the quantity of air in circulation will vary inversely as the pressure or water gage. But, the water gage being doubled in this case, the quantity of air produced against the 8-in. gage will be one-half of that produced against the 4-in. gage.

Ques.—(a) There is a current of 65,000 cu.ft. per min. passing in the return airway of a mine, 3½ per cent of which is methane (CH_4). How many cubic feet of this gas is being generated in the mine and what is the total quantity of air in the current? (b) Is this percentage of gas dangerous?

Ans.—(a) The quantity of gas being generated, in this case, is $65{,}000 \times 0.035 = 2275$ cu.ft. per min. The volume of air passing in the return is, therefore, $65{,}000 - 2275 = 62{,}725$ cu. ft. per min.

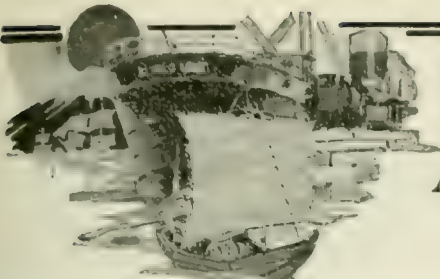
(b) This percentage of gas is undoubtedly dangerous and will require extreme caution to prevent accident, under any conditions in mining coal.

Ques.—There are 60,000 cu.ft. of air passing in a return airway and this current contains 1,500 cu.ft. of marsh gas. (a) What percentage of gas is present in the current? (b) Is this percentage dangerous? (c) Assuming the return current contained 1,400 cu.ft. of carbon dioxide instead of the marsh gas, what is the percentage of the gas and is it dangerous?

Ans.—(a) In a return current containing 60,000 cu.ft. of air and 1,500 cu.ft. of marsh gas, the total volume of air and gas is 61,500 cu.ft. The percentage of gas present is then $(1{,}500 \times 100) \div 61{,}500 = 2.4$ per cent.

(b) In the mining of soft coal, this percentage of gas would be dangerous if the coal is highly inflammable or if it generates much dust that is carried in suspension in the mine air. In the mining of hard coal, this percentage of gas may not be considered dangerous, but requires the taking of extra precautions to prevent accident.

(c) Assuming 1,400 cu. ft. of carbon dioxide in the current, the total volume of air and gas would be 61,400 cu. ft. and the percentage of gas present would then be $(1{,}400 \times 100) \div 61{,}400 = 2.3$ per cent, nearly. This would not be a dangerous percentage of carbon dioxide.



FOREIGN MARKETS AND EXPORT NEWS

Coal and Coke Exports and Imports in 1919

EXPORTS

Articles Coal and coke Coal—	November 1918 Quantity	November 1918 Value	November 1919 Quantity	November 1919 Value	Eleven Months Ending November 1918 Quantity	Eleven Months Ending November 1918 Value	Eleven Months Ending November 1919 Quantity	Eleven Months Ending November 1919 Value
Anthracite, tons					26	156		
Bituminous, tons	13	78	1,200	7,231	1,026	7,818	2,100	13,141

IMPORTS

Coal and coke Coal—	November 1918 Quantity	November 1918 Value	November 1919 Quantity	November 1919 Value	Eleven Months Ending November 1917 Quantity	Eleven Months Ending November 1917 Value	Eleven Months Ending November 1918 Quantity	Eleven Months Ending November 1918 Value	Eleven Months Ending November 1919 Quantity	Eleven Months Ending November 1919 Value
Anthracite, tons, free..	1,179	8,058	13,686	98,905	11,078	45,253	31,118	188,406	62,592	449,942
Bituminous, tons, free..	90,878	508,244	131,334	664,536	1,188,248	4,340,442	1,231,220	6,315,302	783,830	4,279,628
Imported from—										
United Kingdom..	475	2,300			7,900	40,458	33,390	251,730	1,484	10,675
Canada.....	90,402	505,939	119,782	613,542	1,147,592	4,186,392	1,187,960	5,977,692	718,586	3,983,575
Japan.......	.....	......	......	......	17,213	60,954	7,459	75,653	305	3,840
Australia			11,552	50,994	13,148	43,833	1,369	4,869	62,334	273,384
Other countries	1	5			2,395	8,805	1,042	5,358	1,121	8,153
Coke, tons, free.......	1,512	12,701	3,380	28,539	19,871	127,818	24,925	203,659	12,500	119,164

American Embargo Affects France Seriously

A statement in the New York *Sun* states that the shortage of coal facing France is more serious than at any other time since the armistice, according to a report published by the special commission which has been investigating the coal situation. Despite all efforts made by the Government to increase output the coal production of France is 40 per cent below normal and at present transportation facilities for supplying coal to Paris and other great industrial centers are on the verge of exhaustion.

This is the first problem in a long series of difficult questions that the new Government must tackle and it is safe to assume that on the outcome of the coal situation rather than on any political controversy will depend the fate of the Millerand Ministry.

The coal situation here is interesting from the American viewpoint, for it is chiefly to America that the French are looking for a solution of the problem. It is highly probable that an effort will be made soon by the French Government to obtain from Washington special permission to import American coal, the Garfield edict against exportation being the sole obstacle to the renewal of coal shipments to France and not the high exchange value of the dollar, as is generally supposed.

Negotiations were begun in 1917 between the French Chambers of commerce and the Shipping Board for the use of American shipping to transport coal to the port of Marseilles, but these were interrupted by the events of the war. It is expected now, however, that they will be renewed. An intensive study is being made by leading French industrial experts of the specific characteristics and qualities of the products of the various American coal basins in order to determine upon a rational utilization scheme.

These experts have reported already that Virginia coal, particularly from the Pocahontas and New River basins, offers the best prospect both from the viewpoint of quantity and price. The Maryland and Pennsylvania coals, which are shipped from Philadelphia and Baltimore, are sought especially for their coke and gas-making properties, and in these properties they have few equals in Europe.

Plans for the shipment of coal from these regions to the south of France are being prepared and will be ready to be put into execution as soon as a governmental arrangement for the export of this coal can be concluded. French shipping men assert that American ships can expect a better return cargo by touching at French Mediterranean ports than anywhere else in Europe.

The French African colonial possesions offer unlimited resources in tropical fruits, barks, vegetables, nuts, ochres, cork, etc., which, it is pointed out, can be loaded in Marseilles. It is by offering American importers these and other facilities that the French hope to attract coal bearing tonnage to the ports.

Adrien Artaud, president of the Chamber of Commerce of Marseilles and now a member of the Chamber of Deputies, expresses the hope that Americans will be able to replace the Germans in furnishing coal for the great southern port.

"Not only replacing the Germans," he adds, "but also to step in where the British farmers occupied an important place Great Britain, which needs all her fuel production for her home industries and for provisioning her enormous fleet, no longer will be in a position to furnish France with the pre-war supply. It is my sincere hope that America will take her place."

Chinese Coal Sells High

China is hardly in a position to vie with either America or Great Britain in the production of coal. The principal colliery is that of the Kailan Mining Administration, its British partner being the Chinese Mining and Engineering Co., at Kaipling, North China.

Brought to Shanghai by steamship, coal fetches for industrial purposes $14 to $16 a ton, and for household use $18 to $21, both grades being inferior in quality to the British or American product.

High Prices in Italy Lure Lehigh Coal

Railroaders say considerable of the output of the Lehigh coal fields is being sent to ports where colliers await it for transfer to the Italian kingdom, where coal is being sold at from $40 to $60 a ton.

It is understood gilt-edge prices are being secured here by coal companies for fuel being sold to Italy and also that payment is made in advance. Those who know the prices decline to make them public, but claim that coal from the Hazleton district will bring $75 a ton by the time it reaches the stoves of the people in Italy.

Kailan Coal Output

The annual output of coal by the Kailan Mining Administration is over 3,000,000 tons, of which 1,282,733 tons were exported in 1918. In that year 33.244 tons of coke were produced, of which 16,991 tons were exported. The older machinery used is of mixed origin, but all of that recently installed is of British manufacture.

The Kailan Mining Administration is an amalgamation effected in 1912 of the Chinese Engineering and Mining Company, Ltd. (British), and the Lanchow Mining Company (Chinese), the present Chinese interests being reported as merely nominal.

COMPARATIVE STATEMENT OF LAKE COMMERCE THROUGH CANALS AT SAULT STE MARIE, MICHIGAN AND ONTARIO FOR THE SEASONS OF 1918 AND 1919

Items	Total Traffic for Season 1918	Total Traffic for Season 1919	Increase or Decrease Amount	Increase or Decrease Per Cent. Inc	Increase or Decrease Per Cent. Dec
Vessels					
Steamers, number	17,067	14,866	2,201		13
Sailing, number	1,634	1,218	416	...	25
Unregistered, number	1,909	1,503	406	...	21
Total number	20,610	17,587	3,023		15
Lockages, number	14,903	12,302	2,601		17
Tonnage:					
Registered, net	61,100,244	50,089,090	11,011,154	...	18
Freight, short tons	85,680,327	68,235,542	17,444,785	...	20
Passengers, number	34,990	56,992	22,002	63	
Lumber, M.ft.b.m	296,919	244,426	52,493	...	18
Flour, barrels	8,228,844	8,087,554	141,290	...	2
Wheat, bushels	122,718,146	113,734,848	8,983,298		7
Grain, bushels	30,800,621	52,734,345	21,933,724	71	
Copper, short tons	86,078	58,409	27,669	...	32
Iron ore, short tons	60,551,296	46,922,792	13,628,504	...	23
Mfd. and pig iron, short tons	38,767	117,713	78,946	204	
Coal, soft, short tons	15,770,560	11,461,962	4,308,598	...	27
Coal, hard, short tons	2,211,050	2,412,989	201,939	9	
Salt, short tons	81,007	93,893	12,886	16	
Oil, short tons	334,134	387,023	52,889	16	
Stone, short tons	402,009	71,170	30,839	...	8
General merchandise, short tons	494,437	542,17	47,741	10	

The United States [illegible] opened April 10 and closed Dec. 15, 1919, season, 250 days.

The Canadian [illegible] Apr. 12 and closed Dec. 15, 1919, season, 248 days.

Compiled at St. Marys Falls Canal, Michigan, under the direction of Lieut. Colonel E. M. Markham, Corps of Engineers, U. S. Army.

Cosgrove & Co. To Own and Operate a Steamship Line

Owing to the scarcity of boats for foreign trade, Cosgrove & Co., a coal firm with home offices in the Swank building, Johnstown, Pa., has obtained a charter for one of the firm's associated companies and will operate a boat line of its own in its exporting business. Cosgrove & Co. operates coal mines extensively both in the East and in the Middle West and through a branch company exports a large part of the product.

It was announced today at the home offices of Cosgrove & Co., says the Johnstown *Tribune*, that a charter had been granted at Albany, N. Y., to the Wyngrove Line, Inc., an associated company of the Cosgrove firm J. C. Cosgrove, President of Cosgrove & Co., explained that, owing to the scarcity of boats for the foreign trade and the rapid growth of the company's business, it had become necessary to make arrangements which would insure the foreign trade prompt delivery.

The Wyngrove Line, Inc., has purchased one boat and is completing negotiations for four others. It is planned to have the line in actual operation by spring of this year. The officers of the line are:

F. Le Maistre, President, who has been prominent in the financing of large steamship business for a number of years; Daniel J. Boylan, Vice President, well known in the New York Coal Trade as the owner of the Boylan Towing & Transportation Company; C. B. Wynkoop, Secretary and Treasurer, member of the firm of Cosgrove & Wynkoop, Ltd., and Cosgrove & Wynkoop Coal Co.

The Board of Directors is composed of men prominent in financial circles of New York, as well as coal men of equal prominence in the central Pennsylvania field. The Wynkoop Line will have its general office in the Cosgrove & Co. suite of offices in the Singer building, New York City.

Foreign Vessels Permitted to Bunker

Under date of Jan. 27, J. W. Howe, commissioner, Tidewater Coal Exchange of New York City, sends the following communication:

"Have following wire from Regional Coal Committee, Philadelphia, reference to bunkering coal permits.

"My wire Jan. 23 is modified to this extent: Bunkering of vessels flying foreign flags sailing to European destinations will not be limited to sufficient coal to take them to Halifax, but will be permitted to bunker coal to take them to their outbound destinations. This does not change in any way the rule requiring bunkering at Hampton Roads of boats passing that port enroute to southbound destinations."

Bunker Restrictions Modified

The following has been received on Jan. 29, from Mr. Howe, commissioner of the Tidewater Coal Exchange of New York City:

"Instructions for the bunkering of foreign flag vessels are modified to the extent that sufficient coal may be bunkered to carry vessels to outbound destinations."

German Miners Oppose 6-Hour Day

A statement in the New York *Sun* on Jan. 27, states that a conference held in Gelsenkirchen, Westphalia, of the delegates of the Christian Miners Union, which has a membership of [illegible] workers, adopted a resolution, opposing at present the introduction of a six-hour working shift in view of the prevailing economic conditions.

The resolution indorsed the principle [illegible] day and demanded that the Government and the mine owners should strive to have it introduced as soon as [illegible] the [illegible] and miners should be paid extra for working their present hours. At the same time the resolution called upon the miners to avoid possible interruption in the nation's economic activities through decreased output.

Representatives of the Ministry of Labor and of the [illegible] at Ochum to discuss the six-hour work-day issue. The [illegible] urged the miners to desist from their attempts to force such a concession at this time in view of the industrial situation and the deliveries of coal to the Entente required under the terms of the peace treaty. He declared that the issue was one that should be left to international adjustment. He added that the Government approved the plan for the shortening of the working day and the improvement in the working and living conditions of the miners.

The Representative-General of the commission of German labor unions supported the Government's attitude and a commission comprising representatives of the Government and of the miners and mine owners was appointed to confer on the situation in the course of the next few days.

Through the closing of the Berlin railway repair shops 7,000 workers are temporarily without employment. The plants probably will be idle until the midde of February, when, it is hoped, a new wage agreement will have been decided on, based on the piece work or premium system.

Australian Shipments

The following cablegram has been received from the American consul at Newcastle, Australia, dated Jan. 9, according to recent report of the Department of Commerce, regarding the output of coal during December and the oversea shipments: During the month of December the total amount of coal mined was 401,000 tons, value at £321,000. There were 40,334 tons, including 27,283 tons, to New Zealand, exported overseas.

Bunkers furnished overseas vessels were 32,160 tons, including 4,000 tons to those bound to New Zealand and 19,000 tons to vessels bound to the United Kingdom; 1,000 tons for Peru now being loaded on an American sailing vessel; 3,500 tons of Newcastle coal will be taken to Callao by an American vessel now discharging at Melbourne.

Strike of marine engineers, which began on Dec. 16, still in effect and likely to continue several weeks; 6,000 men most wharf laborers, are idle; at steel works one blast furnace is shut down, unable to obtain supplies of ore; other trades are affected.

Coal for Italy

Matteo, Ghio, Genoa, Italy, writes Charles S. Allen, secretary of Wholesale Coal Trade Association of New York City, in part as follows:

"Our object is to represent eventually some first class exporting house of bituminous coals, such as New River, Pocahontas, Westmoreland, Kanawha, etc. on the Italian market. We respectfully request you to put us in communication with some such house (not yet represented here), who desires to initiate business relations with Italy.

"We are fully aware of the present coal crisis in the United States due to the recent strike, and do not expect to do business immediately, but we think best to treat now regarding our eventual representation, so that by the time we will have reached an agreement the present situation will have changed for the better. We are disposed to furnish first class references, banking and others."

Brazil's Coal Exports

The Consulate General reports from Rio de Janeiro that during September coal imports into Brazil totaled 9,294 metric tons, of which 5,388 tons were British coal and 3,906 tons American coal. In September 1918, all the coal imported, 16,032 tons, came from the United States, and in the corresponding month of 1917 of the 25,365 tons imported 19,364 tons were American coal and the remainder, British.

Tidewater Demurrage

News ticker advice is that the tentative decision of the Interstate Commerce Commission in the case of this Association against the Railroad Administration has been handed down, in which it is held that three days, under the average agreement, from Dec. 1, 1918, to March 1, 1919, was unreasonable and that five days would have been reasonable and that the charge of $3 a day was unreasonable to the extent that it exceeded $2 a day, held to be reasonable.

If this is a correct report of what is in the tentative decision it means that reparation may be recovered for the difference in demurrage charges figured on the three day and $3 basis, on which the bills have now been rendered, and five days average and $2 per day.

It is to be understood, of course, that this is merely the tentative report of the examiner who heard the case and opportunity is afforded each side to file exceptions to the report and argue the same before the commission, after which a final decision in the matter is made.

Coal and Coke Exports for December

Exports of coal and coke, as shown by returns to the Department of Commerce, for December, 1919, and those for the corresponding month of 1918, as finally revised, were as follows:

	December	
	1918	1919
Anthracite	292,014	345,402
Bituminous	1,140,455	341,064
Exported to:		
Italy	—	11,040
Canada	903,210	208,091
Panama	6,000	16,300
Mexico	9,836	8,489
Cuba	89,779	57,478
Other West Indies.	21,239	19,633
Argentina	—	—
Brazil	21,974	4,590
Chile	15,821	4,226
Uruguay	41,358	—
Other countries	31,238	11,217
Coke	93,100	43,320

Coal-Mining Developments in Holland

A bill is under consideration of the States-General to develop the coal mining industry in Dutch Limburg. It is stated in the memorandum explanatory of this bill that the output of the state coal mines amounted to 2,804,546 metric tons in 1918; and it is estimated that the output will be 5,200,000 tons in the year 1925, provided that sufficient skilled labour is available. Minerals have been discovered in the Netherlands in workable quantities in two large districts (where coal is found) viz., South Limburg and "de Peel" (Limburg); and in two smaller areas, viz., Winterswijk (rock salt and coal), and Buurse-Hengelo (rock salt).

The Government intend to develop the mining industry in South Limburg as vigorously as possible. The amount of coal in this area is estimated at 4,554 million tons situated at less than 1,200 meters below the surface. In the "Peel" district, to which belongs geologically the small area east of Roermond, in the municipalities of Vlodrop, Melick, and Herkenbosh, there are approximately 1,776 million tons of coal in workable seams at a depth of less than 1,200 meters.

It is this Vlodrop-Melick-Herkenbosch area which by the present bill is to be added to the State coal fields. The coal at Winterswijk is situated at a great depth, and it is not certain whether it can be worked.

Coal Traffic in the Ruhr District

For the week ending Jan. 3, states a recent report in the *Colliery Guardian,* the average daily supply of railway wagons was 15,700 tons, full quantity requisitioned being available. In the same period pit stocks fell from 564,000 tons to 525,000 tons. The flooded state of the Rhine caused a decline in the operation of the Duisburg-Ruhrort tips, only barges being available for loading in the absence of larger craft.

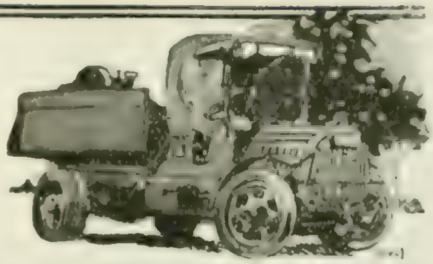
At the same time the water in the Rhine-Herne canal rose so high as to prevent traffic passing under the bridges. The canal pits loaded an average of 22,200 tons per diem.

English Export Levy Lifted

The following notice was posted on the Cardiff Exchange on Saturday, states a recent report in the *Colliery Guardian,* by the district secretary of the South Wales Coal Exporters Association:—

"Coal exporters are informed that as and from Jan. 1, 1920, the levy of ½d per ton made on all coal exporters, colliery owners, and ship owners, no longer continues in its old form. However, it has been found necessary to make a levy of one-tenth of a penny against the exporters only to keep in existence the machinery for supplying our different departments and foreign Governments with the usual daily returns of shipments, etc.

COAL AND COKE NEWS



Charleston, W. Va.

Plants in southern West Virginia operate about two full days per week ended the twenty-fourth. Chesapeake & Ohio helpless. Weather conditions hold back production. General congestion follows coal diversion. Kanawha production at lower ebb than during strike. Embargo on Eastern shipments. New River conditions bad; Monday only day coal is loaded satisfactorily.

Deep dents were inflicted on production throughout this section of the state between Jan. 19 and Jan. 24. As serious as the situation had been during the previous week, it was even more discouraging during the period mentioned, the output reaching extremely low ebb; the general average of production for the week was not over 40 per cent, while during the latter half of the week it was even less than that, the twenty-fourth in fact witnessing only about a 30 per cent supply of empties. There was possibly a 75 per cent supply of empties available on the nineteenth. From that day until the end of the week the supply grew less and less. For instance while Chesapeake & Ohio loadings reached 133,000 tons for Monday, tonnage handled dropped to 79,000 for Tuesday and Wednesday and on Friday only 52,750 tons of coal were loaded. Of course widespread suspension of operations followed in the wake of such an inadequate car supply. In the main, it may be safely estimated, plants did not operate more than two full days during the entire week. Of course protests poured in upon the Chesapeake & Ohio, but that road appeared to be helpless.

Adverse weather conditions also conspired to hold back the production and shipment of fuel from this area. While all streams were high and some of them were above their banks no serious damage to mines in any vicinity were reported. On the other hand continued rains throughout the week resulted in many slides at various points, tieing up railroad traffic to such an extent as to make the movement of either loads or empties decidedly uncertain. Ice-coated rails also retarded freight movement. With motive power inadequate, even under favorable circumstances, physical conditions made it even more difficult to move loads and empties with any degree of dispatch.

Railroads operating in this section were excluding commercial customers from a supply of coal, during the week ended the twenty-fourth, through an embargo effective in certain regions against eastbound shipments, except in cases where such shipments were intended for railroad use. While contract customers were calling vociferously for coal, little coal was being sent to them, mainly because the railroads were insisting upon being served first, as they have been continuing to insist for some time notwithstanding the fact that much of the coal diverted during the strike is still awaiting disposition. As much of the coal diverted was contract coal, it is pointed out by operators that railroads have fought shy of utilizing such diverted coal in order to secure a supply at cheaper prices. General congestion as an aftermath of heavy diversions during the strike plus unfavorable weather conditions only aggravated conditions, insofar as the operators in this section are concerned. Although the continuance of an embargo as to Eastern shipments indicated congestion in the East, and hence a sufficient supply for domestic use, export restrictions were still in force much to the exasperation of exporting agencies.

Mines of the Kanawha field were laboring under many handicaps during the week ended Jan. 24. The number of cars furnished mines in the district was even slimmer than during the exceedingly poor production week ended the seventeenth. In fact production was at a lower ebb, it is believed, than at any time during the strike, the only day on which loadings were within hailing distance being the nineteenth. After that production was under 50 per cent and most of the time during the week it was only 40 per cent. As an instance of the poor supply, only a total of 318 cars were furnished mines in the whole district on the twentieth. Consequently production was under rather than over 15,000 tons a day throughout the week, making the week's output at points on the Chesapeake & Ohio considerably below 100,000 tons. On the twenty-third, for instance, only 14,450 tons of coal were loaded. Upon the whole it is not believed the average plant was in operation more than a third of the time during the week.

Weather conditions also played a part in holding back production, slides at many points both on the main and branch lines of the Chesapeake & Ohio being frequent. For instance the Coal River branch of this railroad was out of commission for several days owing to incessant rains. Even telephone lines were out of commission. Points to which Kanawha mines could ship were limited owing to an embargo on Eastern shipments, except insofar as railroad fuel was concerned. In the face of a strong demand for byproduct and steam coal and with contract customers demanding deliveries, transportation conditions were decidedly discouraging during the week. There was also a strong demand in the district for coal for export but the lid was still clamped down except as to about 50 per cent of normal export shipments.

Conditions in the New River field were just about on a par with those in the Kanawha field, with production just about on the same level, and with transportation disabilities figuring as the most potent factor in putting a crimp in production. In comparison with the week ended the seventeenth, the district suffered more during the week ended the twenty-fourth, there being just one day when it was possible to load coal to any degree of satisfaction and that was Monday, the nineteenth. With a shortage of cars so acute, many mines were compelled to mark time during at least two-thirds of the week, and the general average of daily production throughout the period named was not more than 14,000 or 15,000 tons; loadings in the New River field, or rather that part of it supplied by the Chesapeake & Ohio, being only 14,500 tons on the twenty-third. Production for the entire week was, therefore, not over 90,000 tons, if that much. Branch lines of the Chesapeake & Ohio were also out of commission in the New River field, so that between a poor car supply, adverse weather and inadequate motive power, the week ended the twenty-fourth was one of the worst since the beginning of the November strike. On top of conditions so prejudicial to large production, there was an extremely stiff demand for New River smokeless, but neither contract coal, spot coal nor export coal was shipped in the quantities warranted by market conditions owing to the poor transportation service and the continuance of export restrictions.

Bluefield, W. Va.

Acute car shortage, adverse weather conditions and inadequate motive power hold back production greatly. Output of Tug River and Pocahontas fields much reduced. Norfolk & Western tied up by heavy slides. Worst car shortage in recent weeks in Winding Gulf field. Both Chesapeake & Ohio and Virginian systems contribute to loss of tonnage.

What between an acute car shortage and high water, combined with severe winter weather, production was reduced to the minimum throughout the southern part of the state during the week ended Jan 24. Indeed, production closely paralleled the output during the Christmas holidays but from entirely different causes. While from the very outset of the week, the shortage of empties was serious enough, it grew rapidly worse during the last three days of the week.

Continued rains throughout the week not only affected railroad transportation but it also affected actual mining operations in various fields. Loading tracks in a number of instances were inundated and damaged and production generally brought to a standstill, a heavy tonnage loss ensuing. Railroads suffered most from numerous slides which forced a suspension of traffic, but sleet also slowed up traffic to a very considerable extent. Few cars came in from the West, due undoubtedly to adverse weather conditions and to a continued congestion at Western terminals and gateways.

A shortage of motive power also played a large part in holding back production and in aggravating the car shortage. The movement of such coal as had been produced and loaded was extremely slow and the delivery of empties for the same reason was far behind time, so that between the two there was considerable congestion. Then, too, not many cars were coming back very promptly from the East, as has been the case since export shipments were so materially curtailed, that of course adding to the car shortage.

An embargo became effective Jan. 24 on all shipments of coal from the Clinch Valley, Thacker and Kenova districts, consigned to tidewater, except when moving under numbered permit

There was in the Tug River district during the week ended Jan 24 between a 40 and a 50 per cent loss attributable solely to a dearth of cars and the causes leading to such a shortage. In other words production during the week mentioned dropped from 75 to about 50 per cent or even less, as compared with the previous week. Empties furnished throughout the week grew less in number as it advanced. In the first place inclement weather made it hard to move cars with any celerity from the West and of course the Norfolk & Western obtained few cars from Western connections. Between ice-coated tracks and high water, traffic was held at a standstill for hours at a time, long stretches of track being obstructed by slides. Inadequate motive power was another factor in holding back production Only 55,000 tons were produced in the Tug River field during the week ended the twenty-fourth.

The car situation and other conditions in the Pocahontas region were similar to those in the Tug River district for the week ended Jan 24 and were important factors in holding back production. The Norfolk & Western was almost completely tied up by heavy slides at various points on the Pocahontas division. Sleet and heavy rains also had quite a serious effect on operations, mines being put out of commission in some instances through high water, although no cases of serious damage have so far been reported

As showing how seriously the mines of the Pocahontas region were affected it is only necessary to point to a car-shortage loss of 188,366 tons, with a labor-shortage loss of only 5,118 tons and a mine-disability loss of 12,254 tons. Coal manufactured into coke during the week amounted to 10,765 tons.

One of the worst car shortages in recent weeks drove production in the Winding Gulf field to a still lower level during the week ended the twenty-fourth. The shortage in existence was observed both on the Chesapeake & Ohio and the Virginian railroad systems.

Huntington, W. Va.

Guyan field hard hit by car shortage. Transportation loss mounts to new maximum. Production more than 100,000 tons a week behind weekly average of strike period. Operator's committee goes to Washington to have "heart to heart" talk with director general of railroads.

The car shortage in the Guyan field during the week ended Jan. 24, was more serious than it has been at any time in the last year and more far reaching in its blighting effect. It was so bad in fact that mines of the field found it impossible to produce more than 132,000 tons of coal, that representing a further decrease in production of 42,000 tons as compared with the production during the week ended the seventeenth. Perhaps a further and better idea of the heavy loss caused by the scarcity of cars may be gathered when it is stated that over three thousand hours of possible working time was lost. The transportation disability loss mounted to a new maximum, 204,000 tons being lost from that cause—10,000 tons more than during the previous week. The potential tonnage of the Guyan field is 345,000 tons. During the strike, on an average of 240,000 tons a week were produced, so that production during the week ended the twenty-fourth was running more than 100,000 tons a week behind strike production.

The situation had become so serious in fact that a group of Huntington coal operators left on Jan. 28 for Washington, D. C., where they stated they proposed to have a "heart to heart" talk with the director general of railroads, pointing out that the Chesapeake & Ohio was furnishing only a 50 per cent supply of cars, also charging that coal diverted during the strike was still being held, and that the cars in which such coal was loaded were, in effect, being utilized for storage purposes. In the party were: J. R. Vest, A. Litz, J. J. Ross, James D. Francis, Walter Thurmond, A. R. Beisel, J. A. Kelley and Herbert Jones.

Logan operators were falling further and further behind in their attempts to fill orders and their customers could not understand, it was said, why they should not be able to make better deliveries of coal. Of course under conditions described export shipments were cut to the very quick, only a certain proportion of a limited tonnage being allowed to go forward to tidewater for overseas shipmeint. Tonnage handled by the Chesapeake & Ohio system during the week ended Jan. 24 was 95,550 less than during the previous week, the number of cars transported dropping from 11,454 to 9,543. Between Jan. 19 and Jan. 25, a total of 6072 loaded coal cars were handled by the road through Clifton Forge, Va., for Eastern distribution.

Fairmont, W. Va.

Serious cut in production due solely to a car shortage in northern West Virginia. On Jan. 24 there were 110 idle mines on Monongah division of Baltimore & Ohio. Adverse weather conditions interfere with movement of cars part of week. Development in regard to railroad fuel.

Less coal was produced in northern West Virginia mining fields during the week ended Jan. 24, than at any time since before the strike of Nov. 1, the serious cut in production being attributable solely to a car shortage and an extremely serious shortage at that. While in other weeks the mines of northern West Virginia have managed to load a fairly large tonnage during the first three days of the week such was not the case during the weekly period ended the twenty-fourth for at the very beginning of the week there was less than an 80 per cent supply of empties available on the Baltimore & Ohio for instance. The Tuesday supply of cars was only half of requirements. From Wednesday until the end of the week the number of empties furnished in most regions hovered around 30 per cent. On the Monongahela R.R. there was only about a 20 per cent supply of cars during the last half of the week.

Of course under such conditions many mines found it impossible to operate, there being 119 mines on the Monongah division alone of the Baltimore & Ohio idle on Thursday and 110 idle mines on Saturday. At various times during the week there were 466 idle operations on the Monongah division of the Baltimore & Ohio. Even in cases where mines were able to secure cars, empties only sufficed for part of a day's [illegible] loading. Late placements also contributed further to a reduction in the tonnage. Similar conditions of course prevailed elsewhere in the northern part of the state and half the time mines were shut down for want of cars.

While adverse weather conditions during a part of the week only tended to interfere with the movement of coal and [illegible] the delivery of empties, yet that could not be given as an excuse for the shortage of cars lasting throughout the week. However slides and sleet did make operations difficult for several days and on some of the smaller roads put a complete quietus on the movement of coal for several days. While high water threatened to interfere materially with the operation of both railroads and mines not otherwise affected, streams subsided before any real damage was done; slides were the worst factor with which railroads had to contend.

The filthy condition in which empties were received, necessitating cleaning, prevented prompt loading and retarded the week's production. While it was learned that there were approximately 5,000 coal cars loaded with slag within reach of northern West Virginia regions, and while producers offered to unload the slag at railroad expense, as a means of securing more cars, yet even that failed to bring any more cars into the northern part of the state.

Railroad fuel shipments during the week ended the twenty-fourth were comparatively light. A development of the week was the notice served by the railroads on producers that the latter must fill their contracts with the railroads before shipping coal to any oher class of consumers. From that notice it was inferred that railroads would resort to the assigned car system or to confiscation unless operators were "good." Inasmuch as railroads have been confiscating when the notion struck them, little heed was given to the notice.

There is quite heavy demand in all northern West Virgina fields for both gas and steam coal, a demand it is utterly impossible to fill, operators not being able to take care of contracts let alone ship any "free" coal. Since export shipments were shut off, the tonnage for Curtis Bay during the week ending the twenty-fourth was extremely light.

Norton, Va.

Output above average in Virginia fields. Production 167,000 tons. Heavy shipments for export. Producers in financial straits due to tardy settlement for coal.

The percentage of production was somewhat above the average in the Virginia fields during the week ended Jan. 24, there being only a 15 per cent loss in production. In other words an output of 167,000 tons represented an 85 per cent production, although there was a loss of 30,000 tons attributable entirely to a shortage of cars at various points. Heavy shipments were made during the week to Norfolk, Va., as well as to Charleston, S. C., for export, there having been an especially strong demand from foreign sources.

Labor trouble has been at a minimum since the first of the year in the Virginia fields, since a few Russian agitators who terrorized the St. Charles region were removed. Producers, however, still find themselves in financial straits from November diversions of coal, since both the railroads and ultimate consumers, to whom coal was diverted, have been and are still extremely tardy in making settlement.

Ashland, Ky.

Bad weather conditions main cause of loss in production. Slides suspend freight traffic on Big Sandy. Engine failures and poor motive power congest traffic. Production of coal in northeast Kentucky running behind that of corresponding period last year.

Heavier losses in production were sustained in the northeastern Kentucky district during the week ended Jan. 24 than during the preceding week, production dropping from 135,990 tons to 119,735 tons or from 59 to 54 per cent. There was, of course, a corresponding increase in the total loss which advanced from 94,660 to 103,110 tons or from 41 to 46 per cent. Railroad disabilities were increased to the extent of 13,00 0tons, bringing the total loss in that respect to 89,00 0tons or 40 per cent of the entire productive capacity of the mines.

Unfavorable weather conditions were mainly responsible for the increased production loss, as all parts of the northeast Kentucky field experienced severe sleet storm. On top of the sleet storm there were no less than six slides on Friday, the twenty-third, on the Big Sandy division of the Chesapeake & Ohio, forcing a suspension of all freight traffic. So completely was the Big Sandy division out of commission that only about 40 cars of coal were loaded on the twenty-third.

Conditions are such in fact that loading is falling behind total loadings for the month at the height of the strike when man power was greatly curtailed. Transportation disabilities alone are to blame for such conditions.

Many engine failures in the northeast Kentucky field delayed even what empties were available in reaching the mines. Likewise poor motive power also affected the movement of loads and tended toward a congestion of traffic generally.

Up until Jan. 23 the production of coal in the northeast Kentucky field was running 25,000 tons behind production for the corresponding period of 1919 when there was no market; whereas at the present time there is a particularly strong market for all grades of northeast Kentucky coal, the supply, however, because of conditions already described, running far in the rear of the demand. At the close of the week there appeared to be little prospect of any improvement in transportation conditions.

Sydney Mines, N. S.

Extensive improvements planned by the Nova Scotia Steel & Coal Co., Ltd. Steel tipple to be constructed and electrical equipment installed at Jubilee colliery. Improvements to cost $90,000. Development in lower seam to be pushed and daily output increased to 1,500 tons. Submarine dispute would be settled by amalgamation.

Plans are now being prepared by engineers of the Nova Scotia Steel & Coal Co., at Sydney Mines, for the construction of a steel tipple at Jubilee colliery to cost in the vicinity of $90,000; furthermore electrical equipment for the mine and other improvements are planned, which will mean practically the doubling of the present output from the colliery within the next few months, says the Sydney *Daily Post*.

The local officials have tentative plans for the spending of large sums of money at the Sydney Mines plant, in improvements and new works. Owing to the absence of President MacDougall for the past two months on business matters of importance, it has not been possible for him to go over the plans and make any definite decision as to the extent of the outlay which will be made.

The Jubilee will, before many months have passed, be Scotia's biggest producer. Development work in the bottom seam is being pushed vigorously at the present time. The daily output from this seam is now about 100 tons, and is obtained from one longwall machine. In a short time this amount will be substantially increased. At present the men working in the lower seam are lowered to the pit bottom by means of the coal cages, but workmen are now engaged in retimbering the shaft from the top seam to the lower one, and in a short time, the miners will be lowered in the regular man cage.

Considerable electrical equipment is to be installed shortly on the surface at this mine which will mean greater and more efficient service in the handling of the mine's output. By midsummer officials hope to have a daily output from both seams of about 1,500 tons. The output from all the company's mines for the present year has not been quite as good as it was in December, there being raised approximately 2,200 tons daily. Two-thirds of this tonnage is required for the operation of the coke ovens and other portions of the plant, and the local sales practically takes up the remainder, so that there is little left for export. Under these circumstances the bunkering trade is practically nothing.

There are no new developments regarding the dispute over the submarine areas between the Scotia and Dominion companies. Until it is definitely settled one way or the other as to whether the proposed merger between the two companies is going through, it hardly seems likely that the provincial Government will render any decision in the matter. The amalgamation of the two companies would be a happy solution of the present difficulty.

Victoria, B. C.

Title to Vancouver Island coal area again in the courts. Granby company vs. Esquimalt & Nanaimo Ry. Big plants at Cassidy's and Anyox involved. Previous legislation reviewed. Coal and coke production statistics of British Columbia for 1919 given in detail.

Once more the title of the Granby Consolidated Mining & Smelting Co. to the Vancouver Island coal area, which they are developing, is being contested in the courts of British Columbia. The action has been brought by the Esquimalt & Nanaimo Ry. Co. against Charles Wilson and Angus C. McKenzie, who are executors under the will of the late Joseph Ganner, and the mining and smelting company.

To the Ganner estate belonged much of the coal land, to which the Granby company acquired title from the province of British Columbia under the terms of the Vancouver Island Settlers' Rights Act, 1904, Amendment Act, 1917. Since the acquisition of this property the company has installed collieries at a point colloquially known as Cassidy's, equipped with modern plant, and has built up a community which, in respect of the accommodation provided for officials and workmen, is considered to be a model, at an expenditure aggregating approximately $2,000,000. In the short space of little more than a year, the company has put the mines of Cassidy's on a producing basis of about 700 tons a day. Depending on the coal from this colliery, the Granby company has installed at its smelting centre, Anyox, B. C. (where it is engaged in the mining and the smelting of copper ore,) byproduct coking ovens, at a cost of about $2,500,000. For these reasons the law suit referred to is of first importance to the company and of much interest to the entire western Canadian mining industry.

The Esquimalt & Nanaimo Ry. Co. asks the courts to declare that the Crown Grant issued by the provincial Government to the defendants is null and void in-so-far as it purports to grant coal, coal oil, stone, clay, marble, slate, mineral and substances in and under the said lands, and that part of the surface of such lands to which, or upon which, the plaintiff is entitled to exercise acts of ownership, purchase or rights to easement. An injunction also is sought restraining the defendants "their servants, agents or workmen or assigns from entering and working or mining for coal and other minerals and substances and from registering or applying to register any title to the surface of the lands." The plaintiff also seeks a declaration that the plaintiff always has been the owner of the lands and damages against the defendants.

Wtih reference to this case it is well to note that the Settlers' Rights Act of 1917, which was passed by the provincial Government and under the terms of which the Crown Grants now assailed were issued, was disallowed by the Dominion Government in May, 1918. The Grants in question were given after the passage of the Act and before the Federal Government disallowed it. The point, therefore, arises as to whether the Settlers' Rights Act of 1917 was legally operative during the period that lapsed between the affixing of the signature of the Lieutenant Governor and the receipt of the formal declaration of its disallowance at Ottawa.

The official estimate of the coal production for British Columbia during 1919 places it at 2,504,423 long tons, of which 147,205 tons were made into coke, leaving the net production for use as fuel at 2,357,218 tons. These figures show a decrease as compared with 1918 of 74,301 tons gross and an increase of 54,973 tons net. The quantity of coke made was about 98,598 tons, which is a decrease of about 90,369 tons as compared with the previous year. The decline in coke production is explained by the quite small output of the ovens of the Crow's Nest Pass Coal Co. It was affected by the long-drawn-out strike of the coal miners and by the closing down of the smelters of the boundary district.

The Provincial production of coal is summarized as follows:

	Tons of 2240 lb.
From Vancouver Island collieries	1,690,724
From Nicola and Similkameen collieries	152.731
From Crow's Nest Pass collieries	659.408
From Telkwa collieries	1.560
Total quantity coal mined	2,504.423
Less made into coke	147,205
Net quantity of coal produced	2,357,218

In addition to the above net production of coal there was made into coke the production shown as follows:

	Tons of 2240 lb.
From Vancouver Island collieries	43.517
From Nicola and Similkameen collieries	—
From Crow's Nest district collieries	55,081
Total	98,598

It is observed that the coal mines of the province have had a fairly good year but that there were some interruptions; among which are the strike of Fernie, which closed the mines during June, July and August (work being resumed at the beginning of September), and the fact that the Vancouver Island mines during the months of May, June and July worked on slack time, losing a production of probably 160,000 tons.

PENNSYLVANIA

Anthracite

Shamokin—Local coal production will be increased to the extent of several thousand tons a week shortly when the Slope Mountain Coal Co., which is opening a new colliery on the Helfenstein tract here, will begin operations. The new mine will develop deposits hitherto untouched. New York capital is largely interested in the project.

Tamaqua—Officials of the Lehigh Coal & Navigation Co., are said to be of the opinion that the mine fire in the Greenwood workings, one mile north of the town, is now extinguished. No. 14 colliery, one of the largest in the district, is now in full operation over the burned section; as the underlying seams are being developed no trace of the fire is found, lending strength to the belief that the fire has either burned itself out or has been smothered. This fire started more than fifty years ago.

Pittston—The Scranton, Pittston Coal Co., has secured a preliminary injunction against the mayor and councilmen of Pittston, to restrain the city officials from interfering with the company in sinking a shaft within the city limits without first filing plans for the new mining operations. The proceedings question the legality of an ordinance adopted by Pittston providing that a coal company, before opening any new shaft, slope or drift within the city limits, should first file a plan or draft of the extent and nature of the proposed mining operation and the precautions taken to support the surface.

Pottsville—It has been reported that the present policy of the Hudson Coal Co., in selling some of its collieries in the Northern anthracite field, is to gradually withdraw from the Lackawanna Valley and develop its extensive properties in the Southern anthracite basin. In connection with this report the following statement from the *Eagle* of Reading, Pa., is of interest: Fifty million dollars will shortly be invested in developing the virgin coal lands of Schuylkill County, and considerable significance is attached to an announcement that E. B. Smith & Co., bankers of Philadelphia, have leased offices in Reading and will at once open business, with their own private wires, to New York and Philadelphia.

Hazleton—Plans for stripping the top from the coal measures of the Crystal Ridge tract were ordered prepared by the Cranberry Creek Coal Co., The Crystal Ridge colliery has been used as a feeder for the Cranberry mines since the Crystal Ridge breaker burned down.

The old Linderman & Skeer mines, at Stockton, near here, will be drained through the Lehigh Valley Coal Co.'s Shaft colliery. Additional pumps are now being installed to take care of the water from these old workings.

It is stated that the three collieries of the G. B. Markle Co., north of here, idle since Jan. 1, 1920, resumed operation on Jan. 26. Operation of these mines ceased with the expiration of a lease from the Union Improvement Co., of Philadelphia, the land owner of the properties. A dispute arose regarding the amount of royalty to be paid and pending a settlement of this matter, 2,000 men lost employment and the coal output was reduced 3,500 tons a day. Following a recent conference in the Lafayette Building, Philadelphia, Samuel J. Livingston, secretary of the Union Improvement Co., announced that an agreement had been reached and mining would be resumed immediately. Mr. Livingston said that, aside from stoppages due to strikes and holidays, the recent cessation was the first in more than 15 years. He refused to make known the terms of the new agreement.

Bituminous

Altoona—Shortage of cars has reduced the production of coal in the central Pennsylvania district 40 per cent below normal and has seriously handicapped many industries. The shortage is due to lack of motive power and cars and inability to keep up with the repairs on the part of the railroads, while some 15,000 cars sent West with coal at the beginning of the coal strike have not been returned.

WEST VIRGINIA

Beckley—New officers of the Glen White Mining Institute are: Robert F. Roth, president, J. A. Blake, first vice president, A. E. Barrett, second vice president, Geo. N. McLillan, secretary, and Augustus Pilling, treasurer. Quite an interesting talk was given by Superintendent J. A. Blake on the subject of mine haulage.

Williamson—The powder magazine of the Randolph mine in the surburbs of this town blew up recently. James Childers, the mine foreman, who was near the magazine when it exploded, was killed and another employee was seriously hurt. The cause of the explosion has not been determined and the loss is said to be heavy. The explosion shook the town and windows were broken.

Fairmont—At a meeting of the directors of the Consolidation Coal Co. in New York recently, W. L. Andrews was elected vice president of the big corporation. The directors also announced that they have sold the company's holdings in the Coastwise Transportation Co., amounting to 26,046 shares, to W. A. Harriman & Co., bankers of New York, for $250 a share. This is said to mean that the Consolidation company intends to dispose of all its present holdings in shipping interests.

Charleston—Mines in West Virginia took a toll of 22 lives during the month of December, according to a report just made by the West Virginia Department of Mines, and all but ten of the fatal accidents were due to falling slate or coal. Three mine workers were either run over by motors or otherwise fatally injured by them, while two miners met death in mine-car accidents and one was caught in a mining machine. Two deaths also were caused by premature explosions of powder. There were two fatal accidents on the outside of the mins. Raleigh and Logan counties passed McDowell in the largest number of deaths, each having five, McDowell ending with four. The casualties in Fayette County numbered two while in each of the following counties there was one fatality: Braxton, Kanawha, Marion, Marshall, Monongalia and Ohio.

Bluefield—In a gas explosion at the No. 2 mine of the Yukon Pochahontas Coal Co., at Yukon, W. Va., on Jan. 20, two miners were killed and the lives of seven others placed in jeopardy, all through the failure of the company to employ a fire boss, it is charged by the West Virginia Department of Mines. The No. 2 mine is a small mine, only 12 men having been employed there recently. The explosion occurred about 2600 ft. from the entrance to the mine at the face of the main entry, gas having accumulated between the face of the entry and the second break-through from the face. It became necessary to keep the break-through partly open because of the way the main heading was dipping. So far as the Department of Mines was able to determine the canvas stretched across the second break-through had been torn down and evidently was still down on the day of the accident. While seven of the miners who were in the mine at the time the gas exploded (the seven being in the fourth left heading) were able to make their way out of the mine, three were overcome by after damp and had to be carried out.

KENTUCKY

Louisville—Investigations into the coal-car shortage have been started by the state Legislature. It is claimed that during the past three years there has been an increase of 100 per cent in Kentucky coal production, and an increase of ten per cent in number of coal cars. It is said that the railroads have fallen down badly in keeping up with construction work of equipment as well as roads.

Sergent—The Imperial Elkhorn Coal Co has been incorporated under Delaware laws and has taken over the plant and all the property of the Whitley-Elkhorn Coal Co., at this place, near McRoberts, Letcher County. The purchase includes two operating electrically-equipped mines producing Elkhorn coal on the Lexington & Eastern Ry. U. S. Morris, president of the Superior Colliery Co. will also be president and general manager of the new company. Its offices will be located in New York City and Detroit, Mich. The output of the company will be sold by the Superior Colliery Co., of Detroit, Mich. Considerable additional acreage has been obtained and it is proposed to start new development work that will necessitate a large outlay of capital.

OHIO

Columbus — The annual stockholders' meeting of the Hocking Valley Products Co., which operates large mines in the Hocking Valley field of Ohio, was held at the Columbus office, Jan. 21. Directors elected were: John G. Bates, Samuel L. Chamberlaine, W. B. Franklin, Norbert C. Heinscheimer, Alexander C Massen, Langdon P Marvin, James W Murphy, Albert M. Polack, Sidney S. Schuyler, James B. Taylor and H Montague Vickers, all of New York. The board will meet in New York City soon to elect officers for the coming year. Reports received showed that the past year was a good one in both the coal and brick departments, and prospects for the coming year are bright. Robert Taylor, Jr., is resident manager of the concern.

The Final decree in the John H. Winder-John S. Jones law suit over ownership of certain stock of the Sunday Creek Coal Co., has been approved by Federal Judge Sater and the case is now settled. In the final decree the court holds that Winder is not entitled to any of the preferred stock of the company but should be given 15,000 shares of the common stock. This stock has been delivered. The court also held that at no time did it contemplate the appointment of a receiver for the stock of the Sunday Creek Coal Co., or the Steadman Grocery Co., the latter not being a subsidiary of the former company. The court held that Jones is to be reimbursed in the sum of $1,107,826 for moneys advanced. The suit was started about eight months ago by Mr. Winder who desired additional stock in the company.

INDIANA

Terre Haute—Fifty-one mines in the Indiana field were idle Jan. 20 on account of car shortage. Their total daily production capacity is about 45,000 tons. Eighteen of these mines are on the Vandalia R.R. in the Terre Haute-Brazil area, Bicknell field, seventeen on the Chicago & Eastern Illinois, in the Clinton, Brazil and Sullivan fields; fifteen in the Clinton and Linton fields, on the Chicago, Terre Haute & Southeastern R.R.; and one on the Illinois Central, at Dugger. As shown by a report of Jan. 24, car shortage continues to interfere with production in the Indiana coal field, on which date 67 mines, with a daily tonnage of 56,000 were idle. Three mines are reported closed because of labor troubles. At one mine the supply of union powder ran out and the men refused to use non-union powder

ILLINOIS

Divernon—Coal rights under land in Divernon Township, Sangamon County, belonging to heirs of John A. Vincent, deceased, have been sold to Charles E. Crance for $66,500.

Pana—The Springside mine of the Smith-Lohr Coal Co. in Christian County, has resumed operations after having been idle since Aug. 30, 1919, when fire consumed the surface plant. A new steel tipple has been constructed, 60 men have been given employment and others will be put to work as soon as possible. Officials of the company announce that they have a large number of contracts and the mine will be kept busy.

Duquoin—The first carload of coal has been shipped from a new plant which gives promise of being one of the large coal mines of the state of Illinois. It is located in Sinclair County, northwest of here, and is owned by the Donk Bros. Coal Co., of St. Louis. The mine was recently completed and has a shaft with a dimension of 12 x 24 ft. which is a margin larger than that of the Kathleen mine south of here and operated by the Union Colliery Co. The Donk Bros. mine is said to be planned to have a capacity of 10,000 tons, whereas the Union Colliery mine has only an 8,000-ton capacity. The grade of coal which is of excellent quality was found at a depth of 198 ft. The Donk Bros. Coal Co., has a number of mines in operation in this district and this one will be [illegible]

Coal operators from Belleville headed by L. S[illegible] of that city recently purchased the mine at W[illegible] [illegible] north of here for a consideration of $202,000 and will operate the mine in the future. The office of the new concern will be maintained in St. Louis. The mine is the [illegible] one which was purchased last summer by the Southern Gem Coal Co.

Approximately 5,000 acres of rich coal land were bought last week by Chicago interests under the [illegible] W. [illegible] an [illegible]. It is said that immediate development or at least [illegible] one year from date will be made on the tract as the [illegible]ing the right-of-way of the Davenport, Springfield & Southern Ry., a new road which is being built through southern Illinois. The land is in what is known as Johannisburg and Lively Grove townships.

The operation known as the St. Ellen mine, at O'Fallon, St. Clair County, was recently forced to shutdown as the result of an accident, in which the cage crashed to the bottom of the shaft. While hoisting a car of coal, the rope came loose from the cage, letting it fall to the bottom of the shaft, breaknig the "safetes" on the cage, tearing out many of the guides in the shaft and damaging the timbers at the bottom of the shaft. It was necessary for the men who were at work in the mine at the time, to ascend by means of the air shaft. Several days were required in repairing the damage.

WASHINGTON

Bremerton—A considerable body of coal is expected soon to be proved on the Holmes property along the beach road west of Port Orchard, Puget Sound. A 40-ft. tunnel has been driven and a shaft is now being sunk to prove the coal. It is claimed an 18-ft. seam of lignite will be developed by these operations. It is well known that coal exists in this section as shown by wells; pieces of coal from such sources, when tested have been found to show up well.

Obituary

Willis E. Martin, the treasurer of the H K. Porter Co., of Pittsburgh, Pa., died on Jan. 12, after a prolonged illness. Mr. Martin had been connected with this company for 44 years.

E. Fred Wood, formerly vice president of the International Nickel Co., died suddenly at New York City on Jan. 5, in the sixty-second year of his age. Mr. Wood was born in Milwaukee on Aug. 28, 1858. He was educated in the public schools of his native city and later entered the University of Michigan. After leaving college he studied metallurgy and made extensive trips through the various mining camps of the West, living for a year at Leadville and in other mining towns where he obtained his practical experience. He later entered the employ of the Carnegie Steel Co. and held the position of assistant general superintendent of the Homestead plant for a number of years and was one of the so-called "Carnegie veteran associates." He joined the International Nickel Co., upon its organization, becoming first vice president of the company and a member of the board of directors and of its executive committee; he was an important factor in developing the mining, smelting and refining business of the concern. When the United States entered the war, Mr. Wood became a member of the Committee on Production of the War Industries Board. He was keenly interested in traveling, and had the unique distinction of having traveled around the world twice in one year. He is survived by his wife, and by one daughter, Mrs. Hilda Wood Allen.

Coming Meetings

Material Handling Machinery Manufacturers Association has changed the date of its convention from Jan. 29 and 30 to Feb. 26 and 27, at the Waldorf Astoria Hotel New York City. Secretary, Z. W. Carter, 35 West 39th St., New York City.

Canadian Mining Institute will hold its annual meeting at the King Edward Hotel, Toronto, Ontario, Canada, on March 8, 9 and 10, 1920. Secretary, H. Mortimer-Lamb, 503 Drummond Building, Montreal, Quebec, Canada.

New York State Retail Coal Merchants Association will hold its annual meeting Feb. 26 or 27, the final date depending upon arrangements made with the speakers selected. Executive secretary, G. W. Woodside, Albany, N. Y.

American Institute of Mining and Metallurgical Engineers will hold its annual meeting Feb. 16, 17, 18 and 19, at the Engineering Societies Building, 29 West 39th St., New York City. Secretary, Bradley Stoughton, Engineering Societies Building, New York City.

American Chemical Society will hold its annual meeting at St. Louis, Mo., April 13, 14, 15 and 16. Secretary, Dr Charles L. Parson, 1709 G St., N. W., Washington, D. C.

Personals

Edward Graff has been appointed general manager of all the operations of the New River Co. in Fayette and Raleigh counties, succeeding a Mr. Porter.

George Scott has accepted a position as mine manager of the McCraney mine at Coal Valley, Ill. The mine will be considerably enlarged.

J. K. Taggart, who was the superintendent of the Stonega Coal & Coke Co., at Exeter, Va., has resigned to become general manager of the Northern Coal Co. at Norton, Va.

E. H. Carner has been appointed manager of the Boston office of the Consolidation Coal Co., Inc., in place of R. C. Gillespie, resigned. Mr. Carner's headquarters are at 50 Congress St., Boston.

A. E. Oliver, formerly superintendent of the Pinnacle mine of the Victoria American Fuel Co., at Oak Creek, Col., has resigned to take charge of the mines of the Marshell Fuel Co., of Denver, Col.

James A. Reilly, of the Queen City Coal Co., Cincinnati, Ohio, which was recently purchased by the Island Creek Coal Co., has been made the Cincinnati superintendent of the holdings of the latter corporation.

Chris MacTaggart has been appointed manager of the Monongah Coal Co. operating in the Fairmont field, Mr. MacTaggart having severed his connection with the Carper Foundry-Machine Works for which he was manager.

Robert Lambie, district mine inspector for the Eleventh district of West Virginia, has resigned to accept a position with the New River Co., at MacDonald, in the New River field. Mr. Lambie's resignation was to become effective Feb. 1.

A. A. Mitchell who has been superintendent of the Fort Hill and the Paul works of the W. J. Rainey interests for the past five years, has been promoted to the position of superintendent of the Revere, Pa., works of the same company to succeed Clarence Patterson, resigned.

Robert Lilly, in charge of mine-rescue stations for the West Virginia Department of Mines, has been appointed a district mine inspector for the Eleventh district, effective Feb. 1. He has been succeeded by **H. S. Black,** formerly connected with the U. S. Bureau of Mines.

S. A. Westenhover, of Martinsburg, has been appointed district mine inspector for the eastern Pan Handle, it has been announced by W. J. Heatherman, Chief of the West Virginia Department of Mines, his appointment to become effective Feb. 1. He succeeds Clyde Smith.

J. H. Mandt has been appointed, it is announced, general manager of the Elkhorn Piney Mining Co., with headquarters at Stanaford, W. Va. He succeeds **C. M. Binford,** who resigned from that post to accept an important executive position with the Main Island Creek Coal Co., being associated with Colonel James Sterrett

Frank R. Bacon, president of the Cutler-Hammer Mfg. Co., of Milwaukee, Wis., has been elected chairman of the American Constitutional League. This league was formed by the influential business men of Milwaukee to take up Americanization work, which will embrace all forms of education and publicity in favor of Americanization and in opposition to all radical doctrines, which seek to overthrow our existing Government.

Frank H. Brooks has been appointed superintendent at mines Nos. 28, 36, 47 and 92 of the Consolidation Coal Co., his appointment having become effective Jan. 15. He succeeded W. C. McMahon, resigned. The new superintendent was formerly mine foreman at Wyatt, W. Va. Mr Brooks has long been in the employ of the Consolidation Co.

F. Y. Casey, formerly connected with H. H Lineaweaver & Co., has resigned to become the Philadelphia representative of W. J. Rainey with headquarters in the Real Estate Trust Building, Philadelphia, Pa., in the place of **A. F. Kempe,** who has been made assistant manager of sales and transferred to the general offices of this company in New York.

George Arbuckle, formerly with the Victor Colliery Co., at Tamaroa, Ill., and until lately mine manager for the large Kathleen mine of the Union Colliery Co., at Dowell, five miles south of Duquoin, Ill., has resigned and accepted a position with the Kanawha Fuel Co., of Duquoin. **William Stephenson,** formerly of Carterville has succeeded Mr. Arbuckle at Dowell.

MARKET DEPARTMENT

Weekly Review

Car Shortage Continues—Fuel Shortage Also Prevails in Some Parts of the Country Bunkering Restrictions Modified—Demand for Anthracite Good—Prices Continue as Before

IN FACE of a continued car shortage which has reached big proportions, the mine operators are unable to meet the increasing demand for their output. Part time operation of the mines naturally continued. The districts that have been affected the most severely are certain regions of West Virginia, Kentucky and Tennessee. In the latter two districts, it is said that the condition as it now exists is possibly the worst ever experienced.

The demand for anthracite in the East is so great that it will prevent movement of much of the coal that might have been sent Westward. Because of the uncertainty of the outcome of deliberations at Washington, and also probably because of the coming meeting between the anthracite miners and operators whose wage agreement expires in March, there has been more buying, or attempts to buy—some of the buyers being successful and other buyers not.

The fuel shortage which prevails throughout parts of the country has become more and more critical, especially at the iron and steel centers, where production has fallen off to such an extent as to necessitate many furnaces shutting down. Though public utilities and other essentials have not arrived at a critical point they have been running on a reserve which rapidly decreases and is rather hard to replenish. It is worthy of note that Syracuse University shut down temporarily, thus causing many young men to lose considerable time in the progress of their education.

Because of a modification in restrictions, allowing the bunkering of vessels to outward destinations, the export trade has picked up slightly and such ships have been well taken care of in view of the fact that a better price can be had for coal sold in this manner. However, there is another difficulty which confronts the exporter, namely, the money market. Rates of exchange are about as low as they ever have been. For example, the German mark is worth at this writing only one cent.

Conditions in the West, though this region is facing a serious situation, are made more favorable because of the supplies of anthracite now on hand. Railroads are still confiscating coal and will continue to do so until they think conditions are more favorable.

Prices continue unchanged and are still at the Government figure. Trade associations and similar organizations are being besieged with inquiries relative to ascertaining who should absorb the miners' 14 per cent increase, the operator or consumer.

While a 50 to 60 per cent car supply prevailed in the coke region during the past week, it fell to as low as 20 per cent for one day. Railroads have recently sent to all mine owners a form sheet which is to be filled out by all operators. When these have been returned to the administration, the redistribution of cars will be made in order to alleviate conditions, which is earnestly hoped for.

Stocking in the yards in the coke regions has become a necessity for more coke has been made than has been carried away. Approximately 6,000 tons, the same as for the preceding week, has been added to the stock piles. These stock piles would soon be swept clean if there were cars enough to carry the coke to gas, iron and steel plants that are now running on a small reserve.

WEEKLY PRODUCTION

Bad weather accentuating the shortage of cars appears to have been the cause of a decline of 737,000 tons in the production of soft coal during the week ended Jan. 24, states the weekly report on the production of bituminous coal, anthracite, and beehive coke compiled by the Geological Survey, Department of the Interior, Jan. 31, 1920. The total output, including lignite and coal made into coke, is estimated at 10,772,000 net tons, a decrease of 6.8 per cent when compared with the preceding week.

Exports overseas during December are reported at 182,064 net tons, a decrease of 48,262 tons when compared with November. December overseas exports were thus the smallest of the year, reflecting the embargoes imposed after the strike began. Exports in October had been 1,526,187 net tons

Total overseas exports for the year 1918 from the ports covered by the operations of the Exchange (New York, Philadelphia, Baltimore, Hampton Roads, and Charleston) amounted to 8,292,414 net tons (7,403,941 gross). In spite of the strike this was the largest in any year of American history

Coal moved to New England via tide during December is reported as 674,000 net tons This was less than the November tonnage but greater than October. Compared with December last year it was a decrease of 202,000 tons.

Atlantic Seaboard

BOSTON

Railroad confiscations general. Continued cold also has bearing. Light receipts. Little coal availabe at New York piers. Price situation one of great difficulty. Ground for much uneasiness over spring outlook. Wagon-mine coal appears. Anthracite deliveries interrupted. Renewed inquiry for steam sizes.

Bituminous—The wholesale commandeering of steam coal by the railroads recently has broken all records. Never was a time when both shippers and consignees were so much at sea over the volume of transit. Cars started from the mines mean nothing, so large a proportion is taken en route for locomotive supply both by delivering roads and by the lines that intervene. Short car supply has something to do with it but the underlying cause is the attempt of the railroads last spring to buy in many cases at less than cost.

Receipts are light, both water and all-rail. The slow movement because of heavy weather and delays in freeing cars are assumed to be responsible for short car supply at the mines. At this writing car shortage is very pronounced and doubtless the heavy movement West early in December accounts also for the lack of empties. There are those in the trade who look for an improvement within a fortnight, but there are others who hold out only gloomy prospects. Much depends upon the attitude of the railroads.

Anthracite—Shipments have lately been very much interrupted. The New Haven R.R. has been embargoed since Jan. 19 because of congestion at the transfer points and ice in the Delaware and the frozen condition of cars at the piers have each contributed to delays in shipment. There seems also to be an impression at first hand that New England has been given a liberal share and that there are other sections where, in proportion, there is more tonnage due.

Developments in bituminous have caused a scattering inquiry for the junior-steam sizes. Prices on these coals are still low, relatively, and it is expected an extra tonnage will be moved the next few weeks.

NEW YORK

All anthracite sizes in excellent demand, chestnut and stove being most unpopular, but shipments take care of current demand. Egg easy and fairly plentiful, while pea has stiffened somewhat. Steam sizes show no snap and buying lags. Bituminous situation at New York harbor shows improvement as more coal arrives at piers. Bunkering restrictions placed this week but all but one rescinded after two days. Boat congestion at piers clearing as more coal is dumped and striking tugs resume work.

Anthracite—The local anthracite market is quiet but very firm. A steady market continues on all the prepared sizes and good buying has been taking place. Most dealers yet are very short of chestnut and stove sizes and are calling upon shippers for these two sizes in preference to others Egg has been somewhat slow in moving, but dealers have been persuaded to take a certain percentage of egg with orders of stove and this splitting has kept the market in a well balanced state.

Current quotations for company coals, per gross tons, at the mines and f.o.b. Tidewater, at the lower ports are as follows:

	Mine	F. O. B Tidewater
Broken	$5 95	$7 80
Egg	6 35	8 20
Stove	6 60	8 45
Chestnut	6 70	8 55
Pea	5 30	7 05
Buckwheat	3 40	5 15
Rice	2 75	4 50
Barley	2 25	4 00
Boiler	2.50	4.25

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous — The bituminous market which has been in a very uncertain position during the past two months, is beginning to show signs of improvement. The main difficulty at tidewater has been the very limited amount of coal on hand, and this week a very pronounced improvement in the number of loaded cars on hand at the piers is shown. On a certain day this week between 3,500 and 4,000 cars were on hand, whereas the average for the past month has been around 2,500.

To protect business in this territory, on last Wednesday bunkering restrictions were applied, which if carried out would have radically cut the volume of coal moving into the bunker trade.

PHILADELPHIA

Anthracite trade eases slightly due to milder weather. Nut size leads in demand, closely followed by stove. Egg position better, but pea fails to improve. Retail profits shrink. Look to spring for relief. Little life to steam sizes. Buckwheat fairly active; rice and barley dull. Bituminous unimproved. Car supply causes light shipments. Coke scarce.

Anthracite. With a softening of weatner conditions there is just a least tendency in the same direction in the coal trade. The dealers are not so vigorous in their calls upon the shippers for increased shipments, although the demand for stove and nut is extremely heavy. Usually when the retailer goes after his shipper for more of these sizes the latter takes the opportunity to urge more pea coal, which size the dealers are heartily tired of now.

It is not believed that there will be any real break in the retail trade for some weeks yet, and possibly not then. February is all before the trade and this month rarely has failed in the last ten years or more to be the most wintry of all the season and heavy buying is looked for at that time. In fact the impression is growing that the trade is going to be real active right up to April, as it is expected that the discussion of the wage question with the miners is going to keep the public in the buying attitude.

The [illegible] of prepared sizes have been in fair volume, especially since the question of car shortage has failed to affect the anthracite trade very much. This situation has been helped out by the fact that a [illegible] of the small wooden coal cars which were retired and stored on the [illegible] been released for the coal trade. This action was more welcome to the shippers than it was to the retailers, as it enables the operators to spread their tonnage of the favorite sizes.

The circular prices in effect for the month of February are as follows, being per gross ton f.o.b. cars mines and f.o.b. Port Richmond:

	Line	Tide
Broken	$5 95	$7 80
Egg	6 35	8 20
Stove	6.60	8.45
Nut	6 70	8 55
Pea	5.30	6 90
Buckwheat	3.40	4.45
Rice	2 75	3 65
Boiler	2.50	3.50
Barley	2 25	3 15

Bituminous. There is not the least sign of improvement in the bituminous trade. The one cry of the producers is for cars and yet they fail to come. All coal that is produced is being applied on regular business and the small buyer usually accustomed to have his wants filled as the need arises is in a somewhat ticklish position The resumption of spot business seems to be as far off as ever.

Eastern-Inland

PITTSBURGH

Production scarcely increased, but consumers receive more coal. Many cars out of commission through their coal contents being frozen.

The past week has witnessed a slight improvement in car supplies at coal mines, but not enough to effect any appreciable change in the production. Line consumers are, however, better supplied with coal by reason of other influences. The movement for export is practically stopped, partly because permits are granted very sparingly, but chiefly because the extra price allowed on export sales is suspended, as of Jan. 27. A considerable quantity of coal is thus released for the line trade. In addition there have been the embargoes against several of the lake ports, resulting in the reconsignment of coal, to line consumers. Thus the steel mills are better off than a week ago although the coal operators are not.

There is additional evidence that the shortage in the placement of empties at coal mines is not due wholly or largely to there not being enough freight cars in the country, if all could be used. As has been reported from time to time, the cars that went far afield during the cessation of work at the union mines are not all back yet, but there has lately been another influence in addition, in that there have been large numbers of loaded cars in Pennsylvania and Ohio with the coal frozen solid, and scarcely any means at all for thawing, so that relief may not come until mild weather intervenes.

It is somewhat less difficult to buy coal in the open market, there being a moderate movement, at Government price limits, which remain at $2.10 for slack, $2.35 for mine-run and $2.60 for screened, per net ton at ovens, with a 15c. brokerage allowance, to be paid by the buyer, in some instances.

COLUMBUS

There is a good demand for all grades in Ohio territory, but production is still curtailed by continued car shortage. Domestic demand is the strongest feature at this time. No hopes for improvement in the car supply is held out.

With salesmen called off the road and no effort being put forth in the selling end of the business, the Ohio coal trade can be said to depend almost entirely on the car supply. Operators and jobbers are devoting their attention to speeding shipments and to tracing cars that have been diverted under the railroad administration. The demand readily absorbs all of the coal produced in the state. Domestic demand is the strongest feature, although there is a good healthy call for all steam sizes. On the whole the coal trade is at the mercy of the railroads with no immediate hope of improvement as far as increased railroad facilities are concerned.

Retail demand is strong in every section. Dealers are urging immediate shipment on all orders booked as in many cases their stocks are entirely exhausted. Pocahontas mine-run is coming in small quantities and lump can not be obtained from that district. West Virginia splints are selling well and a fair tonnage is arriving The large bulk of the coal sold in this district comes from Ohio mines however Retail prices are firm at the levels which have maintained for some time. Hocking lump sells at $6.25 while mine-run is quoted at $5.75@$6 Pomeroy Lump sells at $6.50 delivered Jackson lump is around $7. West Virginia grades are quoted at $7 for lump and $6.75 for mine-run.

CINCINNATI

Lifting of embargoes at Northern and Western points caused coal to move more freely through Cincinnati railroad terminal last week. At no one time was there congestion here, the fault being in the ability of connections to take the coal from the coal roads.

The immense amount of coal that has come to this terminal for a fortnight is really the letting go of a "dam," and was coal mined as long ago as three weeks. Since this was mined, however, there has been a steady decline in production in the fields served by the Chesapeake & Ohio and the Louisville & Nashville so that to-day production runs from 50 to as low as 30 per cent due to the lack of coal cars.

This low production will soon be felt in the territory served by these mines. However, no hardship will be experienced here because of the confiscation power given to the Cincinnati Coal Distributing Committee. In the New River district the car supply Jan. 25 was but 40 per cent.

During the past week coal has been coming into the railroad terminal at a rate of 50,000 tons a day or the equivalent of a four-day supply. For some time the Chesapeake & Ohio has been bringing in 600 cars a day, while the other seven railroads entering here have been registering a smaller number. Coal arriving by river has been far below normal during the past two weeks. While part of the coal that arrives in Cincinnati is taken here for domestic and commercial purposes, the bulk of it is being sent to points beyond.

Operators and distributors took exception to a report handed out last week by the Central Coal Committee dealing with the payment for coal during the recent strike of the miners. The part of the report that is criticised follows: "While coal was moved expeditiously to all points there was nevertheless an unavoidable delay in getting it to the ultimate consumer which resulted in apprehension on the part of the shippers that notices would be received too late for them to render bills to the divertee and receive payment within the same period.

Southern

BIRMINGHAM

Movement and production affected to some extent by car shortage. Inquiry good for all grades, both steam and domestic, but consumers are easier on stocks and pressure for deliveries not so great as it has been.

Aside from the effects of the car shortage, which is retarding production and the movement of coal to some extent, particularly on the lines of the Louisville & Nashville R.R., trade conditions under price restrictions have been as satisfactory as could be expected. The demand for all grades of steam is good and sufficient to keep all the coal moving as mined. Sales are confined to spot business mostly, a few short-time contracts being reported, but the uncertainty of developments affecting the industry are such as to render the entering into of long contracts inadvisable.

Domestic demand is easier with the continuation of warm and unseasonable weather, and receipts are sufficient to meet the ordinary demands of the trade, but the mines are not producing sufficient tonnage to meet contract deliveries.

The sharp advance in the price of fuel oils and the difficulty of securing adequate supply is expected to prove advantageous to the coal industry in this district, which has suffered the loss of probably 1,000,000 tons per year from plants which turned to oil for fuel, and which are now considering the use of coal again in many instances. The Seaboard Air Line Ry., which was reported to be negotiating with Mexican oil interests for a fuel supply for its Florida division, is understood to have abandoned the proposition and will continue the use of coal. The conditions in the oil fields is expected to have the effect of placing a damper on further conversion of power plants to the use of oil as fuel.

LOUISVILLE

Demand strong for all grades, with production still short due to car shortage. Operators making hard fight for cars, but getting little but promises.

Demand for all grades of coal continues strong, retailers reporting a good demand, and much trouble in placing orders for lump, while jobbers report very little coal available Production is averaging between two and three days a week in the Hazard and Harlan fields, and sections supplied by the Louisville & Nashville, R R., while other sections report better facilities where not dependent on the Louisville & Nashville. The latter railroad reports that it is 5,000 cars short of its net ownership of equipment, figuring company-owned and foreign cars on its lines

A committee of Kentucky and Tennessee coal men spent several days in Washington last week, and held a conference with Congressmen, Railroad Administration officials, etc., on Friday, but with the exception of promises for better delivery of empties, there hasn't been much improvement.

Coal operators are somewhat put out with wild reports relative to car supply being normal. An Associated Press dispatch out of Washington on Jan. 20, stated that Railroad Administration officials reported that there was no longer a car shortage, while the Geological Survey was reported to have issued a statement to the effect that production in the Northwest and West had increased so rapidly that many mines were idle due to lack of orders. It is felt that such reports going to consumers makes it especially hard on the operator, especially in cases where he is unable to ship on low priced contracts.

Mines are not accepting much new business just now, especially at Government prices, and are content to catch up with heavy orders on hand before taking much new business, as the future is in doubt, and there is a possible chance of Federal regulation being removed, especially in event the peace treaty is ever signed, which would knock out the Lever Act.

It is admitted that the car shortage in Kentucky and Tennessee is the worst in the country, but indications are that it is growing bad elsewhere. Demand is taking all production, and operators claim that even with full facilities it would take some little time to fill up the country again.

Lake Region

DETROIT

With little bituminous or anthracite arriving, Detroit's supply of steam and domestic coal is so low as to cause anxiety.

Bituminous—Officers of the Detroit Coal Exchange are working in the effort to avert a serious coal shortage that is now menacing Detroit. With a number of manufacturing establishments rapidly approaching the end of reserves and the yards of several dealers already barren of fuel, very little bituminous for either steam or domestic use is being brought into this city.

The cutting off of supply is due in part, the jobbers say, to the action of the Railroad Administration during the strike, when hundreds of cars of coal consigned to Detroit were confiscated, and sent to other places. Reports are coming to the dealers that some of these shipments are still in cars on tracks, instead of the cars having been unloaded, and sent back to the mines, the result being a decrease in available car supply.

Operation of the embargo, raised earlier in the year against freight consigned to Detroit, has produced a serious curtailment in supply. Officers of the Detroit Coal Exchange assert that the Regional Director of railroads in Cincinnati has been seizing, and holding back nearly all the coal destined for Detroit. Much of this coal was sent to other points while a large part of it is still in cars in and around Cincinnati, where it is reported the coal supply is greater than the city's requirements justify.

Following the removal of the embargo on Jan. 23, assurances came to Detroit dealers that the Railroad Administration would rush shipments of bituminous to the local market. Three days later the coal exchange announced that coal bound for Detroit is being held back and diverted in Toledo, apparantly without regard to the lifting of the embargo. A local firm operating five yards received one car in three days, while another firm which ordinarly distributes two cars a day, received no shipments in the six days ending Jan. 26.

Anthracite—Owing to the curtailment of shipments of anthracite, resulting from the recent railroad embargo and the heavy consumption during the extended period of low temperature this month, stocks in the yards of most dealers are small and in the case of some have been wiped out. The heavy fall of snow, Jan 23-24, is reported to have seriously retarded the movement of shipments bound for Detroit

CLEVELAND

Receipts of all grades of coal continue barely equal to spot requirements, with outlook for improvement good. End of government control of prices, and consequently increased prices, is expected by the local trade about March 1.

Bituminous—Minimum requirements of Cleveland and northern Ohio are just about being met. Closing of some thirty public schools and several score of factories because of a lack of coal has been threatened several times in the past week, but enough coal has come forward to obviate all this. Bituminous coal, and especially steam-coal grades, are decidedly scarce, but actual operations of factories in the Cleveland district are proof that famine conditions do not exist. The condition was most serious in the first part of last week, but the moderating temperature and slightly increased receipts, believed due to shutting down on exporting, have ameliorated the situation noticeably. It still may be said within Cleveland proper that not a factory nor school nor institution of any kind has lost one hour through lack of coal. Practically all have not more than a few days', if one day's, supply ahead, but the threatened closings always have been averted at the last minute.

Entire blame is placed upon the Railroad Administration. Labor forces at southern and eastern Ohio mines are 25 per cent under normal, but even so 30 per cent operation is considered high at present. Getting empty cars back to the mines continues the sticking point. Congestion in Ohio seems worst at the Toledo gateway. An embargo on all shipments out of Cleveland on all roads except the Pennsylvania has been in effect a week, and has cut down fuel requirements somewhat. Operators and the trade do not look for improvement until spring, and say whatever relief comes will be due to milder weather. Demand for steam coal is probably five times receipts, and prices are out of sight.

Anthracite and Pocahontas—Slight relief is noted in the Pocahontas situation and dealers now are taking business subject to delay of two to three weeks in delivery. Last week they would not promise any delivery. Improvement in anthracite is less marked. Domestic consumers are clamoring for both grades, feeling that prices will decrease little if any in the summer and willing to take all they can get now and held it over until next winter.

Lake Trade—Coal appears to be moving off the Upper Lake docks as fast as the railroads can handle it, and the docks undoubtedly will be clean by the opening of navigation. In fact, some large all-rail shipments will be necessary to meet fuel needs of the upper lake regions. So heavy demands, however, are piling up in the Lower Lake regions that it is not believed the beginning of the season will see as many cargoes floated as in previous seasons. In April, 1919, the Lake trade took 860,979 tons of bituminous coal; the prediction is that April, 1920, will not come near this mark owing to industrial demand.

Retail prices of coal per net ton delivered in Cleveland are:

Anthracite—Egg, $12.20@12.40; chestnut, $12.50@12.70; grate, $12.20@12.40; and stove, $12.40@12.60.

Pocahontas — Forked, $10.50@11.00; shoveled lump, $9.00@9.25; and mine-run, $8.00@8.25.

Domestic bituminous — West Virginia splint, $8.30; No. 8 Pittsburgh, $6.85@7.00; Massillon lump, $7.40@7.65; Cannel lump, $11.00; and Coshocton lump, $7.35.

Steam coal—No. 6 slack, $5.20@5.40; No. 8 slack, $5.20@5.50; Youghiogheny slack, $5.25@5.50; No. 8 ¾-in. lump, $6.00@6.25; No. 6 mine-run, 5.25@5.50; and No. 8 mine-run, $5.85@6.00.

BUFFALO

Still the coal confiscation. Car shortage increases. The late heavy storm tied them up so that coal nearly gave out. Anthracite not so plentiful.

Bituminous—The situation turns largely on the car supply, as affected by the big storm. The cars were scarce at the outset and then there came a storm with all the possible adverse conditions, snow, wind and cold. No wonder that the trains stood still. There has been a much better state of things since, but the time lost was so great and the lead over a coal famine so small that some localities had to cut down consumption in every possible way. Central and northern New York suffered most Side roads did not run even passenger trains for days.

It is not expected that the bituminous shortage can be made up till the cold weather and the snow are gone. Few consumers have any surplus and it is a matter of only two or three days' supply often. If there is no more extreme weather it is likely that the city will pull through in some way, but all shippers are looking after the coal on hand and favoring as much as they can those who are out.

At the same time it is reported that there is a large amount of coal, hard as well as soft, in cars, waiting for the roads to move it. Though the snow is down a trifle and the weather is again only moderately cold, the roads themselves are in a sort of panic, taking often all the coal that a shipper gets. Some of the most successful jobbers in the city are quite discouraged over the situation. The latest report is that at least some of them have arrived at an understanding with the roads, so that only a part of a shipment will be taken.

Some are of the opinion that the roads are very short of fuel, while others claim that a sort of conspiracy exists among the operators to mismanage things in order to give the government handling a black eye. Many opinions are heard to the effect that the roads will never return to normal efficiency till private ownership is resumed. Buffalo has a special shippers' committee that looks after local car movements and it is doing good work

Coal prices are not steady. Most shippers are sticking to the government prices, but there are others ready to ask more if a consumer is found to be in straits. The regulation prices are of course the only legitimate ones, $4.70 for Allegheny Valley sizes, $4.50 for Pittsburgh and No. 8 lump and three-quarter, $4.25 for all mine-run and slack, $4.60 for Pennsylvania smokeless, $4.70 for smithing, all per net ton, f.o.b. Buffalo.

Anthracite—The supply has been cut down of late, mostly on account of the slow moving of cars. Reports from the mining districts state that all available track room is filled with loaded cars and with the locomotives knocked out by the weather. The weather has now become much milder and the supply ought to run up fast. The consumers are much better supplied than those in the bituminous section, and it is expected that the surplus will last till the cold weather is mostly gone.

The Canadian supply is not as good as ours, but it is not bad, and is not likely to be any worse than at present, supposing that there are no more such storms as the one of Jan. 23. In fact this section has seldom had a worse one, for snow, cold and wind all came in together Shippers say that as soon as the sunny days begin to arrive the demand is sure to drop off. Still the consumption is about twice that of such a winter as the last.

Some independent coal is still selling and the premium is increasing but it has not been of much amount since the lakes are closed. No report has been received from the Upper Lakes, but the supply was so much above the average that it ought to be sufficient. With an ordinary winter there would have been a large amount left over. All standard prices remain as before.

TORONTO

Market active—Sufficient anthracite on hand for present demand but bituminous scarce. Shipments delayed by traffic congestion at the border. Serious shortage feared.

There has been an active demand for both anthracite and bituminous, owing to the continued cold weather, but so far there has been little or no hardship on account of shortage, as this winter the public have been better prepared for cold snaps than in previous seasons.

There is enough hard coal on hand for present requirements, but bituminous is scarce and shipments are arriving slowly. Many consignments being delayed by freight congestion at the border. Unless the situation is speedily relieved the shortage threatens to become serious. Prices for soft coal are somewhat fluctuating with a decidedly upward tendency.

Quotations for short tons are as follows:

Retail—	
Anthracite egg, stove, nut, and grate	$12.75
Pea	11.25
Bituminous steam	10.00
Slack	9.00
Domestic lump	10.00
Cannel	12.50
Wholesale, f.o.b. cars at destination—	
Three-quarter lump	6.75
Slack	6.00

Unless this city receives more coal from the United States, there is a possibility of a decrease in production, especially in large manufacturing plants.

Middle West

MID-WEST REVIEW

If the reports brought in from the country are to be believed, the Middle West is facing a very serious situation. Illinois and Indiana mines are seriously handicapped on account of the car shortage, and, added to this, is the fact that shipments are delayed in transit.

Retail dealers complain that coal shipped them as far back as December is still in transit, and that the railroads are often unable to give any record of the shipments in question. Even before this situation developed there was a coal shortage practically everywhere in the Middle West, except Chicago, so it can be readily determined just how serious is the present state of affairs. The retail trade is up against it as well as the steam users.

The bigger factories seem to be suffering more than the smaller ones. Perhaps the reason for this is that the average purchasing agent for a large manufacturing concern is inclined to believe himself infallible, while the purchasing agents of the smaller concerns are a little more humble and inclined to take advice.

The question of car supply, from early reports, is still far from satisfactory. Indiana has suffered more than Illinois so far this week, but whether or not this will hold true for the balance of the week remains to be seen. In Illinois the supply on the Chicago, Burlington & Quincy R.R. appears to be as good as any. The Illinois Central and the Chicago & Eastern Illinois R.R. and others are not so fortunate. Illinois miners will probably receive a 60 to 70 per cent car supply this week, while Indiana will run even lower.

Nearly all the mines in this territory, except a few in Franklin County, are now booking orders at the Government prices. The market is in a good vigorous condition.

CHICAGO

Dealers and steam plants in this city have not as much coal on hand as was thought.

A week ago that it was hard to sell coal here and a number of shippers were called upon to divert coal already rolling towards Chicago. Now the situation has changed and consumers are calling for more shipments.

There is a great demand at this writing for all grades of Eastern coal—particularly gas and byproduct coal. Shipments are moving so slowly from the East, and the car shortage is so serious in West Virginia and eastern Kentucky that a number of gas plants, as well as malleable foundries, are in bad shape—such bad shape that some will have to close down if assistance is not forthcoming soon.

ILLINOIS

	F.o.b. Per Ton	Chicago Rate to
Southern Illinois— Franklin, Saline and Williamson Counties, etc.		
Prepared sizes	$2 55	$1 32
Mine run	2 35	1 55
Screenings	2 05	1 55
Central Illinois— Springfield District		
Prepared sizes	$2 55	1 32
Mine run	2 35	1 32
Screenings	2 05	1 32
Northern Illinois—		
Prepared sizes	$3 25	$1 24
Mine run	3 00	1 24
Screenings	2 75	1 24
Indiana		
Clinton, Fourth Vein District—		
Prepared sizes	$2 55	$1 27
Mine run	2 35	1 27
Screenings	2 05	1 27
Brazil Block—		
Prepared sizes	$3 [illegible]	$1 27
Mine run	3 [illegible]	1 27
Screenings	2 05	1 27
Knox County, Fifth Vein District—		
Prepared sizes	$2 55	$1 37
Mine run	2 35	1 37
Screenings	2 05	1 37
[illegible]		
New [illegible]—		
Prepared sizes	[illegible]	$2 60
Mine run	[illegible]	2 60
Splint		
Prepared sizes	$2 75-[illegible]	$2 60

ST. LOUIS

The car shortage is appalling. ailroads taking all coal. Movement of equipment unusually slow. Demand everywhere for all grades and sizes far exceeds supply. Weather seasonable.

Local conditions in St. Louis are in good shape, but the demand for both steam and domestic far exceeds the supply in Mt. Olive and Standard. There is a light tonnage of Carterville coming in—so light that it is not a factor in the local situation.

In the Standard field the trunk-line carriers have prominently displayed the same old incompetent management. No storage fuel is ahead and there remains failure to move either loads or empties. A few days in this week every trunk line West of St. Louis was embargoed by the delivery lines East of the river. This helps St. Louis locally, but the outside territory is actually suffering for fuel. Two days a week is good working time now on account of car supply. On the short coal roads three and four days has been the rule. The same condition governs in the Mt. Olive field.

There is much dissatisfaction among the miners over the fizzled-out Railroad Administration for the shortage of cars.

In these fields there is no promise of better conditions in the immediate future If severe weather continues the situation will actually be acute.

In the Carterville field of Williamson and Franklin Counties the car shortage is serious. From Jan. 21 to Jan. 30 not one car of domestic coal was listed as being loaded on the Missouri Pacific lines with a total of about 25 mines.

The car supply was for about two days a week and the railroad took all of the coal. Industries on the Missouri Pacific R.R. are in a sorry plight, for there are no rates from other mines to a big Missouri Pacific territory. This has caused a growing shortage of dissatisfied men at many places. The Chicago Burlington & Quincy is supplying the most equipment and shows best movement.

An investigation as to the prices charged by the Franklin County Association members is being arranged for through the Attorney-General's office at Washington for alleged violation of the anti-trust laws and Fuel Administration rules.

A little anthracite still moves in, with no smokeless and nothing from the Arkansas fields. Coke is in fair demand throughout the country sections and is apparently growing in demand in St. Louis proper. Prices same as last week on wholesale.

The retail prices on coal delivered f.o.b. sidewalk are:

Carterville lump egg and nut	$6.20
Mt. Olive "	5 70
Standard "	5.45

MILWAUKEE

Shortage of soft coal beginning to cause inconvenience. Hard coal in good supply, however. Prices unchanged, except on Illinois coal, which is selling from 35c. up to meet miners' recent advance.

The coal situation at Milwaukee is assuming a serious phase, because of a shortage of soft coal, and dealers are finding it difficult to meet contracts and at the same time supply the transient trade. All soft coal is practically sold up, the stocks in evidence on the docks being held to protect contract obligations.

Under the circumstances dealers are forced to depend upon rail consignments for relief. With embargoes at Chicago and in the East because of congested tracks the outlook in this direction is not promising. In some instances coal en route to Milwaukee has been confiscated by railroads for their own use.

Fortunately hard coal is in better supply than it has been in several years. Prices continue unchanged, but an advance on future rail supplies is looked for. Illinois coal demands a premium of 35c. per ton since the recent advance in miners' wages.

Anthracite	
Chestnut	$12 70
Stove	12 60
Egg	12 40
Pea	11 20
Buckwheat	9 75

Bituminous	
West Virginia, splint screened	8 00
[illegible]	8 00
[illegible], screened	7 75
[illegible], screened	7 75
[illegible]	8 75
[illegible], screened	11 00
[illegible]	9 50
[illegible]	8 75
Cannel	12 00

Steam Coal	
Youghiogheny, screened	7 00
Youghiogheny, pile run	6 75
Youghiogheny, screenings	5 75
Pittsburgh, screened	6 75
Pittsburgh, pile run	6 50
Pittsburgh, screenings	5 50
Hocking, screened	6 00
Hocking, pile run	6 50
Hocking, screenings	7 50
West Virginia, splint screened	7 50
West Virginia, pile run	7 50
West Virginia, screenings	5 50
Kentucky, screened	7 77
Kentucky, pile run	7 55
Kentucky, screenings	5 75
Pocahontas, mine run	7 75
Pocahontas, screened	11 00
Pocahontas, screenings	6.75
Smithing	7.75
Kanawha Gas	sold up

Bunker Coal for Steamers and Tugs	
Pittsburgh, lump	6 25
Pittsburgh, pile run	6 00
Youghiogheny, lump	6 50
Youghiogheny, pile run	6.25

Coke

CONNELLSVILLE

Divergent practices as to billing contract coke within Government limits. Production rate steady, limited by car supplies.

The matter of billing coke at the Government price limit when the shipment is made against a contract calling for a higher price, referred to in last report, has become a very live matter in the coke trade. A number of coke producers made readjustments with their customers as soon as they became convinced that the regulations do not permit of billings at above the Government limits and have since billed at the limits when the contracts as written called for higher prices. Others, and probably the majority, have not followed this course, and are greatly perturbed, but apparently as much perturbed at the publication of the facts as at the existence of the facts.

An important circumstance is that consumers of coke have shown little disposition to raise the issue as to the invoice price of coke, and perhaps the coke producers involved had hastily reached the conclusion that the point would not be raised at any time. As coke is scarce, and to start a controversy might result in shipments being shut off, as no allocating is being done by the Government, the buyers may simply be biding their time, as claims for readjustment could probably be made just as well at some later time.

There is practically no free coke coming into the open market, at least at the Government limits. Occasionally an operator offers coke at a higher price, in disregard of the regulations. For several weeks it has been the belief in some quarters that much business of that description has been done, although somewhat quietly.

Production is limited by car supplies to approximately the average obtaining in November and December, while the demand is much greater, and that is true despite the fact that the byproduct ovens are producing more and more freely, though few have thus far attained anything like capacity operation.

The market remains quotable at Government limits, \$6 for furnace, \$7 for foundry and \$7.30 for crushed, over $\frac{3}{4}$-in., per net ton at ovens

The *Courier* reports production in the Connellsville and Lower Connellsville region in the week ended Jan. 24 at 239,606 tons, a decrease of 1,884 tons.

BUFFALO

The situation is not much changed, the demand from the furnaces being rather moderate. The fact is that it seems to be hard to get back to normal production. Reports from the local district complain that the ore moves out slowly. The car situation may be to blame for some of this, but there are also others ~~which tend~~ to hold up the production of the local furnaces. It appears that the furnaces are doing pretty well now. One company reports this week that it is now running strong, as though it had not been till now. Incidentally this furnace is still using beehive coke, but the management expresses the hope that the byproduct plants will soon make an end of the wasteful methods of the system. Local coke prices continue at \$9.60 for 72-hour Connellsville foundry, \$8.60 for 48-hour furnace, and \$7 for off grades, with domestic sizes \$8 per net ton, f.o.b. Buffalo.

COAL AGE

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If We Cannot Be Just, Let Us Be At Least Prudent

By R. Dawson Hall

PUBLIC opinion regarding Government ownership has travelled in the last year or so from the aggressive to the defensive. When in the war, Government management of public utilities was advocated, it was urged on us because private ownership was believed to be wasteful and inefficient. It was stated that the railroads would be able to eliminate duplication of service, would be conducted with a broad view of public needs, and that the nation would be able to save money where the railroads were wasting it. Now we are told pathetically that — how the viewpoint has changed! —federal does not compare unfavorably with private management, which also is not so wonderfully frugal in its operation.

Impoverished Steed (to Overfed Driver)—"If you would ride me, you must also feed me."

During the war we were assured by the socializers that with the Government in charge there would be no strikes. Now the tune changes and we are coaxed to an uncertain comfort by the reflection that there would have been at least as many disputes between capital and labor had private corporations held the reins. Before Government took hold we were informed that there would be, after the first few months, no inadequacies in service. Now we are only asked to believe that the railroads, if they are again placed under private control, will be just as unequal as the Government to meeting public requirements.

Freight rates, as established, have been such as to discourage the purchase of absolutely necessary equipment. Thus they have made every period of national prosperity a moment of peril, lest transportation fail at a crucial juncture. They have caused industry of all kinds to run part time and they are to be blamed for the high prices which an undue constriction of the market inevitably causes. For this reason, surely, it would be the better plan to put up freight rates high enough to make prosperity absolutely sure and bring them down if it is found that a mistake has been made. In fact, seeing that the railroads have had short commons for many years, why not let them have, even for a year, some of the prosperity which the luxury industries have enjoyed unchecked from time immemorial? A year in the sun for them with the makers of non-essentials would seem not an over-liberal measure of generosity.

If the public must control their profits, let them be restricted to dividends, far below those earned and permitted to the automotive industries, and be required to spend the excess in suitable reconstructive work and in the purchase of much-needed equipment. If we do not like the railroads, if we must treat them as pariahs to work for us with a minimum of personal well being, let us at least give them a chance to become competent servants of the public instead of the weak, unstable creatures they now are. The Cummins bill is no solution of the railroad problem. The difficult question will be with us again and again till justice is done, for in the long run the public pays for its injustices and pays dearly

IDEAS AND SUGGESTIONS

PRACTICAL SCHEMES THAT MAKE THE DAY'S WORK EASIER

An Electric Motor and Gasoline Engine Driven Fire Pump

It is always desirable to have two independent sources of power for a fire pump so as to lessen the chances of its being put out of commission when a fire occurs. In some states, a double drive is required by the Underwriter's regulations. The usual form of drive is a steam engine and electric motor, though where there are two separate sources of current, two electric motors are frequently used. Sometimes neither steam nor a second source of current is available, and in that case a pump can be coupled up to a gasoline engine which may constitute the independent source of power. As an illustration, a pump of 1500 gal. per min. capacity can be driven by a suitable 150 lb., alternating-current motor and a 140 hp. gasoline engine of some convenient type and make.

For use in the mines where fires are liable to start, no matter what precaution has been taken, resulting perhaps in a great loss. The combination of an electric motor and gasoline-engine driven fire pump might prove highly serviceable.

A Trackman's Rule

J. H. RITTER

Belington, W. Va.

The advantages of certain mechanical devices such as the slide rule for engineering computations is well recognized. There are, however, certain calculations that cannot be made with facility on this instrument. In order to perform with ease and accuracy the calculations necessary for the laying of switches and other track work in and about the mines, J. H. Ritter of Belington, W. Va., has devised the trackman's rule shown in the accompanying illustration.

This consists of two arms, hinged together at one end and bearing exactly similar divisions, together with a protractor attached to one of the arms with its center at the hinge, and a rule standing at right angles to this same arm and sliding upon it. Both arms and the sliding cross piece are graduated in divisions representing feet to some convenient scale. The sliding arm in its attachment to the scale upon which it travels (which scale is known as the fixed radius rod) is provided with a window carrying a black crosshair and a red crosshair 0.5 division from it.

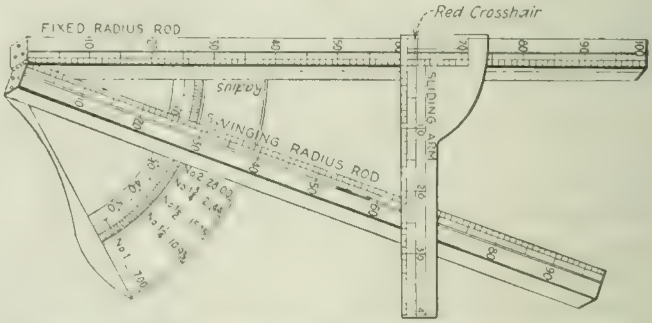
Now suppose that it is desired to find the lead of a switch on a curve of 63 ft. radius. Set the sliding arm (black crosshair) on the 63 ft. division of the fixed radius rod; move the swinging radius rod until the same division (63) just touches the edge of the sliding arm. As may be seen in the accompanying illustration this will be at division 21. This shows that the lead from point of frog to point of switch should be just 21 ft.

The frog number, as is well known, is the switch lead divided by twice the track gage. In this case, assuming that the gage is 42 in., the frog number will be

$$\frac{21}{2 \times 3.5} = 3,$$

showing that a No. 3 frog is required.

In addition to calculating trackwork, latitudes and departures, sines and cosines may be found with this instrument for angles within the limits of the sliding arm. The distance centre to centre of rooms not at right angles to the heading may also be found.



TRACKMAN'S RULE BEING USED FOR COMPUTATION

The employment of some easy, rapid and accurate means of making track calculations will go far toward securing properly constructed tracks. These in turn go far toward insuring satisfactory operation and service from transportation equipment. As all mining men know bad track is responsible for more wrecks than any other one cause. It takes a skilful driver or motorman to haul coal safely over improperly proportioned or improperly laid frogs and switches while the veriest tyro can safely haul it over track that is designed and constructed correctly.

Bringing Out Over-Exposed Blueprints*

S. F. GIBSON

St. Louis, Mo.

When blueprints have been permitted to remain in the printing frame for such a long time that they are over-exposed, they may be restored almost to their normal color by adding about one-teaspoonful of hydrogen-peroxide solution to each quart of the water in which they are washed.

The procedure is to first wash the prints in clear running water, until all the blue liquid which results has been washed away. The prints then are soaked in the peroxide solution until the proper color appears. After this, the prints are again washed thoroughly in clear water. A print which has had the correct exposure or one which has been under-exposed, will not be adversely affected by the process.

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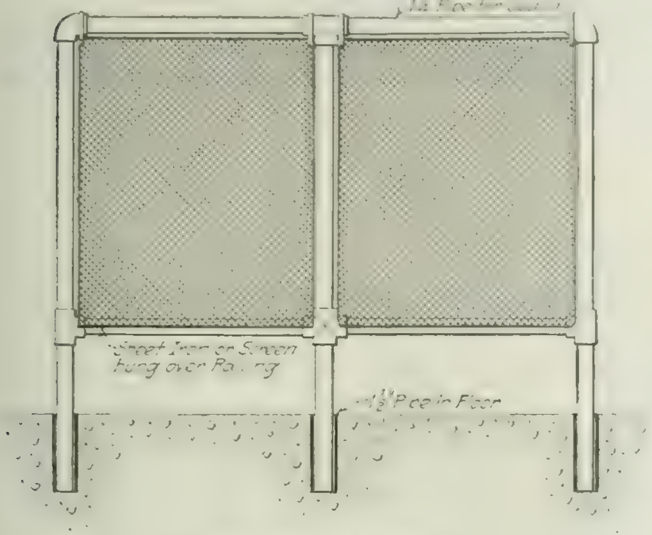
Guard Railings

By G. E. Dougherty
Pikeville, Ky

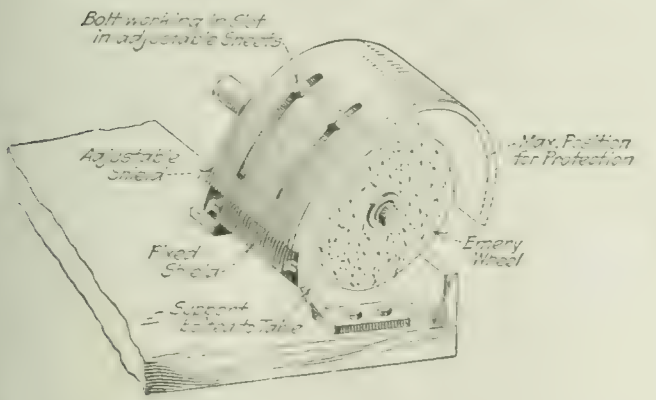
Permanent guards around stationary machinery are frequently the cause of the machine being left unguarded because of the guards being taken down and not promptly replaced. To overcome this danger and the inconvenience in making repairs a removable guard is more satisfactory.

An adequate guard can be built by any one with a set of pipe tools, by placing holes in the floor around the machinery to be protected and placing short lengths of pipe in them flush with the floor. The pipe in the floor should be made just enough larger than the pipe used in making the guard or fencing so that the latter will fit snugly but may be lifted easily out when desired. The accompanying sketch shows how the guard is held in place.



RAILINGS IN PLACE

Safety Device for Emery Wheel


Bolt working in Slot in adjustable Sheets
Adjustable Shield
Max. Position for Protection
Fixed Shield
Emery Wheel
Support bolted to Table

As emery wheels have a tendency at times to break and fly to pieces the master mechanic of the Burnside Colliery of the Philadelphia & Reading Coal & Iron Co. near Shamokin, Pa., has designed a special adjustable shield to cover such wheels.

This shield consists of two iron brackets bolted to the frame under the wheel and passing around to the top. These two brackets are connected with a piece of sheet iron bolted rigidly to them. Another piece of sheet iron goes over the top of the first piece and is provided with two slots through which are placed bolts. The slots allow this piece of iron to be adjusted over the emery wheel to any desired point. When in the proper position the bolts are tightened and the sheet iron stays in place giving full protection.

The only part of the emery wheel then exposed is that portion that the operator is actually using. The accompanying drawing shows the idea in detail.

Electric Drive for Breaker Machinery

The St. Clair Coal Co. at St. Clair, Pa., has done away with the corliss engine driving the breaker machinery and substituted an electric drive. It now employs a 600-hp., 2,200-volt, 3-phase, 60-cycle General Electric alternating-current motor.

The one unusual feature about this installation is that the old crank disk of the corliss engine has been utilized for one-half of the clutch between the end of the chain drive and the bull wheel. From the motor to the bull wheel the drive is by means of a Link Belt silent chain.

The company has been using steam drive, but after the change from steam to electric it was able to abandon its boiler plant, which was out of date and inefficient, and purchase its power from a central station located at Pottsville, Pa. As the current furnished is 2200 volts it is not necessary to install a sub-station.

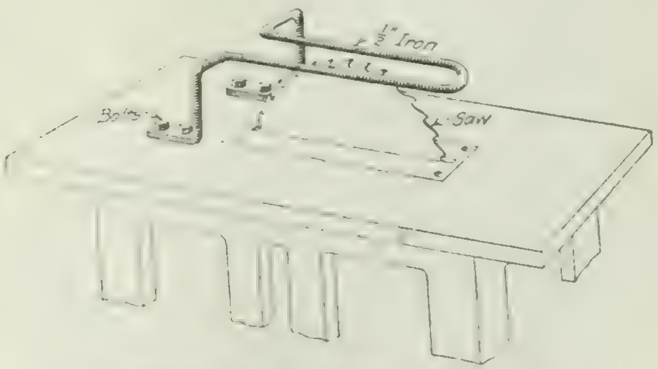
Electric drives appeal both to the designer of mining machinery and to the engineer responsible for the upkeep of the mechanical equipment. The absence of long drive shafts and belting simplifies the design of breakers and also largely does away with many troubles incident to such devices. Group electric drives are advocated by some engineers rather than the use of individual motors for each piece of equipment; for example, one motor for a group of jigs.

Guard for Circular Saw

By G. E. Dougherty
Pikeville, Ky.

Adequate guards for dangerous machinery are often a hindrance to ease in operation or to working about the guarded machine.

A fairly satisfactory home-made guard for a circular saw is being used in the car shop of the Blue Beaver Coal Co. of Prestonburg, Ky.



GENERAL VIEW OF THE SAW GUARD

This is composed of a ½ in. iron rod so bent as to cover the saw a few inches above it. This guard is bolted to the saw stand. The arrangement can be so set as to allow any piece of timber to pass under the guard. The sketch explains the arrangement.

Granby Consolidated Company's Colliery, Cassidy, B. C.

By R. R. Wilson
Cassidy, B. C.

THE Granby Consolidated Mining, Smelting & Power Co. has been one of the most enterprising organizations operating in Canada. This company has developed the two largest copper smelters and the second largest copper mine in the British Empire and has now provided the province of British Columbia with its first modern byproduct coking plant and a coal mine that represents the last word in what has been called the industrial betterment movement.

This colliery was developed to furnish coal to the byproduct coke plant at Anyox. Town and plant have been designed and built with great care, strict attention being paid to fundamental idea that the plant should be modern and efficient, and the town a good place to live in. Both these objects have been accomplished.

The colliery is situated at Cassidy, about 8 miles south of Nanaimo on Vancouver Island. It was acquired and opened mainly to insure a supply of coke for the copper smelter at Anyox. At this point a bed of coal about 10 ft. in thickness outcrops in the bed of the Nanaimo River, the seam being known as the Upper Douglas from which the first coal was mined on Vancouver Island in 1852 by the Hudson Bay Co.

Following the satisfactory prospecting of the area by diamond drilling, a saw mill was erected having a capacity of about 20,000 ft. of lumber per day and as the timber was felled on the townsite it was cut into lumber and utilized in the construction of various buildings or stored for use in connection with mining operations at some later date. Timber suitable for use underground was stored until required.

The townsite having been cleared, a start was made in opening the mine and the first coal was hoisted from the main slope in June, 1918. This slope was sunk through gravel and quicksand, necessitating the use of tongued and grooved spiling. A railroad spur was then constructed for ¾ mile connecting with the Esquimalt & Nanaimo Ry., and a temporary loading plant installed so that coal could be shipped as development work progressed and until the permanent tipple and washery could be constructed.

This done plans were prepared setting aside ground for a residential section, a mine and plant section as well as details of streets, water works, sewerage and electric lighting systems, recreation ground, flower gardens, and sites for various buildings in order to meet as fully as possible the requirements of the industry and its community of employees.

As has been said the colliery is situated about 8 miles south of Nanaimo. A more beautiful industrial townsite could hardly be found anywhere. The area set apart for a residence district comprises about 80 acres of bench land overlooking the Nanaimo River to the north, and Haslam Creek to the south. It is sheltered by forested ridges to the east and west which are being preserved as a park. In the background can be seen Mount Buttle, Tyee and other mountains.

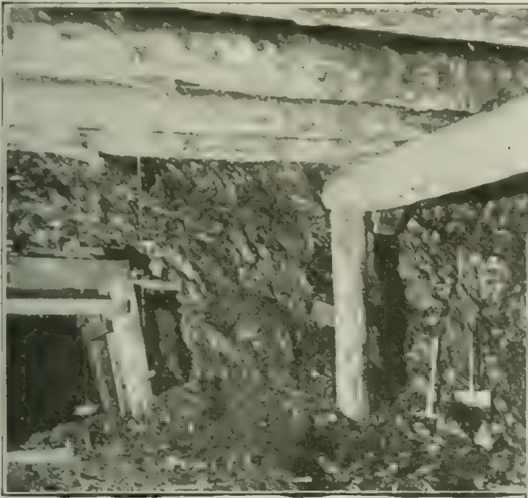
The townsite was carefully planned to present a pleasing appearance. The streets are boulevarded and the houses surrounded by fresh green lawns and flower gardens. Shade trees have been planted along the boulevards on each street, and the streets named after the particular tree planted on that thoroughfare such as hawthorne, maple, etc. The town is furnished with a modern sewerage disposal plant and also with an up-to-date water works system.

The colliery is provided with one of the finest athletic parks in the country. There is a baseball diamond, football ground, tennis courts, bowling green and a quarter mile track. The athletic field is so large that a baseball and football game can both be played at the same time without interference and the entire field is as level as a billiard table. The hillside back of the athletic field forms a natural grand stand, and the company has reserved this as well as the timber on the other side of the town as a natural park.

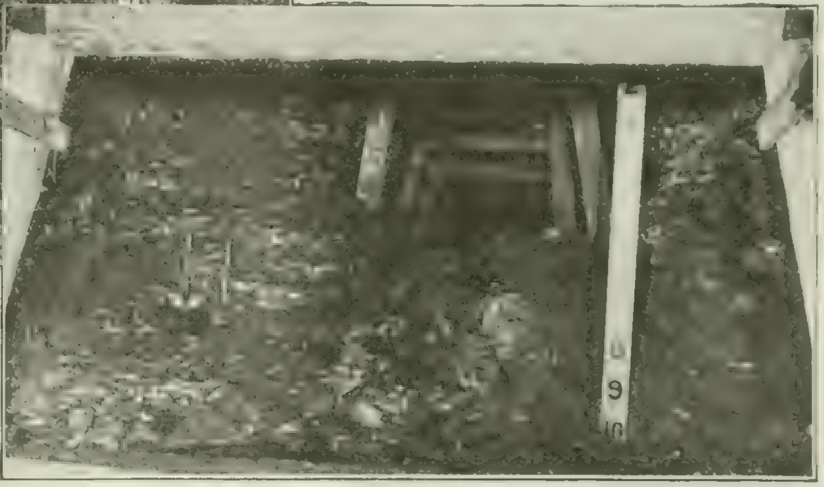
The school is to be erected close to the athletic field and playground equipment installed so that the children will be enabled to enjoy all the advantages of the facilities provided for clean healthy sport.

A striking feature of the company's plans in laying down ideal conditions under which the men may work is the program of entertainment and physical and mental relaxation provided. A temporary recreation hall has been built with gymnasium, dance hall, library, reading room, billiard and pool room, thus furnishing a suitable place for wrestling, boxing and every other means of amusement and recreation that it is possible to give the men.

The town is within a short distance of bathing beaches, in a first-class game country where pheasants, grouse, deer, wild duck and other game are plentiful. It is also within a few hundred feet of the best fishing waters on Vancouver Island.



INTERSECTION OF RETURN AIRWAYS AT CASSIDY, B. C.



MAIN HOISTING SLOPE—385 FT. DEEP AT GRANBY COLLIERY NO. 1

The homes are neat and commodious, the architecture varied and each house is equipped with every modern convenience. The streets are lined with shade trees and lighted with electric lights.

The rooming house for the accommodation of single employees is a gunite structure built in the form of a double L. It contains about 80 rooms all of which open to the outside veranda or balcony. The rooms are steam heated, electrically lighted and each is provided with running hot and cold water. The floor is a patent material, "Raccolith," and the rooms can be washed out with a hose when necessary. On the verandas and balconies are window boxes for flowers. The company supplies the furniture and bedding as a precaution to insure cleanliness and comfort of employees.

The mess house or dining room is a gunite structure and is equipped with every modern convenience. The men enter the building through a lobby equipped with wash basins and running hot and cold water so that they may enjoy a refreshing wash, hang up their hats and then proceed through a pretty, vine-covered pergola to the dining hall. At the entrance to the dining room a drinking fountain is provided where a stream of clear cold water is constantly available. The dining hall is bright and comfortable, cool in summer and steam heated in winter. Each table accommodates six men. No enamel dishes are used.

The kitchen is equipped with every labor saving and modern device—electric dishwashing machine, vegetable paring machine, tables heated by steam coils to keep dishes hot, large bake oven and refrigeration plant. Living accommodation is provided up stairs for the help.

In order that there may be no waste, the scraps from the mess house are fed to pigs. A vegetable garden will furnish all vegetables for the mess house.

The change house is in charge of Mr. Bond, an old British campaigner and experienced first-aid man. Here the miners can turn in their working clothes, if they are wet, and have them placed in the drying room by the attendant so that they will be perfectly dry and comfortable when they are ready to go to work in the morning. The change house is equipped wih steel lockers (which are heated with steam coils from underneath), shower baths and large lavatories. The building is clean and well lighted and there is not a cockroach to be found anywhere.

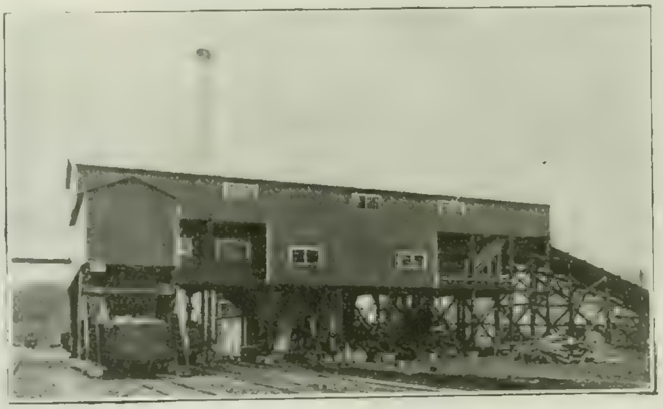
A modern temporary hospital and first-aid station has been established in one of the larger houses until the permanent hospital can be constructed. This hospital is in charge of a skilled matron and trained nurse.

Between the change house and the manway portal are the powder house in which the stock of explosives is limited to one day's supply, the larger mazagine being on the opposte side of a hill from the town, the timekeeper's office, lamp house and mine-rescue station. The lamp house is equipped with 300 Edison storage battery electric lamps. The mine-rescue station is supplied with

TIPPLE AND CAR HAUL AT THE PLANT

WORK SHOPS AT THE PLANT
From left to right: Blacksmith, Machine and Carpenter Shops

Gibbs apparatus, a lungmotor, smoke chamber, etc., and a large lecture room for holding first-aid or mining classes. These buildings are all heated with exhaust steam from the power house. The tipple is equipped with Fairbanks scale, rotary dump, Marcus screen and the necesary loading booms. The railroad cars are handled with Fairmont car retarders. The track scale is a Fairbanks standard, all steel and concrete, with a capacity of 100 tons. The rock cars are handled by a special Wilson rotary dump.



TIPPLE AT CASSIDY, B. C.

The washery is equipped with 2 two-compartment jigs having a capacity of 40 tons per hour each. The tipple and washery were designed by Roberts & Schaefer of Chicago. The washery is equipped with sludge recovery and uses the same water over and over again.

The washed slack is used in the new byproduct plant at Anyox in making coke for the copper smelter while the lump, nut and some pea coal are sold. The bone coal is burned under the colliery boilers.

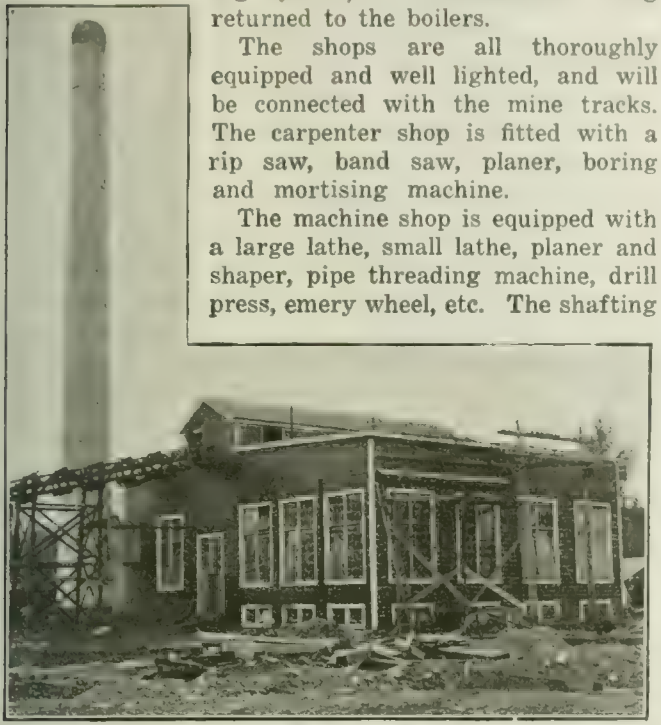
The boiler plant at present consists of two Badenhausen water tube boilers of 260 hp. each fired by mechanical stokers. The ashes are removed by washing and fluming to the dump. The feedwater is heated by a Webster feedwater heater and forced draft is used. The brick stack is 8 ft. in diameter and 125 ft. high. The boilers and steam pipes are all insulated with asbestos and magnesia to prevent loss of heat. Venturi meters are used to check the quantity of water at the pump station and at the boilers. The compressor is a Rand, cross-compound, condensing machine with a capacity of 2,000 cu.ft. of air per minute. The air is used for running the underground drills, pumps and hoists.

MAIN HOISTING SLOPE AT ENTRANCE OF GRANBY COLLIERY NO. 1

Electric power is supplied by an Allis-Chalmers 450-kw. generator (2,300-volt, 3-phase, 60-cycle, at 360 r.p.m.) and also an auxiliary unit of 250 kw. capacity (2,300-volt, 3-phase, 60-cycle, at 450 r.p.m.), both direct connected to vertical high speed engines (Goldie & McCollough). The remainder of the electrical equipment is of Westinghouse make. The power house is equipped with the Bower oil-handling system. A Worthington fire pump with a capacity of 1,000 gal. per minute, size 18 x 10 x 12 in., is ever in readiness for an emergency. The entire plant is equipped with an exhaust steam heating system, the condensation being returned to the boilers.

The shops are all thoroughly equipped and well lighted, and will be connected with the mine tracks. The carpenter shop is fitted with a rip saw, band saw, planer, boring and mortising machine.

The machine shop is equipped with a large lathe, small lathe, planer and shaper, pipe threading machine, drill press, emery wheel, etc. The shafting is all well guarded. The master mechanic's office adjoins the machine shop.



POWER HOUSE

The blacksmith shop is fitted with two forges, a steam hammer and a swing crane. Adjoining the blacksmith shop is a special tool house where miners' picks are kept after sharpening. All scrap iron is sorted out and stored in pockets built for the purpose. Racks are provided for storing iron and steel stock.

The pump station is equipped with two Morris centrifugal pumps each having a capacity of 300 gal. per minute. These pumps elevate the water to the two 50,000 gal. storage tanks situated on top of the hill overlooking the town from whence it flows by gravity through the water mains. The pumps are driven by 50 hp. Westinghouse electric motors. A Venturi meter records the quantity of water leaving the station at all times. The Nanaimo River furnishes a plentiful supply of pure fresh water for domestic and power purposes.

The colliery is equipped with a complete telephone system which connects all surface offices, shops and buildings with the underground workings.

ROOMING HOUSE AT CASSIDY, B. C.

GENERAL OFFICE OF THE GRANBY CONSOLIDATED CO.

The coal bed dips at about 18 deg. and the coal varies in thickness from 5 to 20 ft., averaging about 10 ft. The roof and floor are of shale and subject to rolls. The roof is fairly regular, however, most of the rolls occurring in the floor.

The mine is opened on the dip of the bed, the main slope having been driven to a depth of approximately half a mile. It is being driven 7 x 14 ft. in the clear to allow for double track and is timbered with 12 x 14 in. framed sets spaced 4 ft. centers. A separate manway is provided as a travelling road and employees are not allowed to use the main haulageway in passing to and from their working places. The mine is worked on the pillar and stall system. The operation is divided into relatively small panels as a precaution against mine fires and large pillars are left along all main haulage roads and permanent airways, the idea being to extract a maximum amount of coal at least cost rather than to take out cheap coal for a few years to the final detriment of the mine as has been done in many operations on Vancouver Island and elsewhere.

The mining is planned so as to deliver the coal from the face to the main haulage system by gravity as far as possible. Storage-battery locomotives are used on the levels underground. No horses or mules are employed.

The drainage system has been carefully planned so that surface water entering the mine will drain by gravity and water from workings below the drainage level will run to a central sump.

The mine is ventilated by a Sirocco fan, with a capacity of 150,000 cu.ft. per minute. The operation is provided with a double intake and return airway throughout and the workings are so planned that the air can be taken to the face where required with a minimum of loss.

The fan house is a concrete fireproof structure. It also houses the telephone exchange and motor generator set for charging the storage-battery locomotives. The fan is driven by a 150 hp. Westinghouse electric motor.

The mine cars are built of wood and have a capacity of 1¾ tons of coal. The track gage is 26 in. Hadfield manganese steel, self-oiling wheels 18 in. in diameter and with 3 in. tread are used. The mine cars are built in the company shops at the mine and have no end doors.

COAL OUTCROP-BANK OF NANAIMO FIELD AT COLLIERY NO. 1 OF GRANBY CO.

Cassidy is the conception of F. M. Sylvester, vice president and managing director of the Granby company as to the manner in which a great corporation should provide for the welfare of its employees and his ideas have been carried out in a generous and whole-hearted manner. It is the ideal, which should make for harmony and good fellowship between the company and the men, and is a long step toward the dawn of that day when employer and employee shall recognize that their interests are one, thereby enabling operations to be conducted to the best advantage of all concerned, capital, labor and the general public.

WASH HOUSE AT CASSIDY, B. C.

Repairing the Ruined Mines of Lens

By Mark Meredith
Liverpool, England

ALTHOUGH all possible efforts at reconstruction of the mines of Lens (France) have been, and are being made, there is now no hope that a single ton of coal will be extracted before 1921. Even if the work can be carried on without interruption, which is by no means certain, it will take all 1920 to clear the underground workings of the debris of all sorts with which they are choked, as the result of the policy of destruction carried out by the Germans.

The clearing of the upper works is going on more quickly. Twelve surface plants have been cleared of debris, four are partly cleared and five are not yet touched. Most of the workings, and all the deeper ones, are flooded as a result of the destruction of the shaft lining. A plan for dewatering has been arranged; all the pumps will be electrically driven and the current will be supplied by the Electrical Society of the Pas-de-Calais mines, a company created by the officials of the ruined mines in the Pas-de-Calais district for this purpose. The reconstruction and repair of the shaft linings will be carried out by German workmen, and the cement for the purpose will be brought from Germany.

UPPER WORKS ARE RAPIDLY BEING CLEARED

A number of German experts recently visited the mines in order to make an exact estimate of the damage done. They admitted that the tubing of the 15 principal pits was entirely destroyed. This is scarcely to be wondered at, as the Germans began their methodical destruction of the Lens mines as early as 1915, and did their work thoroughly. The German experts estimated that it would be necessary to remove 130,000 cu.yd. of debris per month in order to have the pitheads relatively clear by the end of 1920. The pumping out of the mines is a far more serious matter and will require at least three years. It is hoped that by next year it will be possible to extract coal from the first galleries, which are only some 650 ft., or even less in depth, but it is not expected that the water will be entirely removed from the lower workings, which run down to about 2,300 ft., until 1923 or possibly 1924.

TRANSPORT CRISIS IS A SERIOUS DIFFICULTY

The transport crisis is also a serious difficulty in the way of reconstruction. The railways in the Lens district will not be completely repaired before 1921, although it is hoped that the quay at Pont-a-Vendin will be opened for water transport soon. The question of housing also remains to be solved. Of the 800 workmen's dwellings belonging to the Miner's Society, not 100 can be repaired. For the Lens mining district 400 concrete huts are to be built in which it is hoped to house the 5,000 workers who will be employed in clearing the pits for the next two or three years. Although every effort is being made to bring back to Lens its former prosperity the task is so immense that it is not expected that the town and its mines will return to anything like their former state before 1928 or 1929.

At the present time France is facing a severe coal shortage. Until recently the embargo which was effective in the United States cut off that source of supply. But this embargo has lately been lifted.

Mine Inspection as It Affects Output

By M. S. Beddow
Scranton, Pa.

Since the cost of a breakdown of almost any electrical equipment used in a mine is by no means measurable by the cost of the repair parts it behooves every mine electrician to prevent such failures by every means possible. One of the most effective means of securing this end is the making of conscientious and thorough inspection of electrical equipment at frequent intervals.

THERE is an old saying that an ounce of prevention is worth a pound of cure. Nowhere is this more truly applicable that in the electrical apparatus applied to coal mining. So dependent has the mining and preparation of coal become upon electricity that prevention rather than cure must be the order of the day. Times without number the electrical equipment used in connection with the extraction of coal is allowed to go out of commission, solely because the operator who guides its destinies forgets, or neglects, to do some little thing which he knows should be done. Then comes the breakdown with its consequent loss of coal and piling up of upkeep cost.

This neglect if persisted in soon becomes a vicious circle widening and ever widening into an orgy of breakdown which seemingly has no ending. Of course this condition cannot prevail if the efforts of all concerned are directed into the one central channel of prevention. Prevention, by actual test, is the one sure way of keeping the rolling stock on the move to and from the faces of the chambers.

The way to put a system of this kind into actual practice seems so easy and plausible on the face of it that one wonders just why it has not become universally prevalent long before this. It needs, and must have, the undivided co-operation of all concerned in the mining of coal. It is an immediate, vital problem, and must not be confused wth lesser ones which are taking up the time of many officials and employees. The hub about which it revolves is contained in just two words—periodic inspection. And this must be an honest inspection for there are inspections of so cursory a nature that they might better not have been made. These are mere shams.

After Long Runs Locomotives Should Be Inspected

After ten and twelve hours of the severest kind of work an electric locomotive, taking this machine as an instance, is so hot in most of its operating parts that there are likely to be a hundred-and-one little things just on the verge of giving trouble. Right then is the time to make a careful inspection with a view to catching these weak spots and preventing the mischief that would surely develop at the beginning of the next workday. This may seem to be of minor importance at the time, but there is no knowing to what lengths they would reach if they are not checkmated at the proper time.

A weak spring in a brush-holder, although of small moment in itself, and easily replaced, has been known to cause the burn-out of an armature and its field coils and run up a bill of expense not covered this side of several hundred dollars. And not the least important part of this stop was the forfeiture of from 50 to 60 cars of coal with its consequent loss of wages to miners, laborers and others in the section of the mines effected. Thus what would originally have taken a half hour of a motorman or electrician's time was allowed, through neglect, to drag over a period of 10 or 12 hours bringing in its train delay and expense that would be hard to measure accurately in dollars and cents. And the original effect of all this, if those directly responsible are permitted to go uncensured, is to make all hands still more careless and there soon will be other stops. The solution, then, would certainly seem to be periodic inspections rigidly adhered to by electrician and motorman.

Make Honest Inspections on Time

The logical man to see that these inspections are made on time, and made honestly would seem to be the colliery electrician, for after all he is responsible for seeing that the equipment is kept in service. It does not matter materially that a particular electrician is able to get a locomotive, hoist, pump, coal-cutter or what not into service again after a stop. Most electricians are able to do this in a shorter or longer period of time dependant upon their respective abilities. The big problems is to keep going. Make your break-downs few and far between and of a minor character. Keep your equipment in such shape that there will be no stops and great will be your reward. It is much easier than you think and requires only honest endeavor coupled with a determination to give of your best. And these attributes are inherent in every one of us.

I have come into direct contact with hundreds of mine electricians in the last 16 years; as a class they are well worth studying. Invariably they are honest and want to "make good" in their chosen profession. Point out the proper path to follow in order to keep things moving and nine out of ten of these men will do their level best to meet you more than half way. And that is why I want to repeat here what I said previously, and I desire to lay special emphasis upon it: It is easy to put this "practice of prevention" into execution because you have these men to work with you and carry out your wishes in the matter. And with this kind of help, working as a team, your breakdowns will be less and less frequent.

But, the question may be raised, is not this only a part of their regular work? Why repeat something known to be a truism?

Periodic inspection is unquestionably a part of their work, but make them understand it is part of your work, too, and just as soon as they learn that you are interested in what they are doing just so soon will their efforts be redoubled, and you will reap the reward in the shape of less breakdowns and of course, increased output.

Twenty years or more ago when mine locomotives were unknown in the anthracite fields mule haulage was the type of transportation in vogue. This answered the purpose well until the veins became smaller and the hauls longer. The work that a team of mules could do was naturally limited, and when one of them was put out of commission because of some accident, the loss in output was infinitesimal when compared to the total tonnage. This of course arose from the fact that there were several hundred mules in the one operation.

As time went on these mules were gradually supplanted by the electric locomotive, two or three of the latter doing the work that had been performed by several of the animals in question. Naturally, then, when a locomotive goes out of commission today the loss in coal is enormous, and there is a combined effort on the part of all concerned to repair the damage wrought so that the locomotive can again be put on the road.

Now if one twentieth part of the energy feverishly expended at such times had been previously employed in prevention the wheels of output would have rolled merrily along without this aggravating stop, and the dispositions of all concerned would have remained much sweeter as a natural consequence. Hard words are often said at such time, too, that would never have been given utterance to had there been no stop, for the tempers of superintendents, foreman, driver-bosses, etc., are beyond understanding when the coal is not moving toward the foot of the shaft. It is truly the end of a perfect day when there are no stops to curtail the output of a coal mine.

PREVENT BREAKDOWNS BY MINOR INSPECTIONS

This question of prevention brings with it still another thought that might stand discussion. This takes into consideration again using the mine locomotives as an example, whether or not the apparatus is operating in normal fashion. To better make this plain I will say that I recently came upon a locomotive which had been giving a great deal of controller trouble. Upon investigation it was found that someone had connected up the blow-out coils so that they opposed each other. The result was that the arcing from the fingers when the controller was thrown to the off position was not smothered, and this fire held over a sufficient length of time to destroy fingers and segments. Several times the whole inside of the controller had to be renewed. It of course took several hours to set things right each time.

This same mistake has been made with reference to motor field coils, also, and in this case, if it is not discovered soon, the result will be a burned-out armature together with its fields. Thus it behooves us to not only be careful in our periodic inspections but to be equally careful in our installation work as well. It is evident, then, that the more careful one is when installing electrical equipment the less will one find out of order when the inspection is made.

Keeping these two facts ever in mind, will mean that the whole organization will be keyed up to a higher point of efficiency. This must of necessity result in an increased yield, for electrical deterioration finds its most severe expression in loss of coal.

LESS BREAKDOWNS WITH MODERN LOCOMOTIVES

Recent years have seen many changes in connection with mine locomotives. Each of these has made the work of the electrician a little easier, of course, and the equipment more efficient as a whole. Less breakdowns have been experienced, also, for the reason that as each of these improvements was incorporated in the general make-up of the machine, it was more able to withstand the heavy shocks and stresses forced upon it by a too-energetic motorman all too willing to make it do in five or six hours the work it should be given eight hours to perform. Not the least important of these changes was the ball bearing on the armature shaft which has nearly put the old sleeve type of bearing out of business.

Probably one thing which the electricians of the old school hated most to see happen was an armature dragging on the poles because of worn babbitt in the bearings. This was bound to happen now and again and probably has occurred to every electrician at some time in his career. Nevertheless it is something that no electrician is proud of and does his utmost to avoid, for while the blame may not be directly traceable to him he must feel that it is a reflection upon his capability just the same.

LOCOMOTIVE BEARINGS REQUIRE CAREFUL ATTENTION

However since the ball bearing largely has taken the place of the older type of journal, armatures are found on the poles extremely seldom. It must not be supposed however that inspection is not needed even with these most efficient of all bearings for mine locomotives. They will go dry, too, just as easily as the old sleeve type, but, thanks to their greater durability, the damage wrought is not nearly so disastrous. In order to get the most out of these bearings they must not only be inspected periodically but must be washed out with kerosene oil every two or three months. This will remove foreign substances and any acids that might tend to destroy the bearings themselves.

Another detail of construction that has kept locomotives from breaking down under the hard usage of recent years is the fact that they are now over-motored instead of being under-motored as was the case up to about ten years ago. Time was, and not long ago, when it was thought by designing engineers that about 6 hp. per ton was sufficient for all practical purposes. How far they were wrong was evidenced by the locomotives that are being turned out at the present time. Ten horsepower per ton seems to be the acceptable rating now, and this does not seem to be in the least too much. It was an easy matter to overload a locomotive with the old rating since because of the too heavy weight on the drivers, it was not possible to develop sufficient torque to turn the drivers and thus allow the armatures to turn sufficiently fast to generate the counter electromotive force which would hold the current taken from the line at a point where it could do no harm. Frequently the load was so great that wheels could not move at all and armature and fields for the time formed a direct path to the ground. The current taken and the heat developed at such times is enormous, and there is no wonder that as the coils were taken from the burned out armature the insulation fell from them like water from the proverbial duck's back.

A motor that cannot develop sufficient horse-power to turn the wheels when the load becomes excessive can be expected to give trouble, and burn-outs of armatures, fields, resistance, controllers and other electrical parts must be looked forward to as a natural result. Motors in modern locomotives are of sufficient horse-power to move a load whose draw-bar-pull does not exceed 20 per cent of the locomotive's own weight when the machine is equipped with cast iron wheels, or 25 per cent when steel wheels are used. Thus a locomotive properly motored and weighing seven tons (14,000 lb.) will pull a load whose resistance does not exceed 2,800 lb. This, of course, assumes that the locomotive is equipped with cast iron wheels. For steel wheels coefficient of friction of which is greater, a load whose resistance does not exceed 3,500 lb can be pulled.

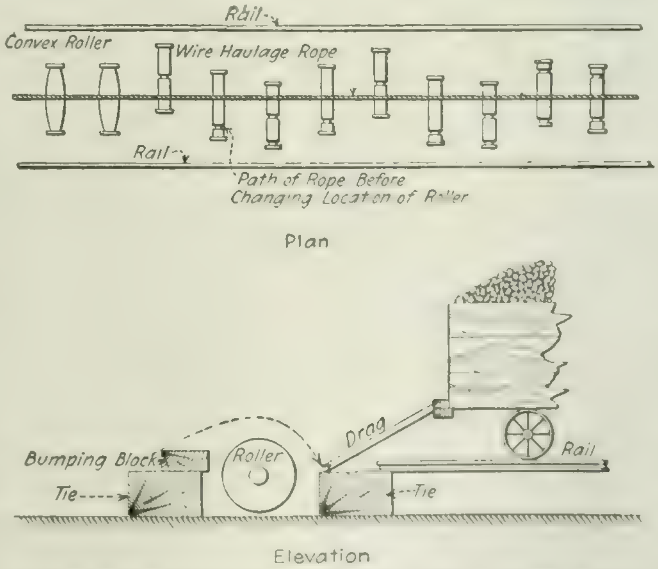
Loads in excess of the above are an evil and should be shunned as such. Prevention here would consist in knowing the grades over which trips must be handled, and then placing a limit on the number of cars that should be hauled on these grades, for while the drivers might be turning regardless of the grade or load, and the horse-power developed might be much below what the motors are capable of giving, continued efforts to surmount a nasty hill after repeated failures does not do the equipment a bit of good, and are doubtless the main contributing causes for many of the stops, the reasons for which cannot be explained satisfactorily.

Summing up, then, it might not be amiss to state that the plan as set forth in this article has been tried out with quite happy results. Breakdowns were so infrequent as to make their occurrence a matter of surprise rather than of expectancy. It is gratifying, at least, to the fellow who is responsible for upkeep to see week after week go by without the customary call for help from the operators of the equipment, and the time thus saved can be put to good advantage in repairing feed lines, signals, telephones and other parts of the system which have a habit of kicking up a fuss when least expected.

Lengthening the Life of Track Rollers

By R. Z. Virgin
Pittsburgh, Pa.

WHERE rope haulage is employed, whether on inclined planes, slopes, or level roads, track rollers, either of metal or wood, are necessary. In the majority of cases, however, wood is employed for this purpose. Track rollers are necessary because they reduce friction and thus save power, which is desirable at all times. They lengthen the life of the ropes by preventing them from dragging on the ground, and they save the ties by holding the rope off of them and thus keeping it from sawing the ties in two, thus weakening the tracks and causing wrecks. Track rollers should be placed at such intervals as to prevent the rope from dragging on the ties. They should be of generous diameter since their life is in general proportional to the diameter and a thick roller is stronger and does not revolve as fast as one of small diameter. Ordinarily, track rollers are suspended and revolve upon gudgeons or spindles, which should be from ⅞ in. to 1¼ in. in diameter, depending upon the size of the roller. In many instances, they can be made from ends or short pieces of pipe.



MAXIMUM SERVICE IS SECURED BY THIS ARRANGEMENT

The usual diameters of wooden rollers vary from 4 to 9 in., depending upon the size of the car wheels. The larger the diameter of the car wheel, the larger may be the diameter of the track roller employed. Wooden track rollers, like all other mine supplies, have increased in price within the past few years. At the present time such rollers cost about three times their former price, so that attention must be paid to the roller's efficiency and life, and each roller should be so placed as to secure its maximum service before it is necessary to discard it. Fig. 1 shows a method of placing rollers so as to secure this maximum service. The practice of placing all rollers in a straight line upon an inclined plane slope or haulageway looks orderly but permits only about one-third, or even less, of the maximum life or service of the roller to be secured. Many foremen are instructed to place rollers in alignment, but where this method is followed, the cost of operation and maintenance of rollers should not be charged in its entirety to equipment or repairs, but to inefficiency of management.

If rollers are placed as shown in Fig. 1, they may be turned end for end in their bearings and twice as much service secured by this reversal. They may then a third time be placed in brackets where the rope will bear on the roller in the center. This secures three times the service available for one setting of the roller only.

If rollers are used on an incline, those near the drum should be turned up with a convex face; that is, they should be larger in the center than at the ends. This will allow the rope to travel from one end of the roller to the other as the rope changes location by its winding upon the drum. This shape of roller is shown near the end of the drawing.

Where trucks are hauled with considerable speed up an incline, and where cars are heavy, drags or dogs are often hung on the rear of the truck to prevent the cars, should the trip be broken, from running backward down the slope. These drags or dogs are often of considerable weight but are required by law in certain states.

Every mining man knows the effect of such a drag pounding along the track and bouncing onto and off of the ground and onto the roller, and either bending or breaking the grudgeon, either of which will affect or probably ruin the free movement of the roller.

Fig. 1 shows a bumping block of suitable size nailed or bolted to the tie immediately in front of the roller. This block is so proportioned and placed as to take the blow of the drag. It thereby protects the roller and is sufficiently strong to resist a considerable blow, one which delivered upon an unprotected roller would probably bend its spindle.

If a bumping block similar to the one shown is placed on the tie in such a manner as to extend out over its edge, as shown in the drawing, it will greatly assist in preventing large pieces of coal or rock from choking the roller and thereby obstructing its free rotation, since by this method if a piece of coal passes the bumping block it has a considerable space to fall into and thus prevent its wedging.

Whatever type of roller brackets are employed, they should be reinforced either in the roller groove or on the side with a piece of iron. This will prevent the roller from cutting into the bracket and thereby secures greater life to the roller support. Discarded or broken car ribs make excellent reinforcement for this purpose.

Resetting Return Tubular Boilers

By C. R. Weihe
Star Junction, Pa.

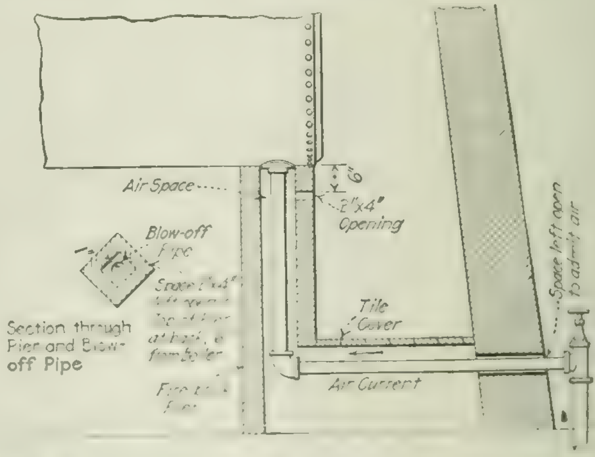
PROBABLY no industry gives as little thought to the fuel wasted in the boiler room as does that of coal production. Nevertheless, if this waste were actually realized there is no doubt but strenous attempts would be made to reduce it. It is not the purpose of this article to discourse on the willful waste that exists at some coal mines but to offer a means by which some of this waste may be reduced.

The most common type of steam generator used at American coal mines is the return tubular boiler, the nominal ratings of which range from 100 to 200 hp. Of the older boilers of this type, the 66-in. x 16-ft. and the 72-in. x 18-ft. are the most common. It has been my experience that these boilers as a rule are set too close to the grade for the successful burning of bituminous coal. They can, in most cases, be made to give much better results if set approximately as shown.

When attempting to increase the efficiency of any boiler plant, the main considerations that should not be lost sight of are: How near perfect is the combustion in the fire box and how rapidly can this combustion be made to take place while still being kept nearly perfect, that is, without an excess of air.

Examples of Raising Boiler Sheet

As an example of what the raising of a boiler sheet above the grate may mean, take the case of a 66-in. boiler. Such a steam generator is usually set so that there is from 20 to 26 in. between the grate to the boiler shell. The volatile hydrocarbons that rise from a fuel bed 6 to 8 in. in the thickness will not be properly mixed with air before they come in contact with the relatively cold boiler sheet, and, since it takes a temperature of from 1,800 to 2,000 deg. F. to burn these gases or cause the atoms of carbon to combine with those of oxygen supplied with the air, the fire produced in such a setting more strongly resembles a smudge than a real fire for producing steam. Such conditions as these actually obtain in many cases where return tubular boilers are employed. This may be obviated, however, at least as far as the smudge is concerned, by admitting a surplus of air into the firebox. This, however, does not improve the efficiency. Although it may make some steam, it is highly wasteful of fuel.


Air Space
6"
2"x4" Opening
Blow-off Pipe
Section through Pier and Blow-off Pipe
Tile Cover
Air Current
Space left open to admit air

ABOVE METHOD GIVES EXCELLENT SATISFACTION

The distance from the bridge wall to the boiler shell is also an important consideration, and, in many instances, this is not made sufficient. If the heating of the boiler had to be all accomplished at the shell above the bridge wall, and nowhere else, the theory of a close bridge wall would be correct. One important consideration that must be continually borne in mind and carefully watched where the distance between the bridge wall and boiler is large is the admission of air above the grate. This air tends to stratify and if its velocity is fairly rapid it will pass next to the boiler and tend to keep the boiler shell temperature down. This is not generally the case where the bridge wall is close to the boiler shell, since the gases are forced to intermix to a certain extent, thus raising their minimum temperature.

By raising the boilers higher above the grate, the combustion chamber is made larger. This is beneficial, since it affords greater room for the ashes carried over the bridge wall. The geatest gain is not, however, the space it affords for these ashes, but arises from the increase in cross-section of this chamber, so that the gases decrease their velocity and have an opportunity to thoroughly mix and burn completely before their journey through the tubes. If the combustion of gases is not complete before they reach the tubes it will never be complete, since in these tubes their temperature will be lowered to such a point that combustion cannot take place.

A lack of excess air increases furnace and combustion chamber temperatures. This is, of course, not a detriment, but provision must be made therefor. One particular detail of construction in a horizontal return tubular boiler is the blowoff pipe, which, in this type of steam generator, must necessarily pass through the combustion chamber. In Fig. 1 is shown a method that has given excellent satisfaction. As here shown, the blowoff pipe is inclosed in a firebrick pier and trench. The pier is built up with a good grade of firebrick laid in fire clay or loam. The space surrounding the pipe has a minimum of about one inch from pipe to brick.

Approximately 6 in. from the boiler shell an opening of about 2 x 4 in. is left in the pier so that air will be drawn into the combustion chamber by the draft. Care should be taken that this opening be not closer than shown in the drawing, since there is a blow pipe effect at this point where combustion is nearly complete and where the draft is strong. The trench inclosing the horizontal portion of the blowoff pipe is also constructed of firebrick laid up in loam or fire clay with a space left between the brick and the pipe. The trench is covered with tile and plastered up tight.

Purposes of An Incasing Pipe

Where the blowoff passes through the rear wall of the boiler setting, it is inclosed in a piece of pipe several sizes larger than the blowoff. This is built into the setting permanently. This incasing pipe serves two purposes: It admits air to the pier and a new blowoff pipe can be passed through it and installed without its being necessary to remove any of the setting bricks.

It is advisable to use double-strength pipe for the boiler blowoff, even when protected in this manner. In any case, the elbow and other fittings should be double strength or extra heavy malleable iron. Although the pier and trench above described afford excellent protection for the blowoff, it should nevertheless be examined every time the boiler is taken off the line to be cleaned or washed.

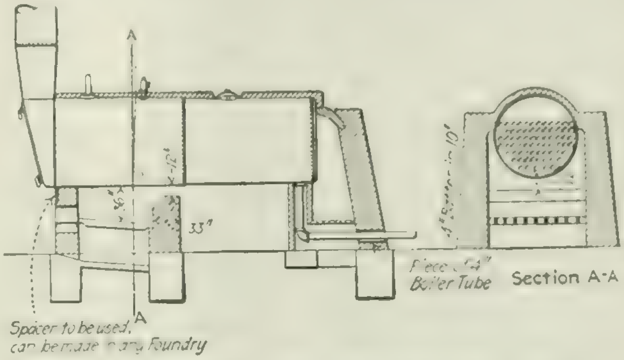
When raising and resetting or when the setting of any return tubular boiler is rebuilt, it is well to place the rear of the boiler 2 or 3 in. lower than the front or firebox end. This greatly aids in washing out the boiler if it is made with more than two sheets. It also helps the circulation of the water.

Care should be taken when boilers must be forced that they be thoroughly clean and that the circulation of water is good. If the boiler is kept clean and the water level is carefully watched, a boiler even when driven far above rating will not require any more upkeep than some that are operated under present conditions.

When rebuilding a return tubular boiler setting, between 60 and 70 per cent of the old brick can be used again if the original setting was laid up in lime mortar. It would not be advisable to re-employ the old firebrick in the new firebox, but they may, however, be used in the combustion chamber to advantage.

Material for Resetting Tubular Boiler

The rebuilding of a setting for a 66-in. x 16-ft. return tubular boiler requires about 28,500 to 30,000 bricks. The walls should be battered about 4 in. in 10 ft. and the grate should be approximately 2 in. lower at the back than at the front.



BETTER RESULTS ARE OBTAINED BY THIS ARRANGEMENT

When contemplating raising a boiler, it should be remembered that the mere fact that the boiler is raised will not attain the desired results unless the distance between the boiler and grate is increased. When this is done a spacer must be provided to fill in the front equal in width to a little less that the amount the boiler is raised. It has been found advantageous in some instances to arrange the front of the boiler as shown in Fig. 1. In this case the fireman is given about 1 ft. more floor space, and should the front manhead leak, the water will not run down the arch inside the setting and cause it to disintegrate.

Shot Firing

OF ALL the archaic, moss-grown, semi-modern so-called safety ideas, that of employing shot firers is probably one of the most harmful and dangerous. This practice is an open acknowledgment that a dangerous condition exists. It attempts merely to smooth over a real peril. Frequently it actually increases the danger since it releases in a very short interval of time the quantity of gas that would ordinarily be released in 24 hours. It is woefully inefficient.

Probably one of the most telling arguments against the shot-firing system is that with increase of real safety departments, mine after mine is abolishing it. This does not apply where the safety department is composed of porch lizards. But take one of your sure-enough, honest-to-goodness safety men and he'll turn up-side-down any shot-firing system yet contrived. Away, then, with the present shot-firing systems and their attendant danger and waste of time and labor.

Spend just half as much money in real ventilation and make the mine really safe.

Use of Electricity in Pennsylvania Coal Mines Discussed

S. E. Button, Chief of the Pennsylvania State Department of Mines, has investigated the question of the safety of electrical equipment in gaseous mines, and recently called together those most interested to discuss the situation. The recommendations of a commission, appointed by Mr. Button, reported to the meeting at Harrisburg and a brief review of the suggestions made are noted in this article.

STATE and Federal mining officials, coal operators, miners and manufacturers of electrical equipment held a session on Jan. 27, at the Capitol in Harrisburg, Pa., and discussed new rules and regulations to govern the use of electricity in the coal mines of Pennsylvania. The State Chief of Mines, S. E. Button, presided at the meeting, and it was the intention of the state mining department to discuss all phases of the application of electricity that pertain to trolley motor, storage-battery locomotives and coal-cutting machines; but the conference advanced no farther than the question of storage-battery locomotives, and the meeting adjourned at 9 p. m. until Feb. 10. For some time complaints have been made to the State Department of Mines against the storage-battery locomotive, and Mr. Button ordered a commission to make an investigation of these motors, calling the conference for the purpose of hearing suggestions that might improve present conditions.

The mine inspectors of the bituminous region believe that the storage-battery locomotives as now constructed, are unsafe in gaseous mines, and, are of the opinion that the motors do not comply with the requirements of the bituminous mine law; therefore they should be restricted to areas where there is little likelihood of their encountering inflammable gas.

It is contended that these locomotives produce sparks and flashes in regular operation. The controller and motors will, when operated, ignite gas due to the flashes consequent upon the breaking of electrical current. Other parts of the storage-battery equipment may produce sparks or flashes, the inspectors claim, in the course of their regular operation or as the result of accident. The locomotives are able to go to any part of a mine where there is a track, making it quite difficult to place any limit on the activities of such equipment.

The committee of mine inspectors and the department electrical engineer, Charles M. Means, went into the question quite thoroughly, and have made certain recommendations to the Department of Mines.

The inspectors, for the purpose of their report, have considered the various parts of a storage battery locomotive liable to cause ignition of gas and have divided them into three classifications as follows:

"Class 1: Includes all parts that may produce sparks or flashes as a result of normal operation of the locomotive. In this list the following parts are included, which list may be extended when new features are incorporated: Motors; resistances; controllers; fuses and switches used in regular operation.

"All the parts above enumerated should be enclosed in explosion-proof cases, as defined by the act of June 9, 1911. These cases should be designed to withstand, without rupture, the maximum pressure that can develop as the result of an ignition of the most explosive mixture of methane and air when the case is entirely filled with such a mixture.

"All flanges between parts of the casing should be so arranged that no flames will pass between the flanges without being cooled to a temperature below the ignition point of gas. All bolt or stud holes should be so made that in case a bolt or stud is left out, there will be no hole from the inside of the casing to the outside. "Class 2 includes such parts as may produce sparks or flashes when operated but which need not be used in regular operation. In this class we have change-over-switches and charging receptacles in case their terminals are 'live' during normal operation. These parts may be placed in a locked box and only operated in the charging station.

"Class 3 includes all parts which do not produce sparks or flashes as a result of normal operation but may do so as a result of accident. This class includes: Battery; battery enclosures; wiring; battery connections; headlights and instruments.

"A battery of good design, fitted with proper terminals and connections, does not seem to offer any hazard if it is properly protected from mechanical injury. The design of the connections is well standardized for the various batteries and the connections are not likely to become loose if a proper amount of care in maintenance is used.

"Unless the battery cells are insulated from the trays in an approved manner, the battery trays shall be insulated from the battery box with porcelain or equivalent insulators of adequate dimensions.

"The headlight should be constructed of a metallic case and fitted with a heavy glass lens which should be protected, in so far as possible, by the casing. This headlight should be of explosion-proof construction, unless some circuit-breaking device is used that will automatically and safely open the circuit in case of accident. The headlight should be so located on the locomotive, or protected, that it will be least exposed to damage from accident.

"The wiring should be in iron conduit or its equivalent. In general, the battery connections and wiring can be so constructed that with a proper degree of attendance there is no likelihood of a spark or flash being produced.

"The matter of charging, while in a manner foreign to this investigation, does have a direct bearing on the problem. It is quite important that all charging stations be ventilated with fresh air which must be carried to the return after passing through the charging room. This room must be treated as a highly-dangerous locality, due to the liberation of hydrogen by the batteries during charging.

"The room must be of fireproof construction throughout and all wood or other combustible material entirely eliminated. No inflammable material shall be stored or allowed in this room. If doors are used, they should be of steel and sufficient openings provided to allow a free circulation of air at all times. This reference to the charging station is suggested by the fact that these rooms have been a prolific source of trouble and represent a hazard that cannot be ignored."

The manufacturers' representatives stated that they were willing to make any changes in their locomotives to comply with the law and do anything to save human life, but were anxious to know if, after spending time and money to produce what they would consider a perfect machine, the State Department of Mines would accept it and allow it to be used. They also contended that to build a machine as required by the State Department of Mines and to meet the requirements of Schedule 15 of the Federal Bureau of Mines, would make quite a costly motor, and that the operators would then probably refuse to put so much money into storage-battery locomotives. Chief Button, of the state mining department, does not deem it advisable to establish fixed standards that might in any way handicap the future development of this class of equipment, but impressed it upon the conference that he would insist that these motors be made safe or the Department of Mines would refuse to allow them to be used in gaseous mines until they are made safe.

Great Britain Looked Ahead

WHEN THE WAR ended the people of the United States, with a genius for self-depreciation, at least, as obvious as their tendency toward self praise, declared that Great Britain had a definite after-war policy, whereas the United States was floundering around without any plan. Everybody admitted we had no definite program. Great Britain had everything plotted and prepared. As usual it looked bad for us. How could we get along without diagram or charted course?

Perhaps it is true that the British were not so clear as to the direction in which to tread as our traveling journalists tried to indicate. Perhaps also there were jarring interests in the United Kingdom as there were here. In fact, it appears that there were. It would be strange, indeed, in that realm of individualists if every one thought the same and traveled in the same direction.

Still the Government did have some sort of plan of control that it hoped would rule and that it trusted would succeed. Advocates of Government control were more numerous than here. The British have during the war at least been a few laps ahead of us in socialism. There is just now a profounder belief in government ownership in Great Britain than in the United States and a greater deference to governmental authority.

What has been the result of British foresightedness? Nothing but disappointment. The mines under government restrictions have proved less fruitful than ever. The output of British collieries has fallen from 5,500,000 tons per week in 1913 to between 2,500,000 tons and 4,750,000 tons per week in the past year. British coal no longer dominates foreign markets.

The payment to the unemployed has made idleness satisfactory if not profitable. Exchange has fallen from $4.87 to $3.50 and lower. Prices have risen more than wages. All this has partly arisen from causes which have inevitably ruled the situation, but more perhaps from a bad practice of looking ahead at the goal instead of making strides to reach it and taking the obstacles as they arise.

Meantime we, who did not look ahead, have found conditions far better, and the difference has largely been that we were on the whole less hampered by government interference, did not have any hearty, yet pension-receiving, unemployed, had not entirely forgotten that on production rested the good fortunes of all our citizens and still remembered the wholesome fact that work is the happy heritage of the poor and rich alike. "Greater," yes, and happier, "is he that serveth than he that sitteth at meat."

Our government will not save us. It is our own strong arms and healthy impulses that will move us onward to prosperity. It is perhaps a good thing to distribute, with admirable precision, a shortened necessity, but better is it to spend time and energy on the producing so much of a necessity that we can let the distributing follow natural lines.

In Great Britain the government fears to advocate production for fear it may raise a quarrel about a distribution of the product. Here, we are not afraid to approach the question of production and, if production be large enough, distribution may be suffered to regulate itself.

Of course, we have no great reason for congratulation. We have Great Britain's foibles in large measure. Production has fallen; shorter hours and more privileges are under discussion; strikes have been many. While we have avoided many of the British heresies, we have in part accepted them and in a degree we have dallied with them.

To produce to produce and again to produce is the simplest solution of our after-war difficulties. To have faith in the future and in work as the saving element in all economic troubles is the surest way of meeting the future. Let us have no diagram but work, and faith in work. No nostrum will meet high prices. It is well-directed labor, that old specific for national ills, which will put the elixir of life into a war-stricken body.

Let the year of unrest and uncertainty and strikes be followed by a year of hard work and industrial co-operation. Let the miner co-operate with the farmer so that each supplies the other generously with products. Let the worker in metals do his part in supplying both with steel for tracks, tractors and automobiles.

Variation of the "Buy Early" Campaign

In Salt Lake City, Utah, has been formed the Mutual Coal Co. which offers its stock in blocks of five shares or over to coal dealers and agrees to give its stockholders coal during June, July and August at cost, charging current market rates through the rest of the year. It hopes to promote storage in this manner and keep its mines working every day in the year that cars are available. Its coal land (640 acres in extent) is under lease from the state of Utah. It has a fee holding of 160 acres for tipple, storage yard and townsite. The capital is $250,000.

Use of the Geophone for Mine Signalling

By Mark Meredith
Liverpool, England

AMONG the interesting inventions which were developed during the trench warfare in France was an apapratus known as the geophone. This device was employed to detect the direction in which mining operations were being carried on by the enemy. It proved of great service and, in its final form, was found to possess a remarkable sensitiveness.

The principle involved is that of the seismograph, in which records of earth movements are obtained through the relative motion between the earth and a suspended mass possessing large inertia. The relative motion in the case of the geophone takes place between an iron ring which is in contact with the ground, and a lead disc, fastened between two mica discs, and thus held within the iron ring in a central position. Two metal caps hold the mica discs in place, and a hole bored in the upper cap communicates variations in internal air pressure to the ear by means of a rubber tube. When the case is shaken by the feeble tremor from a distant blow, the lead disc is comparatively undisturbed, and hence there are compressions and rarefactions of the air within the case which produce characteristic sounds.

Happily there are no longer anxious men sitting in stifling underground tunnels straining their ears to detect the sounds of the German picks, and it is now proposed to apply the geophone to rescue work in mines. Tests have been made to determine the limiting distance at which disturbances can be heard. The sound of a pick striking a rock was distinctly identified at a distance of 900 ft. through coal and earth, while a heavy blow delivered with a sledge hammer was heard 1,150 ft. away. It appears that the presence of galleries and rooms in the intervening space makes little difference in the loudness of the sound, but the amplitude varies to some extent with the nature of the material traversed, metalliferous rock transmitting sound better than coal deposits.

Geophone Determines Direction of Sound

Because of the fact that the ear is easily able to detect differences in the amplitudes of two sounds when they are made in seperate ears, it is possible to use the geophone to determine the direction from which impulses shaking it are arriving. Two similar instruments are used, one being moved until the sound appears equally loud in both ears. The direction of the impulse is then known to be perpendicular to the line joining the two instruments.

This method, which might seem incapable of giving great accuracy, has been proved by experience to be of considerable service in assisting in the alignment of tunnels, and instances have been already recorded where the direction of an approaching tunnel head has been obtained by the geophone and found to coincide, with remarkable exactness, with that determined by the accurate surveying instruments upon which it is usual to rely. The distance of the disturbance can be found from experience if the impulse is constant in amount. This is, however, an inefficient, unsatisfactory method, and better results may be expected by taking simultaneous observations at two separate points and finding the point of intersection of the lines indicating the direction of the approaching disturbance.

There can be little doubt that this ingenious, simple contrivance will facilitate the task of establishing communication with entombed miners after an explosion and enable the work of rescue to be undertaken rapidly and efficiently. One interesting and valuable feature of the apparatus is the ease with which the character of the disturbance can be identified. A blow from a pick or shovel produces a sound which is quite different from that made by a fall of rock.

The question of the likelihood of the geophone being frequently employed in mines depends to some extent upon the future developments of the wireless telephone. The possibility of transmitting speech direct is attractive, and has been the subject of experiments dating back as far as 1887, when A. W. Heaviside succeeded in transmitting telephonic messages through 350 ft. of earth. In these experiments two metallic circuits each over two miles in length and parallel to each other were used, one laid on the ground from the pit mouth and the other in a gallery of the mine.

The remarkable advance of the sensitiveness of receiving instruments which has taken place recently will almost certainly make it possible to communicate from a sending station above ground with any position within the mine. The apparatus for receiving the message is, however, necessarily complicated and requires trained operators, so that the simplicity of the geophone and the possibility of its use by the unskilled are important arguments in its favor at present.

Fuel vs. Water Power

The Division of Power Resources of the U. S. Geological Survey publishes the following tables of production of electric power and consumption of fuel by the public-utility power plants of the United States during the second, third, fourth and fifth months of last year.

It states that the daily output in kilowatt-hours was in February, 106,531,000; in March, 101,609,000; in April, 100,870,000, and July, 101,366,000, while the percentage produced by water power was 39 in February, 42 in March, 43 in April, and 39 in July.

Reports were not received from all the sources from which they should have arrived. About 3,000 electric power plants have been heard from, and the generator capacity of these plants is, roughly, 90 per cent of that of all the public-utility power plants of the United States. To make the returns complete, estimates were made from available information of the output of plants regarding which no returns were received. The figures are subject to revision in subsequent statistical records of the U. S. Geological Survey relating to power production.

A comparison as to the most efficient use of water power or fuels, which compromise coal, petroleum and derivatives, such as kerosene, gasolene, etc., and natural gas can readily be observed as soon as statistics are completed, showing conditions during the latter months of the year. These will also be published.

PRODUCTION OF ELECTRIC POWER AND CONSUMPTION OF FUEL BY PUBLIC UTILITY POWER PLANTS IN THE UNITED STATES FOR THE MONTHS OF FEBRUARY, MARCH, APRIL, AND JULY, 1919

Thousands of Kilowatt-Hours Produced

State	By Water Power				By Fuels				Coal, Short Tons				Petroleum and Derivatives Barrels				Natural Gas Thousands of Cubic Feet			
	February	March	April	July	February	March	April	July	February	March	April	July	February	March	April	July	February	March	April	July
Alabama	39,341	30,275	28,488	28,442	11,059	4,907	4,477	3,689	27,026	16,467	14,836	15,458	8	8	8	8				
Arizona	3,967	6,689	7,577	7,478	17,448	21,807	16,483	18,877	6,316	6,160	5,360	7,315	124,520	88,011	65,824	61,030				
Arkansas	79	72	69	68	6,252	6,625	6,035	7,692	13,386	11,177	9,902	8,364	447	489	456	450	63,430	85,398	97,726	182,848
California	187,486	215,914	228,775	200,528	38,268	33,939	33,645	116,804					199,388	185,127	161,651	550,799	21,611	181,785	273,642	242,228
Colorado	13,141	14,254	15,019	14,947	17,279	17,144	14,365	12,177	41,507	44,079	36,135	27,888	100	95	98	174				
Connecticut	7,043	14,884	15,804	5,943	42,589	37,469	35,525	28,182	63,942	62,234	58,094	67,513	333	323	279	213	20,766a	12,615a	11,309a	
Delaware					5,551	4,784	4,655	5,225	8,610	7,713	7,000	6,604		17						
District of Columbia					18,094	19,331	18,457	19,221	21,418	21,440	20,983	21,412								
Florida	678	892	777	942	8,582	8,789	7,776	7,721	3,424	5,594	3,056	3,193	32,714	32,025	28,785	30,745	98	151	3,780	
Georgia	35,909	37,264	31,404	34,224	6,054	6,082	6,200	6,595	16,529	11,934	12,009	13,560	120	120	167	2,386				
Idaho	41,430	39,913	36,019	50,209	168	257	155	1,219	120	111	121	88	10	10	10	9				
Illinois	15,611	15,282	16,134	15,323	198,899	207,673	194,109	183,518	335,309	350,824	318,378	304,160	3,918	2,198	2,142	984				
Indiana	3,682	3,654	3,511	2,736	52,342	54,617	51,980	54,354	141,060	157,931	143,829	142,587	448	167	420	402	2,159	2,108	1,909	1,878
Iowa	44,182	48,696	48,737	51,802	23,993	24,964	23,646	24,531	85,745	79,694	72,211	69,703	787	730	743	720				
Kansas	1,267	1,223	913	981	29,619	30,458	30,870	35,068	47,588	51,022	48,636	50,817	47,747	60,803	58,432	60,742	83,405	86,901	65,374	80,846
Kentucky	4	4	4	4	18,794	19,127	18,555	19,205	38,252	39,386	37,380	39,390	358	351	353	341				
Louisiana					14,130	14,876	14,582	15,518	14,305	13,885	13,878	11,324	30,811	30,094	28,192	30,508	55,092	47,458	49,599	63,624
Maine	18,831	20,157	18,708	17,678	73	73	93	220	333	348	357	534	7	7	17					
Maryland	284	371	358	329	18,435	13,898	11,442	16,378	28,452	23,657	20,755	25,951	19	18	30	30	1,500	1,500	1,500	1,350
Massachusetts	18,698	31,365	32,322	15,163	101,799	100,030	90,601	110,467	129,171	143,525	129,877	130,506	24	14	17	21				
Michigan	52,236	59,649	65,211	50,043	97,285	96,125	88,363	108,402	129,417	124,941	113,623	129,612	191	104	139	204				
Minnesota	18,303	32,740	43,204	37,436	26,826	15,220	7,261	10,929	57,282	39,810	25,038	25,866	1,138	1,016	854	832				
Mississippi					5,115	5,393	4,927	5,206	16,381	16,542	16,008	13,272	370	320	311	443				
Missouri	4,297	5,920	4,418	2,237	37,207	40,551	36,245	39,132	86,645	89,531	82,143	82,045	33,571	21,053	19,519	18,847				
Montana	68,408	77,869	77,853	83,220	883	888	821	848	5,537	5,591	5,455	4,894	530	492	488	502	1,008	960	907	912
Nebraska	748	959	1,118	1,302	15,493	16,413	16,004	16,602	29,946	30,956	29,813	31,904	3,512	3,509	3,433	3,387				
Nevada	3,198	2,812	2,470	2,559	137	121	727	720	198	180	140	195	900	1,044	997	1,780				
New Hampshire	4,946	5,763	5,683	4,499	2,309	2,114	1,898	3,814	5,395	3,911	3,241	5,808	20	20	3	3				
New Jersey	162	197	187	151	75,665	76,412	76,642	79,546	112,366	115,711	114,137	116,944	92	103	80	79				
New Mexico	57	56	80	144	1,416	1,556	1,455	1,603	4,045	4,438	3,627	4,133	1,060	1,360	1,373	1,610				
New York	195,219	223,078	220,677	212,033	288,271	288,537	270,644	276,828	368,569	363,338	325,474	336,004	544	546	501	1,224	149,831	164,408	147,432	56,947
North Carolina	42,645	46,318	45,755	45,317	7,149	7,426	7,082	7,243	15,648	16,234	15,612	14,915	20	20	20	20				
North Dakota					2,312	2,400	2,103	2,449	16,638	17,153	14,473	14,808	539	514	530	553				
Ohio	3,053	3,932	3,565	2,378	189,041	194,937	183,702	208,240	314,873	321,643	289,610	288,658	739	842	764	689	250,488	323,320	333,684	512,586
Oklahoma	167	183	149	161	13,080	13,796	12,989	13,826	11,136	12,578	10,075	8,717	8,109	6,300	9,921	20,067	423,813	477,050	458,496	474,936
Oregon	27,876	29,113	27,248	29,130	4,754	3,759	3,539	4,323	223	433	223	222	27,684	19,459	15,456	5,664				
Pennsylvania	55,098	62,509	58,466	52,648	238,970	246,930	233,597	238,021	401,874	412,561	396,096	388,957	22	14	16	297	42,301	54,450	53,533	40,531
Rhode Island	562	1,042	726	240	28,767	18,405	16,839	19,821	29,692	22,024	20,819	22,648								
South Carolina	43,899	43,394	43,287	42,649	3,876	4,010	3,676	3,480	9,844	9,540	8,811	8,281	78	82	93	102				
South Dakota	2,683	3,579	4,104	3,468	2,949	3,208	1,920	2,920	7,082	8,395	4,371	6,841	3,164	3,379	3,091	3,192				
Tennessee	43,640	45,222	37,999	32,316	9,774	10,680	10,405	9,164	23,726	28,724	24,710	22,156	86	84	81	82				
Texas	266	284	305	191	43,070	47,616	44,816	45,537	25,330	33,963	26,618	29,269	170,905	181,397	178,033	188,691	173,695	179,760	177,778	114,148
Utah	13,135	15,463	17,434	12,405					65	61	31									
Vermont	13,428	18,574	19,482	11,748	173	179	187	976	542	412	246	3,909	2	2	2	2				
Virginia	17,883	20,122	19,298	17,666	17,254	18,709	16,539	19,336	29,127	31,444	28,453	30,674	122	153	52	122				
Washington	70,779	79,346	74,575	79,881	4,171	4,521	4,164	5,434	3,611	3,473	2,411	2,060	17,810	18,804	17,879	22,071				
West Virginia	1,378	1,593	1,642	1,399	52,620	58,108	59,396	66,523	62,459	70,717	69,426	83,556	52	58	52	45	118,029	142,688	180,069	264,054
Wisconsin	32,534	47,531	48,880	41,512	32,916	33,075	24,682	27,637	69,225	74,987	53,037	46,221	644	662	565	574				
Wyoming	248	172	138	179	3,315	3,603	3,249	3,386	12,450	13,384	12,242	12,752	8,470	9,062	8,840	4,008	5,278	6,208	3,129	3,481
Total	1,148,634	1,308,329	1,308,573	1,213,729	1,834,222	1,841,542	1,717,523	1,928,617	2,873,265	2,919,406	2,648,760	2,676,688	722,133	671,006	610,736	1,014,652	1,412,504	1,766,560	1,859,867	2,040,365
Total, by water power and fuels					2,982,856	3,149,871	3,026,096	3,142,346												

(a) Artificial gas (b) Includes 182,415

THOMAS F. HOLMES

AN OBITUARY

On Jan. 26, 1920, passed away Thomas F. Holmes, one of the most prominent figures in the coal industry in Illinois. At the time of his death he was general superintendent of the properties of the Chicago, Wilmington & Franklin Coal Co.

Mr. Holmes was born in Brooklyn, N. Y., Feb. 7, 1861. He came to Illinois with his parents when he was about five years old and has resided at Lincoln, Ill., almost continuously since that time. He was educated in the Lincoln schools and began work as bookkeeper in one of the mining offices of that town in 1883. From that time he has been identified with the production of coal. He served as workman, foreman, and in various other capacities, until 1889. In that year he became mine superintendent at Niantic, Ill., in which position he remained for three years. He then returned to Lincoln, accepting the superintendency of the Citizens' Coal Mining Co.'s property, and here he continued for 24 years, acquiring later an interest in the local mines at Lincoln.

He was one of the pioneers in the Illinois Coal Operators' Association, the organization that bore the brunt of the collective bargain that just then developed. He was, in fact, a charter member in the association. Later Mr. Holmes became superintendent of the Chicago, Wilmington & Vermillion Coal Co.'s mine at Thayer, Ill. He held this position for five years, and was then appointed general superintendent of the Chicago, Wilmington & Franklin Coal Co.'s properties, which at the time of his death included eight mines with a daily production of 22,000 tons.

Mr. Holmes was married on Sept. 8, 1885, to Miss Jenny McCann. He is survived by his widow, three sons and three daughters, two brothers (Stephen Holmes and W. H. Holmes), two sisters (Mrs. Ellen Maloney and Mrs. Mary Thompson) and one grandson. He was an ideal father and took special pride in his family of fine children. He was a member of the Lincoln Elks and Redmen's Lodges.

Mr. Holmes combined the qualities of kindness and consideration for others, which gave him an unusual standing with his workmen, with a fidelity to his duty as he saw it. These qualities made him invaluable to the concerns with whose work he was entrusted. His sound judgment, strict justice and absolute conscientiousness made him sought after in councils, and for 15 years he served as a member of the Executive Board of the Illinois Coal Operators' Association. He served on the Illinois State Powder Commission for two years and was throughout his life identified with matters of civic welfare and social improvement.

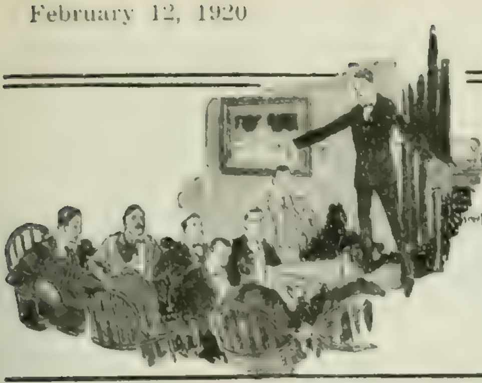
His loss will be greatly felt not only by his associates in the Chicago, Wilmington & Franklin Coal Co. but by the entire industry of the state. His life was marked by a most faithful performance of duty, a constant appreciation and participation in the aims of the organization which he served, and a most remarkable record of accomplishment. The properties coming successively under his management progressed under his logical plans and prospered as the outcome of his untiring energy. He was never too busy to give matters his personal attention and up to the time he was stricken by his last illness he daily might be found in an active discharge of his duties. His capacity for work was unusual and he enjoyed the game of constantly surpassing the old records of accomplishment.

To those who are not Illinoisans it may be permissible to add that the Orient No. 1 Shaft was one of the eight mines mentioned as those over which Thomas F. Holmes had charge. It is the leading shaft of the country from the point of output, and many of its original features are becoming standard practice in the southern Illinois field. Other mines the operation of which he directed were Benton No. 2 at Benton, Ill.; "B" Mine, at Herrin, Ill.; "A" Mine at the same place; Thayer No. 1, at Thayer, Ill.; South Wilmington at a village of the same name, and the Royal Colliery, at Virden, Ill.

In honor of Mr. Holmes the operation of all his company's mines was stopped on Thursday, Jan. 29, when, in the little town of Lincoln, his body was lowered into the grave. The suspension of work lasted only from 9:30 to 9:45 a.m., and the organization, which largely lived and breathed with the power he had put into it, again took up his work, doubtless to exhibit the fact that acts of industrial leaders are not disconnected performances but serve as inspiration and power to those who come after. What one man has done others succeeding them can and will do profiting by the example of their predecessors.

The Chicago, Wilmington and Franklin Mining Co., through President Geo. B. Harrington, of Chicago, paid high tribute to Mr. Holmes in a letter addressed to the company's employees. To quote his words: "From the foundation of the company in 1914, Mr. Holmes has given tireless devotion to his work, and his leadership has been a constant inspiration to his associates. To him must be given a very large measure of credit for the success which the company has won."

Mr. Holmes was not quite 59 years of age when he died but he had outstripped meanwhile many men with larger advantages but less force of character.



WHAT THE ENGINEERING SOCIETIES ARE DOING

American Engineering Standards Committee

AN INTERNATIONAL body to approve American engineering standards and to co-operate with similar organizations in other countries is made possible by a new conference termed the American Engineering Standards Committee. Similar organizations are now functioning in Great Britain, France, Switzerland, Holland and Canada.

Through the new committee the methods of arriving at engineering standards will be unified and simplified and, by co-operation, the duplication of standardization work will be prevented. Standards will not be created without giving all interested an opportunity to participate.

The "approval" of a standard by the American Engineering Standards Committee does not mean that the committee has itself worked over and approved each detail, but rather that the work has been carried out by a sectional committee adequately representing the industry concerned, and sponsored by one or more bodies of ability, experience and standing, so that the result may stand for what is best in American engineering practice.

The committee is not only ready for business but it has made considerable practical headway. It has approved specifications for standard pipe threads, for which the American Society of Mechanical Engineers and the American Gas Association are sponsors, and are representing America on this subject at an international conference in Paris. Co-operation is in progress with the National Screw Thread Commission, authorized by Congress and composed of representatives of the various technical societies, looking forward to standard screw threads. Through this arrangement, direct co-operative work with the British, which is not possible by the official commission, is being carried out. The committee is also in active co-operation with the Canadians on bridge specifications, with the British on specifications for machine tools, and with the Swiss on specifications for ball bearings. In each case the detailed work is being carried out by sponsor bodies by means of sectional committees.

When the E. S. N. E. P. Banquets

When the Engineers' Society of North-Eastern Pennsylvania meets to banquet, as it did at the Hotel Jermyn in Scranton, on Wednesday evening, Feb. 4, a more lively bunch of fellows can scarcely be found. Serious grinds, who have taken up with mathematical sciences and steeped themselves in erudition come to the banquets of the Engineers' Society and exhibit a frolicsomeness that would make one seriously question how they could take up such dour studies and embrace such a serious profession as that of engineering.

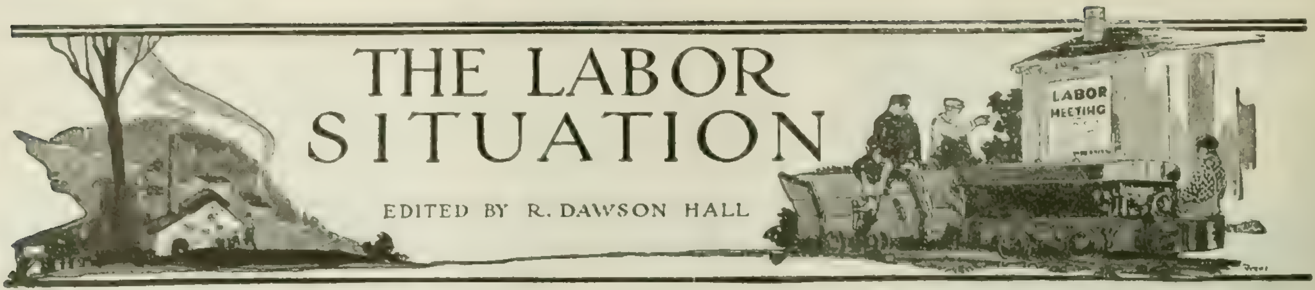
Menus in the form of a bottle were the only bracers provided at the banquet. They showed a picture of a man watching a whisky still, labelling it: "A Very Hazardous Branch of Engineering—A Drawing from Still Life." The menus add "The banquet committee, at this sober moment, wishes to invite attention to the following terms used frequently by those in the engineering profession and asks that suitable substitutes be furnished in order that we may enjoy the freedom that is guaranteed to us under the Eighteenth Amendment: 'gin' pole, 'whisky' jack, 'spirit' level, 'bar'-wound armature, 'still'-son wrench, 'siphon,' 'tank,' 'tipple' and 'flask.'"

Evan C. Jones, assistant district attorney of Luzerne County, a witty Welshman, congratulated the party on the merriment they had achieved upon water. Some few, he said, had been able to get something stronger than water and they were entitled to even greater congratulations. He stated in his remarks that he and his Wilkes-Barre associates, who had come to Scranton in large numbers, had been promised surface support and in return were giving their moral support.

Gustave F. Smith, the president of 1919, reported an increased income during the past year of $715 with 55 new members and 434 members in good standing. Hugh A. Dawson, the incoming president made a short address. Con. McCole, who can imitate the dialect, mannerisms and appearance of all the polyglot peoples inhabiting the anthracite region had the party convulsed with his witticisms. He wound up with his "Miner's Convention." He tries to avoid repeating this feature, but his admirers—and who may not be numbered among them—will never allow him to sit down without this part of his repertoire.

Col. Joseph Thompson addressed the banqueters on "The Engineers in France," who did everything but engineering. Of 1,000 men in his command only 55 privates, one noncommissioned officer and himself came out on their feet. He had both his arms in a sling. The colonel declared himself of the belief that the co-operation between officers and privates during the war was possible between officials and workmen in peace if only the latter knew the plan and purpose as well as did the privates during the war.

Dr. O. F. Lewis spoke on "The Social Unrest and Its Causes," laying it to inhibited powers and ambitions. He believed that community councils would do much to furnish the antidote, permitting of activities which undirected would be likely to drift into improper channels. A Welsh quartette, named Cambria after the old Latin name of the principality, exhibited well how much the Welsh element in the anthracite region helps to maintain the musical standing of that community.



THE LABOR SITUATION

EDITED BY R. DAWSON HALL

Hayes Resigns Presidency

On Feb. 6, the international executive board of the United Mine Workers of America accepted the resignation of Frank J. Hayes, the international president, putting Vice-President John L. Lewis, of Springfield, Ill. (long acting vice-president) in his place. Philip Murray, the president of the Pittsburgh district, becomes vice-president. For more than a year Hayes has been in poor health, the outcome of a nervous breakdown. After some months in a sanitarium he went to Denver and is there now, endeavoring to recover his lost health.

Robert R. Gibbons, who is vice-president of the Pittsburgh district, will succeed Philip Murray as president of that district. He came to the city of Pittsburgh from Scotland in 1903 and in July, 1916, was appointed vice-president to which office he has been elected twice.

Operators Make Their Case

At the hearings of the operators before the Bituminous Coal Commission the earnings of leaders were illustrated by Mr. Crews by the following table for January, 1919, which begins with loaders who worked at least twenty days of the twenty-seven days running time:

WAGES OF MACHINE-COAL LOADERS

Number of Men	Days Worked	Average Earnings for the Days Worked
46	20	$116 39
62	21	127 65
52	22	131 76
61	23	138 02
77	24	145.88
48	25	154 00
30	26	169 84
21	27	197 06

WAGES OF MACHINE RUNNERS AND HELPERS

Number of Men	Days Worked	Average Earnings for the Days Worked
4	20	$168 00
4	21	159 75
7	22	185 57
12	23	211 17
6	24	212 33
11	25	186 00

At this stage of the presentation of the earning and working sheets of the mining corporations, Mr. Crews said to the Commission: "If you could analyze the question of absenteeism without cause down to a final and definite conclusion you would find, and the figures so indicate, that the machine runners are much less often absent than the pick miners or loaders."

The relative merits of the contentions of the miners and operators as to the actual earnings of the miners, and the far-reaching effect of the failure of a large proportion of individual miners to work the full time available, were put in an entirely new light by the data submitted to the commission for the operators by Attorney Crews of New York when the commission resumed its hearings Monday morning, Feb. 2.

The figures were new, taken from the mine records, and giving for the first time the fundamental statistical facts of the coal industry for the ten months' period from January to October, 1919. The trend of the data was that during those ten months previous to the strike the miners made appreciably more than the "decent living wage" which their representatives have urged they were unable to make.

Authenticity of the figures, Mr. Crews explained, rested upon the fact that they were taken bodily from the payrolls of the mines themselves, and as a further voucher for their reliability he informed the commission that the compilation had been made by C. E. Lesher, who, as an expert of the U. S. Geological Survey, was in charge of the mineral fuel statistics.

On account of the time limitations imposed upon the inquiry and the requests of the commission that the results obtained be submitted forthwith, the operators had been unable to carry the data to the full extent originally mapped out when the compilation was begun last December. The data as offered embrace 15 per cent of the working forces of the mining fields involved. It covers both the thick-veined and the thin-veined districts of Western Pennsylvania, Ohio, Indiana and Illinois, all embraced by the Central Competitive field.

It was made clear by Mr. Crews that the data were taken impartially from the mine records in such a way as to give actually representative figures and not "hand-picked" data such as would arbitrarily make out a favorable case for the operators. This was borne out by Mr. Lesher's statement that the mine managers had been directed to select the mines with reference to character, both industrial and fuel, to divide up the fields so reports would be given of mines with the poorest running time, as well as the best, and so that car supply should likewise be taken into consideration.

Irregular Work Causes Low Earnings

Tables showing a striking variation from the claims hitherto advanced by the miners as to their total monthly earnings and revealing the great extent to which the irregularity of the miners in pursuing their work detracts from their potential earning power were then read into the record.

That the miners were able to make much more than an average of $5.00 a day, as argued by the miners' representatives, was shown by a table offered for the Pittsburgh thin-vein district. In this table, taken direct from the mine sheets, it was shown that during the month of January, 1919, pick miners who worked the maximum running time of 27 days made over $9.50 per day, while the miners who worked two-thirds of the time made over $6.23 per day. The table follows:

WAGES OF PICK-MINERS

Number of Men	Number of Days Worked	Average Earnings for the Period Worked
10	1	$7 81
3	2	5 20
5	3	19 82
2	4	18 20
3	5	34 86
6	6	42 31
1	7	18 94
7	8	39 54
9	18	112 29
14	19	138 58
13	20	150 48
14	21	161 61
15	22	157 92
27	23	157 76
37	24	179 86
30	25	207 43
27	26	227.14
30	27	244.43

Time Wasted by the Miner

Taking up the tables for October, 1919, the last month preceding the strike, it was said that although the conditions for marketing and for car supply were 100 per cent favorable to the miner putting in full time, neither the pick miners nor loaders availed themselves of the opportunity to make a maximum wage. "But take the machine runners," pursued Mr. Crews, "There is nobody working one day only; nobody worked just two days or three days."

He cited the following table for machine runners for October, 1919:

Number of Men	Days Worked	Average Earnings per Man for Period Worked
2	4	$31 50
1	5	50 00
2	9	67 50
1	12	57 00
1	13	82 00
1	14	94 00
1	16	129.00
1	18	155 00
2	20	109 00
2	21	154 00
2	53	173.50
9	24	218 78
14	25	224.79
28	26	222 50
8	27	247 00

The greatest average of men in any district in Illinois who worked 75 per cent or more of the time at their disposal, Dr. Honnold said, was 61.2 per cent. In two thick-seam districts of the Central and Southern fields of the State, where more than 50 per cent of the State's tonnage is produced, he said, only 28.3 per cent of the men put in three-fourths of the time offered them.

In the most productive district of the State, Dr. Honnold showed, 38.8 per cent of the men were idle for half the time, while in the poorest district 71.7 per cent labored less than half time, 36.2 per cent working less than one-fourth of the days open to them.

MORE INDUSTRIOUS MINERS EARN $3.74 A DAY

Dr. Honnold's figures showed that the more industrious miners easily averaged $7.34 per day, while the men who worked but part of the time averaged from $4.34 to $6.62 per day. These figures were taken from the ten months of 1919 before the 14 per cent wage increase was given the miners.

CAR-LOADERS' TIME OFF AFFECTS COST

Failure of coal-car loaders to report for work and get the coal out of the mine added 10 per cent to the production cost of the coal, said Dr. Honnold. This was because the men paid by the day had to be carried on, even though the coal was not up on the ground where they could handle it.

Emphasizing the necessity of a penalty clause to make the miners keep their contracts, Mr. Maurer called the attention of the commission to the number of strikes which have occurred in Ohio in spite of the Washington agreement. A summary for the district of Eastern Ohio showed that 70 mines had been affected by 102 strikes, with a loss in days of 25 8and in tonnage of 327,700.

"In Southern Ohio," continued Mr. Maurer, "the exhibit shows by reason of strikes a total loss in hours of 2,088, and in tonnage of 109,207, this being during 1919. They carried through their tonnage loss by the general strike in November and show the total loss in hours to be 70,905, and in tons of 2,687,153.

MINERS' HEALTH SHOWN BY RECORDS

Authoritative reports and statistics from insurance officials, physicians and other reliable sources clearing up misconceptions regarding health and hazards in the mining industry, were introduced by Tracy L. Guthrie, of Pittsburgh, for the operators. Attacking the miners' statements that the work was dangerous to health, he filed a synopsis of replies from 49 physicians to the tenor that claims of the prevalence of miners' diseases were greatly exaggerated.

Regarding assertions that children were forced to stay out of school on account of lack of food or suitable clothing, virtually all of the physicians reported that no cases of malnutrition come to their notice.

From the annual report of the Pennsylvania Insurance Commissioner, on the subject of the hazards and dangers of mine work, figures were presented showing that coal mining is only half as dangerous, as to accidents, as threshing machine or concrete work. In fact, according to the commissioner's reports, next to blast-furnace work and the making of rough building papers, mining ranked as the least dangerous of 53 occupations listed, being even one-third less hazardous than the collecting of garbage.

Would Unionize Pocahontas Region

State-wide interest is manifested in the arrival at Bluefield, W. Va., in the heart of the Pocahontas region on Jan. 30 of John L. Lewis, acting president of the United Mine Workers of America, to take personal charge of the preliminary movement to organize not only the Pocahontas region but the vast territory in southern West Virginia including the smokeless and high-volatile regions which furnished the bulk of production during the November strike, this being the first real attempt to organize the miners in the southern end of the state, aside from the effort in the Guyan region.

PREPARE GROUND FOR COMPLETE LABOR TRUST

This sudden move on the part of the head of the United Mine Workers at a time when many mooted questions are pending before the Bituminous Coal Commission at Washington created a flurry not only in the Pocahontas region but in all the unorganized fields in southern West Virginia including the Winding Gulf, Tug River, Williamson and Guyan fields and it was generally regarded as the forerunner of another general strike, because, when the recent nationwide strike occurred it was the unorganized West Virginia fields that prevented the United Mine Workers from forcing a complete suspension of the coal mines of the country. It is therefore assumed that the mine workers are seeking to strengthen these weak points in preparation for another general strike.

A number of other labor leaders accompanied Lewis to Bluefield. It was reported that C. F. Keeney, president of District 17, was a member of the party, but Keeney, it was learned, was in Charleston during Lewis' sojourn in Bluefield. A number of conferences were held between Lewis and the labor leaders in Bluefield, and, it is said, the matter of obtaining quarters for representatives of the United Mine Workers' organization was under discussion. Lewis admitted that an effort would be made to organize the miners throughout southern West Virginia and that the campaign with that end in view would be waged with Bluefield as the center of operations.

INDISPOSED TO UNIONIZE INTERNATIONALLY

While admitting it was the purpose of the United Mine Workers to bring all miners in southern West Virginia into the fold of organized labor, he was rather loath to discuss details, but did claim that he had been in touch with representatives of his organization who had been making a survey of conditions in the Pocahontas field. He also claimed that he had visited several points on the Norfolk & Western Ry. and that he had found mine workers inclined to favor the formation of local unions. Much doubt is entertained as to whether the miners as a whole desire the advent of the organization, for the earnings of the non-union miners are larger than those of the miners in the union fields further to the north.

Furthermore, during the strike, many union miners migrated to the non-union fields of West Virginia and while some of those who deserted from the union may still desire to see it take in new territory it is believed that the men who came from the union to the non-union fields have created sentiment against, rather than for, the organization of the unorganized regions and that the recent strike instead of strengthening the chances of organizing the Norfolk & Western territory and adjoining areas has rather weakened such chances.

REMBRANDT PEALE AND WHITE COMMENDED

After commending Commissioners Rembrandt Peale and John P. White for their services as members of the United States Fuel Administration under Dr. Garfield, during the war, Mr. Lewis quoted both Mr. Peale and Mr. White as having recommended in 1918 that some increase be given the miners "as a patriotic matter." "If this recommendation had been followed," said he, "the country would have been spared the distressing conditions of the past few months." He also referred to Dr. Garfield's decision in 1918.

What the 14 Per Cent Increase Means to the Operators

What the application of 14 per cent wage advance means to the operators was emphasized by Mr. Crews in his summing up. He adverted to the financial analysis of labor and other costs, income and tonnage produced by the coal industry during the first ten months of 1919, derived from mine reports compiled by Attorney Jean Paul Muller of Washington, D. C., as constituting the best evidence as to this. To obtain results representative of the Central Competitive bituminous territory, typical of the situation as a whole, Mr. Muller's analysis was centered on the reports of the Pittsburgh Coal Producers' Association, the Pittsburgh Vein Operators' Association of Ohio, the Southern Ohio Coal Exchange, the Indiana Coal Operators' Association, Coal Trade Bureau of Illinois, Illinois Coal Operators' Association, and the Central Illinois Coal Bureau for each of the ten months ending Oct. 31, 1919.

PROFIT IN PITTSBURGH FIELD 4 PER CENT

"If we look upon the ten months ended Oct. 31, 1919, as the basis for the present," reported Mr. Muller, "we find that the Pittsburgh Coal Producers' Association reports 22,127,736 net tons of coal produced at a total labor cost of $29,997,749.79, while the margin, or amount left over after all the standard costs of producing the coal at the mouth of the mine were deducted from the sum total realized from the sale of coal was $5,784,852.64. At 6 per cent per annum on a capital charge for investment in property amounting to $6.30 per ton produced, the compensation for capital investment required would be $8,364,284.21, so that the margin on coal represented little over 4 per cent.

"Under the present labor scale involving an increase in labor costs of 14 per cent, on the same tonnage produced, this increase will absorb $4,199,684.97 out of the margin of $5,784,852.64, leaving the compensation for capital investment approximately 1 per cent.

"The Pittsburgh Vein Operators' Association of Ohio on a production of 5,353,494 tons shows a labor cost of $6,900,605.30, with a margin of $1,239,323.40. If the 14 per cent increase in labor cost amounting to $966,084.74 is deducted therefrom, the compensation for capital invested is less than 1 per cent.

"The same is true of the Central Illinois Coal Bureau, while the following will not have any compensation for capital invested but actually will fall short of meeting expenses.

OHIO, INDIANA AND ILLINOIS WILL LOSE MONEY

"The Southern Ohio Coal Exchange with a marginal loss of $208,244.75, plus 14 per cent labor increase of $615,008.17 would have a total loss of $823,252.92;

"The Indiana Coal Operators' Association out of a margin of coal of $357,256.04 will have to meet a 14 per cent increase in labor costs amounting to $1,776,831.41, thus facing a deficit of more than $1,400,000.

"The Coal Trade Bureau of Illinois out of a margin of $161,276.71 must meet a 14 per cent increase in labor costs amounting to $338,293.54, leaving it more than $220,000 short of meeting its expenses, while the Illinois Coal Operators' Association, out of a margin of $1,655,726.89, will have to meet a 14 per cent increase in labor costs of $2,933,239.82, leaving it nearly $1,300,000 short of meeting expenses."

In summing up the arguments during the morning session for the United Mine Workers, Acting-President Lewis expressed the opinion that the facts laid before the commission by the operators had not impaired the position of the miners. In spite of the original sources from which the payroll summaries were taken, Mr. Lewis maintained that the earnings of the miners were inadequate, saying that the best the pick miners could make a year was $1600, whereas an estimated budget of the yearly income required to support a miner's family of five was $2243.94.

Mr. Lewis quoted from a letter written to him by Secretary of Labor Wilson recapitulating the latter's view that the miners should be given a flat advance of 31.6 per cent or 27½c. per ton, and $1.58 per day for day laborers. He also attacked former Fuel Administrator Garfield's method of arriving at the 14 per cent advance.

Penna Declares Miners Are Prosperous

Vigorous summing up by representatives of the miners and the operators on the points in controversy in the investigation by the President's Bituminous Coal Commission into the Central Competitive Field, embracing Ohio, Indiana, Illinois, and Western Pennsylvania, occupied the commission's proceedings on Feb. 3, the other bituminous-coal regions being heard later.

After Acting-President John L. Lewis and Secretary William Green of the United Mine Workers had argued once more for a 60 per cent wage advance, with the six-hour day and five-day week, representatives of the coal operators in reply insisted that the existing wage is adequate and that the miners' demands are unreasonable and unjustified.

Attacking the wage demands of the miners, Phil H. Penna, head of the Indiana operators exclaimed:

"Reduced to the last analysis the demands of the miners are: 'More money for less work'. Let us face the facts without camouflage". One outstanding difficulty the operators have to face in dealing with the miners' union representatives, he said, was the failure of the unions to keep their contracts with the operators. Both sides, he insisted, should be held responsible.

CONTRACT BREAKERS AND SLACKERS

"Our contracts now are mere scraps of paper so far as observance by the miners goes". He went on to say that there were 114 mine strikes in Indiana in spite of 'strike-proof' contracts between the operators and the miners.

"The mine workers' representatives have become special pleaders for violation of contracts." "If it were in my power today to operate non-union mines instead of union mines, I would do so. The position of the non-union mine operator is not so good, but it is better than being in the clutches of the union. I say this in spite of the fact that I recognize the right of working people to unionize. This commission should make agreements enforceable, or make no contract at all".

Mr. Penna denounced what he characterized as the "slacker" among the miners, the man who, as he put it, declines to avail himself of the full opportunity afforded him to work. He declared that this type of miner, regardless of his own responsibility, was seeking to influence the entire mining industry. The slacker calls for shorter hours and more pay. The existing scale of wages, he said, was ample for the man who took full advantage of the working time.

Mr. Crews urged that inadequate car supply seriously embarrassed the coal industry today, and urged a better distribution for coal to the market. He attacked the data of average wages offered by the miners, saying that the miners had not used typical instances, but had endeavored to show by arbitrary figures that wages in general were low.

If the commission wished, he said, the operators would produce ample figures to show that the potential earnings of the miners could be increased 25 per cent, if they would work the time offered to them.

MINE WORKERS ARE SAVING MONEY

To demonstrate the prosperous money conditions of communities made up largely of miners, Tracy L. Guthrie of Pittsburgh gave the commission reports from savings banks, and other financial institutions in twenty-eight mining towns, selected at random in western Pennsylvania, showing that savings deposits had increased $12,000,000 in the last four years. The report embraced 46 banks in operation since 1914 and seven banks established since.

Demands of the operators touching basic points in the controversy were spread upon the commission's records during the day. Among these is a demand for the abolition of the check-off system, under which the operators, by an arrangement with the miners, collect dues for the Mine Workers' Union from the miners' pay. This "check-off" produces $15,000,000 for the United Mine Workers.

Where Miners Violated Injunction

So far as is known the only section of the country in which the mine workers' strike continued after Dec. 11 was that part of the New River field of West Virginia where the operators refused on Sept. 1 of last year to enter into a contract with the miners that would grant them the "closed-shop" and the "check-off." These operators represented about 20 per cent of the tonnage of the New River district. Their declination to become a party to the new contract caused the mine workers to declare a strike at the mines owned by those so refusing, although there were many miners who would have been glad to have continued at work. The strike remained in full force until about the middle of November, the miners still occupying the houses of the coal companies.

When, however, the New River contract of Sept. 1, none too popular anyway among the miners of District 29, became automatically abrogated owing to the miners of the district as a whole going on strike and the miners generally in the field returning to work without the check-off, even voting to return to work without it, a great many of the miners in the field where the new contract had never been in force also began returning to work. Of course in many instances miners who did return to their picks and shovels were non-union miners, but that was not wholly true.

The point is that the miners in the particular section affected were not ordered back to work by officials of District 29, the leaders in that district making the plea that the Indianapolis agreement did not apply to that part of their district where there had been a strike prior to Nov. 1. It will be recalled that the same plea was made by Alex Howat for the Kansas miners and that it was not until after Howat was threatened with a sojourn in jail that he ordered his miners back to work.

The New River situation was exactly similar yet so far as is known neither officials of District 29 nor the Government have taken any action to force a compliance with the Indianapolis agreement even though the continued strike in the face of the Indanapolis agreement and a Federal restraining order issued by Judge Keller culminated in an attack by strikers on miners while on their way to work at the mines of the Willis Branch Coal Co, on Tuesday, Jan. 20. Not satisfied with an attack on mine workers, strikers also entered and wrecked the electrical hoisting machinery of the company, causing damage amounting to thousands of dollars.

No precaution had been taken by the company to guard its property because officials of District 29, United Mine Workers, had assured mine owners that no violence would be tolerated or permitted. It is understood that the question of stopping the strike in the New River field has been referred to the President's Bituminous Coal Commission. Inasmuch as the commission is to pass on such matters it is also believed by the operators of the New River District as a whole that it is proper for the commission also to pass upon the restoration of the check-off now being demended by the miners.

Central Competitive Operators' Demands

The demands of the Scale Committee of the Central Competitive Field as presented before the Coal Commission are as follows:

No. 1.—The present system of collecting dues and initiation fees from the mine workers, and enforcing the payment thereof by deductions from their earnings through the offices of the operators imposes burdens upon the operators for which there is no economic justification, and is unjust to many employees of the operators. The operators therefore request that the practice be abolished.

No. 2.—As the house rent charged the mine workers and the price charged them for their domestic coal have been written into the contracts in some of the states, and the adjustment of those charges, from time to time, is the cause of much dissension, we request that the commission, in its findings, fix an equitable method of dealing with these matters.

No. 3.—The operators request that the commission recommend to the Congress of the United States the enactment of legislation requiring associations of employees which make contracts of employment with employers to take such action as will make them legally responsible for the fulfillment of the contracts so entered into.

No. 4.—The operators request that the national officers of the United Mine Workers of America and the national organization, being parties to the making of the contract, be required to assume responsibility for enforcing the terms of such contract in the various districts, notwithstanding the present limitations in the Constitution of the United Mine Workers of America.

No. 5.—As a matter of safety to employees, and as there is now no system by which the actual working time of the mine workers can be determined, the operators request that the contract shall provide that time clocks or time devices may be installed at mines, and that the miners and inside day-men be required to register when they enter or leave the mines, and that the outside day force be required to register when they arrive at or leave the mine. All men refusing to comply with such requirements to be subject to discharge.

No. 6.—The operators request that the commission, in its award, provide for the introduction of devices or machinery which may serve to reduce the cost of coal, and consequently the cost to the public, and for which there is no scale of wages in the then-existing contract.

Farrington's Wage Figures Untrue

When Frank Farrington, president of the Illinois United Mine Workers, told President Wilson's Coal Commission that the miners in Illinois are now getting only $3.72 a day, he could not have been thinking of those who work around Edwardsville and Collinsville. At these places the men are receiving from $8 to $12 a day and it is understood that these figures represent the miners' earnings throughout the Illinois field adjacent to St. Louis.

The Consolidated Coal Co. paid at its mine No. 17 at Collinsville, a few days ago, $36,231.50, an average of $103 a man for two weeks' work. The pay at the Donk Bros. Coal and Coke Co.'s mine at Edwardsville about the same.

The men might be making more, but officials of operating companies declare that they are holding down production. At the Consolidated mine it was stated that if the loaders had loaded as many cars a day as they did in the latter part of October, there would have been an increase of approximately 20 per cent in their earnings. It is understood that the word has been passed to the men to hold down the production until after the Coal Commission acts.

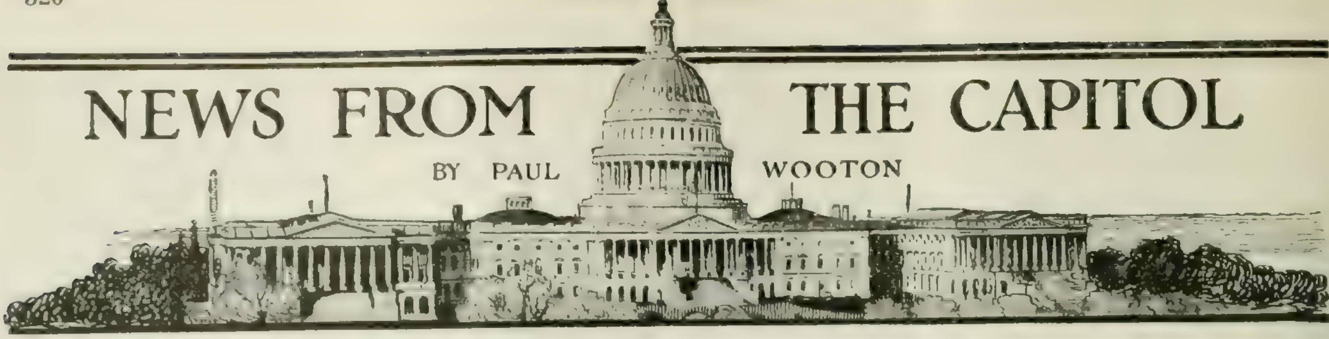
Miners in the Illinois field are threatening to change their occupation unless higher wages and shorter hours are granted. Propaganda to that effect is being circulated.

British Miners Want Cheaper Coal

Premier Lloyd George of Great Britain recently met a committee of mine workers who demanded that the Government immediately reduce the price of industrial and export coal, limit coal operators' profits not only in the future but retroactively and reduce the price of food and clothing, threatening that if these demands were not complied with they would demand an all-round increase of five shillings daily. That amount was before the war about $1.22, but now it is only 87½c.

Foreign Born Miners

Figures compiled for the use of Congress in connection with the discussion of Americanization legislation showed that of the total number of employees engaged in the mining of bituminous coal, 61.9 per cent were of foreign birth; 9.5 per cent were of native birth, but of foreign father; and 28.5 per cent were native born persons, having native born fathers.



NEWS FROM THE CAPITOL

BY PAUL WOOTON

Anthracite Cost and Prices

DETAILED costs of anthracite coal and a statement concerning margins, including profits, are contained in a pamphlet just made public by the Federal Trade Commission, referred to in last week's issue, entitled "Coal No. 2—Pennsylvania Anthracite." The figures cover costs for 1917 and 1918 and show an increase in costs from January, 1917, to December, 1918, of $2.02 (approximately 80 per cent) or from $2.64 to $2.47. Margins range from 54c. per ton in the first quarter of 1917, and 72c. in the second quarter of the same year, to 35c. in the third quarter of 1918, and 39c. per ton in the last quarter in 1918. It is quoted in part as follows:

"From 99 to 95 per cent of the total tonnage of the commercial production comes directly from the mines, and of the remaining 5 to 10 per cent the greater part is reclaimed from culm banks which were formed in years past through the dumping of coal which was then unmerchantable, but which has since acquired sufficient market value to be worth reclaiming. The product obtained directly from the mines is usually known as 'fresh mined,' that from culm banks is known as 'culm-bank washery,' or simply 'washery.'

Average Costs Shown

"The average costs and sales realizations per gross ton are shown below for five specified periods during 1917-1918, for operators who produced about 99 per cent of the total anthracite output in those years.

COSTS PER GROSS TON

Period	Labor	Supplies	General Expense	Total F o b Mine Cost	Sales Realization Per Gross Ton	Margin (Sales Realization over total F o b. Mine Cost)
Fresh-mined product of 65 operators						
January-April, 1917	$1 79	$0 41	$0 46	$2 66	$3 29	$0 63
May-August, 1917	1 96	44	46	2 86	3 65	79
September-November, 1917	2 03	53	49	3 05	3 82	77
December, 1917-October, 1918	2 57	61	53	3 71	4 18	47
November-December, 1918	3 41	81	62	4 84	5 20	36
Culm-Bank Washery Product of 23 operators						
January-April, 1917	35	16	34	85	1 81	96
May-August, 1917	43	22	30	95	2 26	1 31
September-November, 1917	44	24	35	1 03	2 50	1 47
December, 1917-October, 1918	65	29	33	1 27	2 91	1 64
November-December, 1918	93	39	35	1 67	3 32	1 65
Combined Fresh-Mined and Culm-Bank Washery Product total 84 operators						
January-April, 1917	1 71	40	48	2 59	3 23	64
May-August, 1917	1 83	44	47	2 74	3 57	83
September-November, 1917	1 90	53	51	2 94	3 76	82
December, 1917-October, 1918	2 38	61	53	3 52	4 10	58
November-December, 1918	3 10	77	62	4 49	5 03	54

"About 99 per cent of the total production of the larger sizes of coal (the 'prepared sizes,' which enter principally into domestic use) is obtained from the fresh-mined coal. About 75 per cent of fresh-mined coal consists of prepared or domestic sizes and about 25 per cent of small or 'steam' sizes, which are used in industries. Most of the coal recovered from culm banks consists of these steam sizes.

"In this report are shown the total f.o.b. mine cost, the sales realization received by the operators, and the margin between it, and the total f.o.b. mine cost. From this margin would have to be paid any sales expense, interest and Federal taxes, the remainder being available for surplus and dividends.

Cost of Fresh-Mined Product Increased

"Comparing the first period with the last period in the above table, it will be seen that the total f.o.b. mine cost of the fresh-mined product increased 82 per cent (from $2.66 to $4.84 per gross ton), the sales realization increased 58 per cent (from $3.29 to $5.20 per gross ton), while the margin decreased 43 per cent (from 63 to 36c. per gross ton).

"Average costs and sales realizations for operators producing about 42,000,000 gross tons annually (of which about 39,000,000 tons was fresh-mined product, and 3,000,000 tons was culm-bank washery product) are shown below for the fresh-mined product for 19 significant periods between Jan. 1, 1913, and Dec. 31, 1918.

COST PER GROSS TON

	Labor	Supplies	General Expense	Total f.o.b. mine cost	Sales realization per gross ton	Margin (Sales realization over total f o b mine cost)
January-March, 1913	$1 58	$0 43	$0 33	$2 25	$2 69	$0 44
April-August, 1913	1 60	0 35	0 34	2 29	2 60	0 31
September-December, 1913	1 60	0 36	0 36	2 32	2 71	0 39
January-March, 1914	1 71	0 38	0 39	2 48	2 70	0 22
April-August, 1914	1 57	0 30	0 36	2 23	2 60	0 37
September-December, 1914	1 56	0 31	0 36	2 23	2 73	0 50
January-March, 1915	1 71	0 36	0 42	2 49	2 69	0 19
April-August, 1915	1 58	0 29	0 37	2 24	2 59	0 35
September-December, 1915	1 57	0 30	0 36	2 23	2 73	0 50
January-March, 1916	1 63	0 33	0 42	2 38	2 79	0 41
April-August, 1916	1 77	0 36	0 44	2 57	2 95	0 38
September-December, 1916	1 72	0 40	0 45	2 57	3 14	0 57
January-April, 1917	1 76	0 44	0 44	2 64	3 18	0 54
May-August, 1917	1 91	0 48	0 46	2 85	3 57	0 72
September-November, 1917	1 97	0 58	0 49	3 04	3 74	0 70
December, 1917 – March, 1918	2 58	0 62	0 53	3 73	4 12	0 39
April-August, 1918	2 45	0 65	0 50	3 60	3 99	0 39
September-October, 1918	2 55	0 72	0 55	3 82	4 17	0 35
November-December, 1918	3.31	0 80	0 61	4 72	5 11	0 39

Note: The bill of material above is for a washhouse 3 ft narrower than the one given in the detailed drawing and for 6 rows of benches instead of 8; otherwise everything else is the same.

$50,000 Appropriated for Coal Commission

Without question the House Committee voted the $50,000 appropriation asked by the Bituminous Coal Commission for its expenses. The appropriation is to cover the salaries of the Commissioners, secretaries, chief clerk and other expert, clerical and other assistance; equipment and supplies, including law books, books of reference, newspapers and periodicals; traveling expenses, per diem allowances in lieu of subsistence, and for printing and binding done at the Government Printing Office.

As some time must elapse before the appropriation can be approved by the Senate and the President.

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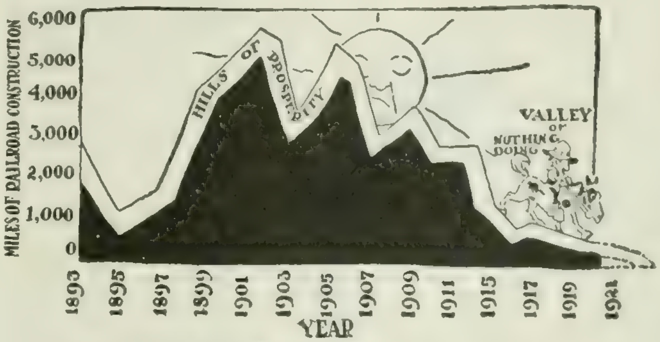
Our Growing Soft-Coal Shortage

DURING the twelve months of the year past we used 458,000,000 tons of soft-coal, or roughly 9,000,000 tons a week. This winter, business has picked up so prosperously that, with all the soldiers returned, there must be almost as great an industrial activity as during the war. The scarcity of labor certainly seems to prove it. While labor may not produce as much as before, it assuredly needs, for as many hours as working lasts, about as much power and as much heat or even more than it did when labor was more energetic.

Consequently, increasing man power compensating for decreasing working hours, the average consumption of fuel, the year through, is probably no less than it was during 1918, the closing year of the war, when it averaged about 11,100,000 tons a week. In making that estimate no deduction in the figure for consumption is made for the large stocks left at the end of the year 1918, because the reasons for these stocks were exceptional conditions—the mild winter and the failure of business following the armistice.

From the Hills of Prosperity to the Valley of Nothing Doing



In 1901 nearly 6,000 miles of railroad were constructed while in 1919 construction dropped off to 686 miles, and 689 miles were abandoned

It must be remembered that there were reasons why in 1919 the tonnage produced was small. The year commenced with heavy stocks, business was bad, and it ended with no stocks and everyone conserving fuel because of the strike and coal shortage. The past year was certainly abnormal. So looking at the subject broadly it may be safely assumed that our normal needs the year over at the present stage of prosperity are about 11,000,000, rather than 9,000,000 tons weekly.

Just now, we are faced with cold weather and bad working conditions. As a result the amount of coal needed is at its full winter height. Perhaps, if a guess may be hazarded, 14,000,000 tons a week is not too large a figure to put on our present consumption.

As a rule there are big stocks that are gradually eaten into during the winter. During the strike that marked the close of 1919 these stocks were considerably depleted. They were abnormally small, in any event. Consequently it is not surprising that we are faced by a bigger shortage than existed after the strike was concluded. Our output, owing to car shortage, averaged only 11,334,000 tons in the first three weeks of the year and totaled 8,531,000 tons in Christmas week.

The public breathed a sigh of contentment when the strike ended. Naturally, the consumer thought his difficulties were at an end, but the coal shortage was not cured by the cessation of labor trouble; it was only retarded from continuing to go from bad to worse as fast as it did while the strike lasted. The condition was none too good before the strike; it was disheartening at the end. Yet, with agitation in the New River and Pocahontas fields, the production of coal may soon decline and conditions get rapidly worse.

The public is comparing the output of this winter with that of other winters. But is that safe? We have produced more than in the winter of 1918-1919 because there was, at that time, a glut of coal, the market being overstocked and the winter being mild. We have sent more coal to market than in the winter of 1917-1918 because, then, a big storm prevented the railroads from functioning, because the nation had borrowed many expert and energetic workers from the railroads, and industry had taken from them all the roustabouts and maintenance-of-way men and because equipment ordered for America had been diverted to France, and a licentious red tagging of cars had demoralized traffic and filled every railroad siding.

But not with such times should we be content to make comparisons, for the winter of 1917-1918 was a time of heatless, workless days, imposed by authority and the winter of 1918-1919 a time of joblessness when the nation waited for the word that it was safe to buy goods. We do not wish such conditions to be resumed. Now a severe storm has made matters worse, and the prospects grow less hopeful hour by hour.

Our troubles did, indeed, begin with the strike, but, assuredly, cannot be said to end with the return to work. The evil has been done and only saving and diligence can cure it.

What Can Bankrupt Railroads Buy?

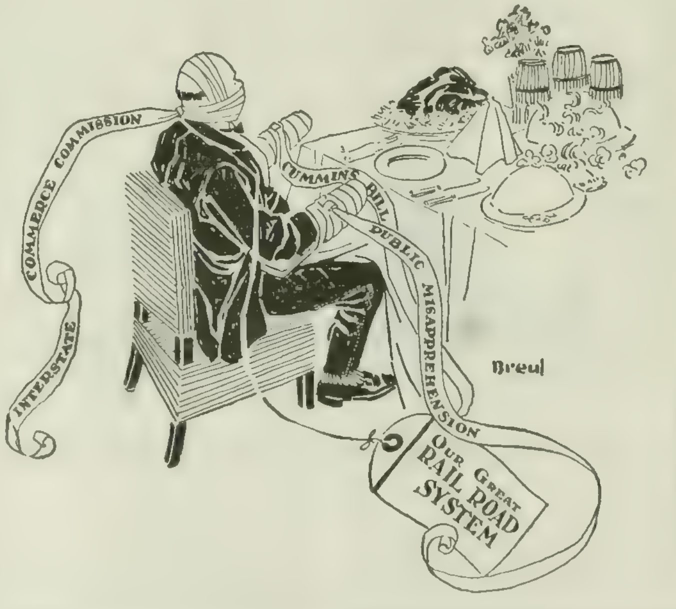
EVEN THE railroads are not certain as to the outcome of the immediate future. Coal men are wondering whether in the coming spring the railroads will be any more free of unfair practices and delayed purchases if the Government is going to make it impossible for the railroads to undertake financial reëstablishment. They naturally wonder whether a commission judging the affairs of corporations will be able to use good judgment, when the U. S. Railroad Administration, making its own rates, did not have political courage enough to make railroad operation profitable. If the commission keeps rates down till it sees how much they must needs be raised, and that is what the outgoing Railroad Administration has done, then the coal year will begin with bankrupted railroads and a penury so great that coal cannot be purchased.

Get a Declaration of Principles

WHEN A MAN declares for the regulation of the public utilities and requires that they be kept down to a profit of 5 per cent or thereabouts, get from him a declaration of principles. Request him to say that he believes that all industry should be kept down to that maximum or that he believes that only those whose services are universally helpful should be restricted to such a profit.

Ask him why sewers and roads, things so useful that they are being built by municipal corporations, are being paid for by bonds that are paying that amount of interest, 5 per cent, a rate necessary to obtain the money. And such bonds have the tax-free privilege added. Ask him also if an industry with an element of risk can borrow money, or, if it can, should borrow it, at the same rate of interest or a trifle more than is paid by a municipal enterprise in which there can be no risk so long as the community is solvent. Get from him a declaration of principles.

If Somebody Doesn't Feed Him He'll Starve to Death



Most men, having declared exactly what they think they believe, are astounded at the wrong thinking into which they have been led, not by logic but by self-interest. The baiters of corporations are people who do not think. They are temperamental people who feel without thinking. They well know, when the facts are brought to their attention, that they have been surprised not in thinking but in an envious and ungenerous feeling. They would not run any such risks for a small interest which only in fifteen or twenty years would double their money, and they think that there are others who should take that risk. Most of such persons, when they, themselves, invest want to be assured that they will double their money in a year. Of course, only rarely do they achieve their ambition.

They think they believe that the man who devotes his time or his money in a public service should consent to do it for far less than the man who does the same in a trade that does no one any good but rather tends to debauch the public. A little thought would protect them against such odd notions, but how rare is such thought!

Weighed on Its Own Scales

IT MUST be confessed that we are still sitting in judgment over Government ownership and trying it by the standard it set for itself. It promised us a new United States, and we have not seen it. Instead we see that Government ownership has at least left us in the same stranded situation that we would have been in if the railroads had been suffered to continue private management under the old system of excessive and unsympathetic public control.

The advocates now say that we should try two years more of Government ownership. It is asserted that the Government may be able, if its powers are extended, to go on operating without any further aggravation of our present misfortunes. We have endured Federal mismanagement for several months; with a little courage and self-negation we might endure it for a further period of time of at least equal duration.

The tune has indeed changed. It is now more nearly in harmony with the facts. We now know that Federal ownership is no better than Federal supervision.

Federal Trade Commission

"THE TRUTH, the whole truth, and nothing but the truth" would be a good maxim for the Federal Trade Commission. It stops short of the whole truth when in making its statements regarding the cost of producing coal it overlooks hazards, interest on investment, all kinds of taxes and other like charges. "It would be a fair day if it were not for the rain" must be a reflection of many an anthracite operator who sees in the report of the commission a differential between production and selling cost which he was somehow never privileged to put into his pocket. Seeing, however, that there is a differential between total ingo and outgo, the public and miner feel that here is something for which they may profitably fight. The chunk of "meat" is mostly bone, but those battling for it do not know that. It looks a goodly morsel, but when the gristle of investment and the ivory of income and excess profits taxation is considered, it is nothing but a dry, unappetizing bone.

Dr. Garfield admitted that he guessed wrong and put prices too low and declared that if the war had continued he would have had to have made an adjustment.

To quote the report: "The costs shown by the Federal Trade Commission are not intended to include any of the following items: Reserves for uninsurable hazards, such as mine fires, floods, cave-ins, squeezes, strikes or similar causes contributory to destruction of property and idleness at the mines (especially as revealed in greater overhead per ton by reason of lessened output); increased risk in the recovery of the capital involved in extra cost of development work under a normal régime in prices of coal; selling expense, where a selling organization other than the mine office force, is maintained in order to market the product; interest on the investment including borrowed capital; allowances for income and excess profits taxes."

DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

Electric Mine Haulage

Letter No. 6—Kindly permit me to express my opinion in regard to the question raised by Charles F. Sherman, *Coal Age*, Nov. 27, p. 861, in reference to the tendency of a mine locomotive to lift at the front end when pulling a load.

This is a common occurrence with all electric locomotives of the four-wheel, two-armature type. Mr. Sherman is correct in believing that the load hauled acts with a leverage to lift the front end of the machine, the rear axle being the fulcrum. This has the effect to relieve the front wheels of some of the weight resting on them and causes them to spin, although the wheels may not be lifted clear of the rails.

Now, my idea is when a locomotive is hauling a trip of cars on a level track there is what I would call a line of pull extending from the rear car to the front of the locomotive. When the motor is pulling its maximum load this line of pull is a straight line that resists bending. Consequently when the front wheels of the motor approach a low joint in the track the straight-line pull tends to hold up the front end of the machine. In hauling a lighter load the drag or drawbar pull is less and there is not the same lifting tendency.

The best that can be done to avoid the trouble is to have the locomotive drawbar at the same height as the drawbar of the cars. To lower the drawbar of the locomotive as Mr. Sherman suggests would have the effect of reducing the tractive effort of the rear wheels and increasing that of the front wheels, without any gain. Assuming that the locomotive is properly handled by an experienced motorman and that the load does not exceed the maximum haul, I would say the best remedy is to surface the track so there will be no low joints and all four wheels of the locomotive will bear equally on the track. GEORGE COLE.

Donora, Pa.

Authority of Shotfirers

Letter No. 2—Referring to the inquiry of "Shotfirer," Nortonville, Ky., *Coal Age*, Jan. 1, p. 26, relative to the authority of shotfirers, allow me to express the opinion that it is the height of folly for any mine committee or miner to arbitrarily question or condemn the practice of the shotfirer, whose action based on his judgment and experience concerns not only his own life, but the lives of all the employees in that mine. The shotfirer is held responsible by the state and by the company who employ him for the safety of the men working the mine. It is his responsibility alone, and any damage or disaster resulting from the unwarranted interference of the mine committee would mean but little to the committee.

The laws of many states protect the shotfirer in his extremely hazardous work, and give the competent man supreme authority to exercise his own judgment in the performance of his duties, in the belief that the minimum of risk is thereby taken by all the employees of the mine. The state has defined the qualifications of the shotfirer and, without question, his competency as well as his duties should be judged by a higher court than that of the mine committee.

FOOLISH OPPOSITION TO AUTHORITY

A miner would be very officious to attempt to supersede the authority of a shotfirer, fireboss or any other mine official, or to disregard the injunctions of the Bureau of Mines, which may cause some little inconvenience to the miners because of certain enforced practices that insure the greatest amount of protection to the health and lives of the workmen. No committee or miner can afford to be pig-headed or arbitrary with a shotfirer or other mine or state official, because it would only expose the objector to ridicule and lessen his chances of securing a hearing for his alleged grievances.

Placing one's self in contempt of the law does not make the authorities more kindly disposed toward a person, and no self-respecting and progressive shotfirer, who is fair enough to listen to reason, will be moved or bullied by the threats and demands of the miners bent on following the practice offering the least exertion, regardless of safety.

CAUSES OF FAILURES IN SHOOTING

Assuming that black powder is in use, if a good grade of stiff paper is employed a sufficiently long cartridge can be made up, and it will be rarely necessary to make two sticks or more. It is bad practice to use newspaper or other soft paper, in making up even a short cartridge, as the powder will easily cause the stick to bulge or break, in ramming the charge back to the end of the hole, and scatter the powder along the length of the hole. The charge is also liable to stick in the hole, making it both dangerous to tamp and to fire, besides lowering the force and efficiency of the shot.

In my own personal experience in shooting with black or permissible powders and using two or more sticks, I have rarely failed to have them all explode at the same time. When that was not the case, I attributed the failure to lack of care in preparing the sticks or inserting them, or tamping the hole. If the hole is thoroughly cleaned and the sticks all tamped back to the end of the hole, the chief source of failure is eliminated.

In the use of permissible powders, many failures are due to leaving the powder inside the mine till it has absorbed much moisture, or to the detonators being likewise affected. Few failures of the sticks not all going off at the same time have ever occurred in my experience, unless an extremely poor grade of permissible explosive was used. It is sometimes possible that one will get a poor quality of powder from even the best of the powder manufacturers, and this may be a fifty-pound box that has, perhaps, been damaged by moisture, in shipment or in storage.

In the case of the mine committee's contention, cited by the correspondent writing from Nortonville, it is probable that everybody else concerned would be willing to have the State Department of Mines decide the issue If the Department of Mines decides that it is a safe practice to tamp holes with loose powder or open cartridges, this should be considered the last word. However, it is very unlikely that the State will sanction a recommendation that places in jeopardy the lives of its miners, and especially the lives of the shotfirers, in order to gratify a whim containing no more merit than an occasional shot failure, perhaps due to another cause having no connection with the point in dispute.

Thomas, W. Va. MINE WORKER.

Unaccountable Explosion

Letter No. 1—No doubt many readers will be deeply interested in the account given by "Superintendent," describing an explosion that occurred under mysterious circumstances, in a mine at Buffalo, Ohio. It is stated that the mine was working the Upper Freeport seam of coal, in the Cambridge district; and the explosion occurred in a room where the pillar was being drawn by machine. A short time before the explosion occurred, the place had been examined and reported as "free from gas," by the fireboss.

Without going into the technicalities of the question, it can be said that similar trouble has been experienced by many mining men working under like conditions. The incident related serves a double purpose, however, since it emphasizes the danger that arises when undercutting coal with machines, besides suggesting the fact, often overlooked, that gas will frequently be produced in large volume through the cutting of a clay vein.

The fact is well known that coal-cutting machines make large quantities of fine dust, which renders the work of mining with machines more dangerous than pick mining, unless due precautions are taken to clean up the places and load out the fine cuttings as they are made. It is evident to any practical man that the condition surrounding the drawing of pillars with machines are such as to invite just such an explosion as this, described by "Superintendent."

For the sake of illustration, let me assume a mine having a pillar section where the coal has been worked all around, by rooms and headings. We will suppose that some gas is given off from the floor of the seam, but the circulation when driving the rooms was such that open lights have been used without danger. When the work of drawing back the pillars in this section is commenced, machines being used for the purpose, there will naturally be large quantities of fine dust produced and much of this dust will be found floating in the mine air.

Under conditions such as these it is quite possible that the air charged with gas and dust would be ignited on the open lights of the machinemen and, once ignited, the presence of the dust will certainly cause a violent explosion and produce the effect mentioned in this inquiry. The danger, in that case, would be all the greater if the machine should chance to cut a vein or fissure that gives off a fresh quantity of gas.

It is common, in mining practice, to find mines that have always been and are still considered as "free from gas," because they do not generate gas in sufficient quantity to be detected by a safety lamp. In many of these mines, it is possible to ignite the gas, however, by bringing a naked light close to a fissure coming from the bottom coal or from the floor of the seam.

Nevertheless, the gas rising diffuses rapidly into the air and gives little or no trouble in the working of the seam, provided the circulation is sufficient to dilute and carry away the gas generated. Mines such as these make the judgment of practical mining men often of more value than the results of the chemist in his laboratory. They are conditions that must be viewed from a practical standpoint.

In my experience, I have frequently been in places where it was possible to pass along the rib of a room and ignite small jets of gas coming from the seams in the coal, and yet no standing gas could be found at the face of such rooms, owing to the rapid diffusion of the gas into the air current, which made the use of open lights quite safe in those places. I have no fear but that many of my fellow mine officials will bear me out, by recalling similar experiences of their own. It will be interesting to learn of these conditions, which throw light on many unaccountable occurrences.

Where gas is generated in the floor of a seam, the use of electric coal cutters should be discouraged, as affording a dangerous element that is liable to cause the ignition of the gas before it has had an opportunity to diffuse into the air. The presence of the fine dust produced by the machines makes this danger all the greater.

It is also worthy of consideration that a sudden inburst of gas may have occurred due to a recent gob fall releasing some pent up gas in the abandoned area, with the result that it was ignited when the machinemen entered the place holding their lights down near the floor. There would seem to be no proof, in the account given, that this place was not filled with gas; and it may be wrong to assume that the gas ignited was accumulated at the floor of the workings.

Perryopolis, Pa. ROBERT W. LIGHTBURN.

Effect of Wire Gauze on Flame

Letter No. 1.—The effect of the wire gauze, which is one of the essential parts in a mine safety lamp and furnishes the needed protection when the lamp is surrounded by an inflammable or explosive mixture of gas and air, is a question that always creates much interest in the minds of young men studying the science of mining.

In the anthracite mine foremen's examination, *Coal Age*, Dec. 11, p. 902, the following question is asked:

> Are there any conditions under which the flame will pass through the gauze of a safety lamp?

In many of these examinations for mine foremen and firebosses, the question is asked:

> What prevents the passage of flame from within the lamp to the outer gaseous atmosphere?"

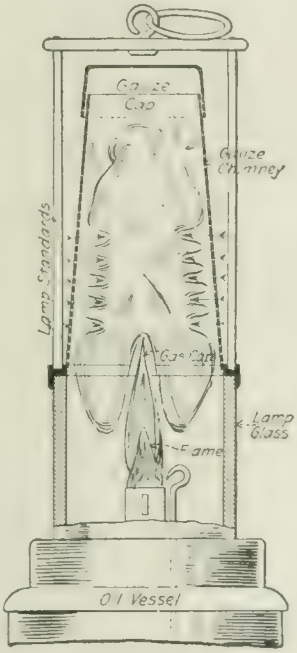
It is usually explained that the cooling effect of the wire gauze lowers the temperature of the gas burning within the gauze chimney and extinguishes its flame, as the gas passes out through the mesh. As stated in the answer given in *Coal Age*, however, "flame will pass through the gauze when the wire has become heated."

It must be remembered that there is an appreciable amount of space between the cool wire of the gauze and the flaming gas. This is due to the absorption of the heat from the film of gas-charged air in immediate proximity to the gauze, owing to the lower temperature of the wire. It is this absorption of heat by the wire that cools the gas close to it so that its temperature is too low for burning.

After many experiences, Sir Humphry Davy found that a wire-gauze mesh, consisting of 28 wires crossed by 28 wires and making 784 holes or aperatures to the square inch. was best suited for the purpose of a safety lamp. The fact that, today, 100 years later, the same mesh is the approved standard in safety-lamp construction, in this country and in England, shows how well and carefully he performed his work.

The size of the wire forming the mesh recommended by Davy is No. 28 B.w.g., which has a diameter of 0.014 in. A little calculation shows that this standard mesh provides an area of opening of 21.6 per cent, and 78.4 per cent of the mesh is solid metal. The air required to support the combustion of the flame of the lamp must enter through these small openings in the mesh of the gauze.

In the accompanying figure, I have attempted to show one of the effects of the entering air on the air within the chimney of the lamp. This air is not only charged with the products of combustion of the lamp flame; but it contains, besides, whatever gas is in the air surrounding the lamp and fed into the combustion chamber. As indicated in the figure, each little streamlet of entering air pierces the inside atmosphere like an arrow.



The practical effect of these entering darts of air is to pierce and cool the heated atmosphere of gas within the gauze and which may be flaming or ready to burst into flame. Thus, in immediate proximity to the gauze, the inner atmosphere presents a saw-tooth surface, which is the effect of the entering jets of air. The general effect is to increase the cooling power of the gauze and lower the temperature of the atmosphere in contact with it.

As the action and reaction progresses, there will be little bursts of flame that die out almost as quickly as they form, unless the lamp is exposed for too long a time to the gas-charged air surrounding it. In that case the effectiveness of the gauze and the entering air jets to prevent the passage of flame through the mesh is greatly reduced, until a temperature is finally reached at which they offer no resistance at all.

The cooling effect of metal on flame is clearly illustrated in the use that many firebosses make of the lamp pricker when making a test for gas. After lowering the flame as far as possible without extinguishing it, there is still a small bright yellow spot at its base, the light from which interferes with the ready observation of the flame cap.

In order to eliminate this bright spot, the fireboss pulls down the pricker of his lamp into the flame, until it rests on the wick or nearly so. The effect of doing this is to cool the temperature of the flame, so that the bright spot disappears and in its place is a non-luminous and hotter flame for testing. I should state that the temperature of ignition for methane is 1212 deg. F., and ignition of this gas only takes place when this temperature is reached and maintained for an appreciable period of time. The ignition of the gas is not instantaneous.

R. Z. VIRGIN, Asst. Professor of Mining,
Carnegie Institute of Technology.
Pittsburgh, Pa.

Co-operation Among Mine Officials

Letter No. 4.—I have read with much interest the letter of James Touhey, which appeared in *Coal Age*, Dec. 11, p. 900, regarding the need of co-operation among mine officials. Co-operation among the officials themselves and co-operation between the officials and their men are urgent factors where the best results are to be obtained.

Close practical interest is demanded of every unit where smooth running of the organization is desired. While this is needed today more than ever before, it has always been a recognized fact in the past that earnest co-operation is most fruitful of results. On the other hand, the marked absence of co-operation in an organization is harmful and disruptive, as it breeds distrust, fear, suspicion and contempt of one party or faction for the other.

Harmony, understanding and even sympathy sometimes mean more than anything else in the building up of an organization so efficient that it is practically immune to attack from radicalism and labor unrest. We can nearly always trace the absence of co-operation to the absence of a mutual understanding, or an unwillingness or aloofness and, later, open hostility, which is shared alike between the employer and employee.

CO-OPERATION NO BAR TO MINE DISCIPLINE

It is not necessary to confuse co-operation, with a leniency that breeds disorder in an intelligent system of discipline, through a laxity of authority that eventually defeats its own purpose. Intelligent discipline is always impossible without co-operation. For the enforcement of discipline, there must always be respect for authority and officials must create that respect if they are to retain their authority.

Beginning with one of the boon principles of co-operation a mine official should be able to readily mingle and mix with his employees, in order that he may at once disarm them of any suspicion or distrust. This is not possible when an official holds himself aloof from his men.

Some officials feel themselves so far superior to their employees that they consider it highly discreditable to their station to be even in close enough touch with them to properly perform the duties of their office. It would be well for such to remember that a certain familiarity does not breed contempt; but builds the foundation for a good strong organization and creates a uniform respect for discipline and authority.

It is a good habit, and one that is easily acquired, to speak to everybody, and to encourage and help those who are doing good work. Poor workers, not inherently so, have often become good or fair workers under proper handling. Nevertheless, if a man is a part of the human driftwood and will not or cannot work, he can be released without a verbal explosion, which only makes him worse and more vindictive than ever and his next employer finds him of little use and again he goes away with the feeling that he would like to tear everyone to pieces.

Ridding the Mine of Indifferent Workers Without Incurring Their Illwill

There is a way of discharging a man and still retaining his good will. Some officials have the faculty of discharging an unsatisfactory employee and making him feel that he is doing him a great favor. I have worked in mines where the miners were lax and careless in setting timbers and there was little discipline. Explosives were scattered around loose; the rooms were driven wide and off the points; and other flagrant violations of the law were observable.

I have listened to mine foremen fume, fuss and threaten their men in a manner that it seemed sure the men would lose their jobs and be sent to jail the next minute; but, in each such case, I have failed to notice that it brought about any improvement in conditions. On the other hand I have gone into mines where the foremen manifested good fellowship and mixed with and encouraged their men. In these mines, it was noticeable that but few if any violations of law and bad conditions were found.

It is a wise foreman that will say, "Mike, here, will never get his head cracked. His place will be timbered right to the minute when he gets this one set," at the same time indicating with a piece of chalk where a prop should have been set. In response, Mike would explain the reason for his neglect and proceed to set the post at once. A good foreman will always find a pleasing and conciliating way of calling men's attention to a breach of discipline. Such a foreman's organization is the acme of co-operation and efficiency, and represents the achievement of the highest possible results.

Thomas, W. Va. EFFICIENT.

Finding a Mine Door Set Open

Letter No. 20—I have followed this discussion closely and have wondered at the many different opinions in regard to an open trapdoor. After something like 30 years' experience in mining, I am led to condemn in the severest terms the general use of doors in mines.

It has often been a wonder to me how a mine door came to be called a "trap." There is no doubt in my mind, however, but that the name originated from the fact that all such doors are real "traps" and are certain to cause injury or death to someone, sooner or later. I only wish I could give statistics that would show a true record of the injuries and death of men, boys and animals, and the number of explosions caused by these doors. It is claimed that we have reached the progressive age in mining, and yet this discussion shows that the majority of mining men have little inclination to do away with this source of danger in mines.

Let me say, briefly, in reference to the points in question, that the only safe way for a fireboss to proceed, on finding a mine door set open when starting his examination, is to return at once to the surface and, taking with him a competent man and breathing apparatus for their protection, proceed to examine the section for the purpose of ascertaining if there is any fire burning therein. Then, return and close the door if everything is found to be safe. I would suggest that the fireboss write the word "danger" on the door and ask the foreman to have the door taken out and an overcast built or the circulation arranged so as to avoid the need of a door.

Regarding the other points in question, allow me to remark that a fireboss should never start to examine his section at the return end. There should be no need of giving a reason for this statement when one recalls the deadly effect of carbon monoxide or even blackdamp that may be present in the return air. Consider, for a moment, the danger that would arise if there was methane present in the air.

Even assuming that the fireboss carried only his safety lamp, he runs a risk of having it extinguished in the gas, or, possibly, igniting the gas when proceeding against the current. With his lamp extinguished, there is little chance for escape to fresh air. It would seem that what we need is a wider spread of the practical training of mining men along these lines, which are so essential to safety, and this training should be conducted in every mining district in the country.

Practice Condemned Angers Foreman

Not long ago, when working for the Inland Collieries Co., at Harmarville, Pa., I condemned much of the system employed in the mine, in respect to trapdoors, timbering and the handling of locomotives in haulage. For this, the mine foreman called me a "meddler" and used his influence to get me out of the mine. But, the superintendent realized that there was much truth in what I said. He knew that, some time before, I had left a mine after informing the mine boss that there was every probability that the place would blow up, which happened within a week after my leaving. Fortunately, it occurred on a Sunday when few men were in the mine and these we were able to rescue.

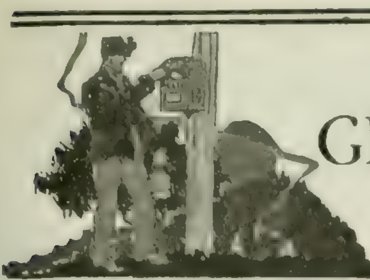
From my own knowledge, the past year has recorded many casualties as the result of trapdoors, poor timbering, improper systems of haulage and other details of mining. It is my belief that these accidents could be largely avoided by the proper education and training of all men in charge of underground work. Too often it happens that a long established custom results in disaster, because no one has dared to say that it was unsafe. For example, the hauling of powder in a mine car attached to a mantrip, as was the case in the accident at Wilkes-Barre, not long ago.

In closing, let me urge that the trapdoor will only cease to be a source of danger in mining when it is kept out of the mine. There is no economy in its use; on the other hand, it is a source of expense. The only way to get rid of a bad habit is to quit it, and my answer to this discussion is, to do away with the use of a trapdoor. C. W. ATKINS.

Kyle, Pa.

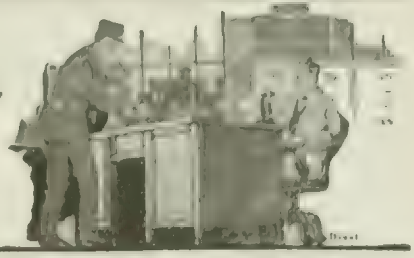
[This letter will close the discussion "Finding a Mine Door Set Open."—Editor.]

[Contributors sending type-written copy should make it double-space to permit of editing.—EDITOR.]



INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD



Shifting the Worker

An incident occurred not long ago, in connection with my work, and I would like to have the views of others in regard to the treatment I received at that time, at the hands of the mine superintendent. In this narration, I will endeavor to be as brief as possible and yet give the facts necessary to enable a just opinion. They are as follows:

An experience of 12 years, working at various jobs in and around coal mines, had enabled me to do almost anything required in the mine. At the time to which I refer, I was operating a substation and received a small salary, which was less than I could make at other work. For this reason, I wanted a change that would take me into the mines. As a motorman or a shotfirer I could make more money. For five years, I had filled the position of motorboss in another mine, but had been only a short time in my present position at the substation.

Knowing of my desire for other work, the mine electrician dropped into the station one morning and told me he had a job for me that would give me better pay. The work was bonding track with an arc welder. It was then Sunday morning and he told me he would like me to report for work Tuesday morning. I replied, "All right, I will see the boss tomorrow and get a transfer if he will give it to me."

The following morning, Monday, I got the nightman to stay in my place while I went to the superintendent's office. Finding the superintendent at his desk, I stated the case to him, explaining my desire for other work and better pay and asked him for a transfer. I explained that I had a large family and could not support them on the small salary of $110 a month. The job that had been offered me by the mine electrician paid 69c. an hour, which would mean an increase of at least $30 a month in my pay.

The superintendent began to curse and swear. He said, "I will not do any such d—— thing," and asked, "What will you do if I do not transfer you? It is against the rules of the company for a man to leave one department, for work in another." To this I replied, "I can get better work and more money by going to another company." The result was that the superintendent gave orders to the mine electrician that he was not to employ me on his work, and I quit the company and secured a position as shotfirer at another mine, although it put me to the expense of moving.

My own thought regarding this incident is about as follows: As superintendent of a mine and having one of the men apply to me for a transfer, under similar conditions, I would have answered him, "Well, I haven't got anyone to fill your place; but you stay on a day or two, until I can get a man, and I will see the electrician and have him hold the job for you, as I am glad that you can earn more money in another place." It will be interesting to learn the views of others, some of whom may have had like experiences with mine.

Fleming, Ky. A. H.

This is a fair question that will without doubt find an echo in the experiences of many ambitious and hard-working men, who are filling temporary places in hopes of being soon transferred to positions they are fitted to fill. *Coal Age* believes that men always make better and more efficient workers when employed at tasks to their liking and for which they are fitted. At the same time, all cannot be firebosses, or motormen or drivers. It is up to the worker to earn his advancement. Let us hear from many on this point.

Supporting Roof, Pittsburgh Seam

In view of the growing scarcity of mine timber, to which attention has frequently been called in *Coal Age*, it seems to me that it is not amiss to ask for the views of practical men in regard to methods that can be adopted for supporting the roof in mine workings when the time comes that the supply of props and other timber for this purpose fails.

In my opinion, this is a situation that we must all face sooner or later. It is particularly true of mining operations in the Pittsburgh district. As one who is deeply interested in the problem, I want to ask for the views of *Coal Age* and its readers. I would suggest that the discussion have particular application to the Pittsburgh thin vein and the Pittsburgh thick vein, both of which are under practically the same cover. The height of the coal in the two seams is, say 6 and 9 ft., respectively. The question is, how can the roof be supported, in working these seams, without the use of timber?

Perryopolis, Pa. INQUIRER.

This is certainly a timely subject for discussion. In some mining districts, the scarcity of timber is becoming acute. In numerous instances, operators of large mines, in districts where the timber supply has become depleted, have already resorted to the use of iron supports, consisting of T-iron and channel bars of specified sizes and dimensions.

This method of supporting mine roof has been called "steel timbering," and has given much success in its application. One of the chief points to be considered in steel timbering, is a suitable form of joint that will permit such frames or sets to be readily placed in position and taken down and moved when needed elsewhere. Steel timbering will also call for special consideration in order to give ample footrest where the bottom is soft, and to protect the metal from corrosion.

Coal Age will be glad to receive the views and suggestions of practical readers, many of whom have had valuable experience in this line.

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Miscellaneous Questions

(*Answered by Request*)

Ques.—What quantity of water will a double-acting pump deliver if the plunger of the pump is 4 in. in diameter and the piston speed 100 ft. per min.?

Ans.—The diameter of the plunger being 4 in., its sectional area is $0.7854 \times 4^2 = 12.566$ sq.in. The piston speed being 100 ft. per min., the plunger displacement is $12.566(100 \times 12) \div 231 = 65.28$ gal. per min. Now, allowing a water-end efficiency of 85 per cent, the quantity of water delivered by this pump would be $0.85 \times 65.28 =$ say, 55½ *gal. per min.*

Ques.—With 3 hp. we are producing 25,000 cu.ft. of air per minute; how many horsepower will be required to produce 60,000 cu. ft. per min., in the same airway?

Ans.—Disregarding any difference there may be in the efficiencies of the ventilators, the power producing circulation will vary as the cube of the quantity of air circulated, in the same airway. In other words, the power ratio will equal the cube of the quaittity ratio. Hence, calling the required horsepower x, we have,

$$\frac{x}{3} = \left(\frac{60{,}000}{25{,}000}\right)^3 = \left(\frac{12}{5}\right)^3 = 2.4^3 = 13.824$$

$$x = 3 \times 13.824 = 41.472 \textit{ hp.}$$

Ques.—What are the advantages of a double over a single hoisting engine?

Ans.—A double or duplex engine has two cylinders connected with crankarms set at right angles to each other on the drumshaft. The advantage of this arrangement is that the engine is never on dead center, but is alwaps able to start its load in any position of the crankarms.

Ques.—With a water gage of 5 in., we are producing 50,000 cu. ft. of air per minute; what will a 9-in. water gage produce in the same mine?

Ans.—Assuming that there is no change in the circulation of the air or in other conditions in the mine, the quantity of air in circulation will vary as the square root of the pressure or water gage. In other words, the quantity ratio is then equal to the square root of the water-gage ratio. Hence, calling the required volume of air x, we have,

$$\frac{x}{50{,}000} = \sqrt{\frac{9}{5}} = \sqrt{1.8} = 1.34$$

$$x = 50{,}000 \times 1.34 = 67{,}000 \textit{ cu. ft. per min.}$$

Ques.—(a) If a pressure of 2 lb. per sq. ft. produces a velocity of 200 ft. per min. in an airway, what pressure will be required to produce a velocity of 400 ft. per min., in the same airway? (b) What pressure will produce a velocity of 600 ft. per min., in the same airway?

Ans.—(a) The pressure producing circulation, in a given airway, varies as the square of the velocity. To double the velocity in the same airway, therefore, will require four times the pressure; or, in this case, $4 \times 2 = 8$ lb. per sq. ft.

(b) To increase the velocity three times will require $3 \times 3 = 9$ times the pressure; or, in this case, $9 \times 2 = 18$ lb. per sq. ft.

Ques.—A cross-entry that was driven up from a main entry having caved in, it was decided not to clean up the cross-entry, but to start a road 300 ft. back on the main entry in a direction to strike the cross-entry 800 ft. in from its mouth. Using a tape for that purpose, how can sights be given on the entry for driving this cutoff?

Ans.—Assuming that the cross-entry runs at right angles to the main entry, the cutoff when driven will form the hypotenuse of a right triangle whose two sides are 800 and 300 ft., respectively. The *direction* for driving the cutoff, starting at a point 300 ft. back from the mouth of the cross-entry, on the main entry, can be indicated by drawing a right triangle on the roof at that point. The shorter side of this triangle must correspond to the direction of the main entry and the longer side be at right angles to it. The ratio of these two sides is 300 : 800, or 3 : 8. That is to say, for every 3 in. on the line parallel to the main entry, 8 in. must be measured on the line at right angles to it. The line joining the extremities of these two measurements, or the hypotenuse of the right triangle, will indicate the direction for driving the cutoff.

Ques.—An airway 4,500 ft. long, 4 ft. 3 in. high, and 9 ft. 3 in. wide, is passing 54,500 cu. ft. of air per minute; what is the velocity of the current?

Ans.—The sectional area of this airway is $4.25 \times 9.25 = 39.3125$ sq.ft. The velocity of the air current at the point where these measurements were taken is, therefore, $54{,}500 \div 39.3125 = 1386+$ ft. per min.

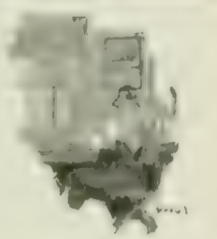
Ques.—Explain the formula, $pa = ksv^2$.

Ans.—This is the formula for calculating the total resistance ($R = pa$) in an airway where the rubbing surface is s and the velocity of the air current v. In the formula, k is the unit of resistance, or the resistance offered by 1 sq. ft. of rubbing surface to an air current having a velocity of 1 ft, per min. The resistance varies with the square of the velocity. Therefore, multiplying the unit resistance (k) by the rubbing surface (s) and that product by the square of the velocity (v^2) gives the total resistance or total pressure concerned in moving the air through the airway.

Correction

The last two lines of the first paragraph of the answer to the first question, *Coal Age*, Jan. 29, p. 246, should read: the assumed velocity of the air current $450 \times 100 \div (100 - 3) = 463.9$ ft. per min. Then, the last two lines of the following paragraph would read: the quantity of air passing is $72 \times 463.9 = 33{,}400$ cu.ft. per min.

FOREIGN MARKETS AND EXPORT NEWS



Wasteful Methods of Working in India

A report has been made by Mr. Treharne Rees to the Secretary of State for India on the working of the Indian coal mines. He has made a survey in accordance with the suggestion of the Industrial Commission, with a view to introducing economies in mining methods. Mr Rees, who is a partner in Messrs. Forster Brown and Rees, of Victoria Street, London, S W., comes to the conclusion that one-third of the coal in Indian mines is being lost, owing to bad methods of working, and that three-quarters of a million tons are lost annually by wasteful power working of the collieries.

He notes the absence of supervision, such as inspection by agents of land owners or by Government officials to prevent wasteful methods of working, and the lack of covenants to work economically and guard property for the future. The result has been that in a large number of properties the colliery has been worked chiefly with the object of producing outputs at the earliest possible moment, without due consideration being given to the most efficient methods of laying out collieries for the future.

The waste is abnormally high, and he concludes that the quantity of coal destroyed or lost by present methods is not less than one-third of the total amount in situ. The longwall system is generally unsuitable, while in thinner seams coal-cutting and coal conveying machinery should be more widely introduced. The time has arrived when companies have to consider the winning of more valuable coal at greater depths. Sinkings are at present actually being made to win seams lying at varying depths of about 1,000 ft. Mr. Rees points out that over-pressure of superincumbent strata at these depths will make pillar working still more wasteful. In view of the comparatively shallow depths from which coal is at present won in the two main fields at short distances, he considers that the average annual consumption of fuel for producing power, more than 10 per cent of the total annual output, is excessive.

It should be reduced to not more than an average of 5 per cent by the application of electricity for winding, hauling, pumping, etc. Several of the larger companies have erected electric generating stations, and have effected thereby considerable economies. But steps should be taken to insure the more general use of electricity, and those companies whose mineral areas are too small to admit of the initial outlay necessary for individual generating plant should have facilities for obtaining suitable electrical power at reasonable rates for use at their mines.

A general survey should be made of the Jherriah and Raniganj coal fields, and central generating stations should be equipped on a large scale to centralize work as far as economically possible. The system in India is criticized under which the mine sidings are owned and maintained by railway companies and constructed mainly at their expense. The system prevents a colliery company, without permission of the owners of these connections, from obtaining access to another railway company's system, causing in some instances detour of traffic.

If the colliery companies owned their own branches, ran their own locomotives, and became responsible for any damage accruing to railway company's wagons while on colliery property, railway companies would be safeguarded and large quantities of coal would be liberated for working. Coal left for support of colliery branches would be reduced by these means, and also by the colliery companies centralizing their loading depots.

With the erection of central electrical power stations there should be sufficient power not only for working collieries, but for conveying coal to central loading depots and electrifying railway sidings and branch lines within coal fields

Most serious efforts should be made to increase the number and improve the type of wagons in the main coal fields. Mr Rees proposes the setting up of a controlling authority to supervise negotiations for leases. To insure better supervision of coal extraction, he suggests that all coal when brought out of the mine should be weighed and an accurate account recorded in books at the colliery. The labor force is described as insufficient and unambitious. Methods are suggested for improving the conditions of labor, so as to settle non-fluctuating industrial populations near the mines.

He also recommends modern coking, the utilization of byproducts, and the manufacture of briquettes. He states that the introduction of hydraulic packing will increase the cost of production of coal from seams in which it is employed to the average extent of 1 rupee per ton.

Foreign Freight Rates

During the past week the market has softened considerably to all destinations outside of the West Indies. Many additional steamers were chartered to transport coal to ports in South America and Europe at very favorable rates and conditions, says W. W. Battie & Co.'s coal-trade report.

Because of the continued demand for coal in this country, the demands of the export shipper are not favorably met. A terrible storm such as occurred the past week was another hindrance in last week's shipping.

Export licenses are still very difficult to obtain. To West Indian ports the rates were firmer the latter part of last week owing to the report that licenses already issued would be withdrawn unless steamers were declared against these licenses.

Shipping Board rates by steam are as follows:

FOREIGN FREIGHT RATES

	Rate	Tons Displaced
Genoa Leghorn	$26 50	1,000
Spezia Savona	26 50	1,000
Piraeus	28 50	1,000
Trieste/Venice	31 00	800
Algiers	26 00	800
Cadiz Bilbao	23 50	1 000
Barcelona	26 00	1,000
Antwerp Rotterdam	22 50	1,000
Lisbon	22 50	1,000
Gothenburg	24 00	1,000
Marseilles	26 00	1,000
Stockholm	26 00	800
Hamburg	25 00	1,000
Rouen	23 00	1,000
Malmo	25 00	800
Pernambuco	16 00	500
Bahia	16 00	500
Rio	17 00	1,000
Santos	18 50	600
Rio Grande do Sul	19 50	500
Buenos Aires or	16 00	1,000
La Plata or	or	
Montevideo	17 50	750
Rosario	19 00	750
Bahia Blanca	17 50	1,000
Havana	7 50	600
Sagua	9 00	300
Cienfuegos	9 00	500
Cardenas	9 00	300
Caibarien	9 50	300
Guantanamo	9 50	300
	9 00	400
Manzanillo	9 50	300
Bermuda	9 00	300
Bermuda p. c. and [illegible] free		
Kingston	9 50	400
St. Lucia	11 00	500
Barbados	11 00	500
Santiago	850	500
	9 00	400
Port of Spain, Trin	11 00	500
Curacao	10 50	500
Free p. c. Curacao		
Demerara	13 00	400
St Thomas	10 00	500
Nitrate Range	12 00	500

All above rates gross form charter.

Holland's Coal Imports Increased

Holland's consumption of coal has constantly increased during the past years, states a recent report of the Geological Survey. In 1901 about 5,000,000 tons sufficed; in 1905 over 6,000,000 tons were consumed; in 1913 about 10,000,000 tons were required, and this figure is now accepted as the normal requirement of the country. Of this amount approximately 8,500,000 tons were imported bituminous and 1,500,000 tons were anthracite, practically all the latter being home production.

The normal consumption of coal, in tons per annum, was distributed approximately as follows:

Railroads	1,200,000
Bunkers in Dutch ports	1,200,000
Gas factories	1,500,000
Other uses	6,100,000
Total	10,000,000

The following table indicates the net imports of coal into Holland. Germany supplied much the greater part of these imports, approximately 70 per cent coming from that country just before the war. England supplied about 20 per cent, and about 10 per cent was credited to Belgium.

MONTHLY IMPORTATION OF COAL INTO HOLLAND FOR NINE MONTHS, BEGINNING OCTOBER, 1917

Coal, Lignite and Briquets	1917, Oct	1917, Nov.	1917, Dec	1918, Jan.	1918, Feb.	1918, Mar.	1918, Apr.	1918, May	1918, June
Germany	116,252	255,521	195,512	285,698	201,285	191,039	49,705	3,637	14,385
Belgium	5,047	961	303	20	191	288	8,937	595	328
Great Britain	15,111	34,394	19,636	35,891	28,713	10,277	1,272	1,742	
United States							110		
Total	136,410	290,876	215,451	321,609	230,189	201,604	60,024	5,974	14,713

COAL SITUATION IN HOLLAND, 1912-1918

	1912	1913	1914	1915	1916	1917	1918, Jan.-June
Total net imports	7,432,596	8,264,029	7,334,207	6,712,334	5,597,748	2,603,353	788,822
Domestic production	1,680,146	1,744,140	1,929,000	2,862,000	2,586,280	3,018,726	1,707,352
Total available for consumption	9,112,742	10,008,169	9,263,207	9,574,334	8,184,028	5,622,079	2,496,174

Nova Scotia Coal Co. Acquires Another Company

The official announcement is made of the acquirement of control of the Acadia Coal Co. by the Nova Scotia Steel and Coal Co. During the administration of the Belgian interests, which the Scotia people have now taken over, the property of the Acadia coal field was more thoroughly and more scientifically prospected than it had ever been previously, and the Belgian management did unusually good work in a coal field of extraordinary complexity.

The number of coal seams already proved in the Stellarton area controlled by the Acadia Coal Co. is 16, but there is very reasonable possibility that others may be encountered at lower depths. Another undeveloped asset of this field is the oil shales and oil coals which are associated with the coal seams in much profusion. The Stellar, or oil coal seam (from which the town of Stellarton receives its name is a case in point.

English Premier Meets Miners' Committee

The Parliamentary committee of the Trade Union Congress and the executive committee of the Miners Federation will be received by Premier Lloyd George tomorrow, states the *Sun and New York Herald* dated Feb. 4, and will ask for the nationalization of the mines, railways, shipping, shipbuilding and other key industries covered by the resolutions of the Glasgow conference, which was called to discuss the high cost of living and electoral reform.

In the miners' case nationalization would eliminate 1,500 colliery owners and 400 royalty owners, and the mines could be worked on a basis of wholehearted coöperation by both technical and manual workers and greater productive efficiency could be brought about.

In coalition circles it is believed the Prime Minister will reply to the delegates that the Government has no intention of adopting nationalization and will announce his readiness to introduce legislation insuring that the workers shall have a share in the control of industry and a share in the profits based on actual production. It is expected the committee will refuse this offer pending a decision by the Trade Union Congress on Feb. 28, and at the same time will demand an increase in wages of $1.25 a day. The trend of feeling in railway circles indicates that the men are not satisfied with the recent settlement, and already the lodges are discussing the possibilities of new demands, the chief of which will be the immediate nationalization of the railways.

Full Industrial Demand in Scotland

The effect of the holidays has practically worn off, states a recent report in the *Colliery Guardian* and business is once again very antive. Industrial demands are pretty full. Household requests are very large, but unfortunately supplies are limited, and great difficulty is experienced in meeting ration allowances. Fair shipments are going to Irish ports, chiefly of industrial qualities, consignments of house coal being very small. A fair amount of foreign business is in the market and Allied orders too are pressing.

The clearances during the past week, however, were almost entirely oastwise. Ell coal and splint are very busy and still realize about [illegible], and [illegible] neutral, and 76s. and 72s. allied respectively, with treble nuts 78s. 6d. neutral, and 65s. Allied f.o.b. Glasgow. Shipments amounted to 61,961 tons, against 55,287 in the preceding week, and [illegible] tons in the same week last year.

With a Government-fixed price on a much higher level there is every inducement for operators to withhold deliveries on contracts and to the best of their ability take care of orders on which the prescribed price can be charged. In many instances the railroads are insisting upon their full requirements before cars are placed for other buyers, this under threat of not hauling the coal away, and in still other cases cars are supplied only for railroad fuel. The whole railroad-coal situation is certainly in bad shape, and because of this a large number of consumers in this territory are utterly unable to count upon any current receipts [illegible] Tidewater ports

The sustained cold weather through most of January has also upset many plans. More coal was burned than it was expected would be required and together with confiscations and generally light shipments there is slightly less complacency among buyers than was the case a month ago. Stocks are being gradually depleted, but there is nothing like the alarm among industrial steam users that is so evident among railroad fuel agents.

There are quiet efforts to secure spot coal, in some cases to replace contract shipments that have been confiscated, and in still other cases, usualy of small plants, there is threatened distress, but on the whole there is even now suprisingly little snap to inquiry.

At the New York and Philadelphia piers there are only small tonnages available. Confiscations have been general and shippers of low volatile coal who were hoping to profit by the premium allowed for export coal are now obliged to bill to the railroads at the Government price.

English Colliery Deputies Discuss Grievances

Important matters were discussed in London at the Coal Mines Production Department on Wednesday affecting the wages and hours of colliery officials, states the *Colliery Guardian*, when a deputation of the Federation of Colliery Firement, Deputies, and Examiners of Great Britain waited upon the Coal Controller's representatives. The questions in dispute related to the demands of deputies employed in collieries at Yorkshire in respect to the hours of their working shifts.

The Controller's representatives promised to give the case their immediate attention. The demands of the Yorkshire deputies, if sanctioned, will mean an increase of 1s. 6d. a day upon base rates, which would thereby cover the additional working time involved by the present effect on hours.

Hull Coal Trade for December

Figures which have been extracted from the statement compiled by the Hull Chamber of Commerce and Shipping, from a return made by the coal inspector to the Corporation, W. Herbert Truman, state that during the closing month of last year 236,955 tons of coal were consigned to Hull from the collieries, as compared with 177,402 tons in December, 1918. Of this amount, 226,732 tons were transported by rail and 10,223 tons by river. The total quantity imported into Hull during the completed year ending Dec. 31 was 2,101,648 tons, as against 2,605,602 tons in 1918. The totals for the last 12 years were as follows:

Year	Via River	Via Railway	Total
1908	665,256	5,241,624	5,906,880
1909	633,608	5,467,032	6,100,640
1910	539,368	6,335,784	6,875,152
1911	522,392	5,933,592	6,455,984
1912	462,636	6,549,342	7,011,978
1913	517,488	7,428,477	7,945,965
1914	431,944	5,220,689	5,652,633
1915	261,346	4,406,387	4,667,733
1916	217,849	3,072,432	3,290,281
1917	195,431	2,616,925	2,812,356
1918	160,930	2,444,672	2,605,602
1919	164,080	1,937,568	2,101,648

Swiss Coal Situation Improved

During the month of November, 1919, states Trade Commissioner H. Lawrence Groves, Geneva, in *Commerce Reports*, the importations of coal into Switzerland, and the sources from which it came, were as follows: 17,262 tons from the basin of the Saar; 14,577 tons from the basin of the Ruhr, of which 11,464 tons came in under the 6-months' coal agreement that is now in operation between Switzerland and Germany; 3,779 tons from the basin of the Rhine; 16,712 tons from Belgium, 7,349 tons from France, 13,689 tons from England, and 89,934 tons from the United States. The total for the month was 163,302 tons. In the corresponding month of 1918 the imports were only 79,188 tons.

The notable increase has been brought about largely by the shipments from the United States, but, in spite of the recent availability of American coal for the first 11 months of 1919, the imports were only 1,468,135 tons, according to the information which has just appeared in the Swiss press, as against 2,103,915 tons for the corresponding period in 1918.

However, the coal situation in Switzerland appears to be better than in any of the neighboring countries, and, with the continuation of the present rate of importation the country should be able to get through the winter without serious difficulties.

The supply of industrial coal appears sufficient to avoid any cause for immediate alarm. The greatest shortage appears in the quantities available for household purposes; but the rationing of coal was abandoned some months ago, and there appears to be no immediate need or prospect for reviving this system.

General License for England's Exports Issued

The English Board of Trade announces that, with a view to the decentralization of coal export control, an open general license has been issued, with effect from Thursday, Jan. 1, 1920, states the *Colliery Guardian*, permitting the export of coal, coke and manufactured fuel to all destinations abroad except Russia, Germany, Hungary, Austria, Turkey, and Bulgaria, subject always to the approval, previously obtained, of the Controller of Coal Mines, or his duly authorized representative, and subject to shipment being made in a vessel approved by the Commissioners of Customs and Excise or their officers.

The Customs authorities will require pre-entry to be made in all cases; and at ports where there is a duly authorized local representative of the Controller of Coal Mines, the approval referred to above will be signified by his indorsement on the pre-entry form, which must be presented to him for the purpose, before shipment.

Where shipment is proposed to be made from a port not included in the list given, it will be necessary for application for the Controller's approval to be made to the Export Branch of the Coal Mines Department in London. Similarly, shipments from all ports in the United Kingdom to the destinations excluded from the purview of the general license must still be covered by an export license from the Coal Mines Department.

German Troops Check Miners' Strike

The expected strike this week in the coal regions has been prevented by the strategy of the Government, which moved large numbers of troops to the neighborhood of the mines with orders to arrest immediately any workman who attempted to lay down his tools at the end of the six-hour work shift, for which the miners were to strike.

All the railroad shops also have reopened on a piece work basis after the lockout, and the Government reports that work is progressing peacefully.

Coincident with this announcement *Zeitung am Mittag* declares that the exceptional measures of the Government while they may be toned down somewhat, will remain in force until the elections. The right of public meeting will be extended within certain limits, and suppression of the press will be only for a defined period.

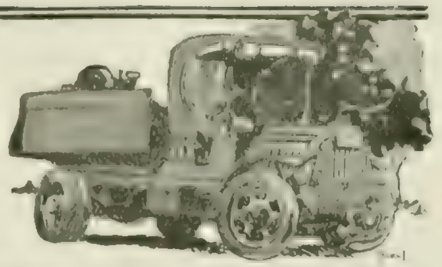
Danish Coal Imports

In times of peace Denmark obtained most of its coal and coke from the United Kingdom. The difficulties of ocean transportation made it necessary to import coal from Germany. This explains the enormous increase from $2,520,000 to $27,599,000 in the imports of "Coal and other raw minerals." In 1913 Denmark imported from Germany only 362,920 metric tons of coal, coke, briquets, and cinders, valued at $2,000,000; in 1917 these imports aggregated 1,257,467 metric tons, valued at $25,844,000.

French Coal Situation

Coal shortage remains acute in France. The great rains have caused water transport to be almost impossible, and railway transport has not improved. Among other impediments is a combined strike, states a recent report in the *Colliery Guardian*, of the *peniche* owners and of the tugboat mechanics whch has started at Rouen, which is full of coal.

COAL AND COKE NEWS



Charleston, W. Va.

Greater car shortage on Chesapeake & Ohio than any other road in the state. Few mines operate more than two days in the last week in January. Embargoes removed. Car shortage most acute in Kanawha field; production for last week of January only 60,000 tons. General strike in New River field materially reduces output of coal. Strike to force return of "check-off" system.

While car service on the Chesapeake & Ohio had been extremely poor througout the earlier weeks of January, it was worse by far during the last week of that month than at any other time not only during January but in recent months. The supply on Monday, Jan. 26, was far below the usual Monday supply so that it was not surprising, during the remainder of the week, to observe quite a serious shortage of equipment. Less than half enough cars were furnished, in fact, for mines on the Chesapeake & Ohio in this territory, the supply averaging not more than 25 per cent during the last three days of the month.

So far as it was possible to determine, the Chesapeake & Ohio had less cars available for coal loading than any other road operating in the state, even though there was also a shortage on other lines. On branch lines the supply of cars fell as low as 26 per cent, according to authentic reports. Under such conditions few mines were able to operate more than two days out of the week, so that the output of fields in this part of West Virginia fell below 50 per cent of capacity. Weather conditions were far more conducive to larger loadings and to the better movement of loads and empties than during the previous week. Despite such improvement in the weather, however, there was little or no improvement in service, motive power continuing to be far short of requirements.

Embargoes in force earlier in the month had been removed by the beginning of the last week of January and had there been a larger production there would have been a heavier Western tonnage. The curtailed production also had the effect of decreasing export shipments.

Production in the Kanawha region, during the week ended Jan. 31, was seriously crippled through a shortage of empties, as acute as has been witnessed at any time since the severe weather of 1917-18, mines without number throughout the region finding it necessary to suspend operations because of absence of loading facilities. Few if any mines in the field were operated more than two days out of the six. Toward the latter part of the week not more than 10,000 or 11,000 tons of coal were being loaded per day in the entire Kanawha field. It is estimated in fact that production for the entire six days did not reach more than 60,000 tons.

In some parts of the region the supply was as low as 25 per cent. The situation has become so serious, in fact, in the Kanawha as well as in other regions, that traffic managers are being employed with a view to going into the subject of car supply more thoroughly and finding out just what the trouble is.

Under date of Jan. 26, notice was received in the Kanawha field that exports, in so far as that field was concerned, would be allowed only where shippers could show that boats would be available by a certain time after shipments were made. That of course tended to cut down the export tonnage.

Between a serious shortage of cars and a general strike in the New River field, affecting 26 different operations at one time, during the final week of January, production was materially reduced in the region mentioned. Of course with a strike in effect at a number of mines, the need for cars was not so pressing as it would have been had all mines been in operation. Production was limited to about 90,000 tons. With exports still limited, more New River coal was finding its way westward than is usually the case when the movement of such coal is unrestricted. The New River field was affected to some extent also by inadequate motive power. The strike in this field during the early part of the week affected only three mines. However the middle of the week found at least 16 operations affected, and by the end of the week the number had grown to 26. The strike was preconcerted and a part of an effort of the leaders in District 29 to force a return of the "check off" system of some of the New River operators. District officials of the United Mine Workers were unable to induce a general walk-out in the field.

Bluefield, W. Va.

Last week of January brings improved car supply in southern West Virginia. Norfolk & Western only road here showing improvement. John L. Lewis determines to organize non-union fields here. Virginian Ry. mines work 3½ days and Chesapeake & Ohio mines two days a week. Winding Gulf feels shortage; Tug River and Pocahontas fields increase output.

In a part of the smokeless and high-volatile areas of southern West Virginia, there was a slight improvement as compared with conditions during the week ended Jan. 24, the last week of January bringing a somewhat better car supply at least at Norfolk & Western mines. That appeared to be the only road reaching into the coal regions in the lower part of the state where there was any improvement, however, and production continued to be far below normal even on the Norfolk & Western.

Usually cars are less plentiful during the last half of the week than earlier in that period, but in that respect conditions were reversed, as January came to a close, in southern sections, loadings being nearer normal in several fields during the last three days; the car supply, in fact, being not far short of normal on one of those days. Weather conditions, for one thing, were more favorable to the movement of traffic and the Norfolk & Western was better able to accept empties from western connections at junction points previously congested.

Coal men in the southern part of the state were considerably interested in the expressed determination of acting President John L. Lewis to organize all non-union fields in southern West Virginia. Mr. Lewis was in Bluefield during the last two days of January.

Severe blows were dealt the mining industry in the Winding Gulf field during the final week of January owing to the scarcity of empties in the field. Insofar as the Virginian Ry. was concerned, that road was able to furnish only enough empties to keep mines on its line in operation for 3½ days during the week. Conditions were even worse at Chesapeake & Ohio mines, operations on that road averaging only two working days out of the six. In other words Virginian mines were operating on about half time and Chesapeake & Ohio mines on one-third time. Such a curtailed car supply made serious inroads on the tonnage shipped from the Winding Gulf region and had pretty well taken the starch out of the industry in that particular district, companies being utterly unable to take advantage of present market opportunities, either at home or abroad.

While the output of the Tug River field was increased during the week ended Jan. 31, the increase was slight, only 61,700 net tons being produced. In other words the mines of this field were only mining about two-thirds of capacity, working on an average of only four days a week. Such conditions are not only injuring operators financially but are creating a spirit or unrest among the miners, and operators find it difficult to understand why there should be any shortage, in view of the fact that congestion has been relieved, unless it is that the coal cars are being used for storage purposes and that there is indiscriminate diversion. Not only are export shipments limited by the curtailed tonnage, but it is impossible to keep up with contract requirements.

The curve of production in the Pocahontas field was upward during the last week of January, mines in that field loading 295,540 tons or about 40,000 tons more than during the week ended the twenty-fourth; yet the failure of the Norfolk & Western to supply an adequate number of cars was responsible for the loss of 132,000 tons, a reduction, however, of about 50,000 tons in the loss as compared with that of the preceding week. During the first few days of February, mines were only operating on a half-time basis, since mines were able to secure only about half enough cars. The coke production in the Pocahontas region was somewhat in excess of the previous week, the tonnage of coal coked amounting to 14,000. Up until the end of January influenza had not been prevalent enough to interfere with the mining of coal

Huntington, W. Va.

Absurdly low tonnage for Logan field in last week of January. Similar shortage in Guyan production. Logan operators' commission goes to Washington to secure relief from Railroad Administration. Chesapeake & Ohio weekly movement of cars.

While the mines of Logan field managed to produce 13,000 more tons of coal during the final week of January than during the previous week, yet the output was still short of 50 per cent of capacity, reaching only a total of 145,000 tons; this tonnage is absurdly low for the Logan region where the average output during the strike, for instance, was nearly 250,000 tons a week. The best index to conditions in the Guyan field, however, was found in the increasing loss from car shortage, a total of 236,000 tons having been lost from that cause alone —an increase of 32,000 tons.

Thus it will be seen that the car shortage in the Guyan field was most grave and was playing havoc with mining conditions in that field. At no time during the week was that maximum production over 30,000 tons a day. During the last two days of the week the output was less than half of the figures just given. As the shortage grew worse and worse, a hurry-up call was sent out to the operators and a special committee of Logan operators was sent to Washington to secure some relief from the Railroad Administration; the committee made the complaint that although mines west of the Ohio River were receiving a fairly adequate supply, as shown by Geological Survey reports, yet Chesapeake & Ohio mines were limited to less than a half supply. Some assurances of relief were given, but the committee was not very hopeful of any improvement in the transportation situation.

There was an unusually heavy demand for Logan coal and for gas coal especially, but the supply was so disproportionate to the demand that producers were utterly unable to even keep up wth contract deliveries. The continued shortage is playing havoc with their business, not to speak of creating dissatisfaction among the miners, and some connection is seen by operators between the pronounced car shortage in non-union fields and the campaign about to be launched for the organization of such fields.

Another index to curtailed production was furnished in the weekly movement of cars on the Chesapeake & Ohio system, only 9,087 cars of coal having been handled on the whole system during the last week of January against 9,543 during the previous week; this represents a decrease of 456 cars, the decrease in tonnage—22,800 tons —being the difference between 477,150 and

454,350 tons. During the week ended the twenty-fifth, 6,072 loads were handled by the Chesapeake & Ohio through Clifton Forge, Va., for the East, the eastern movement representing about two-thirds of the total tonnage handled. The average eastern movement for each day of the week mentoned was 867 as compared with 664 cars per day average during the same week of 1919.

Fairmont, W. Va.

Three-fourths of northern West Virginia mines idle during some days of last week of month. Acute car shortage. Some mines operated only two full days out of ten. Most of northern West Virginia coal going east. Coal sent to New England by rail.

The end of January in northern West Virginia mining fields witnessed one of the worst car shortages since the winter of 1917-18, with the supply running as low at times during the week as 25 per cent, so that there were days during the final week of the month when fully three-fourths of the mines in northern West Virginia were not in operation. The only day during this period, in fact, when there was anything like an adequate supply was on Monday, Jan. 26, when cars furnished were equal to about 85 per cent of requirements. There was a drop from that figure to about 25 per cent, that representing the average for the remainder of the month. Late placements tended to further curtail production.

While the scarcity of cars was most marked throughout the final six days of January, the twenty-eighth was probably the worst day in the week, there being only a litle more than 400 cars available, for instance, in the Fairmont region on that date, with about 1,600 ordered. The shortage on that date resulted in a suspension of operations at 132 mines. A large number of mines were also closed down because of no cars on each of the last three days of the month. Weather conditions were in nowise responsible for the inadequate supply since exceedingly mild weather prevailed throughout the week.

On nearly all other roads operating in northern West Virginia, the shortage of cars was equally serious. The supply sank as low as ten per cent on the Monongahela R.R. at one period during the week. Consequently there was a general reduction in the output throughout all northern fields. Cars were so scarce that, for one mine of a company able to operate, there were several of the same company in complete idleness. In some instances mines were not able to operate more than two full days out of ten, and such a situation was causing much unrest among miners as well as demoralizing mining conditions generally.

The eastern movement of coal from northern West Virginia regions far outstripped the tonnage going west. Ohio and Michigan sections were the principal points of Western consignment. Railroads in the East, in so far as it was possible to tell, were not taking as heavy a tonnage as they had earlier in the month. There was also a material decrease in Curtis Bay shipments, but the fact that coal for New England and other Eastern points is now being shipped by rail alone may have had something to do with that. A somewhat larger wagon-mine tonnage than usual was reported.

Ashland, Ky.

January production for northeastern Kentucky only 40 per cent. Loss of output due to car shortage. Big Sandy and Guyan operators go to Washington to learn cause of shortage. Other districts favored with cars. The reason given and operators assured of improvement in supply. Future export business promises well. Labor plentiful, assuring large output when railroad conditions are normal.

Production in the northeastern Kentucky district during the week ended Jan. 31—reaching only 91,730 tons—fell behind production for the same week of 1919 (111,070 tons) when "no market" was seriously curtailing the output. During the month just ended the output in this district was 520,605 tons, or a decline of 53,000 tons, as compared with the same month of 1919. With production reaching only 40 per cent of capacity during the last week of the month, it follows that there was a loss of 60 per cent or 137,095 tons. Nearly all of such loss (131,220 tons), representing 58 per cent, was due to a car shortage.

During January [illegible] there, a car shortage amounted to almost [illegible] tons, so that the situation has become quite serious in this field. During the week ended Jan. 31, there were 470 mine days when no cars were supplied; that meaning a loss of 112,500 tons. In other words, out of a total of 153 mines in the district, which during the week would have worked 918 days, 470 mine days were lost because of no cars; the loss figures being augmented because of the fact that other mines received less than their full supply on some days. As a whole, there was less than an average of 2½ working days for all the mines during the week.

When the Geological Survey reported the production (for the week ended Jan. 17) for the entire country, as the largest production for any week in January during the last three years, the operators along the Chesapeake & Ohio (getting only 50 per cent supply) became quite agitated with the thought that other districts were being favored in the supply of cars from the pool. On short notice, therefore, a delegation of Big Sandy and Guyan operators hurried to Washington to acsertain, if possible, the reasons for this apparent preferred treatment. The Car Service section of the Railroad Administration frankly admitted the inability of the lines serving the eastern coal fields to handle the cars offered them at the important junction points and, when this condition continued indefinitely, the idle cars awaiting delivery to the eastern lines were diverted to the more western coal fields close at hand. This enabled the miners in the western and scuthern fields to work almost to maximum capacity, bringing about quite a marked increase in production in those fields.

Severe winter weather was mainly responsible for the railroad deficiencies and now, with a return to a normal temperature, the railroads are feeling the serious effects from the inroads of the influenza epidemic. Assurances were given the delegation of Chesapeake & Ohio operators that, if favorable weather continues, improvement in the car supply would result and that the Car Service section was exerting every effort to supply the eastern railroads to their fullest capacity to handle, hoping in a short time to make the present disparity in the relative supply between the western and eastern fields a thing of the past.

Other radical steps are being taken to further improve the supply along the Chesapeake & Ohio by the addition of extra equipment from the anthracite railroads in the North and the several railroad lines in the South. With such assurances as have already been mentioned a more optimistic view immediately became manifest and it was decided to watch carefully any changes which might occur.

Considerable activity on the part of consumers for their next year's requirements has been noticed in the northeast Kentucky field, at prices ranging close to the present Government price and continuinng the usual labor clauses covering any increased cost resulting from an increased wage scale. Requests for quotations on export business are almost a daily occurrence, and the shippers are anticipating quite a heavy movement from the northeast Kentucky district to Charleston, S. C., immediately after the Lever Act is nullified and tidewater embargoes lifted. It is safe to assume that quite little if any tonnage, other than the usual current tonnage reserved by the operators, will remain uncontracted for by March first, to begin with the usual time of contracts on April first.

The mines are reporting the best complement of labor in their history and, once the railroads experience a return to their normal performances, quite large production increases will immediately result. Very little fear is felt by the shippers in this field on an overproduction for some time as, even though the mines were able to increase their production, it is safe to assume that the railroads will be prevented from handling any greater tonnage than the normal 12,000,000-ton average per week and, with stocks almost entirely depleted and the opening of the Lake season near at hand, together with the great export tonnage, it will be some time before the consuming trade begins to catch up with its usual normal supply.

Louisville, Ky.

Coal-production tax bills brought up in Kentucky Legislature. Details of bill introduced by Assemblyman Beckman. Includes tax for state and county purposes. State Tax Commission proposed. Comment of state press on coal-production tax. How the coal-tax matter stands in other coal states. Kentucky operators expect to see measure defeated.

Bill introduced into Kentucky Legislature to amend law relating to miner's checkweighman. Affects mines employing as many as 20 men. Duties and privileges of checkweighman noted. Methods of his payment. No interference with his rights. Fine in case of violation of act.

Assemblyman Beckman quite recently introduced a bill into the Kentucky Legislature whose purpose is to impose a license on any person, firm, corporation or association engaged in the mining of coal in the state and authorizing counties also to impose a tax for road, school and county purposes.

This bill aims to provide that every person, firm, corporation or association engaged in the business of mining coal in the state shall, in lieu of all other taxes imposed by law, annually pay a tax for the right or privilege of engaging in such business in the state of 1c. per ton on all coal mined in the state, and this tax shall be for state purposes. In addition any county in the state may impose a like tax of ½c. per ton for road purposes, county purposes or school purposes on all coal mined in such county, and the Fiscal Court of any county may levy the tax for county purposes, determining what fund or funds shall receive the taxes when collected; when coal is mined in any separate taxing district in a county, the Fiscal Court shall equitably distribute such taxes between the county and such taxing district.

Those mining coal in the state within the meaning of this act shall make a report to the State Tax Commission on July 1, 1920, and every three months thereafter, showing the number of tons of coal mined during the previous three months and the mine from which it was taken. All such reports are to be made upon blanks prescribed and furnished by the State Tax Commission. Failure to make such a report within 30 days after it is due, on conviction, is punishable by a fine of $50 for each day thereafter the report is not made.

The bill provides that the State Tax Commission shall determine the correct number of tons of coal mined in any county in the state, by any person, firm, corporation or association, from the date this act goes into effect until the day on which the first report is required to be made, and thereafter from the day on which the last report was made until the day when the next report is required to be made. The Commission shall certify as to the correctness of this report to the County Court clerk of the county in which such coal was mined, within ten days after the correct number of tons of coal has been finally ascertained.

All taxes due under the provisions of this act shall be payable 30 days after notice has been given by the State Tax Commission, and all taxes due to any county shall be payable 30 days after the certification is made to the County Court clerk. Failure to pay such taxes, after receiving 30 days' notice, imposes upon the delinquent a penalty of ten per cent on the amount of the tax, and thereafter such tax shall bear interest at the rate of ten per cent per annum. All such state taxes shall be paid to the state treasurer, and all county taxes to the sheriff or collector. The reports giving the correct number of tons of coal mined shall be made by the various companies through their chief engineer or other agent in the state and shall be duly verified.

The introduction of this bill renews the old fight for the tonnage tax on coal and considerable discussion has been aroused over the matter. In his message to the Legislature, Governor Morrow asked for a production tax on oil and gas but not on coal. It has been said that the tonnage tax on coal was not asked for because the competing states of Pennsylvania, Tennessee, Indiana and West Virginia do not tax their coal interests, except nominally; and that for Kentucky to take such action would be to put coal operators at a disadvantage in a strong competitive market. The coal-tonnage tax matter has been thoroughly thrashed out in Alabama, where a 2-cent production tax on coal was enacted into law last year. References to this matter appeared in the July 31, Aug. 14 and Aug. 28, 1919, issues of *Coal Age*. The question of a production tax on coal was also brought up in the Pennsylvania Legislature within the last six months.

Other coal production-tax bills have been introduced in the Kentucky Legislature and some of the newspapers of the state are advocating that positive action be taken. The *Louisville Times* suggests that the governors of the coal-producing states arrange for representatives of their respective tax departments meeting and drawing up a uniform bill, which will affect all operators in all of the coal states alike

The Kentucky operators have defeated several similar attempts to force a legislative act to place a production tax on coal mined in the state. It is said that they have been successful in the past due to the fact that such taxation was not in effect in other states and would work a hardship on operators. The operators seem to be solidly arrayed against this bill and plan to make every effort to defeat it in the Legislature. In the case of the Alabama coal tax, the governor of that state included it among the state administration measures and was said to be largely responsible for its enactment into law against strong opposition. On the other hand Governor Morrow of Kentucky does not seem to favor the introduction of such a tax measure in the Legislature of his state.

Assemblyman McCandless recently introduced a bill in the Kentucky Legislature to amend and re-enact Section 2733-A of Carroll's 1909 Edition of Kentucky Statutes. The bill was referred to the committee on Mines and Mining.

Paragraph 1 is amended and re-enacted to read substantially as follows: That when a majority of the miners engaged in digging or mining coal at any mine in this state (Kentucky) at which as many as 20 men are employed request the owner or operator of such mine to allow the miners to employ, at their own expense, a person to inspect the scales at the mine and to see that the coal dug by the miners is properly weighed and accounted for, and perform such other duties as will assist in bringing about correct weighing, the owner or operator is to permit such a person to be employed by the miners making the request, and it shall be the duty of the owner or operator to permit the weighman selected to deduct his wages from the miners each day upon the proper sheet, to turn this coal sheet into the company's pay-roll clerk and receive his pay in the same manner as any other employee of the company; provided the person so employed has an honest and trustworthy reputation and also that he is an employee of the owner or operator at the time of his selection as set forth. This weighman chosen by the miners is to hold his office for a period of three months or until his successor is elected and qualified, and the appointment, under the provisions of this act, of each inspector and assistant weighman shall be approved by the judge of the County Court of the county wherein the same is made.

Paragaph 2 states that the person appointed and employed by miners to perform the duties noted in paragraph 1 shall at all times have free access to the scales at the mines and shall not be hindered or prevented from a proper performance of his duties by the person who weighs coal for the owner or operator of any mines, nor any of the agents or employees of the operator. On the other hand the miner's checkweighman shall in no way prevent the weighman or other employees of the owner or operator from performing their duties in a proper manner.

Paragraph 3 notes that any person violating any of the provisions of this act shall be fined not less than $10 nor more than $50, and each day on which any of the provisions of this act are violated shall constitute a separate offense.

Norton, Va.

Virginia fields produce 176,000 tons of coal in last week of January. Gain of 9,000 tons. Labor more plentiful than cars. Large export tonnage.

Production in the Virginia fields during the last week of January amounted to 87 per cent as against an 85 per cent output for the preceding week; the total output advancing from 168,000 to 176,000 tons, a gain of 9,000 tons. The production loss during the week ended the thirty-first was 31,000 tons. The entire loss followed in the wake of a car shortage, the labor supply having been such as to have been conducive to a 100 per cent production. Since radical agitators were weeded out of the Virginia fields, miners have been extremely regular in their work.

As was the case during the previous week, there continued to be a large volume of tonnage for export through Charleston, S. C., and through Norfolk, Va., the demand far outstripping the supply, in fact, as was also the case with reference to the domestic demand.

PENNSYLVANIA

Anthracite

Pottsville—Prospects are bright, it is said, that the entire anthracite coal region will be working on a daylight-saving plan in the spring. Under the leadership of Mayor F. P. Mortimer Council was asked to indorse the proposition. Council unanimously acquiesced in the plan and the coal companies will work in harmony with the proposition to move the hands of all clocks forward one hour on the last Sunday in March. The big repair shops of the Philadelphia & Reading Coal & Iron Co. and the Eastern Steel Co.'s works will be operated under the plan.

Jeddo—Highland No 5, Jeddo No. 4 and Ebervale mines of the G. B. Markle Co., north of Hazleton, are still idle, due to the nonrenewal of the lease of these lands, which are owned by the Union Improvement Co., of Philadelphia. Employment agents are working among the idle Markle employees, and are inducing many to leave for work in steel mills. The Freeland and Hazleton Chamber of Commerce, in separate resolutions, asked Attorney General Palmer to use his office in getting the idle Markle mines in operation.

Bituminous

Indiana—Judge J. N. Langham has appointed D. J. Jones, of Ernest, Pa., as the miners' representative on the mine foremen's examining board of the Twenty-Fifth Bituminous district. He succeeds J. R. Balls, of Ernest, resigned. The other board members are, W. B. Wardrop, of Iselin, representative of the operators, and Thomas S. Lowther, inspector of the district.

Pittsburgh—Thomas K. Adams, of Mercer, Pa., president of the Pennsylvania Bituminous Mine Inspectors' Advisory Association, has called a meeting of all the bituminous mine inspectors of the state, together with the other members of the mine foreman's examining boards, to be held at the Seventh Avenue Hotel here on Friday, March 5. The meeting promises to be attended by about one hundred mining men. The purpose of the meeting is to set the dates for the annual mine foremen's and fire bosses' examinations and to discuss the questions which will be asked the candidates.

Rossiter—The new repair shop of the Clearfield Bituminous Coal Corporation, here, has been completed. It is said that it will be one of the most modern mine repair shops in central Pennsylvania and will include repair departments for electrical machinery and section for the building of mine cars. A large blacksmith shop is in one section and a modern store room in another part. One end is devoted to a large office for the mine foremen of the three Rossiter mines, each foreman having his own compartment. The building is of fire-proof construction and is 60 x 160 ft. The sides are practically all glass and the window frames are of steel.

Coming Meetings

Material Handling Machinery Manufacturers' Association has changed the date of its convention from Jan. 29 and 30 to Feb. 26 and 27, at the Waldorf-Astoria Hotel, New York City. Secretary, Z. W. Carter, 35 West 39th St., New York City.

Canadian Mining Institute will hold its annual meeting at the King Edward Hotel, Toronto, Ontario, Canada, on March 8, 9 and 10, 1920. Secretary, H. Mortimer-Lamb, 503 Drummond Building, Montreal, Quebec, Canada.

New York State Retail Coal Merchants Association will hold its annual meeting Feb. 26, at the Pennsylvania Hotel, New York City. Executive secretary, G. W. Woodside, Albany, N. Y.

American Institute of Mining and Metallurgical Engineers will hold its annual meeting Feb. 16, 17, 18 and 19, at the Engineering Societies Building, 29 West 39th St., New York City. Secretary, Bradley Stoughton, Engineering Societies Building, New York City.

American Chemical Society will hold its annual meeting at St. Louis, Mo., April 13, 14, 15 and 16. Secretary, Dr. Charles L. Parsons, 1709 G St. N. W., Washington, District of Columbia.

New England Dealers' Association will hold its annual meeting March 24 and 25, at Springfield, Mass. President, W. A. Clark, 141 Milk St., Boston, Mass.

North Western Pennsylvania Coal Operators' Association annual meeting will be held at Butler, Pa., March 2. Secretary, F. B. Reimann, Butler, Pa.

National Coal Association annual convention will be held May 19, location to be decided later. Secretary, W. B. Reed, Commercial Bank Building, Washington, District of Columbia.

American Wood Preservers' Association will hold its annual meeting Feb. 16, 17 and 18 at Chicago, Ill.

American Concrete Institute will hold its annual meting Feb. 16, 17 and 18 at Chicago, Ill. Secretary, Henry B. Alvord, 6 Beacon St., Boston, Mass.

Trade Catalogs

Catalogue 53. The American Pulverizer Co., St. Louis, Mo. pp 16; 8¾ x 11½ in.; illustrated. A description of the pulverizing and grinding machinery made by this company.

Blawforms. The Blaw-Knox Co., Pittsburgh, Pa. Folder. Pp. 4; 3½ x 6½ in.; illustrated. Gives a brief idea of the extent to which Blaw steel forms are being and can be used in connection with concrete construction.

Mine Car Lubrication. Standard Oil Co. (Indiana,) Chicago, Ill. Bulletin. Pp. 15; 6 x 9 in.; illustrated. This bulletin points out losses in coal transportation from the face to the tipple and also methods of eliminating such losses.

Handbook of the I. T. E. Circuit Breaker. The Cutter Electrical & Manufacturing Co., Philadelphia, Pa. Series M. Pp 263; 6½ x 9 in.; illustrated. Bound in cloth and marginal indexed. Printed on coated paper and well illustrated. Complete information for prospective customers.

Worthington Condensing Apparatus. Worthington Pump & Machinery Corp., New York, N. Y. Pp. 115; 6 x 9 in.; illustrated. Information about the various condensers made by the company together with useful information on condensation. Printed on heavy coated stock.

W-C-K City, Westinghouse, Church, Kerr & Co., Inc., 37 Wall St., New York, N. Y. Folder. pp. 4; 15 x 21 in.; illustrated. Half of the folder presents a large group of buildings erected by the company giving the appearance of a city. General data about the work here illustrated.

Evans Scraper Loading Apparatus for Loading Coal into Mine Cars. Engineering Development Co. of America, Scranton, Pa. Bulletin 1. Pp. 12; 8½ x 12 in.; illustrated. Describes the method of scraper loading and illustrates by photographs taken in the mine. List of parts given and illustrated.

Recent Coal Washing Plants. The Roberts & Schaefer Co., Chicago, Ill. Bulletin 36. Pp. 26; 8½ x 11 in.; illustrated. Description of some of the recent coal-washing plants designed by the Roberts & Schaefer Co. for the preparation of coal for coking, domestic-fuel and railroad-fuel requirements.

Harris Electric Mine Pump Bulletin. Harris Pump & Supply Co., Pittsburgh, Pa. Pp. 114; 8½ x 11; illustrated. Bulletin 400. Illustrates and describes completely the various pumps handled by the Harris company; also pipe, valves and fittings for mines and other requirements. This bulletin is a valuable guide as well as catalogue.

Saving Fuel Automatically and Scientifically in the Boiler Room. The Northern Equipment Co., Erie, Pa. Booklet. Pp. 24; 5½ x 8½ in.; illustrated. A digest of some of the data prepared for the U. S. Fuel Administration during the war, together with comments by the technical press and mechanical engineers on hand and mechanical feeding and mechanical regulation.

Engines and Equipment. Ideal Engine Co., Lansing, Mich. Catalogue 719. Pp. 40; 6 x 9 in.; illustrated. Description of the Ideal type of gasolene engines in their several sizes, also Ideal equipment for contractors and industrial plants.

Brown Pyrometers. The Brown Instrument Co., Philadelphia, Pa., Catalogue 12. Pp. 88; 8 x 10½ in.; illustrated. This catalogue is elaborately illustrated on heavy coated paper and contains much "real meat" on the subject of pyrometry. Thousands of dollars worth of work is turned out of furnaces and kilns the quality and spoilage of which is dependent upon the accuracy of pyrometer readings. The Brown instruments indicate and record temperatures; over 20,000 Brown pyrometers are said to be in successful operation.

Industrial News

Williamson, W. Va.—The Himler Coal Co. has completed the work of sinking a shaft near Warfield, Ky., and is producing coal although a bridge across Tug River has not so far been completed. In the meantime the coal is being stocked and the company is now engaged in work on a slope.

Sullivan, Ind.—R. E. Price, acting as agent for the Mutual Coal Co., of Dugger, has purchased the Keeley mine from the Dugger State Bank and John E. Griffith and has leased 200 more acres of coal land, which should make the mine a producer for 12 to 15 years. Work of cleaning up preparatory to driving new entries will start at once.

Peoria, Ill.—An agreement involving a consideration of $150,000 and the transfer of 1,132 acres of coal lands in Peoria County, Ill., has been filed. John A. Hoffman, of Kickapoo Township, transferred the lands to Frank L. Bunn, of Bloomington, Ill., under an agreement whereby Mr. Bunn will serve as agent for Mr. Hoffman is selling the properties to parties who desire to develop the coal lands.

Princeton, W. Va.—The Virginian Ry. expects shortly to open bids for the construction of about 14½ miles of branch railroad up Milam Fork in Wyoming County, W. Va. This branch line will be known as the Virginian-Wyoming R.R.—a branch of the Virginian. It will open up a large territory of smokeless coal which is under the control of Godfrey Himes, of Boston.

Pittsburgh, Pa.—The American Blower Co's Pittsburgh branch announces that the office here is now under the joint management of Thomas Chester and Edwin C. Evans. The former has been with the company for 12 years including six as chief engineer; Mr. Evans has been in the service of the American company for 15 years. The Sirocco and Ventura mine fans are made by the American Blower Co.

Morgantown, W. Va.—According to information received here, the Connellsville Coke Co. has purchased 210 acres of coal land in Redstone township of Fayette County, Pa., from the Republic-Connellsville Coke Co., the consideration being (it is understood) $454,500. It is also reported here that the Consolidated Coke Co. has sold to J. H. Hill, Jr., 110 acres of coal land in Nicholson and German townships of Fayette County, for a consideration of $99,000.

Elkins, W. Va.—The Brewer-Harrison Coal Co., which recently incorporated with a capital of $125,000, has perfected its organization, and plans are being arranged for the development of properties located in Lewis County. It is proposed to install complete mining machinery and equipment, including mine cars, etc., as well as to construct a new tipple, to have an annual capacity of about 150,000 tons. W. W. Brewer, Belington, W. Va., is president and manager.

Erie, Pa.—The Ball Engine Co., of this place, has distributed a large wall calendar which should be of considerabe interest to those using steam shovels or contemplating engaging in this kind of work. The Ball Engine Co. makes the well known Erie type of steam and electric shovels, also railroad ditchers, locomotive cranes, drag-line excavators, etc., for contracting and general excavating requirements. The calendar shows a number of the types of shovels and apparatus made by this company.

Bethlehem, Pa.—The Bethlehem Fabricators, Inc., of this place, has distributed an unusually attractive calendar of interest to coal men. It is made of pressed steel and includes a good photographic reproduction of the Loree coal breaker, erected for the Hudson Coal Co., at Plymouth, Pa., in the northern anthracite field. The steel work for the breaker was designed, fabricated and erected, by this company, within 82 days from the signing of the contract—a noteworthy feat. The calendar is 9 x 18 in. in size.

Newark, N. J.—The Hyatt Roller Bearing Co., of this place, announces that after 18 years of service with this company, B. G. Koether has been promoted to the vice-presidency of the organization. In a short time he will leave Detroit for Harrison, N. J., where he will have his headquarters as head of the entire sales and advertising departments of the company. Mr. Koether was assistant sales manager of the Hyatt company at Harrison when he was promoted to the position of sales manager ten years ago, at which time he went to Detroit to take up his new duties.

Towson Heights, Baltimore, Md.—The Black & Decker Mfg. Co. has further extended its permanent organization by the establishing of a branch office at 6523 Euclid Avenue, Cleveland Ohio. Garth A. Dodge, formerly connected with the Austin Co. at its Cleveland headquarters, has recently joined forces with Black & Decker in the capacity of branch manager for the states of Ohio and Indiana, and will be in charge of the Cleveland branch.

Ackerman, Miss.—The Mississippi Oil & Gas Co-operative Joint Stock Co., of this place, furnishes the following information. On Jan. 27, 1920, the company opened up a 4-ft. seam of coal by means of an inclined shaft 300 ft. long. The mines are at Ackerman, and the coal is of the semi-bituminous variety. The Mississippi company is now busily engaged sinking the shaft 200 ft. deeper to an underlying 7-ft. seam of coal which is said to rest on a floor of fine grindstone rock. The company holds more than 50,000 acres of territory underlaid with coal, iron ore and clays.

Pittsburgh, Pa.—The annual meeting of the stockholders of the Bostaph Coal Co. was held on Jan. 30, 1920, at the office of the company, First National Bank Building, Pittsburgh, and the following officers were elected: Luster L. Corbin, president; L. L. Carson, vice president; Adam W. Tritsch, treasurer; James G. Armstrong, secretary, and W. A. Libengood, superintendent. The Bostaph Coal Co. owns and operates an electrically-equipped coal mine at St. Petersburg, Clarion County, Pa., on the Butler-Kane branch of the Baltimore & Ohio, and produces a high grade of steam coal. The Weaver Coal Co., Inc. of Buffalo, N. Y., handles the output.

Pittsburgh, Pa.—The Iron-Trade Products Co., Farmers Bank Bldg., Pittsburgh, Pa., has increased its capital to $200,000 to take care of its growing business. W. J. Strassburger remains president as heretofore, with the following elected to fill the other positions: J. L. Hukill, vice president; L. J. Adler, treasurer; E. M. Moreland, sales manager, steel department; C. E. Kitchen, sales manager, coal department. Mr. Kitchen was formerly car distributer for the Pennsylvania Lines, then with the Valley Camp Coal Co., and for the past four or five years with the Fort Pitt Coal & Coke Co., Pittsburgh, resigning his position as sales manager to come with the Iron Trades Products Co.

New York, N. Y.—A proposition to continue the Tidewater Coal Exchange which, it is reported, will be discontinued on March 1, when the railroads return to private ownership was considered at the annual meeting of the Wholesale Coal Trade Association of New York, at the Whitehall Club, on Jan. 20. A tentative set of rules were considered. The committee of the association that studied the situation says that the exchange, in the nine months, February to October, inclusive, of last year (by reason of the facilities for exchanging coal in the pools) worked a saving in car demurrage of $731,462 out of a total of $1,263,218 demurrage. Figured on the individual shipper basis, it means an average saving of 11.3 c. per ton.

New York, N. Y.—The Steinmetz Motor Car Corp., with executive and sales offices in the Ziegler Bldg., here, has been chartered under the state laws of Maryland with a capital of $2,000,000, to manufacture a new type of light weight electric delivery truck and an improved electric industrial car for use in manufacturing plants. Both cars are the invention of Dr. Charles P. Steinmetz, chief consulting engineer for the General Electric Co., of Schenectady, N. Y. Dr. Steinmetz will act as consulting engineer to the Steinmetz corporation and will also serve on its board of directors. The concern has acquired a manufacturing plant at Baltimore, Md. A. Robert Elmore is president; J. P. Story, vice-president; Nelson H. Truett, secretary and treasurer.

Huntington, W. Va.—A syndicate of Columbus, Ohio, capitalists have purchased the holdings of the Lynne Block Co. operating in the vicinity of East Lynne, Wayne County, W. Va., the price paid, it is understood, being $100,000 in cash. The Lynn Block mines have been in operation for several years, there being about 500 acres in their holdings, underlaid with a six foot seam of coal. The officers of the Lynn Block company were, Dr. A. K. Kessler, president; L. P. Miller, vice president; M. J. Ferguson, treasurer; S. H. Bowman, secretary and Frank Bosley, general manager. The Columbus people who have acquired the Lynn holdings expect to install much additional machinery and to enlarge and improve the plant so as to materially increase its capacity.

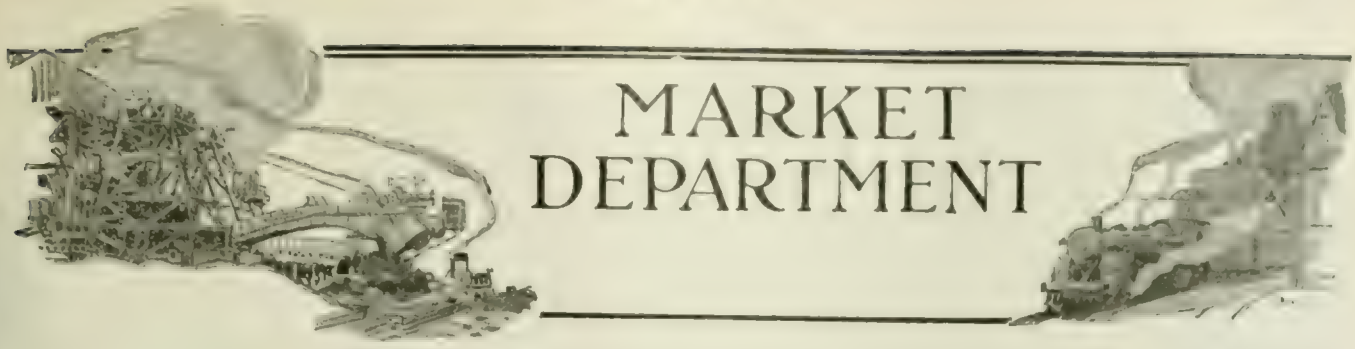
Beckley, W. Va.—The Crab Orchard Coal Co., opening up a property near here, will be in the market for supplies and equipment about March or April. The railroad siding to the mine will take 75-85 lb. rail and good second-hand material will be acceptable. Equipment needed includes mining machines, motors and mine cars. Rail for mine track will also be in demand. The company expects to buy electric power either from the Virginian or the Appalachian power companies and will erect a substation at the plant installing rotary converters. The capacity of the plant will be about 500 tons per day. Prince E. Lilly is the manager in charge of the work.

Beckley, W. Va.—Semi-official information is to the effect that the capital stock of the Inter-State Coal & Dock Co., of Chicago, will be much increased and that the company will handle a greatly increased tonnage hereafter, adding smokeless coal to the high-volatile product which the company has heretofore been handling. It is well understood that producers of the Winding Gulf and New River fields will become stockholders under the plan for an increase in capital. As a part of the company's plan for handling a heavier tonnage, branch offices will be opened at Beckley and at tidewater. The Inter-State company has large dock interests on the Lakes, and will now also engage in the export business and will be able under the new arrangement to handle about 2,500,000 tons of coal a year.

New York, N. Y.—At the annual meeting on Jan. 20, the following were elected members of the board of directors of the Wholesale Coal Trade Association of New York: C. Andrade, Jr., Matlack Coal & Iron Corporation; George M. Dexter, Dexter & Carpenter, Inc.; E. Kelley Downey, B. Nicoll & Co.; Wallace D. Eyre, Eyre Fuel Co.; E. W. Lewis, M. A. Hanna & Co.; Wilbur A. Marshall, (resigned—vacancy to be filled) W. A. Marshall & Co., Inc.; Charles A. Owen, Imperial Coal Corporation.; Henry M. Payne, Bertha Coal Co.; Gardner Pattison, Pattison & Browns; Charles F. Randolph, Thorne, Neale & Co.; W. M. Woodward, Wentz Corporation. At the meeting of the new board of directors on Jan. 21, the following officers were elected: C. Andrade, Jr., president; Charles A. Owen, vice president; Henry M. Payne, treasurer; Charles S. Allen, secretary.

Huntington W. Va. — Having leased a large property in Dickinson County, Virginia the Virginian Elkhorn Byproduct Co. has been organized with a capital of $300,000 to develop the acreage under lease. The new company has been fully financed by Huntington, W. Va., Pittsburgh, Pa., and Marietta, Ohio, men. The roster of officers includes: J. R. Slayton, president; J. F. Ratcliff, vice president; H. H. Morris, secretary; A. C. Thomas, treasurer; W. H. Cunningham, consulting engineer. On the board of directors are the above named officers and Samuel R. Upham of Pittsburgh; John McLeod of the Carnegie Steel Co., Pittsburgh; Forest Kyger, Marietta. The general offices of the company will be at Huntington. The Company will begin construction work in the very near future on a large modern plant and will, in addition to the plant proper, erect a large number of houses for miners, a church, recreation hall, medical dispensary, etc. The company expects to be able to begin mining at an early date and to ship north and to the seaboard via the Carolina, Clinchfield & Ohio R.R.

Washington, D. C.—The appeal of the United States for the revival of certain indictments against J. V. Thompson, of Uniontown, Pa., which were quashed by the United States Court for the Western District of Pennsylvania, is being argued before the Supreme Court. The Government is represented by W. C. Herren, special assistant to the Attorney General, and Mr. Thompson by J. E. B. Cunningham, of Greensburg, Pa.; W. C. McKean, of Uniontown, Pa., and Robert Gibson, of Pittsburgh, Pa. It is now currently reported that Mr. Thompson himself is the principal in the Piedmont Coal Co., which some time ago purchased from the Thompson Creditors Committee, a large block of the Thompson coal lands in Fayette and Greene counties, Pa. Considerable consternation is felt at this action in many quarters. It was at first reported that the H. C. Frick Coke Co. was behind the Piedmont company, color being lent to this supposition by the fact that Mr. Samuel McClay, of Pittsburgh, was named as president of the Piedmont Coal Co., and he is a member of the law firm of Reed, Smith, Shaw & Biehl; attorneys for the H. C. Frick Coke Co.



MARKET DEPARTMENT

Weekly Review

Coal Shortage Continues—Car Supply, Though Improved, Continues to Be a Menace—Stormy Weather Prevents Better Distribution—Influenza Curtails Production—Retail Trade Active

HAVING received little coal to replenish their stockpiles, public utilities and manufacturing plants along the Atlantic Seaboard still continued to make urgent demands. This may be exemplified by the conditions in New York City, where the largest local traction company, the Interborough Rapid Transit, had but 7,000 tons, and was using 2,200 tons a day, thus making it necessary to consider pooling reserves to tide over the emergency.

Although alarm was taken at the rate with which the supplies were dwindling, no city was actually without coal for its public utilities. Receipts were below normal, but still these receipts kept up to the minimum requirements.

Moderate weather had been prevalent during the week before last and both consumer and operator hoped this would continue, but it changed to colder and brought with it on the Atlantic Coast the worst storm of the winter. This hampered the car distribution in those sections and also reduced the production at the mines, but at the present writing the outlook favors the idea that the weather will be milder, and the traffic movement should from these indications be slightly improved.

Influenza, bringing with it a larger number of deaths than the week previous, was also a hindrance to the operators. The number of absentees at the mines was greatly increased, and, moreover, the number of men available for train crews was reduced, thus giving the Railroad Administration another possible excuse for not supplying enough rolling stock.

Then, too, in Canada, where an embargo exists against the smallpox, now rapidly spreading along the lake fronts, trade is suspended. However, there is not quite enough coal to meet the entire demand of those lake ports in the United States; much less is there enough to supply points outside the national borders.

Steam sizes are being used in larger amount than before, especially where there are no other sizes available. Retailers are having a busy season in such sizes as they are able to obtain, but it seems that the anthracite operators have not received all of the cars that were recently sent West to meet the demands in that section or to anticipate its wants. Cars are still being diverted, and shippers still suffer losses due to confiscation made by the railroads.

In the coke regions the demand from the iron and steel plants still continues, but, there too, the inadequate supply of cars affects the producers, so that although there is enough coke obtainable, only a small amount can be shipped.

Bunkering of foreign vessels was still allowed to continue, but the supply to this trade was limited. Then, too, the stormy weather and high tides, possibly the highest tides on record on the Atlantic coast, made it impossible to get these vessels satisfactorily under way.

WEEKLY PRODUCTION

A slight increase in the production of bituminous coal was recorded during the week ended Jan. 31. The total output (including lignite and coal coked) is estimated at 10,638,000 net tons. Compared with the preceding week this was an increase of 175,000 tons, or 1.7 per cent.

The recovery has once more carried the line of 1920 production above that of 1917. Present output is thus again in excess of any attained during the last three years, the period over which the records of weekly production extend. The production of the corresponding week in 1917 was 10,512,000 tons; in 1918 it was 9,492,000 tons, and in 1919, 8,316,000.

Production in the month of January is estimated at 48,732,000 tons. Unless revised downward, this establishes a new record for the month.

The achievement is the more remarkable when it is remembered that it was attained under the handicap of severe winter weather and of a transportation situation of exceptional difficulty resulting from the strike.

The production of anthracite during the week of Jan. 31 is estimated at 1,790,000 net tons, an increase of 80,000 tons, or 4.5 per cent, over the preceding week, but less by 31,000 tons than the output of the corresponding week last year.

The cumulative production since the beginning of the coal year, 1919-20, is now 6,429,000 tons below that of the year 1918-19.

The weekly statistics of beehive coke production published by the Geological Survey are based on reports of cars loaded by the principal coke carriers. The 26 railroads reporting loaded 97 per cent of the rail shipment of coke in 1917. On this basis the output of beehive coke during the week ended Jan. 31 is estimated at 473,000 net tons, an increase over the preceding week. The cumulative production from Jan. 1, 1920, to date is 1,976,000 tons, a decrease of 466,000 tons, or 2.4 per cent, compared with the corresponding period last year.

Atlantic Seaboard

NEW YORK

Storm conditions around New York seriously interfering with movement of coal in harbor. Coal blocked in transit to piers. Pier dumpings far below normal through men not reporting for work. Heavy demand for all domestic sizes. Bituminous market chaotic. Public utilities and traction companies in desperate need for coal. Shipping delayed for lack of bunkers. Bituminous stocks at piers increasing.

Anthracite—The severe snow storm which hit the Atlantic seaboard last week, covering various cities with a foot or two of snow, has almost completely paralyzed the boat movement in New York harbor. Fortunately, household consumers have protected themselves by heavy buying during the earlier part of the winter, and are now in a position to meet such a condition.

The movement of coal in New York harbor has been restricted to about 25 per cent of normal, through the men not reporting for work at the principal piers. There is a good supply of coal on hand at the piers, but this coal has been frozen tight in the cars, and before being dumped must go through a thawing process to enable dumpings to be carried on.

Reports from the mines indicate that transportation has been seriously interfered with and at certain sections trains were forced to suspend schedules. Therefore within the next few weeks, we can expect smaller receipts of anthracite coal, due to delays en route to the mines. Also difficulties are said to be arising at the mines, due to the railroad companies having trouble in bringing sufficient cars to the collieries to keep them working to capacity.

Current quotations for company coals, per gross tons, at the mines and f.o.b., tidewater, at the lower ports are as follows:

	Mine	F.O.B. Tidewater
Pea	$5 30	$7 05
Buckwheat	3 40	5 15
Rice	2 75	4 50
Barley	2 25	4 00
Boiler	2 50	4 25

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—The bituminous market is in a very precarious position. This is not due to any shortage of soft coal at the piers, to the contrary, the surplus of coal on wheels has been increasing. The situation has become desperate through the inability of the piers to effect dumpings, owing to the piers being partially crippled by the recent snow storm. Also at Arlington, Port Reading and South Amboy men have been reporting to work very slowly, and lack of labor has played a heavy part in reducing materially the number of barges being loaded.

The heaviest call for coal comng in this distressing period is from the traction, electric and lighting and railroad plants. Surplus stocks at these various large plants have been very slim all winter, and last week the storms came near interrupting the movement of all coal by barges which would have meant the stoppage of all transportation in and around New York, including Brooklyn.

Among the utility plants, the New York Edison Co. is one of the largest consumers. At the height of the storm last week, this company had in its station bunkers 22,045 tons of coal; alongside stations, 13,591 tons; at Shadyside, 7,584 tons, and has received by collier from Hampton Roads, 3,245 tons of Pocahontas coal, making a total of 52,465 tons. This is considered a two weeks' supply.

At this same period another large, the Consolidated Gas Co., had enough coal on hand to carry on operations for nine days; the Brooklyn Union Gas Co. enough for two weeks. The Interborough Rapid Transit Co. at its 59th and 74th St. power plants had a surplus on hand of 6,500 tons, and this tonnage is not a week's consumption. All the utilities are protected by ample contracts and have coal en route to the piers, but the railroads are pursuing their confiscatory methods, are taking loaded coal cars regardless of the character of their ultimate consumers.

The steamship trade have been expensive sufferers from the delay in securing coal in the harbor. Large liners have been delayed in port from four days to a week waiting for sufficient bunkers. Loaded cargoes can quickly secure the peemium of $1.35 for spot bunker business.

Government prices prevail on all spot spot business, which are as follows:

	Mine	F.O.B. Tidewater
Broken	$5 95	$7 80
Egg	6 35	8 20
Stove	6 60	8 45
Chestnut	6.70	8 55

PHILADELPHIA

Anthracite stirred by winter storms. Dealers meet demand for fuel. Pea stocks come in handy. Mines handicapped by weather. Car supply cut. Nut in chief demand, followed by stove and egg. Pea draggy. Independents maintain their 75c. premium. Spring prices under discussion. Buckwheat only active steam coal. Bituminous unimproved. Car supply chief trouble. Heavy snow delays delivery of coal. Consumers anxious for coal.

Anthracite—With an old fashioned snowstorm descending upon the city this week, the retail dealers were beset with requests for coal. With snow on three successive days, and with eight to ten inches on the ground, deliveries were only made with the greatest difficulty. Fortunately, with the large number of people who had put in their coal during the summer, the urgent cases were reduced to a small proportion. As it was, the storm proved to the consumers more than anything else, the advisability of having their supplies on hand.

So far as stocks on hand were concerned the dealers were not in very good shape to stand heavy demands for fuel. There is an extremely small tonnage of stove and nut on hand, and even egg had melted away to the point where most dealers were anxious to replenish. Fortunately for those who simply had to have fuel of any kind, the stocks of pea coal were well able to meet their needs, and the tonnage of this size put out was real encouraging to those dealers who were becoming distressed with the quantity of this size in the yards.

The receipts of all sizes this week have been most meager, and very little prospect is held out for the next week. Storm conditions were even more severe in the anthracite region and on one day this week every mine was closed down due to the men being unable to reach their work through the drifted snow.

The only encouraging feature to the local trade was the fact that with heavy storms outside the bay all tide shipments to Northern coast points were shut off. The result of this was that much coal originally consigned to the piers was diverted to line consignees. However, even a large percentage of this coal was simply consigned all-rail.

Egg had began to waver and some dealers had begun to report having fair stocks of stove and nut until it began to look as if a break must come. This is now changed for the time being but it is not believed that the individuals can insist much longer on their 75c. differential; at least it is not believed that they can carry it right up to April 1.

Of course many shippers had been getting even more than 75c. on stove and nut, but the demand at these fancy prices had ceased several weeks since. Despite weather conditions pea coal continues in most abundant supply, and no dealer now expects to be able to clean up his stocks by spring.

Bituminous—With the coming of heavy snows the soft-coal situation has grown more acute. Less coal has come into this market this week than in any week for several months past. Despite the fact that the railroads had promised a much better car supply by the diversion of cars from other districts, it would appear that the weather has interfered with their plans. Many of the mines in the Pennsylvania district have received only 15 to 25 per cent of their requirements. In addition there has been almost two feet of snow in that district and the movement of the loaded cars has been very much delayed.

The same holds true of the coal destined here from the Fairmont region, where the haul over the mountains is even more severe than in the Pennsylvania district. Consumers are extremely anxious for coal and are calling on the shippers daily for increased shipments, and from the present outlook it would appear that the situation will likely be somewhat worse before there is any real improvement. There is no coal whatever in the spot market. Even contract customers are receiving but a portion of the fuel consigned to them, as much is confiscated by the railroads.

Eastern-Inland

PITTSBURGH

Car supplies not increased. Better situation expected soon. Rumor of demurrage charge revision.

Car supplies in the Pittsburgh district have shown no material improvement, and there is no question but that there has been some loss. The movement is still a long distance from the 70 per cent which it was intimated at the time of the placing of the price restrictions on coal would mark the point at which it would be considered safe to remove the price control.

There is a somewhat larger volume of coal moving in the open market, and buyers in urgent need of coal are generally able to pick up some, though they rarely get the tonnage or the quality they desire.

A much easier market situation is expected to be developed by the fore part of March, through the double influence of better weather, incrasing the railroad movement, and of there being a seasonal decrease in the consumptive demand.

There are rumors that the Interstate Commerce Commission has ordered reductions in demurrage charge in coal, but the precise scope of the changes it not known. The operation of the usual demurrage rules, when the movement of coal has been so peculiar, has worked a hardship to many consignees.

The market remains quotable at the Government limits: Slack, $2.10; mine-run, $2.35; screened, $2.60, per net ton at mine, Pittsburgh district.

COLUMBUS

Demand for all grades is increasing, while products are still held below the 50 per cent mark by lack of cars. No immediate hope for improvement is seen. Railroads are in bad shape generally.

A feature of the Ohio coal trade is the strong demand for all grades, including both steam and domestic sizes. With short stocks in every locality buyers are placing orders briskly and all ask for immediate shipment. With car shortage growing worse instead of better, production in all Ohio fields is still low and this is having its effect on general market conditions. The tone of the market is good and a brisk demand is expected for several months.

Many causes are given for the growing car shortage. Principally is the lack of cars due to the fact that during the strike loaded cars were sent far and wide and the empties have not yet been returned. Still another cause is the lack of motive power on all of the railroads, which mitigates against a promptly handling of both loaded cars and empties. Then the influenza epidemic has played havoc with the train crews and as a result conditions are getting worse as the time passes. The severe winter has also had its bearing on the railroad situation.

Retail trade is exceedingly strong in every respect and dealers are clamoring for stocks. In many cases retail stocks are very low and dealers have been compelled to restrict orders to small lots. Practically no Pocahontas lump is coming in now and only a limited amount of mine-run. Some West Virginia splints are being sold as a fair tonnage is arriving. The large part of the retail trade, however, is confined to Hocking and Pomeroy varieties. Retail prices are firm at the levels which have prevailed for several weeks.

Hocking lump retails at $6.25 and mine-run around $5.75 to $6. West Virginia splints sell at $7 for lump. Pocahontas mine-run is quoted at $7.50@$7.75, while Pomeroy lump sells at $6.50. Jackson lump retails around the $7 mark.

Steam trade is also strong, as many of the larger consumers are short on stocks. Reserves were reduced during the period of suspension and purchasing agents have been unable to accumulate a surplus since that time. All lines of manufacturing are buying actively with iron and steel concerns and rubber plants in the lead. Public service corporations are also good purchasers. Hospitals and schoosl are now pretty well supplied. On the whole the steam trade is showing more strength in every section.

CINCINNATI

While there is no concealment of the fact that there is a pronounced car shortage in this territory hampering operations in West Virginia and Kentucky fields, reports from throughout Ohio and Indiana district indicate an increase of more than 100 per cent in cars loaded with coal.

For the last two weeks of January there were 14,470 cars loaded with coal. For the last two weeks of January 1920 there were 31,305 cars loaded with coal in this district. Delegates from these fields have gone to Washington and returned with promises, but no cars in sight to relieve the situation. Right now there is a shortage of fuel for domestic and industrial uses.

Immense quantities of coal poured into the Cincinnati terminal last week, and were promptly sent on their way. There is no congestion of any kind in the Cincinnati terminal, and no embargoes on it, while in other terminals, Toledo in particular, there are much congestion and a number of embargoes.

Operators say the lack of cars is decreasing production 60 per cent. Labor is also effecting further decreases. The situation is close to a famine in Ohio, especially in the small towns. One of the largest coal operations in this vicinity mined 19,000 tons of coal on its biggest day last week.

The demand is keen for all grades, although it is believed that if all mines in this locality had full car supplies the deficit would be made up quickly.

Instead of improving, the car supply has been even worse that it was last week. Dealers attribute this to a number of causes.

Coal companies report that some of their money is coming in from confiscated and diverted tonnage, but the bulk of it is yet to be heard from. Operators are not taking on much new business as they are far behind on deliveries, and no one wants new business for future delivery at government prices, with a possible chance of the peace treaty knocking the Lever Act out of commission.

Receipts by river were below normal the past week. Dealers are not optimistic as to the prospect of any immediate relief. No one sees any chance of the situation being straightened out to pre-war basis until spring.

Several dealers report that they have still deliveries to make on last summer's orders. The tonnage alloted to jobbers is being decreased weekly according to reports. The mild weather in this vicinity during the past ten days has helped the situation considerably.

Southern

LOUISVILLE

Better production reported from the state fields. Demand for steam coal continuing good, with block not quite so active, due to retailers' stocks showing improvement, and lack of domestic demand.

As a result of numerous conferences in Washington with Congressmen, Senators, Railroad Administration officials, committees, etc., and the coal operators' committees from Kentucky, there has been some improvement noted in car supply in Kentucky, and production is on the up grade. It is claimed that the state showed a production of better than sixty per cent last week on the Louisville & Nashville lines, with the exception of the Hazard field, which ran about fifty-four per cent. Other railroads are managing to provide better car service as a whole.

Demand for steam coal continues very strong, as many industrial concerns are short and are stocking all the coal they can get just now. Prepared sizes are still in good demand, but not as active as they were, as retailers are fairly well stocked, and report a very slack demand from the domestic consumers, who as a rule are well supplied with stocks from last summer and fall, as the winter has been as mild as that of last year, and consumption has been light.

An epidemic of smallpox in the Harlan fields is general, although the cases reported show a light form. It is feared that the disease may spread, and the State officials are discussing plans for placing a quarantine, and would have done it before except for the fact that coal is needed, and it is a bad time to block production.

Heavy rains in eastern Kentucky have esulted in many bridges, rights of way, etc., being washed out of branch lines. Whitesburg reports that it will probably be several weeks before service will be resumed on Carr's Creek and Rockhouse branches of the Louisville & Nashville, into eastern Kentucky, as much track has been totally swept away.

Lake Region

TORONTO

Retail Government prices prevail.

Anthracite, egg, stove, nut and grate......	$12.75
Pea..................................	11.25
Bituminous steam.....................	9.00
Slack................................	8.00
Domestic lump........................	9.00
Cannel	12.50
Wholesale, f. o. b. cars at destination—	
Three quarter lump...................	6.75
Slack	6.00

BUFFALO

Still the car shortage. Buffalo is sure that it is to blame for the coal shortage. Local association contradicts the opinion expressed in Washington. No relief yet. Anthracite rather scarce.

Bituminous—The situation does not change much. All shippers are busy trying to keep up the supply. They say it would be easy enough if the railroads would stop diverting it to other sources. If they would merely use what they need at present there would not be much complaint, though the idea is that the roads should buy their coal as other consumers do and pay for it when they buy it. This they would never do and it is to be hoped that the agitation is kept up till they are obliged to fall into line, like other consumers.

The chief complaint against the Railroad Administration is that it has lately diverted coal from certain needy consumers and turned it over to others who did not need it any more than those did to whom it was consigned. At the same time it is most discouraging to sell a thing and then find that it is in the hands of someone else and out of your control. So much of this sort of thing has been done lately that some of the city shippers have about given up trying to do business till there is a better understanding with the roads.

At the same time it is the belief of all bituminous shippers that there would be coal enough mined to meet all needs if the cars were moved promptly. Reports come from all mining sections that the sidings are full of cars loaded with coal. Of late the weather has had much to do with the delays, some storms being so severe that trains could hardly be moved at all, but at the same time shippers say that, though coal is going to be short for some time the situation can be kept from getting any worse if the railroads will do their share of the work.

Buffalo is suffering along with other localities. Some of the factories have only a few days' supply and in some instances shippers, though with contract demand for all the coal that the roads will let alone, have come to the rescue and helped out this or that institution or factory.

Prices are not talked about much, but are supposed to be based on the government regulation of $4.70 for Allegheny Valley sizes, $4.50 for Pittsburgh and No. 8 lump and three-quarter and $4.25 for all mine-run and slack, with $4.70 for Pennsylvania smithing and $4.60 for smokeless, all per net ton, f.o.b. Buffalo.

Anthracite—The consumption of anthracite has been so heavy all winter that it has been a hard matter to keep the supply up to the demand While the weather is not now so severe as it was it is anything but mild most of the time. The trade will take a long breath as soon as the sunny days of March are here, for the consumer is no longer scared and will not order more than he needs Any day may now see the letting up of the winter severity. It took place on Feb 6 two years ago. The solid freezing weather after that date gave way to a goodly amount of mild days and the situation became easy

Buffalo does not hear much of the Canadian situation, for the smallpox embargo is still on and few members of the trade there are coming here. It is really quite as well, so far as the trade as a whole goes, for the shippers here try to distribute the supply according to the needs and what one dealer gets by personal application is merely diverted from someone else At the same time the rail line trade west is not likely to be satisfied till it is warmer weather. The Upper Lake situation is fairly good, due to the big shipments in that direction last fall, though it does not now look as if any loading into vessels would be done before spring. Some seasons there are hundreds of thousands of tons ready to go as soon as the lakes open.

CLEVELAND

All of the local markets appear to have settled down to a low level which the trade believes will continue at least until March 1. Receipts of all grades still are far below normal, but apparently sufficient to satisfy all requirements.

Bituminous—Conditions in the steam-coal trade are little changed, with the possible exception that receipts in the past week have decreased slightly. This reflects poorer car supply at eastern and southern Ohio mines. Moderating weather, it is believed, will work for improvement in the next few days. Because of a shortage of engine crews—due to the influenza epidemic—considerable time is being lost in the yards here

Despite the unusually small number of cars of steam coal now coming into Cleveland, so far as known no industry yet has had to suspend operations for lack of fuel. Minimum requirements are being met, and that is all. The local trade considers it is doing remarkable, in the light of difficulties confronting it. Demand from apartments and domestic consumers has increased somewhat; to this class of consumers dealers are allotting their supplies on the basis of past purchases.

Belief still prevails here that about March 1 government maximum price regulations will again be abrogated. By that date receipts of bituminous coal here will be close to 70 per cent of normal, it is believed, and most of the domestic demand for this winter will have been satisfied. An open market is bound to result in increased prices, with supply so small and demand so large.

Pocahontas and Anthracite—Demand for these grades, like that for domestic bituminous, has taken on new life the last few days. Dealers are paring down allotments to one ton to one and a half tons. Were all of the Pocahontas and anthracite booked by dealers to come through without being diverted the supply would be ample, dealers say. Diversion constitutes their biggest problem.

Lake Trade—Iron ore selling now is on in earnest, and this is the forerunner of the early fixing of carrying charges. Fixing of ore carrying charges always is followed by the same action in regard to coal. Lake vesselmen expect to get 1918 charges on ore, and this presumably will be the case with coal. In 1918 the carrying charge on coal per net ton from Lake Erie ports to Duluth was 48c. and to Lake Michigan 55c. The 1919 and 1917 rates were 42½c. to Duluth and 47½c. to Lake Michigan. Increased car supply at the head of the Great Lakes is fast making the docks bare, and early-season shipments will be limited only by receipts at the Lake Erie loading ports.

Prices of coal per net ton delivered in Cleveland are:

Anthracite—Egg, $12.20@12.40; chestnut, $12.50@12.70; grate, $12.20@12.40; and stove, $12.40@12.60.

Pocahontas — Forked, $10.50@11.00; shoveled lump, $9.00@9.25; and mine-run, $8.00@8.25.

Domestic bituminous—West Virginia splint, $8.30; No. 8 Pittsburgh, $6.85@7.00; Massillon lump, $7.40@7.65; Cannel lump, $11.00; and Coshocton lump, $7.35.

Steam coal—No. 6 slack, $5.20@5.40; No. 8 slack, $5.20@5.50; Youghiogheny slack, $5.25@5.50; No. 8¾", $6.00@6.25; No. 6 mine-run, $5.25@5.50; and No. 8 mine-run, $5.85@$6.00.

DETROIT

Consumers of steam and domestic coal in Detroit are again confronting a shortage due to failure of railroad transportation facilities.

Bituminous Though hundreds of cars filled with coal for Detroit are reported on railroad sidings between the mines and Detroit, very little coal is being brought into the city. The blame for this situation is placed with the federal railroad administration.

Alexander Dow, president of the Detroit Edison Co., asserts that many Detroit industrial plants will be compelled to close within 10 days, unless there is hastened delivery of the delayed coal shipments With only six days' supply of coal on hand, Mr Dow says the Detroit Edison Co.'s daily receipts do not average a one-half day's supply, although coal in quantity sufficient to meet the company's full requirements is somewhere on the way between the mines and Detroit Messages have been sent to Congressman Doremus in Washington and A T Hardin, Regional Director of the Railroad Administration in New York, urging that action be taken immediately to relieve the situation.

Jobbers assert that representatives of the Railroad Administration in Ohio are continuing the confiscation of coal sent to Detroit, and are diverting it to supply the needs of railroads which neglected to make provision for their fuel requirements last summer. This is regarded as an injustice to Detroit users of steam and domestic coal.

Cincinnati is reported to have a generous supply of coal on tracks, but Detroit consumers are still receiving notifications from the regional director there of confiscation and diversion of coal consigned to them for use of railroads and industries in Ohio.

The failure to get coal to Detroit is attributed chiefly to the railroad shortage of motive power and in part also to the congested terminal yards in Toledo

Anthracite—Supplies of anthracite in the yards of retail dealers have been largely depleted by the increased demand of household consumers, resulting from the long period of very cold weather in January. While temperature conditions have moderated and the season is now well advanced, the return of extremely cold weather would be likely to find many of the dealers unable to provide for requirements of their customers.

Middle West

MIDWEST REVIEW

With the car shortage as it is, and with shipments delayed, it is very easy to see that there is a strong market for coal, practically all kinds, and all sizes, both steam and domestic. A week or so ago, there appeared to be a slight softening in the market on steam sizes, but this has changed completely, as all coals are now in strong demand.

A representative of the **Coal Age** spent part of the week in the outlying districts of this territory, in order to get a true idea of what the coal situation is in the middle west. In brief, the situation in the country is that there is a serious coal shortage. Hardly a retail dealer had enough coal in his bins to take care of his trade more than a few days. One of the largest retail dealers in the city of Rockford has had his bins empty for some time. As fast as the mines where he buys his coal ships the cars to him, they are unloaded into his waiting wagons, and delivered to his trade. Practically every dealer has coal in transit, but the transportation question is so unsettled at this time that he cannot count on when his coal will arrive.

The situation with the steam trade is almost the same. Steam coals, however, have not been so scarce as domestic coals The average steam plant in the territory visited, has from one to two weeks' supply on hand. Of course, manufacturers have some storage coal, but we are talking about the average plant, not the exceptional one. The manufacturing class of consumer has coal in transit, too, but is unable to count on when this coal will reach destination. It was found that one reason for the poor service that the railroads are giving is that their crews are badly crippled with the "flu."

Many freight yards, as well as freight thains, had but one half of their nomal cews, the other half being ill or absenet for one reason or an other. An additional reason why the railroad service is poor at this time is that the men appear to be very discontented with the present wage scale. They feel that they ought to have more money, and ought to have it before the Railroad Administration goes out of office. This has put them in a discontented frame of mind, and the efficiency per man has dropped considerably on this account.

One item of great interest to the coal industry, in Illinois, is that one of our largest producing companies has discontinued selling its coal at the Government prices. This company is now selling its prepared coal at $3.10 f.o.b. mines, these mines being located in southern Illinois, and the Government price being considerably below this $3.10 figure. The reason for this is that the company has been operating for the past six or eight weeks at a loss, as they have been unable to sell their coal at the Government price, and make both ends meet.

The legal advisors of this company argue that under the Levr Act the company is entitled to a fair prifit, and in raising the price to $3.10 they are fully covered. It is generally believed, in coal circles, that this company is acting entirely within its rights, and cannot be molested. It will be interesting to note whether other coal-producing companies follow this example.

CHICAGO

Retail trade in Chicago is far better off than others.

A great deal of coal coming into Chicago, comes in direct and this coal is shipped direct from the mines to the city, on the originating line. This does away with delays at transfer points, etc., and consequently the city retail trade are able to figure, from day to day, just what their supply will be.

Eastern coal continues to be extremely hard to get, and is very slow in arriving in Chicago. There is a big demand but very few dealers have been able to place orders. Coal from the West Virginia, Pocahontas and New River districts and Block coal from eastern Kentucky, are most in demand, after anthracite.

Demand for coal in this city is much better than it was a week or so ago, as the car shortage has shown both dealers and manufacturers the difficulties the operators are having in producing enough coal for all. All grades, both steam and domestic, are holding firm, and will continue to be firm in price, until the car shortage situation clears up, which will not be for some few weeks, at least.

Illinois

	F o b Per Ton	Chicago Rate to
Southern Illinois—		
Franklin, Saline and Williamson Counties, etc		
Prepared sizes	$2 55	$1 32
Mine-run	2 35	1.55
Screenings	2 05	1 55
Central Illinois—		
Springeld District:		
Prepared sizes	$2 55	1 32
Mine-run	2 35	1 32
Screenings	2 05	1 32
Northern Illinois—		
Prepared sizes	$3 25	$1 24
Mine-run	3 00	1 24
Screenings	2 75	1.24

Indiana

Clinton Fourth Vein District—		
Prepared sizes	$2 55	$1 27
Mine-run	2 35	1 27
Screenings	2 05	1 27
Brazil Block		
Prepared sizes	$3 60	$1 27
Mine-run	3 30	1 27
Screenings	2 05	1.27
Knox County, Fifth Vein District		
Prepared sizes	$2 55	$1 37
Mine-run	2 35	1.37
Screenings	2 05	1 37

West Virginia

New River and Pocahontas		
Prepared sizes	$2 60	$2 60
Mine-run	2 35	2.60
Splint		
Prepared sizes	$2 75 to $3 00	$2 60

ST. LOUIS

Car shortage bringing disaster to the coal industry in Middle West. Motive power partly the cause. Warm weather causes easing up in demand. Country districts suffering on account of embargoes. Steam demand keeps up.

The local situation continues fair. This is [illegible] trunk lines West [illegible] switching limits. The car shortage is worse now than at any previous time. Warm weather has made it easier for the [illegible] who couldn't ship, but even at that many outside places are short of fuel. On the Missouri Pacific lines South no coal is moving because that road has cars for about two days work a week, and the road needs that coal for its own use and is taking nearly everything loaded.

In the Carterville field of Williamson and Franklin Counties the work is light everywhere, although the Chicago, Burlington & Quincy is doing far better than any other road in equipment. A little more than half time is the best that any mines get even when located on three or more roads.

Labor is short, but the men are working at every chance. Influenza is raging through the Illinois coal districts, not so much with the miners as with their families, and this is cutting tonnage down in some places.

Railroad tonnage continues heavy in this district. Conditions are much the same in the Duquoin field, but two days a week is the best that the Illinois Central R.R. can give cars for.

In the Mt. Olive field the mines work almost three days a week. Railroad tonnage is good here, but embargoes cause a one-sided distribution. Steam demand is good, and domestic is far behind on shipments.

In the Standard field the railroads have let up some on their tonnage, but this does not release any coal for the open market on account of no cars. The few cars that are furnished are those from the East. It is impossible to get men to unload them, and at many mines they are too high to go under the tipple.

The market on this coal is easy. Embargoes force it for local use, and while there has been no surplus, lump has been plentiful. For country shipments it is impossible to make promises. Steam sizes are in good demand.

Prices on all coals remain firm. Almost no Franklin County coal is coming in here since the United States Attorney has ruled that on orders taken prior to Oct. 30 where no price was specified, the price to be charged was the government price, regardless of how the acknowledgement was worded.

The United States Attorney at East St. Louis is now charged with an investigation to determine whether there has been a violation of the anti-trust laws in these operators fixing prices and selling conditions.

No smokeless is coming in and practically no anthracite. Prices are the same as last week.

Prices per net ton bituminous coal f.o.b. mine today as compared with a year ago are as follows:

	Williamson and Franklin Counties	Mt. Olive and Staunton	Standard
Prepared sizes (lump, egg, nut, etc.)	2 55@2 70	2 55@2 70	2 55@2 70
Mine Run	2 35@2 50	2 35@2 50	2 35@2 50
Screenings	2.05@2 20	2 05@2 20	2.05@2 20

Williamson-Franklin rate to St. Louis is 1.10, other rates 0.95.

MILWAUKEE

Government prices are as follows:

Anthracite

Chestnut	$12 70
Stove	12 60
Egg	12 40
Pea	11 20
Buckwheat	9 75

Bituminous

West Virginia, splint screened	8 00
Hi-Heat	8 00
Hocking, screened	7.75
Pittsburgh, screened	7 75
Pocahontas mine run	8 75
Pocahontas, screened	11 00
Cheerful Chunks	9 50
Smithing	8 75
Cannel	12 00

Steam Coal

Youghiogheny, screened	7 00
Youghiogheny, pile run	6 75
Youghiogheny, screenings	5 75
Pittsburgh, screened	6 75
Pittsburgh, pile run	6 50
Pittsburgh, screenings	5 50
Hocking, screened	6 00
Hocking, pile run	6 50
Hocking, screenings	7 50
West Virginia, splint screened	7 50
West Virginia, pile run	7 50
West Virginia, screenings	5 50
Kentucky, screened	7 77
Kentucky, pile run	7 55
Kentucky, screenings	5 75
Pocahontas, mine run	7 75
Pocahontas, screened	11 00
Pocahontas, screenings	6 75
Smithing	7 75
Kanawha Gas	sold up

Bunker Coal for Steamers and Tug

Pittsburgh, lump	6.25
Pittsburgh, pile run	6.00
Youghiogheny, lump	6.50
Youghiogheny, pile run	6.25

Dealers report an unsatisfactory market, owing to a scarcity of popular grades of coal. Anthracite about exhausted. All Eastern coal sold up.

There is a fair demand for coal, but the supply is unsatisfactory and dealers are having considerable trouble in satisfying their trade. Anthracite is about sold out, except pea and buckwheat, of which there is a reasonable amount in stock. Pocahontas mine run is the only grade of that coal to be had. There is only enough Eastern coal on hand to meet contracts and dock companies are urging those holding contracts to take in their supplies at once.

The transient trade will have to depend upon rail supplies from now on. The rail situation is better, and cars are moving in and out of the yards in a more satisfactory way than has been the case for weeks. Illinois coal is arriving on track daily, but very little Eastern coal is finding its way here at present. Prices continue unchanged.

Coke

CONNELLSVILLE

Connellsville production very steady. By-product greatly increased, 15 per cent more pig iron being made in January than in December.

The Connellsville coke trade has given a remarkable exhibition of steadiness and lack of developments since Christmas. The curtailment in production resulting from that holiday was recovered from, and from that time to now there has been practically no change in the rate of production.

The rate has been far from satisfactory, seeing that many more blast furnaces desire a supply of coke than two months or three months ago, but the railroads have shown at any rate that they are not really disorganized, in that they have furnished sustantially the same car supply each week since Christmas. The Connellsville. **Courier** reports show that since Christmas the weekly output has varied no more than about 1,000 tons either way from a mean of about 240,000 tons, which means a remarkably steady gait.

The production of pig iron in the United States in January was 15 per cent greater than the output in December, the increase proving quite a surprise when there was so much complaint in January about coks shortage. Undoubtedly there was a coke shortage, but the furnaces were endeavoring to operate at a much heavier rate than formerly. The increase in supply of coke in January chiefly came from the byproduct ovens, which were better supplied with coal, although they are not yet fully supplied.

The coke market remains stagnant, as the output is going out on contracts. Many of the contracts were made originally at above the Government limits, reinstated Dec. 8, and while it seems clear that the regulations require that invoice prices on such contracts be the Government limits, less than half the coke involved has been adjusted to the lower price. The market remains quotable at $6 for furnace, $7 for foundry and $7.30 for crushed, per net ton at ovens.

The **Courier** reports production in the Connellsville and Lower Connellsville regions in the week ended Jan. 31 at 241,935 tons, an increase of 2,329 tons.

BUFFALO

Coke—The demand is increasing all along the line. Not only are the smaller private consumers in the market, but the furnaces are increasing their demand.

If the jobbers were allowed and profit on it they would be able to work up a good trade, but as it is they only sell to accommodate, for the producers will by no means favor them with a reduction of price. The output can be sold direct.

Quotations continue at $9.60 for 72-hour Connellsville foundry, $8.60 for 48-hour furnace, and $7 for off grades, with $8 for domestic sizes. It appears that the market for Lake Superior iron ore is good, so that the lake vessel owners are trying to get better carrying rates for next season. The old dollar rate from Duluth to Buffalo was cut to 80c. last season and the vessels made a poor showing, so the effort is making to restore the rate.

COAL AGE

Volume 17 New York, February 19, 1920 *Number* 8

Shall We Store Coal in Summer or Dollars in Winter?

By R. Dawson Hall

OWING to the unusual degree with which the public, and especially the Railroad Administration abstained from the buying of coal during the early part of the past year, and to the coal shortage that has followed, the coal industry has managed to convince the public that it should buy coal early and spread the production evenly over the entire twelve months. Owing to the mine workers' bitter complaints and their loud demands for more wages, the public has begun to see that it is both fruitful and fair to do something to relieve the seasonal condition of the coal industry.

But it behooves the industry itself to take stock of the situation and question whether there is not some duty that can be performed by those employed in producing coal to alleviate the situation. Unfortunately, the miner is prepared to argue that the consumer, who may be only a poor man after all, should save money and buy coal when he does not need it, in order that he may have it on hand when he desires to use it. He is asking the consumer to exhibit a frugality and foresightedness in which the miner himself is too often lacking

There is no reason why the miner should not work his hardest in the winter and put away his money so that he can meet the trade depression which begins in April and lasts often until the early fall. Too many miners, in the winter, desire to work only as much as will enable them to make living expenses during that period of the year. Three days a week and five hours a day are too often the total effort that can be obtained from the miner, and as a result he is not able to lay by for the period of slackness which occurs in the summer.

Civilization has been described as a foresighted preparation for future needs. The difference between the lower animals and man is the fact that for the most part the animal is disposed, and able only, to look after immediate necessities. He cannot prepare for the difficulties with which he may be faced in the future.

Too many mine workers are disposed in the winter to let the summer take care of itself. That statement is as true as another which has more general currency, namely that the consumer is willing in the summer to let the winter look after its own problems.

As one looks over other fields of enterprise one notes a different disposition among workingmen. The farmer, the carpenter, the paperhanger and decorator, and the man who moves goods from place to place, just to mention a few of an extremely numerous body of men, work their hardest when the opportunity to work is furnished them, knowing that the chance to labor is not spread in equal measure the year over. By this means they keep needless men from thronging into the industry. They fill the need of the hour, so that no one notices the scarcity of help in the time of need, or at least suffers so much from it as he otherwise would. The labor market is not, therefore, cluttered with men who must necessarily during the period of short demand find time hanging heavily on their hands.

The coal miner is responsible for the slow time from which he suffers during the summer. If he had been more keen to work in the winter and less disposed to leave his work to hunt or to observe all kinds of festivals and to lay-off for all kinds of imaginable causes, he would have had less men in the industry in the summer to compete for the little work that is then available. There should be no difference in the attendance at the mines between the early portion of the fortnight for which payment is made and the last few days toward the end of the pay period.

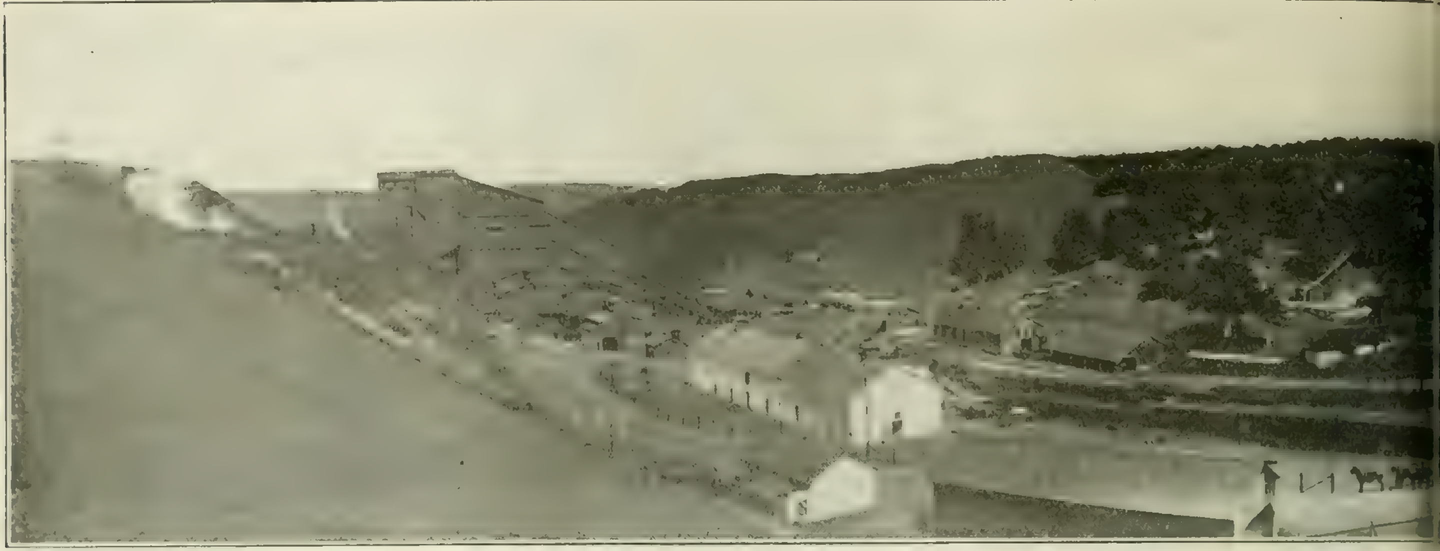


FIG. 1. PANORAMIC VIEW

Burnside Colliery of the Reading Company at Shamokin, Pa.

Although Intricate, the Process of Preparation Is Thorough—Concrete, Steel and Other Incombustibles Have Been Employed in Remodeling This Colliery—Much Ingenuity Is Exercised in Securing Ample Water Supply.

ALTHOUGH the Burnside Colliery of the Philadelphia & Reading Coal & Iron Co. near Shamokin, Pa., is not entirely new, a number of features both underground and on the surface have been embodied in it that are of interest. Some innovations not in common use have been adopted at this colliery. The surface plant has been entirely remodeled during the past few years which makes the colliery one of the really new and model installations in the southern anthracite coal field. The system of mining in itself is not different from that followed in numerous other collieries in the field, but some uses of materials underground possess possibilities to which attention should be called. That which most impresses a visitor to this mine is the amount of concrete used throughout the operation, particularly at important points. The mine abounds in numerous concrete arches, columns and walls. This can be readily seen in the accompanying illustration (Fig. 4) showing a heading on the bottom lift of the shaft.

All these concrete supporting structures are protected from having any great weight thrown suddenly upon them. This is accomplished by providing a cushion of timber between their tops and the weight they must sustain. A sudden load would thus be applied to the timbers first and must crush them before acting on the concrete. This tends to prevent the concrete from cracking because of sudden stresses, allowing it to take the load gradually from the timber. The timbers employed are small, not being over 3 or 4 in. thick. Another underground feature that attracts attention is the mine stable. This is on the second level of the mine and is probably one of the cleanest, best designed and best equipped existing in this section of the coal fields. In compliance with law, no wood is used in its construction except for the flooring, and the columns and supports for the roof are made either of cast iron or concrete. The mangers, built of concrete, are designed for two mules. They are 10 ft. long with a small box at each end for the grain feed with a large space between them for the hay. These mangers are arranged in one straight line so that it is possible to have a track on which is a small car to carry the feed from the feed room to the manger. Back of the mangers, at a sufficient distance to allow plenty of room for the mules, another track is laid on

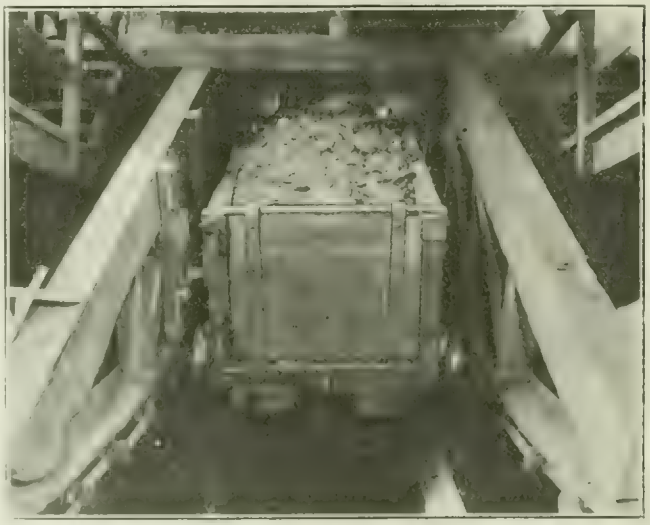


FIG. 2. CAR DUMPING AT TOP OF CAR HOIST

OF THE SURFACE PLANT

which the car for removing the manure is run.

One particularly interesting feature of the stable is the method by which the mules are watered. A 10-in. pipe has been cut in half and run just between the feed track and the mangers. This pipe is so arranged that it is kept full of a running supply of fresh water, allowing the mules to drink whenever they desire. Fig. 1 shows the interior of the stable and the watering trough.

To the left of the entrance to the stables there is a large feed room. In this the grain feed which consists mainly of oats together with a little corn is kept in large waterproof iron boxes. The hay is stacked up on one side of the room. Practically no dampness is encountered in this room because a steam condenser here installed keeps the temperature rather hot and drives off the moisture.

Men's Accommodation Looked After

At each of the shaft stations concrete rooms supplied with benches are built for the accommodation of the men waiting to go to the surface. The approaches to these waiting rooms are so arranged that the men do not have to cross either the loaded or empty tracks at the shaft bottom nor any of the main haulage tracks. This tends toward safety at all times.

The waiting room and the pump room at the bottom of the shaft are one and the same structure. A duplex Jeansville pump 23 and 40 x 12 x 48, is here installed. This has a vertical lift of 730 ft. and a capacity of 2,000 gal. per minute. The water from this pump is discharged into a creek on the surface and flows a distance of about 400 ft. when it is again picked up by another pump and used in the breaker. A description of this latter will be referred to later. The roof of the pump room is supported by concrete arches surmounted by lagging made from old 40-lb. steel rails. Fig. 9 shows the pump end of the waiting room. At the junction of all headings and manways a sign is placed giving full directions as to how to go either to the shaft bottom or to the foot of the main manway.

The underground hospital at this mine is well equipped and absolutely fireproof, no wood being used in any part of its construction. The end wall is built of concrete and has a steel door, and the three closets at the rear are of concrete with steel doors. The floor is of concrete. The roof is the natural rock. Hot and cold water is supplied at a wash basin just to the left of the entrance. The furniture is substantially built and is covered with black oil cloth. The closets contains a full supply of everything needed in the hospital. On the wall at the right of the entrance is the stretcher. A man is in continual attendance.

On the surface one is impressed with the beautiful lawns that have been laid out and the general cleanliness and attractiveness of the grounds and buildings. This is well shown in the panoramic view Fig. 1. The paths and walkways have been so laid out that it is absolutely unnecessary for any man to cross a single track or conveyor line in order to go from one part of the plant to another.

All the buildings are of the same general design having concrete foundations and concrete sidewalls to a height of about 8 ft. Above this height the construction is of wood. The wood work is painted red and makes an attractive contrast against the green lawns and white concrete.

The men's welfare is as carefully guarded on the surface as underground. This company has established excellent wash houses built of brick with concrete floors and wooden roof trusses. The wash house at this mine has a capacity for 340 men. The usual arrangement for taking care of the men's clothes by raising them up

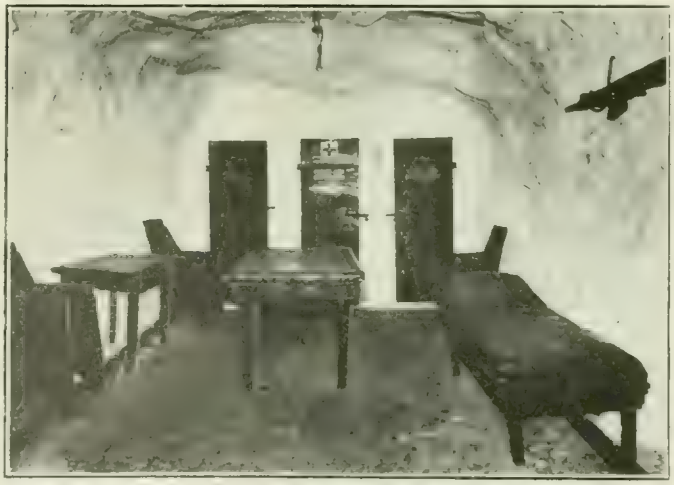


FIG. 3 INTERIOR OF MINE HOSPITAL

in the air with a chain passing over a pully together with a locking device is provided. All wash houses are steam heated and have a vestibule so arranged that when the outside door is opened the inside door stays closed and vice versa. This prevents cold drafts from striking the men while they are dressing. One shower bath is provided for each 20 men. The fire bosses, assistant mine foremen, etc., have their own separate wash house which accommodates about 20 men.

The use of the old-fashioned safety lamp has been dispensed with as much as possible at this colliery, these lamps being now used for testing purposes only. The Edison electric head lamp has been substituted. The lamp house has a complete charging outfit for about 100 lamps.

A well-equipped machine, carpenter and car shop combined has been built at this plant. The machine shop proper is provided with a large shear capable of cutting a piece of iron 6 in. wide by 1 in. thick, a Leyner Drill Sharpener, (also equipped to make bolt heads), a bolt threader, two forges, one drill press, one steam hammer, one large lathe. This lathe is so arranged that it can cut threads on pipe up to 10 in. in diameter.

The carpenter and car shop is equipped with two cutoff saws, one band saw, one mortising machine, and a two-ton Yale electric hoist for handling the mine cars so arranged that it can be used as a travelling crane. The cutoff saws are provided with special safety devices for the protection of the men as is also the emery wheel. Besides the machinery already mentioned, there is here installed a roll in which the sheet iron that has been used in chutes, underground and on the surface are straightened out allowing its reuse.

Even Miners' Tool House Is of Concrete

A small concrete building called the miners' tool house is also here used. This is divided into two parts, one for the reception of dull, and the other for the issuance of sharpened tools. When a miner desires to have any tool sharpened he attaches his number to the tool and drops it through an opening into the dull tool compartment. From here the blacksmith takes and sharpens it, after which it is sent to the issuing room and the next morning just before the miner goes underground he goes to this point and procures the tools which are marked by his check and which are issued to him by the room clerk. This prevents a man from getting someone else's tools.

The car-supply house is divided into four rooms. The first two are small and in them the metal parts of the mine cars are kept. Immediately adjoining these is the lumber stock room. This lumber room is divided into a number of sections by iron pipes, which extend from the floor to the ceiling. Each section is distinctly marked showing the size of the pieces stored therein. Each course or layer of lumber is separated from the courses adjoining by small strips of wood allowing a free circulation of air thus preventing warping.

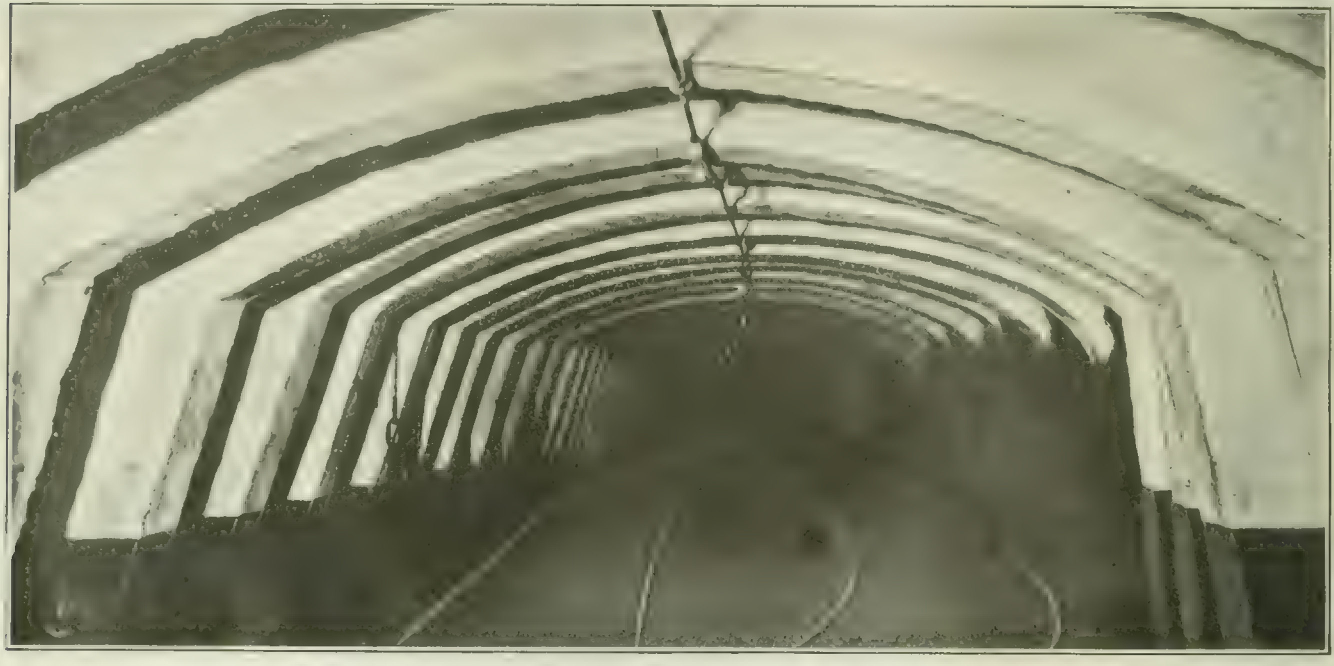


FIG. 4. CONCRETE CONSTRUCTION ON HEADING ON BOTTOM LIFT

The fourth compartment of the supply house is so arranged that in summer it can be used as an outside repair shop. The men working on the cars are well protected from the elements by a large shed roof and are much more comfortable than if working inside. During the winter all such work is done in the carpenter shop.

Another building is divided into three parts, one of which is used for the storage of cement and another for the storage of company tools. At the end of this building is a small room for the use of the men working in the timber yard.

The hoisting engine employed at this mine was built at the shops of the company in Pottsville and has a maximum capacity of 495 cars of coal a day, each car having an individual capacity of 2½ tons. The most interesting feature of this hoist is the method used to allow either cage to be operated from any level in the mine. The two hoisting drums are entirely separate, but can be fastened rigidly together by means of a toothed clutch. This permits one of the drums to be held stationary by the brake, while the other drum with its cage can be run to any desired position in the shaft.

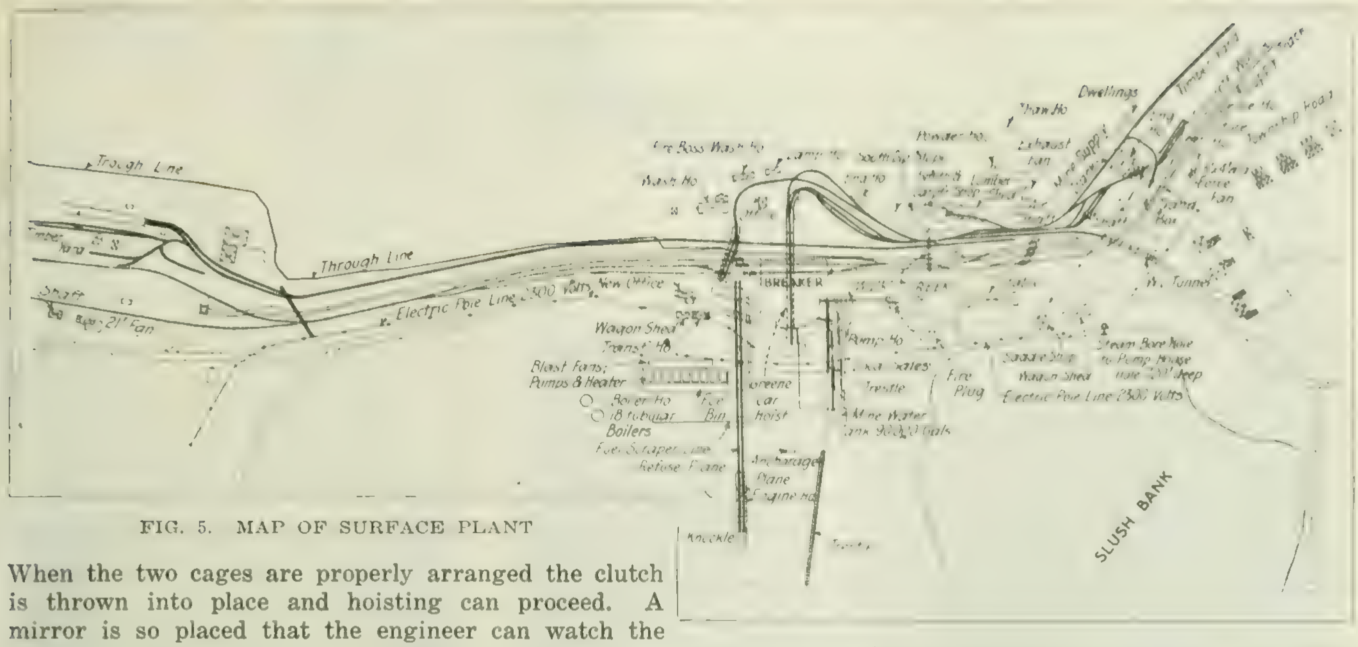


FIG. 5. MAP OF SURFACE PLANT

When the two cages are properly arranged the clutch is thrown into place and hoisting can proceed. A mirror is so placed that the engineer can watch the shifting of the clutch and see that it is in the proper position before it is thrown.

The timber yard is equipped with a steam drag saw built by the W. M. E. Hill Co. of Kalamazoo, Mich., that cuts all timber used in the mine and also notches it. Two timber cars are operated by means of a rope haul. Each car is about 30 ft. long and designed to carry one large stick of timber. It is run up to the drag saw and the timber cut. From there it goes to the finished yard where the cut pieces are piled according to their size. While this is being done the other car is being loaded. The yard for cut pieces is so arranged that when the timbers are rolled off the timber truck they can either be placed in stock piles or immediately loaded into mine cars on the other side of the yard.

The supply house is divided into three parts, the first of which is used as an office and small electrical supply room combined. The second part is used for the storage of small supplies such as bolts, nails, rope and fire fighting apparatus. The third portion is used for the storage of heavy material such as bar iron, sheet iron, castings, etc. Everything is arranged in small compartments, distinctly marked as to their contents.

On the outside of the building on the opposite end

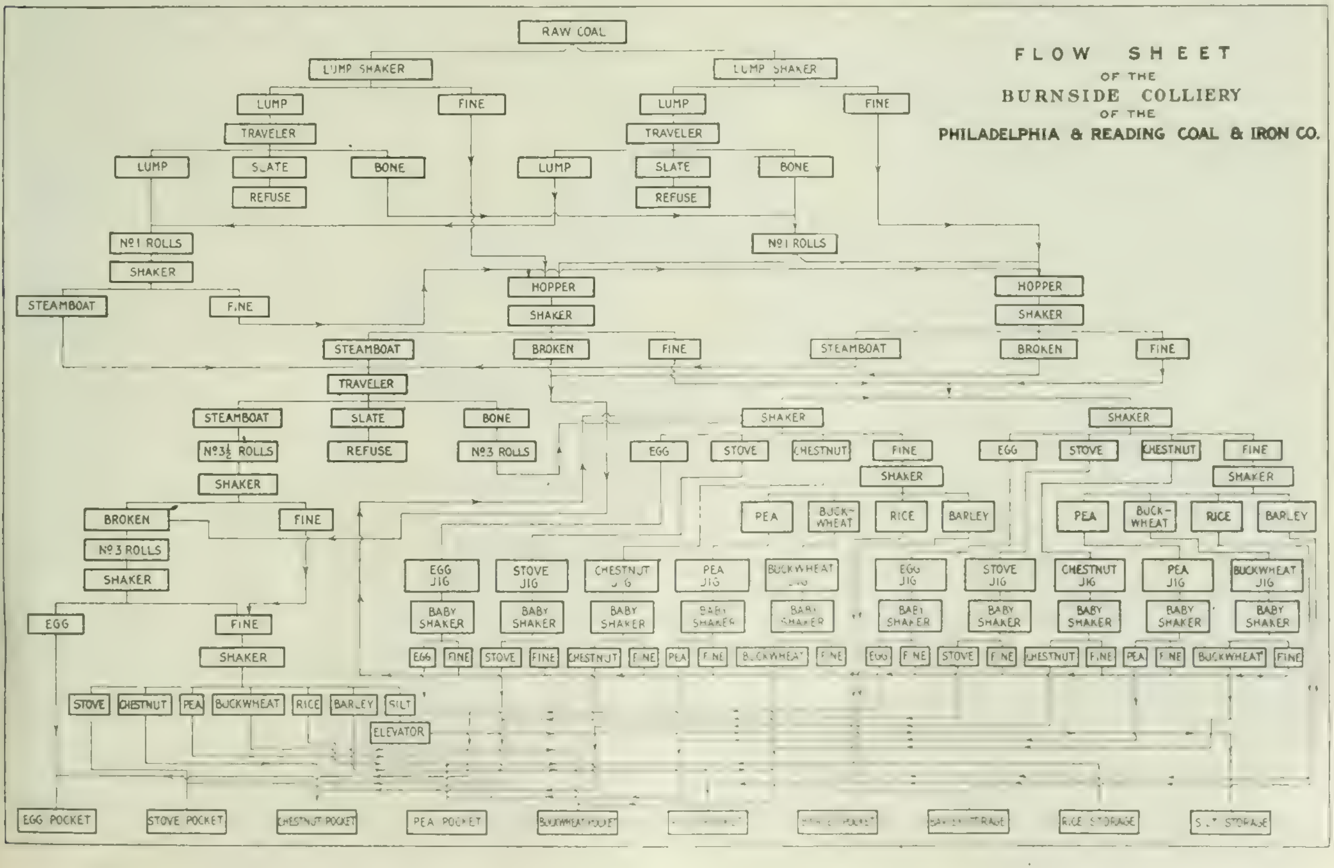


FIG. 6. THE INTRICACY AND THOROUGHNESS OF THE PROCESS PERFORMED IN COAL PREPARATION IS HERE SHOWN

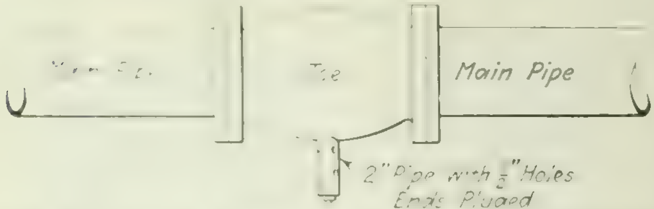
FIG. 7. INTERIOR OF STABLE

from the office a traveling crane is installed. This crane is a 6-ton Yale electric hoist mounted on a traveler. The crane runs from the salvage yard across the railroad track, past the end of the supply building, across a mine track to a wagon road. This permits the unloading of a railroad car direct to either a mine car, a wagon, or the supply house, or vice versa.

MINE VENTILATION WELL TAKEN CARE OF

In addition to the exhaust fan built by the company (with a capacity of 100,000 cu.ft. of air per minute) there is installed in a brick building a 4 x 6 ft. Jeffery blowing fan with a capacity of 100,000 cu.ft. of air per minute. This is driven through a belt by a 50 hp. General Electric motor.

The surface tracks are well laid out as may be seen from the accompanying map, Fig. 5. The breaker at this plant serves three openings, the Stirling slope, the water level and the main shaft. The loaded cars all come to the foot of a Green car hoist. Those from the water-level opening are brought by a trolley locomotive to the hoist as are those from the shaft. The cars from the Stirling slope reach the hoist by means of a tail rope. The cars carrying slate are placed on a separate track and run to the foot of the refuse hoist where they are dumped into a large hopper.



SPECIAL NOZZLE USED ON FIRE PROTECTION SYSTEM IN BREAKER

The Green car hoist above mentioned is 400 ft. long and extends to the top of the breaker. The cars enter on the lower deck of the hoist and are so placed that the doors are on the rear end. Upon arriving at the top a trip device is so arranged that the doors are opened automatically. The coal is dumped from the cars, while they are in motion, into a long chute, Fig. 2. The cars themselves never stop. As soon as a car reaches the top and is completely dumped it passes into a cage which lifts it from the lower to the upper deck where the car hoist takes it back down the slope. The cage, that lifts the car, works on a pivot and moves through an arc of 45 deg. There has never been the breakage of a single link on this car hoist. It is operated by a 150-hp. General Electric alternating current 440-volt 3-phase 60-cycle motor.

The water used in the breaker as mentioned before is pumped from the mine to a creek and from thence to a tank on the mountain side 125 ft. above the creek. This tank is made of wood and has a capacity of 90,000 gallons.

At times there is not sufficient water furnished by the mine and the creek for the operation of the breaker. It then becomes necessary to procure more water, and this is secured from the Stirling slope. The water from this slope is pumped to a trough or flume on the mountain side and flows by gravity to the creek at a point near the breaker from whence it is picked up by the breaker pump. The flume is shown on the map, Fig. 5.

The breaker is well protected in case of fire. Pipe lines from 1 to 8 in. in diameter are run throughout the building. Special nozzles are so arranged that the whole interior of the breaker can be drenched. Water is not allowed to stand in these pipes but in case of fire they can be filled and put into use by the turning on of a valve.

The coal after it is dumped from the mine cars is separated into two parts. These each pass over a lump shaker, which separates the lump coal from the balance. The lump coal then passes over a traveler (picking table) where the slate and bone coal is removed. The slate goes direct to the refuse chute. The lump coal from the two travelers passes through a No. 1 roll, and from thence to a shaker which separates the steamboat from the finer sizes.

The bone coal which was picked from the lump traveler passes through a No. 1 roll and then goes into a hopper. At the same time the coal which passes through the lump shaker and through the steamboat shaker is also delivered to hoppers.

From these hoppers the coal is fed by an automatic feeder to double-decked shaker screens on which the steamboat and broken are separated. The steamboat from these two screens is mixed with that from the first steamboat screen and then passes over a traveler on which the slate and the bone are picked, the slate going to the refuse chutes. The steamboat then is passed through a No. 3½ roll and over a shaker and the broken separated. The broken then passes through a No. 3 roll and thence over a shaker on which the egg is separated, going direct to the egg pocket.

The fine coal from the broken and egg screens then passes over a series of shakers where the fine sizes are separated going to their proper pockets.

The fine coal from the screen which separates the steamboat and broken passes over two shakers, which separate this coal into egg, stove, nut, pea, buckwheat, rice, barley and silt. The egg, stove, nut, pea, and buckwheat then pass through the jigs and from the jigs over baby shaking screens, which separate the undersized coal. The proper-sized coal then passes direct to the pockets. The undersized coal is carried by an elevator back to the last shaker for retreatment.

The rice and barley coal are not jigged but pass directly from the shakers to their respective pockets or to a storage pile. The bone coal from the steamboat shaker passes through a No. 3 roll and is delivered to the shaker separating the finer-sized coal just before they pass into the jigs.

TREATMENT OF EGG COAL

In case there are not sufficient orders to absorb all of the egg coal an arrangement is provided whereby it can pass into a No. 4 roll and then to the shaker that separates the fine coal that has passed through the egg screens.

The silt from all the operations passes into a tank just above the pump room and is fed by gravity to the silt pump which takes it to the top of the mountain to a storage pile. The method by which the coal is handled can be readily seen by referring to the flow sheet Fig. 5.

In the pump room in the breaker there are two sets of pumps, one of which handles the silt, which is smaller than barley in size, to the storage piles on top of the mountain. This pump is 16 and 24 x 14 x 36 in. and handles a sludge containing 25 per cent solid matter to a vertical height of 180 ft. The suction is so arranged that the sludge flows into the pump, by gravity, the storage tank being higher than the pump itself. This makes it unnecessary to agitate the material in the tank.

A separate building has been constructed for the accommodation of the domestic supply. The coal is

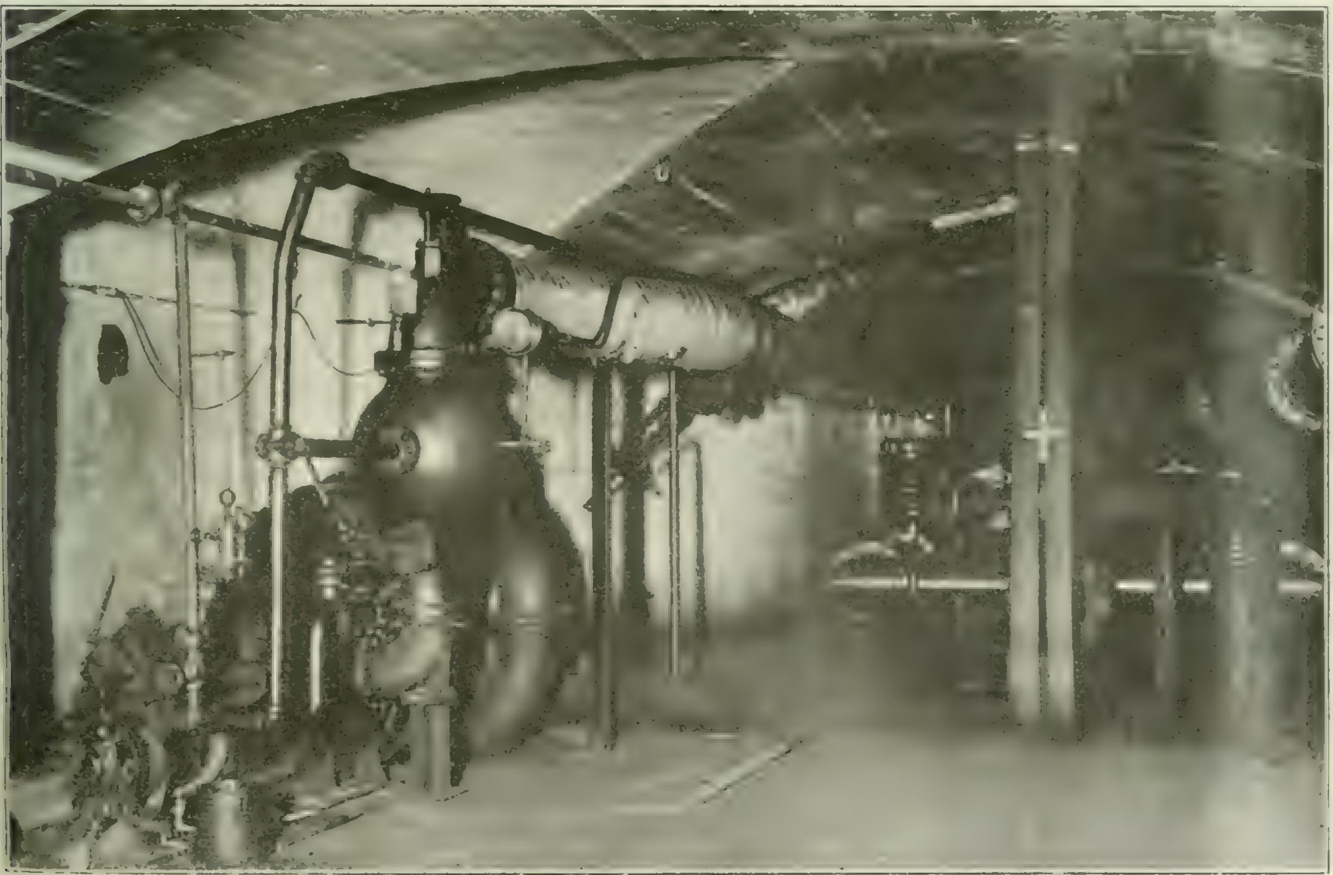


FIG. 9. PUMP END OF THE WAITING ROOM ON THE BOTTOM LIFT

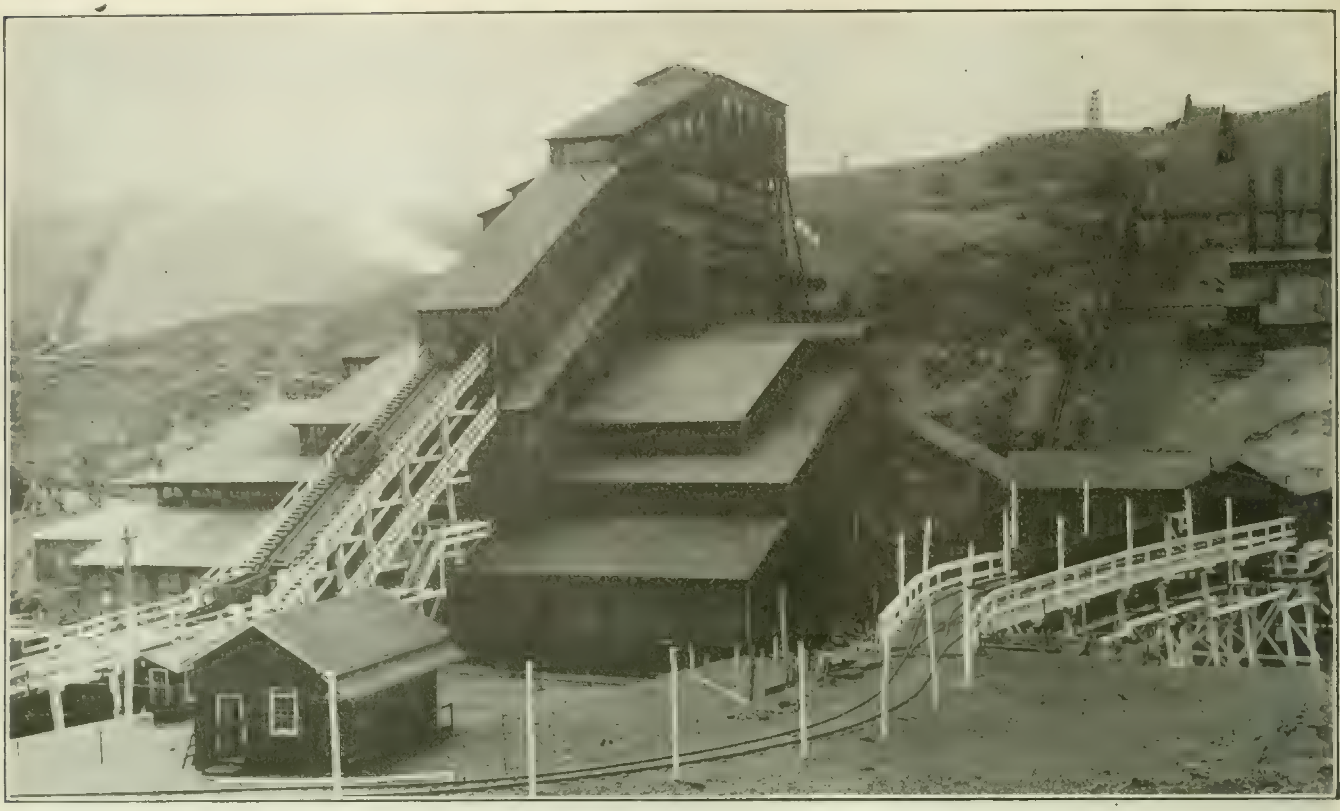


FIG. 10. CAR HOIST AT THE PLANT

brought from the bins in the breaker by means of a drag line conveyor to the bins in the domestic supply house. Arrangements are made to handle 6 different sizes of coal. The coal in passing from the bin to the wagon moves over a small screen over which a jet of water plays, washing out the fine material. The coal then passes over a chute into the wagon. At times instead of open wagons, covered ones have to be loaded and a special tilting chute which can be raised and lowered by means of chains is provided for this purpose, and deposits the coal in the rear end of the wagon.

Current Delivered From Sub-Station

There is no electric plant at this mine, but the current consumed is generated at the Bear Valley power plant, three miles away and is delivered to the sub-station in the boiler house at 2300 volts. The sub-station has two direct-connected motor-generator sets. One of these sets is a Ridgeway machine and consists of a generator delivering 250 volts at 900 r.p.m. and a 300-hp. motor using 2,200 volts 3-phase 60-cycle current. The other motor generator set is of General Electric manufacture. The motor is a type ATI 300-hp. 720 r.p.m. 2,300 volts 60-cycle machine while the generator is a type DMC 250 volts. The switchboard consists of six panels built by the General Electric Co.

The boiler feed passes through a large Cochrane-feed water heater. In the boiler room proper there are installed 18 return tubular boilers carrying steam at 110-lb. pressure. These boilers are all hand fired with a mixture of rice and barley coal.

The ashes from the fires are raked direct to a pit immediately in front of the fire door. This pit is covered with a steel plate, when the fire is not being cleaned. From the pit the ashes are sluiced by running water to a chute on the outside of the building, down which they pass to the bottom of the rock haul.

The power house is entirely of concrete construction. On the wall of the boiler room directly in front of the boilers is placed a 12-in. spiral steel pipe provided with 2 by 6-in. slots covered with sliding doors. To one end of this pipe is attached an electric blower having a capacity of 5,000 cu.ft. of air per minute. By opening the slots it is possible to secure a circulation of fresh cool air during the summer.

The fuel coal supply is brought up from the breaker by a drag line conveyor to a point on the mountain side above the power house. From here it is discharged into a horizontal drag line conveyor and distributed to convenient points in the building. This also permits the storage of a large amount of coal at this point. By means of a series of chutes this coal can be returned to the breaker for the filling of orders.

The refuse from the mine, from the boiler house and from the breaker is hauled to the top of the mountain by a barney engine hoisting plane. The cars on the top are taken away to the point of discharge by a Porter steam locomotive.

Four Billion Balance of Trade

The excess of American exports over imports in 1919 amounted to $4,017,000,000, a new record, according to a statement issued today by the Bureau of Foreign and Domestic Commerce. Exports for 1919 totaled $7,922,000,000, as compared with $6,149,000,000, while imports were valued at $3,904,000,000, against $3,031,000,000 in 1918.

December exports amounted to $681,000,000, a falling off from the $741,000,000 recorded for November. Imports also fell off for December, the total being $381,000,000, as compared with $425,000,000 for November. Both exports and imports were higher than in December a year ago. The imports of gold in 1919 amounted to $77,000,000 compared with $62,000,000 in 1918.

Germany's Coal Supply, Past and Present

BY M. MEREDITH
Liverpool, England

IT MAY be truthfully said that Geheimer Bergrat Stutz holds the fate of the German nation in his hand. For upon the coal he supplies every household depends, and so also every industry—all lighting, heating, cooking, and most of the means of transport. The organization over which he presides was established on March 1, 1917. Whatever previous government administration regulated the coal production and distribution during the war was more or less perfunctory. Herr Stutz, unlike most of the German ministers, public officials, and business men, is conversant with the coal problems of England and France and therefore realizes the difficulties which the allied countries have in assisting Germany in her plight—quite apart from the many sacrifices properly imposed upon Germany as the result of the war.

The output of coal in Germany, excluding lignite, amounted in 1913 to 15,960,000 tons per month, and July, 1919, to 11,805,000 tons per month (of which 800,000 tons came from the Sarre and 200,000 tons from Lorraine).

In 1913, 12,233,000 tons were removed from the Sarre district for German consumption, or roughly an average of 1,000,000 tons per month. In September, 1918, the amount received by Germany had fallen to 771,000 tons. From Alsace-Lorraine, in 1913, the amount received for German consumption was 3,816,815 tons, or roughly an average of 300,000 tons per month. In July and August, 1918, the output had fallen to about 200,000 tons per month.

The loss of the Sarre and Alsace-Lorraine coal fields will deprive Germany of an appreciable fraction of the coal supply she enjoyed before the war. The 7-hr. miners' day was not then in practice, and transport facilities and other conditions were satisfactory. Germany's production must suffer greatly for a long time from the reduced hours of labor. The gravity of the situation did not end with the enormous reduction in the amount of coal available. The question of transportation was probably equally as serious. From the Westphalian coal fields in peace time an average of 33,000 coal cars (each containing ten tons) were daily filled and shipped.

ONLY 23,000 CARS LOADED DAILY

During the war the amount loaded out daily fell to about 23,000 cars. The number of coal trucks now required by the mines in the Ruhr area daily amounts to 18,000, but this number was not available, mainly owing to an insufficient number of locomotives (5,000 engines having been handed over to France), and to the delay in the return of cars in which coal had been sent to France. The result is that on Oct. 1, 1919, 8,000 cars of the 18,000 daily required in the Ruhr district could not be supplied and on Oct. 10, 3,000 of the daily 18,000 could not be provided. Were it not for these difficulties the output would certainly reach 17,000-18,000 cars daily, and even more, as considerable quantities of coal lie on the mine-dumps—in the Ruhr district 669,381 tons (Oct. 6), in the Upper Silesia 575,000 tons (Oct. 4). The shortage of locomotives was also intensified by the moving of the beetroot and potato crops.

From Upper Silesia the number of coal cars filled and despatched daily was: In peace times, 13,000; in war time, 11,000, and now, 4,000.

The Prussian railways in 1918 held reserves for 35 days' supply, and traffic was then much greater than now. Traffic on the Prussian railways has now been reduced to 56 per cent of the traffic of 1913, and the coal reserve amounts only to enough for 8 or 9 days (Oct. 8, 1919). In 1918, Bavaria, Baden and Wurttemberg had stocks for 56 days ahead. Bavaria has now coal for only 20.4 days (coal transport by the Rhine closes in winter Wurttemberg, 23.2 days, and Baden, 11.5 days.

SITUATION IN BERLIN BECOMES CRITICAL

In 1918 there was an average of 31 days' coal reserve in the gasworks throughout Germany. In 1918 Berlin had 35 days' reserves. On Oct. 1, 1919, the reserves at all the gasworks in the German Empire amounted to 1.8 day's supply, and in many places gasworks had been closed. On Oct. 8, 1919, the Berlin gasworks held only 4 days' reserve, and quite recently 2 days' supply was all that was available. The situation in Berlin was critical because, during the winter months, the railways in Upper Silesia are occasionally snow bound, thus interfering with the regular delivery of coal to the metropolis. It was more than likely that, before the winter was over, Berlin would be in darkness from time to time. In order to cope with the emergency, it was intended to institute public kitchens, at which the poorer classes could cook their food when the gas was cut off from their homes. Needless to say, political difficulties and riots were to be expected if there was no gas for heating or lighting in Berlin.

RATION CARDS DISTRIBUTED

Every consumer is rigorously rationed under a system of monthly ration card. A certain amount of coal is allocated to various districts or towns on the basis of the size of the towns and the industries therein. Before the war the average consumption per family of four persons was at least three times as great as that permitted at present. Furthermore, of the amount promised by ration cards (i.e., one-third of peace-time consumption) to communities of under 10,000 inhabitants, for three months, including August, 1919, the public had only received from the coal controller, in Prussia, 40 per cent; in Bavaria, 42 per cent (where some Bohemian coal had been received), or an average for the whole of Germany of 41 per cent. Of the amount promised by the coal controller, in towns of over 10,000 inhabitants, the population had only received, in Prussia, 56 per cent; in Bavaria, 31 per cent. Great towns, such as Berlin, had received 62 per cent of their promised allotment.

Industries were strictly rationed, and were controlled by the coal controller's inspectors, some of whom never left the premises in which the coal was consumed . The amount the coal controller had been able to give, from April to July, inclusive, of the restricted supply was, in percentages:

Chemical industries	53.1 per cent
Glass and porcelain factories	46.4 per cent
Textiles	51.5 per cent
Iron and steel industries (metal and smelting works, mining, etc.)	64.2 per cent

These received more because many lay near the coal mines, and therefore required no railway transport.

Machine and locomotive works	45.3 per cent
Kali and salt works	59.1 per cent
Gasworks	60.9 per cent

(Of the allowance, which was again based on 80 per cent of their prewar consumption.)

At this time, agriculture suffered most of all industries from the dearth of coal. In many parts of eastern Germany a great area of land could not be tilled because no coal was procurable for steam plowing. In east Prussia nearly one-third of the land has not been plowed, and, could not be tilled last autumn so that at best only the spring sown crops of lower yield can be cultivated. On the fertile island of Rugen 25 to 30 per cent of the 1918 grain crop has not yet been threshed for want of fuel.

FUTURE MINING PLANS PROPOSED

It has been proposed that the 8-hour day should be resumed forthwith, and 25 per cent higher pay given to the miners during the winter in order to secure the coal required. The men's representatives have refused these terms, but it is possible the promise of a 6-hour day two years hence may lead to the acceptance of the 8-hour day now. Another suggestion to encourage the men to further work is that a premium should be granted so that if a man received 50 marks per day for producing two tons of coal per day he would receive a premium of 20 marks for an additional half ton, and 30 marks for the next half ton. Others recommend that the minimum wage now payable to a miner, even if he practically does no work, should be reduced by 30 to 50 per cent, so as to make him work and that unemployed pay should be abolished, or be confined to the supply of one hot meal daily at some institution.

Galvanized vs. Blue Sheet Iron Chute Linings

By Dever C. Ashmead
Tarrytown, N. Y.

IT HAS been the custom for a number of years to use blue-annealed sheet iron, black sheet iron, or common sheet iron as it is variously called for chutes or chute linings in the breakers, tipples, washeries or the rooms of the coal mines, particularly in the anthracite regions of Pennsylvania but to a less extent in the bituminous coal fields. This sheet iron is also used for linings of pockets so that either the pocket will not wear so rapidly or when the surfaces are of slight inclination the coal will slide easier and at a less angle.

This sheet iron is a great help in the handling of the coal but it often causes delays especially in the morning by the coal sticking, requiring the miners or their helpers to push or "buck" it out of the way. This same trouble occurs in the breaker and during the first hour or so in the morning considerable difficulty is encountered because of the chutes clogging requiring men to maintain strict watch to keep them clear. After an hour's run this trouble generally ceases and no difficulty is encountered throughout the day.

This trouble arises from the rust forming on the sheet iron when standing over night and until this rust is removed by the action of the coal passing over and polishing the surface the coal is liable to stick and hang. New sheet iron gives better results than old, no matter how well it may be polished. This is because of the fact that as the sheet iron is used the continual rusting and polishing eats a series of small pits into the metal and these pits have a retarding effect on the particles of coal. of course they only directly affect the fine coal but this in turn affects the larger grains, and as a result there is a tendency to retard the general movement of the coal.

During the war the Trevorton Colliery Co. at the Katherine Colliery near Shamokin, Pa., had considerable difficulty in procuring sheet iron for use in the mine. As a result George H. Jones, the general manager, finding that he could secure galvanized sheet iron, purchased one ton for trial purposes. As a result of this trial this firm has been using the galvanized iron for a period of two years with excellent results and has entirely abandoned the use of the old plain sheet.

This company found that the new iron did not rust and that coal slid just as well in the morning as it did at any other time of the day. Because of this non-rusting galvanized sheets do not pit and therefore there are no minute depressions to retard the fine particles of coal. By actual tests the coal company claims that it was found that coal will slide on an angle of 8 deg. less pitch on galvanized sheet iron than it will be on blue-annealed sheet iron.

The pitting of the blue-annealed sheet iron has another effect besides retarding the passage of the coal. The pit immediately makes a point of attack for wear since it is a thin spot in the sheet. The retardation of the coal by the pits has a tendency to cause a grinding action on the iron at this point and as a result a hole extremely small in size is formed. Possibly hundreds of these minute holes are formed close together and as a result the wear soon connects them and the sheet is worn out.

With the galvanized sheet iron this tendency to wear in the same manner as the blue iron does not exist. The galvanized iron does not rust and as a result, rust does not cause pits and therefore points of intensified wear. Galvanized iron of course wears but its wastage is even and not concentrated as is the case with the blue annealed sheet iron.

ADVANTAGES OF GALVANIZED SHEET IRON

A further proof as to what advantage the use of the galvanized sheet iron has over other kinds is shown by the figures the Trevorton Colliery Co. has compiled. During the year 1916 it used 53,000 lb. of the blue annealed sheet iron and in 1917 it used 30,000 lb. of galvanized sheet iron. In 1917 the production of coal was 33 per cent greater than in 1916 and the use of sheet iron was 43 per cent less. This shows an actual saving of about 40,000 lb. of iron.

From the above the following conclusion may be reached: That galvanized sheet iron is better for use in mines and breakers than blue-annealed sheet iron because coal will slide upon it at a lower angle; chutes will not clog; it will not wear out as rapidly since pitting will not take place; it wears out evenly and slowly giving a longer life.

As a result of two years use of galvanized sheet iron at this colliery a number of other operators are beginning to use it instead of the old blue sheet iron.

Slush Breaker and Mine-Water Problems

By John Griffin

SYNOPSIS — *Breaker or washery slush is now a nuisance and in most cases represents an actual waste. Breaker water is often a source of no inconsiderable expense. Much of the coal in the slush can be recovered and the water clarified by means of suitable apparatus. Mine water may also be made available for breaker use. A source of additional output and profit is thus made available.*

IN THE anthracite-coal region wet methods of preparation have been almost universal. In the so-called Middle and Southern fields they have for years been used and now the Northern field has almost entirely adopted them.

The enormous quantity of water required for wet preparation of anthracite is indicated when it is realized that a breaker shipping 2,000 tons per 8-hr. day requires about 2,000 gal. per minute of water or 4,000 tons per day. To obtain this quantity of water is often a problem and the disposal of the waste water or slush in such manner as to prevent stream pollution presents many difficulties.

The gradual extension of the mines has caused a constant increase in the volume of mine water made, most of which must be pumped. According to the reports of the mine inspectors of Pennsylvania for the year 1916, approximately 600,000 gal. per minute of water was pumped from the anthracite mines. Almost invariably the pumping load is continuous for 24 hr. per day, which means that 3,500,000 tons of water must be handled per day. The extension of the mined area has also had a decided effect upon the character of the mine water. The oxidizing action of air on ground waters in mine workings, active and abandoned, results in the formation of free sulphuric acid and soluble acid sulphates. Any appreciable quantity of these produces a water extremely corrosive upon metals and destructive to vegetation. The extension of mine workings increases the production of these corrosive agents and as a result mine waters tend to grow more and more corrosive, increasing their menace as a pollutant and, when used for washing coal, increasing the maintenance cost of breaker equipment enormously.

It will perhaps be of interest to take up these problems separately, analyze the situation and point out the results of the latest steps toward handling these problems most effectively and economically.

Breaker slush at present is a nuisance and source of expense to the coal companies, whereas it should be a source of additional revenue because of its large content of coal which can be recovered and made available for industrial or domestic use. An extended study of the problem shows that an increased recovery amounting to from 3 to 5 per cent of present production is easily possible. Fully 3,000,000 tons per year can be added to anthracite production from the same mine output. This does not include additional tonnage that can be recovered from culm banks.

POTENTIAL VALUE OF SLUSH RECOGNIZED

The coal companies, recognizing the potential value of coal wasted in slush, and desiring to reduce pollution of streams to a minimum, have endeavored to retain as much of the solid contents of slush as possible in settling ponds or by back filling underground. The settling pond proves an inefficient expedient since the retained solids are generally unfit for use, without preparation, and the water discharged still carries large quantities of fine solids which pollute the streams. Back filling with slush is generally uneconomical as the cost of operation is not warranted by the solids retained.

STOCKPILE OF DORR FINE COAL

Settling tanks, consisting of a bucket elevator partially submerged in a tank, or a slow moving conveyor

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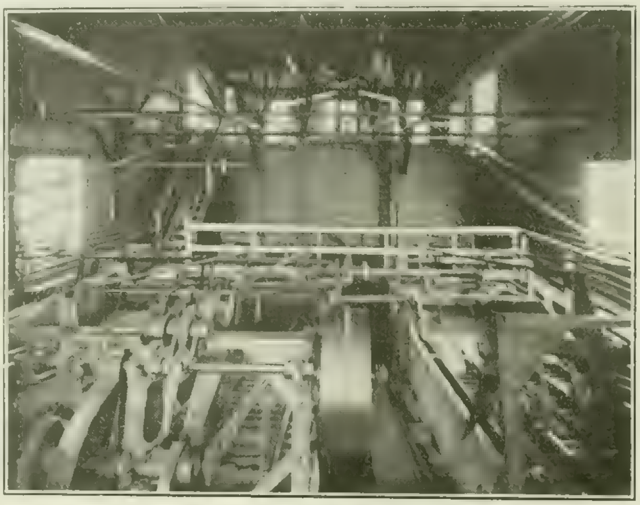
Paper presented before the October meeting of the Engineers Society of Northeastern Pennsylvania.

line working in a trough are in operation and furnish a partial solution of the problem. In these machines no attempt is made to recover all the solids, and the size of the recovered coal cannot be definitely controlled. Maintenance costs on the bucket-elevator type of recovery are usually excessive.

A consideration of the quantities and character of the solids in breaker slush will throw considerable light on the problem. As a rule the total solids amount to from 4 to 10 per cent. They vary in size from steam sizes down to the finest slime. An ash analysis of the various-sized solids shows that generally the coarser sizes are reasonably low in ash, or mainly coal, while the ash content increases with decrease in size.



INTERIOR OF DORR COAL RECOVERY PLANT

It will be noted in Table 1 that, generally, the ash content increases markedly in the material finer than 100 mesh. It is often possible to obtain a product relatively low in ash by recovering only the plus 100 or plus 60 mesh material. If not, the impurities in these sizes can be removed easily and cheaply, which is not the case with the material finer than 100 mesh. Thus generally from 40 to 60 per cent of the solids in slush can be recovered as a fuel of relatively low ash. As a rule the balance of the solids must, at present, be considered an absolute waste because of their high ash content. When low in ash they can be recovered for use as pulverized fuel, or they may be briquetted.

The latest development in a plant to recover the fine coal from breaker slush is illustrated in Figs. 1 to 4. This plant is designed to recover the plus 60 mesh coal, without elimination of slate or sand, and with a minimum of undersize; its operation is entirely continuous.

EQUIPMENT USED

The equipment used consists of a Dorr hydroseparator and three Dorr duplex classifiers. The function of the hydroseparator is to reject the bulk of the water and the greater part of the solids finer than the desired size. It also serves to stabilize the quantity and dilution of the feed to the classifier. The classifiers serve to eliminate the remaining fine solids and at the same time to dewater the finished product. No screens are used and in consequence maintenance costs are exceedingly low.

The Dorr hydroseparator consists of a wood tank with an overflow launder around its periphery at the top and a discharge at the center of the bottom. Suspended in this tank is a mechanism consisting of a central vertical shaft with radial arms at the bottom equipped with ploughs to bring the settled solids by means of the slow rotation in the mechanism, to the discharge opening at the center. The slush is fed at the center of the top of the tank. The area of the tank is proportioned to the average flow of slush, so that the solids larger than 60 mesh fall to the bottom of the tank while most of those smaller than 60 mesh, together with the bulk of the water, overflow the edge of the tank. The overflow may either go to waste or be clarified for reuse, as described later. The underflow, containing the coarse solids, is controlled by a suitable valve, by means of which any desired proportion of water and solids may be maintained. The operation of the separator is not materially affected by the wide variation in rate of flow usual with breaker slush. The separator can be designed to make a sizing split either coarser or finer than 60 mesh.

The Dorr classifiers receive the pulp discharged from the bottom of the separator and complete the removal of the water and of material smaller than 60 mesh. The classifier consists essentially of a settling box or tank in the form of an inclined trough open at the upper end and equipped with mechanically-operated reciprocating rakes which remove the coarser material as fast as it settles onto the bottom of the tank, the water and finer solids overflowing at the closed lower end. The tank is set at a slope of 2¼ in. to the foot for a 60-mesh split.

The rakes are made up of angles attached to the bottom flanges of two channels placed on edge. The construction of the rakes is similar to that of a ladder, and they are carried by suitable hangers from bell cranks connected by rods to levers which terminate in rollers. These latter press against cams attached to the crank shaft, which is driven by belt through a counter shaft and spur gears. The rakes are lifted and lowered at the opposite ends of the stroke by the action of the cams. The horizontal motion is produced by cranks and transmitted to the rakes by connecting rods. The motion imparted to the rakes is, therefore, a forward stroke along the bottom of the tank toward

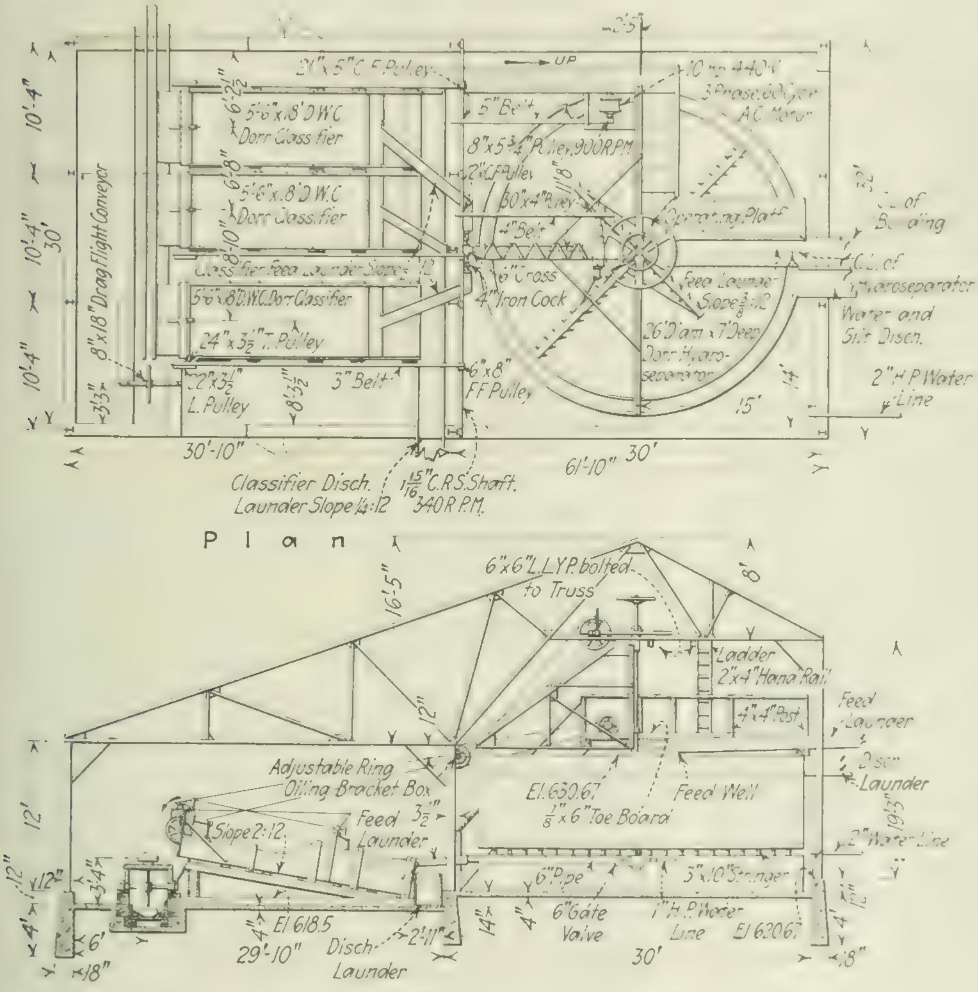
TABLE I. PER CENT ASH ANALYSES OF VARIOUS SIZES OF COAL IN SLUSH

	[illegible]			Shenandoah			Wilkes-Barre			Scranton		
[illegible]	[illegible] in. round			$\frac{3}{16}$ in. round			[illegible] in. round			[illegible] in. round		
[illegible]	[illegible]			8.58			5.00			3.86		
[illegible]	[illegible]	[illegible]	Ash Cumulative	Size	Ash	Ash Cumulative	Size	Ash	Ash Cumulative	Size	Ash	Ash Cumulative
[illegible]	7.7	26.2	26.2	20.0	20.9	20.9	1.3			10.8	19.5	19.5
[illegible]	9.6	29.8	28.7	...	...		19.2	19.7	19.7	26.8	21.5	21.4
— 4 [illegible]	[illegible]	[illegible]	29.7	21.5	24.6	22.8	17.0			18.2	35.1	26.9
[illegible]	3.5	29.9	29.8	10.0	29.5	24.1	21.9	28.0	22.8	14.6	24.9	26.4
[illegible]	[illegible]	46.1	41.3	48.5	50.1	36.7	40.6	31.5	31.5	39.6	40.4	32.0
Daily [illegible]		[illegible]			130			180			95	
Ash [illegible]		29			25			23			27	
Daily [illegible] shipments, tons		[illegible]			2300			4200			2500	
Recovery as per [illegible]		3.0			5.6			4.3			3.8	

the upper discharge, a lift of the entire rake at the end of the stroke, a return stroke in the elevated position, and a lowering to the initial position at the end of this stroke, thus completing the cycle of movement.

The classifiers used are duplex, that is, they consist of two rakes operating in parallel in the same tank. The rakes are arranged to alternate in such manner that the weight of the moving parts is largely counterbalanced and the power required is only that necessary to overcome friction and advance the settled solids. The design is such that all bearings are well removed from exposure to the material treated.

The feed is delivered to a trough across the tank toward the lower end, where the water forms a pool which extends only part way up the sloping tank bottom. The granular solids settle through the pool and are advanced up the inclined bottom of the tank by the rakes. After emerging from the pool and while ascending the sloping bottom the solids have an opportunity to drain before being finally discharged from the upper end of the tank. In this case, the material minus 60 mesh overflows the closed end with the water. The classifiers can be adjusted to make a separation either finer or coarser than 60 mesh.



PLAN AND ELEVATION OF HYDROSEPARATOR

This plant is handling from 3,500 to 4,500 gal. of slush per minute made through a $\frac{3}{16}$-in round screen and containing 5 per cent of solids or a total of 360 tons of solids per day. The ash content of these solids average from 30 to 32 per cent. The plant is designed to recover the plus 60 mesh material with a minimum of undersize. The product recovered averages between 150 and 160 dry tons per day and carries about 15 per cent undersize, and 22 to 26 per cent of ash. The product is delivered to the stock pile with 35 to 40 per cent moisture which drains down in a few hours to 15 to 18 per cent moisture. The loss of plus 60 mesh material is low. The plant is operated by one man and driven by a 10-hp. motor. At present capacity, and allowing 20 per cent fixed charges of which 10 per cent covers amortization of plant, the first charges per ton of product amount to 7 to 8 cents. Three months of operation have shown no maintenance expense. The plant will handle nearly double the present tonnage, as it was designed to treat slush made through a $\frac{3}{32}$-in. round screen.

Where it is desirable to obtain a product relatively low in ash some sort of wet concentration device must be used. Operating experience in the bituminous fields and tests run with anthracite slush indicate that the concentrating table, similar to that used in lead, zinc and copper concentration, offers the most advantages. Adjustments of the table allow a wide range of products. In general the loss of coal in the refuse increases as the ash in the finished product is reduced. Test runs with this device indicate a capacity of 4 to 6 tons per hour and a coal product as low as 10 per cent in ash, if desired. Usually 15 to 18 per cent ash is satisfactory and in such case the waste product will analyze between 65 and 75 per cent ash, giving only a small loss of coal in the process.

The concentrating tables are installed between the hydroseparator and the classifiers, the latter machine thus treating only the coal product from the tables. Any pyrite contained in the slush can be recovered in the same operation. Operation in the soft coal fields indicates that 10 cents per ton will cover tabling costs.

The recovery of fine coal, plus 60 to 100 mesh, as a usable fuel removes about one-half of the solids which would cause pollution. The recovery of the balance in the form of a thick sludge which can be stored easily is possible at relatively little cost for equipment and operation. At present between 3,000,000 and 4,000,000 tons of such material are discharged each year from breakers and washeries in the anthracite region.

The equipment available for this recovery is the Dorr thickener. Its arrangement is identical with the Dorr hydroseparator already described. By simply enlarging the area of the tank, the settling velocity of the slush is so reduced that practically all of the suspended solids settle to the bottom and the water overflows the edge of the tank clear or only slightly turbid. Such thickeners in sizes up to 200 ft. in diameter are in operation in other industries. The tank can be constructed of wood, steel or concrete as proves most advantageous.

In the bituminous fields this system is now being introduced. Practice in this field is referred to in a paper by J. R. Campbell, presented at the Chicago Meeting, September, 1919, of the American Institute of Mining and Metallurgical Engineers; also by Ernst Prochaska in his paper on "Preparation of Bituminous Coal," VI., in *Coal Age* of July 3, 1919.

At the washery referred to, which has a capacity of 4,000 tons of raw coal per 16 hours, two 70 ft. diameter Dorr thickeners were installed to take the overflow from the washed-coal settling basin, and one 50 ft. thickener for the overflow from the refuse settling basin of wasted coal.

Mr. Campbell gives the following results on the operation of the two 70 ft. thickeners:

	Influent	Effluent	Underflow
Water, per cent	98.0	99.7	47.2
Solids — coal, per cent	2.0	0.3	52.8
Specific gravity, per cent	1.0052	1.0008	1.1580
Total per cent	100.0	97.0	3.0
Tons per hour	500.0	485.0	15.0

The underflow carrying 47.2 per cent of moisture is either fed with the coarser washed coal to the mechanical dryers, or delivered on top of the washed and dried coal going to the coking plant. The latter practice adds about 3 per cent of moisture to the final washed product.

Since Mr. Campbell's paper was written, the installation of a third 70 ft. thickener has been completed.

The three coal thickeners now take a total slush feed amounting to 6,150 gal. per minute containing 275 tons of coal per day. Of this there are recovered 269 tons per day or 97.87 per cent in the form of a sludge carrying 48 per cent moistue.

The overflow carrying less than 0.15 per cent. of solids, together with the overflow from the 50 ft. thickener, is returned to the washery circulation. This return constitutes 98 to 99 per cent of the water fed to the thickeners. The net consumption of water exclusive of evaporation, plant leakages, etc., is thus reduced to 40 to 45 gal. per ton of coal washed. Anthracite practice requires approximately 480 gal. of water per ton of finished coal when the breaker slush is run to waste.

In the anthracite fields no such thickener plants are as yet in operation, but tests made at several plants show the following possibilities:

[illegible]	1,500
[illegible]	1.3
[illegible]	72
[illegible]	0.03
[illegible]	98
[illegible]	95
[illegible]	55
[illegible]	35
[illegible]	$10,000 to $12,000
[illegible]	$500 to $600
Annual fixed charges at life of 15 yr	$2,000
[illegible]	[illegible]

Mine Water Treatment

Of the total of 600,000 gallons per minute of mine water pumped, no data are available as to the quantity which contains an excessive amount of sulphuric acid and acid sulphates. Although the mining companies appreciate the expense entailed by the use of such water in preparing coal, their efforts have been directed toward obtaining supplies of good wash water rather than development of methods to purify the mine water.

That much mine water is of a corrosive nature is well recognized. It would appear that more such water is produced in the Middle and Southern fields than in the Northern field.

It is well known that all the free acid and most of the acid sulphates may be removed by treatment of the water with finely ground limestone or milk of lime. The free acid is precipitated as calcium sulphate, while the reaction with the acid sulphates precipitates both calcium sulphate and iron and aluminum salts.

The precipitate is bulky giving a dirty water and one that will produce rusty-looking coal unless the solids are removed.

That such treatment of mine water is feasible has been demonstrated at one of the large coal mines in the Pittsburg district, where 1,250,000 gal. of mine water per 24 hr., containing about 30 grains per gallon of free acid and 60 grains per gallon of combined acidity, is being regularly treated. A 70 ft. diameter thickener serves to clarify the treated water, the precipitated solids being continuously collected and removed in the form of a thick sludge. The clarified water contains but a few grains per gallon of acid sulphates and suspended solids, and has little effect upon piping or other iron parts.

In the anthracite region some much worse mine waters exist. One mine pumping station is handling 430,000 gal. per day of water carrying 130 grains per gallon of free acid and 140 grains per gallon of combined acidity. This water, of course, cannot be used for washing coal, but goes direct to the river.

Typical Regional Situation

The following is perhaps more typical of the situation in this region and this water is used in a breaker. This mine water amounts to 1,300 gal. per minute, and the analysis shows 29 grains per gallon of free acid and 39 grains per gallon of combined acidity, a total of 68 grains per gallon. It is of interest to see what this means as to quantity of sulphuric acid per day. In 8 hr., 624,000 gal. of this water are put through the breaker which contains 2,500 lb. of 100 per cent sulphuric acid. Added to this is the corrosive effect of the combined acidity, which is equivalent to another 1,000 lb. of 100 per cent acid. Eight tons of storage battery acid (electrolite) contains about 3,500 lb. of 100 per cent sulphuric acid. In other words, the equivalent of one ton per hour of battery acid is going through the breaker.

This corrosive agent can dissolve about 1,400 lb. of iron per day. If only 5c per pound is taken as the price of the iron, $17,000 worth can be consumed per year. The assistant general manager of the company operating this breaker estimates that the extra breaker maintenance cost due to the acid water amounted to roughly $20,000 annually.

The cost of plant to treat this water will be about $10,000. Direct operating costs would be about $4,000 annually, of which lime accounts for $2,000. The total cost per 1,000 gal., including liberal fixed charges, is about 3½ cents.

Breaker Water Supply

It will be seen that the clarification of slush besides solving the pollution problem offers a source of water suitable for breaker use at little expense—from 1c to 2c per 1,000 gal. In many cases breaker water can be obtained only by pumping from considerable distances against high heads, and sometimes in case of drought, can be obtained only by purchase from water companies at considerably in excess of 2c per 1,000 gal. In such cases, clarification of breaker slush would be justified by the water-supply cost only.

In conclusion a brief summary of the universal application of these processes to the entire hard coal region will indicate the comparatively small investment required for the benefits obtained.

The recovery of fine coal would produce upwards of 3,000,000 tons annually of high grade anthracite that can be converted into a fuel for either industrial or domestic purposes. The investment cost would amount to only about $3,000,000 for the entire region. The product certainly would be worth 50c per ton at the mines and, at this figure, the coal companies could make 15c a ton profit as a minimum.

If this fine coal were briquetted it would add 8 per cent to the domestic anthracite production. The market for briquets as a domestic fuel is gradually being established. Briquets can be sold at about the prices of pea coal and would in this case yield a net profit of 50c per ton. The investment for briquetting plants to handle this 3,000,000 tons of recoverable coal would be about $10,000,000.

At the present time the investment in the anthracite industry per ton of annual production averages about $8. This combination of fine coal recovery and briquetting shows less than $5 investment per ton.

Industrial Unrest and Its Cure

By Jack L. Ball

WILL 1920 prove to be a banner industrial year, or will it be one of sabotage, strikes and discontent? Conservative minds are moving heaven and earth, as it were, to discover a panacea for the present industrial unrest; radical leaders—spurious to the core—are busily devising ways and means in an attempt to destroy the sane and logical ideas that are advanced for the good of all the people.

The basic industries of the United States are so closely co-ordinated that when the production of one is lessened it ultimately affects, through reaction, not only the employers or employees of that particular industry, but the whole population of the land.

As citizens of the United States we are granted the privilege of life, liberty and the pursuit of happiness. If we are good citizens, we should see that these three privileges are enjoyed by our neighbor as well as ourselves. We are fully agreed that every man has the right to benefit in the fullest measure possible from his labor, but no man or group of men should be accorded the power to exact a wage higher than his or their actual earning capacity warrents. When this occurs one group profits at the expense of the others.

Money is a necessary and essential commercial medium. We can exchange it for those commodities which bring to us and our families the pleasures that the world has to offer. Moreover, it should be a pleasure for a man to labor if he expects something in return that he can utilize in a beneficial way. If our work is a task and we cannot enjoy it, we should find a pleasure in the beauty or usefulness of that which we produce and in the ultimate pleasure that it will bring to others. It is becoming more apparent, however, that we are asking for a beautiful and bountiful harvest without the necessity of planting the seed; asking the other fellow to give his fullest measure so that we may secure something for nothing.

People have acquired a kind of madness in their attempt to buy all the luxuries—not actual necessities—that can be produced. The war with its super-demands and abnormal wages is, in a measure, responsible for this condition of affairs. With the cessation of hostilities it was thought that people would drift back to their former mental equilibrium of pre-war days, but the reverse is true. The universal idea is to demand and exact wages without proportionate production. John Smith proved the fallacy of this Bolshevik principle at Jamestown three hundred years ago, proved it false because it conflicted with economic law.

Panics began in the United States in the first quarter of the 19th Century and have occurred with astonishing regularity ever since. Soap-box orators assert that panics—call them hard times if you wish—are caused by over-production. Well-informed men maintain exactly the opposite and say that prices are due to under-production and the resultant price inflation. If the prevailing thoughts in the minds of the workers continue in the same channel as now, the business and industrial world will not be stabilized except by a gradual upbuilding after the crash that is certain to come. And this panic that the country is facing cannot be blamed upon over-production.

If the men and women workers of the United States would put forth their individual maximum efforts for 90 days, the prices—not wages—of the necessities of life would take a slump such as legislation could not effect in five years.

Employers and employees have always misunderstood each other. Russia has proved to us that capital and labor depend directly upon each other. When these two powerful factors of our economic life are bound together by the link of mutual understanding, and when all men are willing to perform an honest day's work for an honest day's wage, than, perhaps, a universal remedy will have been found for our present and demoralizing industrial ills.

Let us put into the discard the bitter feelings of both the past and present and employ in their stead those new standards of benevolence, which the war has given us, so that we may effectively combat the common enemy of the human race, industrial unrest.

Philadelphia Retailers Protest

Confiscation is again becoming general, states the National Retail Coal Merchants' Association in a letter to its members, and not only that but diversions are being made from retail merchants to manufacturing plants. There is of course a great chance for the playing of favorites.

They advised the retail coal trade to have recourse in every case to the only remedy available, namely "that which we advised the Director-General we were going to follow. We stated to him that claim would be filed for all coal taken, whether confiscated for railroad use or diverted from retail consignees, covering in addition to all general damages, all special damages, including the following:

Loss of profits.

Increased cost of doing business.

Damages for loss of or interference with business, or by delaying or preventing delivery of fuel to consumers.

Causing breach of contract by the retailer to supply fuel.

Injury to reputation of business and character of service, etc.

Waterford Lake Power Plant of the Dominion Coal Co.

By Frank H. Kneeland
Editorial Staff, *Coal Age*

This is believed to be the only coal-mine power plant in America burning powdered coal under Bettington boilers. The fuel arrives at the plant as slack and is ground when and as needed. One of the advantages of these boilers is the rapidity with which steam can be raised.

During the past few years much interest has been manifested in the application of pulverized coal to power purposes. This fuel unquestionably possesses certain obvious advantages while as experience has shown its use also involves equally obvious disadvantages. Among the former are usually claimed perfect and smokeless combustion, high efficiency, and great flexibility. The disadvantages include considerable complication of machinery, the expense of drying and pulverizing the fuel, and usually a high upkeep charge entailed by the intense local heat generated.

Although it has long been known that coal pulverized to a sufficient degree of fineness would burn while suspended in air, practical application of this principle has only been made during comparatively recent times. Pulverized fuel has been successfully applied to cement burning of several years and to metallurgy and steel manufacture (e.g. the open hearth furnace) for a shorter period. Its application to steam generation involves several problems not encountered in the processes above enumerated and unless special attention is here given to furnace construction, difficulties arise.

The secret of successfully burning powdered fuel in steam-boiler furnaces appears to lie in providing sufficient combustion space within the furnace to insure complete combustion of each coal particle before it shall leave the furnace or come in contact with the comparatively cold boiler surfaces. Various expedients have been resorted to in order to secure this result. One of the first boilers to successfully use powdered coal was the Bettington. This boiler had its origin in South Africa, and was designed especially to burn this fuel.

Briefly the Bettington boiler consists of an annular mud drum connected by water tubes to a compound upper drum. This upper drum is made up of a central portion or drum proper surrounded by and connected with an annular ring into the lower surface of which the above mentioned water tubes are expanded. The tubes are thus arranged in the form of a skeleton cylinder open at the bottom. Special fire brick with a U-shaped cross section straddle the tubes and extend from the upper or steam drum to within two or three feet of the lower or mud drum and form the furnace of the boiler. Pulverized coal and air are blown through a water-jacketed nozzle placed in the centre of the lower end of the cylindrical furnace. The burning fuel thus passes upward through the centre of the furnace, turns outward and moves downward to the lower end of the fire brick baffle or furnace lining. The products of combustion here again turn outward and move upward between the boiler tubes and through the superheater to the breeching or uptake. The whole boiler is, of course, incased with a suitable jacket.

The Bettington boiler is by no means a common type of steam generator in America. While a few have been imported and installed it is believed that only one coal-mine plant West of the Atlantic generates current from steam raised in these boilers fired with powdered coal. A description of this plant will, therefore, doubtless be of interest.

The plant in question is located on the shore of Carney Lake about 8 or 10 miles from the town of Glace Bay, Nova Scotia. It is the property of the Dominion Coal Co., and is known as the Waterford Lake Power Plant. It is not at or in close proximity to any coal mine and fuel is shipped to it in railroad cars. The lake furnishes an abundant and cheap supply of water, which was probably the reason for placing the plant where it is. Current here generated is transmitted to and is consumed at various coal developments throughout the mining region of which Glace Bay is roughly the centre.

As may be seen in the accompanying illustration, the plant consists primarily of two buildings in close proximity to each other. One is a frame and corrugated iron structure and houses the boilers while the second is of brick and contains the turbines, generators and auxiliary equipment.

In the boiler house four stoker-fired 500 hp. B & W boilers are installed on one side of the central alley. They are equipped with economizers and superheaters. On the opposite side of the building stand four Bettington boilers each 18 ft. in diameter and 26 ft. high, the tubes being 20 ft. long. Each of these boilers has a rated capacity of 20,000 lb. of steam per hour. These boilers also are provided with economizers and superheaters as well as having air heaters in the breeching or uptake through which the air blast is drawn and heated prior to passing to the furnace nozzle. Steam is normally carried at 180 lb. gage pressure and 150 deg. superheat.

How Coal Is Brought to the Boilers

Coal is brought to the plant in railroad cars and dumped into a hopper. From here it is taken by a bucket conveyor and delivered into the overhead bunkers in the upper portion of the building. Downcomer pipes from the bunkers lead the coal to the hoppers of the Taylor stokers serving the B & W boilers and to the hoppers of the beaters or pulverizers grinding the coal for the Bettingtons.

Four pulverizers are installed or one for each powdered-coal boiler. Any two of these machines will however run all four of the boilers. These pulverizers are combination machines—they not only grind the coal but furnish the blast by which the fuel is carried to the so called carburetter and subsequently to the boiler furnace. In the carburetter the fine coal is screened, the coarse particles being returned to the pulverizer while those of suitable fineness are sent to the boiler. Two of the pulverizers are driven by 35 hp. 550 volt motors running at 1,500 r.p.m. The other two pulverizers are driven by steam turbines.

One stack is provided for each two Bettington boilers. This is placed directly above the economizers in the rear of and between the boilers.

The pipes carrying fuel from the pulverizers to the furnaces are of sheet iron and about 12 in. in diameter. The orifice in the fuel nozzle is 9 in. in diameter.

In addition to the equipment above described the boiler house contains two vertical Weir and one Terry feed pumps. Two American Blower Co. fans, direct connected to engines made by the same firm, supply draft to the Taylor stokers.

In the power plant or generator room proper the following machinery is installed: One Rateau horizontal steam turbine, direct connected to a Siemens Bros. 2,500 kv. 6,600 volt, 273 amp. 3 phase 25 cycle generator. This unit operates at 1,500 r.p.m. One General Electric horizontal turbine direct connected to a 2,000 kw. 6,600 volt, 195 amp. 1,500 r.p.m. G. E. generator. These two machines operate in synchronism with each other and in parallel with two other power plants about 15 miles distant also owned and operated by the Dominion Coal Co.

Abundant Exciting Capacity Furnished

Two exciter units, Siemens Bros. 45 kw., 110 volt, direct current, shunt field generators, are joined by a flexible coupling and driven by a Belliss & Morcom engine at 525 r.p.m. Another exciter unit consists of a Canadian Westinghouse 75 kw. 125 volt generator driven at 290 r.p.m. by a direct connected 12 x 12 in. Ideal engine made by the Goldie & McCulloch Co., of Gault, Ont.

An eight-panel switchboard provided with all necessary switches and instruments is installed in one end of the generator room. A 30 ton hand-operated crane spans the building and may be traversed from end to end.

As may be seen in the accompanying illustration, barometric condensers are installed just outside the building. Circulating water is drawn from and returned to Carney Lake. About 28½ in. of vacuum is normally obtained. Under ordinary circumstances the circulating water is handled by a turbine-driven, single-stage centrifugal pump. Two engine-driven centrifugal pumps are also kept as standbys. These machines as well as two vacuum pumps are installed in the basement of the power plant. All steam piping leading to the power units and auxiliaries is also carried in the basement. This relieves the turbine room proper of all piping and makes possible an extremely neat appearance.

As was stated in the beginning one of the chief objections to a pulverized fuel boiler is the high upkeep charge. This has not been entirely escaped in this boiler plant and repairs are frequently necessary to the firebrick furnace lining and to the beaters or pulverizers. On the other hand the Bettington boilers are efficient steam makers and extremely "lively" in starting. With cold water in the boilers at the start a full head of 175 lb. of steam has been developed in them in exactly 25 min. after the fires were lighted.

Overall Efficiency of the Plant

An idea of the overall efficiency of the plant may be gained from the fact that power is delivered to the bus bars of the switchboard for 3 lb. of coal fed to the boilers for each kilowatt hour. The coal burned is slack with a heat content of about 13,000 B.t.u. per pound.

The plant above described is under the direct charge of Everett McPherson, a machinist by trade, and a man of wide experience. V. McFadden is mechanical superintendent of the Dominion Coal Co., thus having general supervision over all its mechanical equipment. And since this company is probably the biggest coal producer in Canada and operates many mines in Northeastern Nova Scotia, many of which include submarine areas, it will readily be appreciated that the Waterford Lake Power Plant is only one of several of its generating stations.

West Virginia Accountants Organize

At a meeting held at the Hotel Farr, Huntington, W. Va., Jan. 30, 1920 a number of accountants who were present organized what is now known as the West Virginia Accountants Association.

The following officers were elected for the fiscal year ending Dec. 31, 1921: M. P. Morris, president and general manager; R. L. Baugham, vice president; H. E. Meadows, secretary; T. M. Bowman, treasurer; J. C. Riggs, director.

The object and purposes of the association are:

1. To standardize the science of accounting, and bring about plenary understanding of theory, practice, technology, terminology, books, forms, files, formulas, rulings, spacing, sizes, weights, colors, binding and references, incident to administration and representation of the affairs of corporations, associations, individuals and the public generally.
2. To co-ordinate the actuarial, statistical and economic experiences of statesmen, lawyers, bankers, chemists, experts, civil and mining engineers, accountants and administration men to the point of common understanding of commercialism, and the fundamental principles of accounting, the elements of cost and component factors thereof.
3. To classify by decimal system of expansion and contraction the assets, liabilities, earnings and expenses of corporations, associations, individuals and the public generally.
4. To perfect and adopt by resolution, uniform standards for balance sheets, financial statements, profit and loss statements, cost sheets, inventories, tax renditions, and all other forms necessary and incident to authentic representation and common understanding of comparisons.
5. To acquire, own and operate all real estate, construction, equipment, other property and investments, necessary and incident to the successful maintenance and operation of the association and branches thereof.
6. To solicit and admit to membership corporations, partnerships and individuals and to charge and collect fees and dues as regulated by the constitution and by-laws of the association.
7. To examine and admit to membership, accountants, auditors, statisticians, economists, secretaries, clerks, stenographers, bookkeepers, cashiers, pay roll clerks, store managers, purchasing agents, civil and mining engineers, experts and efficiency men, foremen, superintendents, managers, officials and directors, and to award certificates as to their proficiency and knowledge of association methods, and to charge and collect fees and dues as regulated by the constitution and by-laws of the association.
8. To practice the profession of public accounting in all of the United States and foreign countries as regulated by the constitution and by-laws of the association.
9. To investigate, examine, audit, adjust, report, and certify the legal, financial and statistical affairs and conditions of corporations, associations, and individuals, and to charge and collect fees therefor as regulated by the constitution and by-laws of the association.
10. To assemble the membership in conventions at stated periods and to provide ways and means for the furtherance of the best interests of the association in accordance with the statutes, made and provided and as regulated by the constitution and by-laws of the association.

President Morris stated further that the association was not a competitive organization, the nature of the work being mainly a missionary service to the industries, and that the association had an authorized capital of $10,000.00, the major part of which has been subscribed in order to become legally responsible and to protect the association against malignment and being characterized as a union of bookkeepers, or an employment agency by those without the state, whose desire it is to capitalize the necessities of the industries.

Urges Continuance of Coal Exchange

At THE annual meeting of the New York Wholesale Coal Trade Association recently held in this city the members voted in favor of a continuance of the work of the Tidewater Coal Exchange. On March 1 when the railroads are turned back to private ownership and the Railroad Administration is dissolved, the Tidewater Coal Exchange is also slated to pass out of existence. Therefore, in view of the large savings which have accrued to those using the pools, efforts are being made by the above association to put the exchange on a permanent basis. Charles A. Owen, chairman of the committee to furnish data concerning the work of the exchange, addressed the meeting and presented very vital figures concerning past history of the exchange, and also of its necessary character to tidewater shippers.

Mr. Owen stated that in nine months from February to October, 1919, the exchange had effected a saving in car demurrage of $731,462, out of a total of $1,263,218, figured on the individual shipper basis, or an average of approximately 11c. per ton. Mr. Owen told the members present that through the pooling arrangement a daily average of around 6,000 cars on hand was sufficient to take care of the harbor trade, whereas if we resorted to the old method of every shipper for his own coal, double the number would be necessary to be kept on hand, thereby materially increasing demurrage bills.

A vote was taken and it was unanimously agreed that a committee of seven be appointed to investigate further and adopt a policy to be outlined to members of the trade at a meeting to be held at a later date.

Industrial Safety Codes Discussed

On DEC. 8 there was held at the Bureau of Standards in Washington a notable conference on industrial safety codes, at which there were representatives of practically all organizations of a national scope interested in any of these wide phases of industrial safety. The conference grew out of an earlier one held on Jan. 15, 1919.

There was a thorough discussion of the whole situation, the consensus of opinion being that there should be a large number of industrial safety codes—perhaps 50 or even 100—developed during the next few years.

Coal Age Index for Last Half of 1919

The index to *Coal Age*, Volume 16, covering the last half of 1919 is now ready for distribution, and will be sent free to anyone addressing a request to the subscription department of *Coal Age*, New York City.

Government Returns For 1919

PRELIMINARY returns on the byproduct coke industry indicate a total production for the year 1919 just short of 25,000,000 net tons.

Compared with the record year, 1918, this was a decrease of 1,000,000 tons or 4 per cent. The decrease was general with the exception of New Jersey, Ohio and Pennsylvania. In the last-named state the completion of new byproduct ovens brought output to approximately 5,750,000 tons, an increase of 25 per cent over 1918. Ohio ranked second with 5,450,000 tons and Indiana, third with 3,560,000.

The year 1919 was a turning point in the history of coke manufacture in the United States. For the first time the tonnage of byproduct exceeded that of beehive coke. In 1918, 46.0 per cent of the total coke output was made in byproduct ovens, the percentage from beehive ovens being 54.0. In 1919 these proportions were reversed, 56 per cent coming from byproduct and only 44 per cent from beehive ovens.

The rise of the byproduct coke industry from its small beginning in 1893 is shown below:

BYPRODUCT COKE PRODUCED IN 1918 AND 1919, BY STATES, WITH INCREASE OR DECREASE

(Net Tons)

	1918		1919		Increase (+) or Decrease (—)	
State	Ovens	Tonnage Produced	Ovens	Tonnage Produced	Tons	Per Cent
Alabama	847	2,634,451	906	2,255,000	— 380,000	—14
Colorado	120	(a)	120	(a)	(a)	(a)
Illinois..	626	2,285,610	714	1,705,000	— 581,000	—25
Indiana	1,026	3,898,215	1,216	3,691,000	— 207,000	— 5
Kentucky	108	517,749	108	408,000	— 110,000	—21
Maryland.	180	474,368	360	356,000	— 118,000	—25
Massachusetts	400	556,397	400	393,000	— 163,000	—29
Michigan..	269	(a)	389	(a)	(a)	(a)
Minnesota..	220	784,065	220	586,000	— 198,000	—25
Missouri.	56	(a)	56	(a)	(a)	(a)
New Jersey	260	682,148	315	789,000	+ 107,000	+16
New York	615	1,069,587	591	751,000	— 319,000	—30
Ohio..	1,658	5,226,334	1,608	5,445,000	+ 219,000	+ 4
Pennsylvania	2,368	4,586,981	2,846	5,747,000	+1,160,000	+25
Rhode Island			40	(a)	(a)	(a)
Tennessee.	24	124,469	24	105,000	— 20,000	—16
Washington...	20	30,129	20	28,000	— 2,000	— 7
West Virginia.	214	603,393	214	393,000	— 210,000	—35
Wisconsin...	268	(a)	232	(a)	(a)	(a)
Combined states(a)		2,523,684		2,519,000	— 5,000	— 0.2
Total	9,279	25,997,580	10,379	25,171,000	— 827,000	— 3

(a) Includes Colorado, Michigan, Missouri, Rhode Island and Wisconsin, combined to avoid disclosing operations of individual companies.

BYPRODUCT OVENS IN EXISTENCE AT BEGINNING AND END OF 1919, AND BUILDING JAN. 1, 1920, BY TYPE

Type	In Existence Jan. 1, 1919	In Existence Jan. 1, 1920	Building Jan. 1, 1920
Koppers...	4,829	5,659	497
Semet-Solvay	2,035	2,275	180
United-Otto	1,840	1,754	36
Rothberg	281	257	
Wilputte	78	206	
Cambria-Belgium	90	90	60
Gas machinery	60	60	
Klönne	42	42	
Roberts	24	24	80
Piron.		12	
Total.	9,279	10,379	853

ESTIMATED MONTHLY PRODUCTION OF BEEHIVE COKE AND OF PIG IRON IN THE UNITED STATES IN 1919

Month	Beehive Coke (Net Tons)	Pig Iron (a) (Gross Tons)
1918, monthly average	2,540,000	3,586,000
January	2,384,000	3,306,000
February	1,787,000	2,948,000
March	2,091,000	3,088,000
April.	1,343,000	2,474,000
May	1,103,000	2,108,000
June	1,148,000	2,114,000
July	1,482,000	2,424,000
August	1,699,000	2,742,000
September	1,755,000	2,481,000
October	1,521,000	1,864,000
November	1,647,000	2,407,000
December	1,690,000	2,630,000
Total	19,650,000	30,586,000

(a) Figures for 1918 quoted from American Iron Steel Institute, for 1919, from *Iron Trade Review.*

ESTIMATED PRODUCTION OF BEEHIVE COKE BY STATES IN 1919 WITH COMPARATIVE (NET TONS) FIGURES FOR 1918

	1918 (Final)	1919 (Estimates)
Pennsylvania and Ohio	22,276,000	14,861,000
West Virginia	2,717,000	1,061,000
Alabama, Tennessee and Georgia	2,042,000	1,695,000
Virginia and Kentucky	1,535,000	1,201,000
Colorado, Oklahoma, and New Mexico	1,401,000	558,000
Washington and Utah........	510,000	274,000
United States total	30,481,000	19,650,000

BYPRODUCT OVENS UNDER CONSTRUCTION JAN. 1, 1920

Company	Location of Plant	No. of Ovens	Type of Ovens	Probable Date of Operation
Birmingham Coke & By-products Co..............	Birmingham, Ala.	50	Koppers	Mar. 1, 1920
Sloss & Sheffield Steel and Iron Co........................	Birmingham, Ala.	120	Semet-Solvay	Feb. 1, 1920
Tenn. Coal, Iron & R.R. Co...	Fairfield, Ala....	77	Koppers	Feb. 1, 1920
St. Louis Coke & Chemical Co.	Granite City, Ill.	80	Roberts	June 1, 1920
Donner-Union Coke Corp.....	South Buffalo, N. Y.........	150	Koppers	June 1, 1920
Lackawanna Steel Co.........	Lackawanna, N. Y.	60	Semet-Solvay	July 1, 1920
Cambria Steel Co	Johnstown, Pa	60	Cambria-Belgium	June, 1920
Jones and Laughlin Steel Co...	Pittsburgh, Pa.	60	Koppers	April 1, 1920
Pittsburgh Crucible Steel Co..	Midland, Pa.	100	Koppers	June, 1920
Domestic Coke Corporation...	Fairmont, W. Va.	60	Koppers	May 1, 1920
Steel and Tube Co. of America.	Mayville, Wis...	36	United-Otto	Jan. 1, 1920
Total		853		

PRODUCTION OF BEEHIVE AND BYPRODUCT COKE IN THE UNITED STATES, 1893–1919

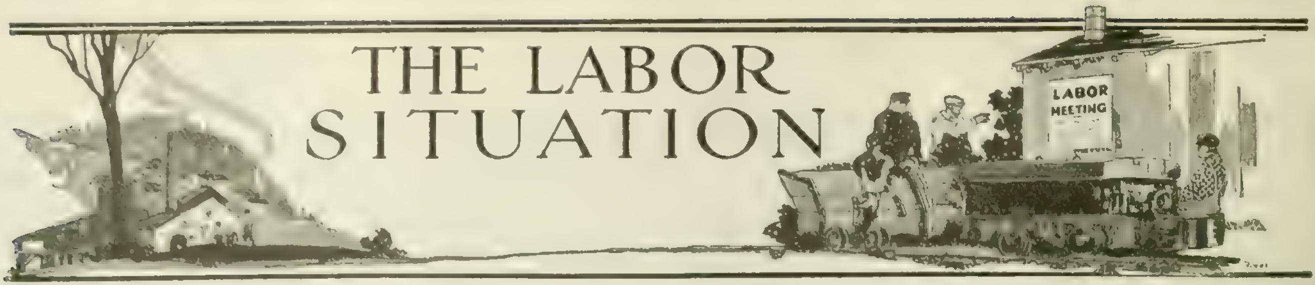
	Tons Produced			Per Cent of Total	
Year	Byproduct	Beehive	Total Coke	Byproduct	Beehive
1893	13,000	9,465,000	9,478,000	0.1	99.9
1900	1,076,000	19,457,000	20,533,000	5.2	94.8
1905	3,462,000	28,769,000	21,231,000	10.7	89.3
1910	7,139,000	34,570,000	41,709,000	17.1	82.9
1913	12,715,000	33,585,000	46,300,000	27.5	72.5
1914	11,220,000	23,336,000	34,556,000	32.5	67.5
1915	14,073,000	27,508,000	41,581,000	33.8	66.2
1916	19,069,000	35,464,000	55,533,000	35.0	65.0
1917	22,439,000	33,168,000	55,607,000	40.4	59.6
1918	25,997,000	30,481,000	56,478,000	46.0	54.0
1919a	25,000,000	19,650,000	44,650,000	56.0	44.0

(a) Estimated, subject to revision.

NEW BYPRODUCT OVENS COMPLETED AND PUT IN BLAST IN 1919

Company	Location of Plant	No. of Ovens	Type of Ovens	Date Blown in
New plants:				
International Harvester Co.	South Chicago, Ill.	88	Wilputte	Nov. 13, 1919
Steel & Tube Co. of America.	Indiana Harbor, Ind	120	Semet-Solvay	Aug. 28, 1919
Ford Motor Co.............	Detroit, Mich...	120	Semet-Solvay	Oct. 14-Dec 6
Jones & Laughlin Steel Co.....	Pittsburgh, Pa.	240	Koppers	June 18, 1919
Rainey-Wood Coke Co	Swedeland, Pa	110	Koppers	Aug. 26, 1919
Providence Gas Co	Providence, R. I.	40	Koppers	Jan. 28, 1919
Additions to existing plants:				
Tenn. Coal, Iron & R.R. Co...	Fairfield, Ala.	77	Koppers	Dec. 17, 1919
Citizens Gas Co............	Indianapolis, Ind.	40	Wilputte	Jan. 31, 1919
Indiana Coke and Gas Co.....	Terra Haute, Ind.	30	Koppers	Jan. 1, 1919
Bethlehem Steel Corp........	Sparrows Point, Md..........	180	Koppers.	Jan. 1, 1919
Seaboard By-product Coke Co.	Kearny, N. J....	55	Koppers	Jan. 21, 1919
Carnegie Steel Co...........	Clairton, Pa.....	128	Koppers	June 3-July 1
Total		1,228		

THE LABOR SITUATION



To Present Public's Viewpoint

The Coal Commission appointed by President Wilson to investigate the bituminous industry on Feb. 11 fixed Tuesday, Feb. 17, as the day to begin hearings of the public's side in the inquiry, when representatives of public-utility corporations, individual consumers, manufacturers and consumers were to appear, this phase of the inquiry to run on for at least a week.

It is stated that the commission has received a number of protests from representatives of the consumers urging that it take no action that would increase the price of coal in the market. These protests have carried with them strongly-worded requests to be heard, after the respective cases of the miners and operators were in.

Committee on Price Investigation Established by Coal Commission

Chairman Robinson of the Coal Commission announced the personnel of a sub-committee of five which will consider the effect of the recent 14 per cent wage advance upon operators' profits. The sub-committee will consider the protest of the operators, voiced before the commission, that, under the fixed price for coal of $2.35 a ton, at the mine, together with the wage advance, their profits have disappeared, while many mine operators actually face possible bankruptcy.

Commissioner Robinson, touching upon the fixing of prices, before the Coal Commission has emphasized the point that the commission had no authority to fix any prices, and that it did not expect to ask for such authority from the President, even in the event that it considered a readjustment of prices necessary, until the commission had agreed upon its final award.

In announcing that the commission would look into the matters of coal prices, he said:

"There have been references and statements made by both operators and miners bearing on the subject of past and present profits of operators," said Mr. Robinson. "The commission desires to say that it will treat the question of profits as one of the factors, and that in making its award, including the fixing of prices, if it shall fix prices, it intends to use available evidence on profits both as it relates to wage scale and to prices, if the latter are to be fixed.

Commission Without Power To Fix Prices

"The commission desires to say further that it has no authority to fix prices, that it does not expect to ask for authority until it has unanimously agreed on its final award, including the fixing of prices, if it concludes that there is a need for price fixing. In making the award the information furnished to the committee will be used, together with other information bearing on the subject.

"It is the belief of the commission that this method will enable the determination of cases brought before it more quickly than as if it now had the authority to fix prices, and should take up cases separately with the idea of adjusting the particular situation.

"It is fair to assume that the President expected that the 14 per cent increase would be applied by the operators and miners in a manner to stabilize the industry, pending the survey and final award of this commission. In making this award the commission will consider and determine the application of the 14 per cent average wage increase."

The sub-committee is as follows: John P. Cameron, chairman, a Pittsburgh mine operator, regional distributor for central Pennsylvania under the Fuel Administration during the war; C. E. Lesher, of Washington, D. C., statistical expert for the Geological Survey; Percy Tetlow, of Salem, Ohio, statistical expert for the United Mine Workers of America and a secretary of the Bituminous-Coal Commission; D. M. Reynolds, of Pasadena, Cal., Western representative of the Council of National Defence, and Paul White, of Cleveland, Ohio, son of John P. White, the latter of whom is the representative of the miners on the Bituminous-Coal Commission.

The sub-committee will sit in Washington, devoting itself entirely to the question of fixed prices, and their effect on operators' profits, in relation to the wage advance. Chairman Robinson, in announcing the personnel of the committee, reiterated his statement of Monday that the commission has no authority to fix coal prices and will not determine whether to ask the President for authority to do so until after it has "unanimously agreed in its final award." Mr. Robinson added: "In making the award the information furnished to the sub-committee will be used, with other information on the subject."

The operators have contended before the commission that no wage advance to the miner is needed and that even the 14 per cent advance was not necessary to enable the miner to met the advanced cost of living.

As regards coal shortage, Mr. Robinson recently said: "The commission also desires to say that both the operators and miners have referred to a car shortage, and car irregularity, but the reference has been general. The commission desires to give to both operators and miners, opportunity of presenting reasons, so far as the same can be established, for this shortage and irregularity."

The various sections outside the central Competitive region are presenting their individual cases before the commission. In particular the Central Pennsylvania region is anxious for the complete elimination of car pushing, urging that mine cars are increasing in size and that the placing of them at the face or on the parting is work appropriate to mule or locomotive.

Check-Off Restored in New River Field

The check-off has been restored in the New River field. It has been the subject of controversy between the operators and the miners of that region ever since the contract of Sept. 1 was abrogated automatically on Nov. 1 by a strike of the miners of the New River field, in violation of their contract. Decision to restore the check-off was reached at a meeting of members of the New River Operators' Association held in Charleston on Wednesday, Feb. 4. The meeting of the operators' association preceded a joint meeting between representatives of the New River Operators' Association and the representatives of the miners of District 29 of the United Mine Workers of America.

As soon as a decision had been reached at the operators' meeting, representatives of the miners were called in and a joint meeting was held, and the decisions reached will doubtless end the 10-day strike that has prevailed at a number of plants in the New River field. This action on the part of the operators followed a long interchange of communications with the authorities at Washington. The chiefs at the capitol have insisted that the "status quo" of Oct. 31 must be restored despite the fact that the miners broke their newly signed contract without any occasion on Nov. 1.

It is considered likely, although no definite statement has been made to that effect that the restoration of the check-off was directed from Washington. On the other hand there were several of the larger companies in the New River field who had continued the check-off system and there were still others who were insisting that the check-off be restored, as by doing so, production would be no longer hampered. As a result of the meeting of Feb. 4 the contract of Sept. 1, although broken by the miners when they went on strike, has been restored as of Feb. 1, the deduction for union dues, etc., commencing on that date. The three principal items in the agreement are as follows:

"1. No fines are to be imposed, no initiation fees collected and no penalties of any character imposed, nor is any form of discrimination to be shown against any employee of any operating coal company in the New River field that is a member of the New River Coal Operators' Association, on account of such employee continuing to work, or resuming work at any time after the strike was declared on Nov. 1, 1919. All employees are to be reinstated to their former employment as nearly as possible.

"2. It is understood and agreed that the operating companies, members of the New River Coal Operators' Association, will not collect any dues, assessments, initiation fees or fines, for the period previous to Feb. 1, 1920.

"3. The employees at any of the mines of the members of the New River Coal Operators' Association are to resume work immediately and are to be notified to do so not later than Feb. 5."

While the miners who had been on strike were prepared to return to work on the date fixed in the agreement, they were unable to do so in many cases owing to the fact that no cars were available until the very end of the week or until about Feb. 7, so that the signing of an agreement did not accomplish immediately just what had been hoped for.

Since the first pay day in November no check-off has been in effect in the New River field except at the operations of two large companies. The Charleston agreement of Feb. 4 establishes it everywhere except in the mines of the group of operators in the Glen Jean section, who represent about 10 per cent of the field. They have always resisted the check-off and the closed shop.

Not Safe to Shoot at Workingmen

After a second trial, Tony Stafford, an unnaturalized Italian, a resident of this country for fifteen years and an organizer for District 29, United Mine Workers, was found guilty of an attempt to commit murder in the first degree, by a jury in the Criminal Court of Raleigh County on Jan. 28. Stafford was charged with being the instigator of an attempt to kill a number of mine workers at the plant of the E. E. White Coal Co. at Glen White, W. Va., on Nov. 16, 1917. Stafford was indicted as one of the principals and was tried at the October, 1919, term of court, when the jury was unable to reach a verdict. The situation was very tense at that time, the miners having made numerous threats that the defendants would never be brought to trial.

At the second trial the chain of evidence was more complete and the jury lost no time in reaching a verdict. Briefly it was alleged that Stafford had advocated the use of force to win a strike of miners even though the Government was then at war, and in pursuance of a general plan of violence Stafford organized a party who, stationing themselves on a hillside overlooking the Glen White tipple proceeded to riddle the tipple with bullets endangering the lives of men who had just come up on a cage at 4 p.m.

Stafford was implicated in the trouble on Cabin Creek in 1912-1913 and was sentenced at that time to serve a term in the penitentiary, but was pardoned by Governor Hatfield. Stafford has frequently boasted that the law could not touch him. Others awaiting trial as accomplices of Stafford are Lawrence ("Peggy") Dwyer, international board member of the United Mine Workers for District 29, and Obe Clendenin, an organizer.

Colorado, Wyoming, Montana and Washington Present Striking Evidence

On Feb. 9 the Bituminous Coal Commission took up an inquiry into the bituminous mountain districts of Colorado, Wyoming, Montana and Washington. Striking evidence showing the wage earnings of miners in those districts was offered by Mr. White, representing the operators of Montana. Mr. White put in figures taken from the mine records, showing that contract miners earn from $7 to $10 a day, and that day labor is paid $5.64 to $6.95 a day. The day wage rate has increased in Montana since 1915 from 70 to 90 per cent.

"During the year 1919 practically every commercial operator in the state," Mr. White said, "has operated at a loss, even though selling prices have advanced from 30 to 55c. a ton for lump coal." He urged that some way be found to make the miners responsible for their contracts with the operators. Strikes in violation of contract, he said, have worked a tremendous hardship to the industry.

Will Try to Unionize Pocahontas

During the visit of President John L. Lewis of the United Mine Workers of America to Bluefield, W. Va., in the Pocahontas region he indicated that a corps of organizers would be sent into the Pocahontas field just as soon as a plan of campaign was completed. He therefore devoted part of his time while in Bluefield in trying to find quarters for such organizers and other members of the United Mine Workers' staff who might be detailed to such work. He also sought to establish financial connections at a Bluefield bank, but arrangements for the opening of an account were not completed during Lewis' stay owing to the fact that the question of accepting a deposit had to be submitted to the directors of the bank.

Sentiment not only among the coal operators of Bluefield and other sections but among business men in general is decidedly against the organization of the Pocahontas or any other region now unorganized, in southern West Virginia, and decided views were expressed by citizens of Bluefield, the Bluefield chamber of commerce adopting a resolution against the proposed organization of the miners. On the other hand, organized crafts and brotherhoods in and around Bluefield are favorable to the proposed unionization of the southern coal fields.

Much doubt is expressed in coal circles as to the ability of the United Mine Workers to bring their campaign for the organization of the Pocahontas and other regions to a successful outcome. Announcement has been made from time to time by district officials of the U. M. W. of A. in West Virginia that they expected to make an attempt to organize the miners of the Pocahontas field. Operators, therefore, were not unprepared for the present move of the United Mine Workers' organization and if the southern fields are unionized it will not be without a struggle, as the operators of the sections which would be affected have made plain since the advent of Lewis and his associates.

Strikes in the Indiana Field

Twenty-one strikes in the bituminous coal fields of the Terre Haute field during the month of January, causing a loss of 28 days of mining time, were reported at the headquarters of the Indiana Bituminous Coal Operators' Association at Terre Haute, Ind. Practically one-fourth of the mines in the field, numbering 85, have been on strike and the loss in production amounted to 28,108 tons.

Want Maintenance Work Divided

Instead of striking for shorter hours and less work, miners employed at what is known as the Webb mine at Shadyside near Wheeling, W. Va., went on strike during the last week of January for more work, asserting that they were entitled to a share of the maintenance work given other day men when the mine was idle.

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Making Trusts by Enactment

THE PLAN to consolidate the railroads is but a scheme to make them forcibly into trusts. When each region becomes an organic whole there will be no other plan open to the public than to prevent the trusts by Government ownership or control, from oppressing the public, for at all times, if the oppression is not actual, the potentiality of it will be a nightmare (imaginary possibly, but nevertheless a nightmare) to the politician.

A certain tyrant once said: "Oh that the people had but one head that I might lop it off." Congress seems to pray for monocephalous railroad systems that it may use them in the same manner.

A League of Essential Industries

WHAT IS here said is really not about essential industries at all, but about industries that the people regard as so essential that they wish to curb and control them. Some are not so really essential, as sugar for instance, and all are essential only in part, because in many cases they only minister to inessentials.

Then, again, the automotive industries say they are essential, but if you test the persons engaged in them by saying they are so essential that profits and wages must be curbed they declare with vehemence that they are essential but do not have that element of essentiality which makes them fit subjects for price control.

But all those who are attacked, which must eat soured corn to please their masters, the luxury industries, should be one in demanding justice. Not from the coal men should come a call for unfair freight rates, not from railroad men should come a cry for unfair coal prices, not from the street-car and power companies should be heard a shout for mine control, not from the packers should there be complaints against the transportation industry. All the essential industries should be one in a cry for justice and fair dealing. The public needs require that the essentials stand together for their rights. Otherwise they will perish and the public will suffer.

A host of distributors, middlemen and caterers to public foibles, a crowd of people who have money for folly and none for useful things, surround the public utilities with their selfish clamor. Let us rally together round a standard of fair play and honest purposes. The owner of the *Dearborn Independent*, who in a few years has made his tens of millions in making automobiles, is leading the hosts against those who are making scarcely a profit and often a loss.

The multi-millionaires of nondescript industries are clamoring for subservient utilities that will serve as men with the hoe. We want no trust but merely a truce. Let every useful industry, assailed by the children of fashion and ease, leave every other useful industry alone and unhampered so long as its course is fair and honorable. Let us forget the past or remember it only in proper proportion. Have not the industries that make trade-marked proprietary articles also watered their stock and profiteered? Are they not doing it yet? Why hunt up the past of the essential industries and be stoneblind to the present of the non-essential?

Where Bolshevism Failed

NO ONE knows just exactly what Bolshevism is. Some would define it as the ownership by the worker of the tools of his employment and the receipt by him of the entire outcome of his labor. Neither of these provisions will work in practice, but they have at least, a goodly outward appearance.

Whatever Bolshevism may be in theory, in practice it is confiscation pure and simple. The Bolshevist takes what another man has labored to produce. If the Bolshevist does not destroy it, he uses it for his own convenence. What is the outcome? No one wants to produce, for it will be taken from him when he has produced it, and if he needs anything for which he has not labored there is always the way of loot to get what he covets. Consequently the well-disposed person produces little and hides what little he creates, and the ill-disposed person relies, at least for a while, on getting by force what he believes the better-disposed person will produce. Soon no one is producing, and then, at last, everyone becomes convinced of the necessity of toil and the ill-disposed realize that loot as a law of being has its disadvantages.

It is a long way from Russia to the United States, but still there are people who need to learn that the errors of Bolshevism are prevalent here and ensconced in high places. Railroads in the anthracite region have built and put in service many coal cars that their mines may work steadily. The Railroad Fuel Administration finding cars in demand in Chesapeake & Ohio Ry. territory takes cars from the anthracite fields and puts them to hauling coal in West Virginia. Does that encourage car buying either in the anthracite region or by the Chesapeake & Ohio? The first will not buy what it is not allowed to use, and the second will not purchase cars when they can be taken from some other more foresighted company.

Similarly, when industrial companies were allowed increased car allotments by reason of their ownership of freight cars, they bought them freely and helped to equip the railroads. Afterwards, when they were forbidden that advantage they bought no more, and the supply of cars failed to keep up with the demand. The use of the cars was practically diverted from their owners and granted to others who had no share in the ownership.

In like manner the repeated grant of the right to seize coal in transit to the Railroad Administration did not encourage it to buy and store coal in the summer. It felt that it would not be so well assured of its supply by storing as it would be if it were permitted to commandeer it at pleasure.

Eventually commandeering of product and controlling of industry must cease. It is a "babying" of the weaklings of industry and a disheartening of the strong and self reliant. It gives to the infrugal the product of the frugal; it hands to the careless the savings of the prudent; it makes judgment and energy unprofitable and madness and laziness no disadvantage. He who risks borrowed money on improvement finds his competitor is given the use of his investment, and he is indeed fortunate if the risk he has taken does not bankrupt him when the appropriate usufruct is denied him.

Our New Slogan "Do Without"

OF ALL the sad reminiscences of the European war one of the most persistent is the slogan "Do Without." No doubt it is the part of patriotism to accept with resignation all the necessary burdens of war shortages, but now peace is declared they seem to be more numerous than ever, and we are beginning to learn that the trouble is in the remedies by which we are continually trying to meet them.

We consistently endeavor to cure symptoms rather than diseases. The cures do well for a while, but the root of the evil is not reached. A palliative is not a cure. In the winter of 1917-1918 we were ordered to do without work during the celebrated workless days in order that coal might be moved on the railroads and the ships in the harbor might be coaled, and we did as we were ordered, even those of us who had stocks of every kind of material, including coal, on hand or were using water power or electricity generated by the energy of water or were using coal that did not pass over the railroad tracks and materials that had already passed with much difficulty through the railroad muddle.

It was said that by doing without work we "mortified our souls" and learned as in no other way what the war meant. In this manner the Administration in the midst of a great war excused itself for an immense waste of human energy in the districts supplied by hydroelectric power, in industrial works that had been forehanded enough to provide themselves with fuel and in establishments so near the mines that shipment by motor truck or horse wagon was practiced or was possible.

It was said that Dr. Garfield knew that he was following the wrong and indirect course, that the railroad embargo was the right cure, but he wilfully adopted the wrong remedy because William D. McAdoo, then United States Railroad Administrator, would not admit that he was nonplussed and would not consent to declare an embargo. This story may or may not be true, but even if true it does not save Dr. Garfield, for he could easily have given exemptions to all industries not calling on the railroad for fuel, as he did to those plants which were essential to the nation's defense and sustenance and were rightfully given that exemption.

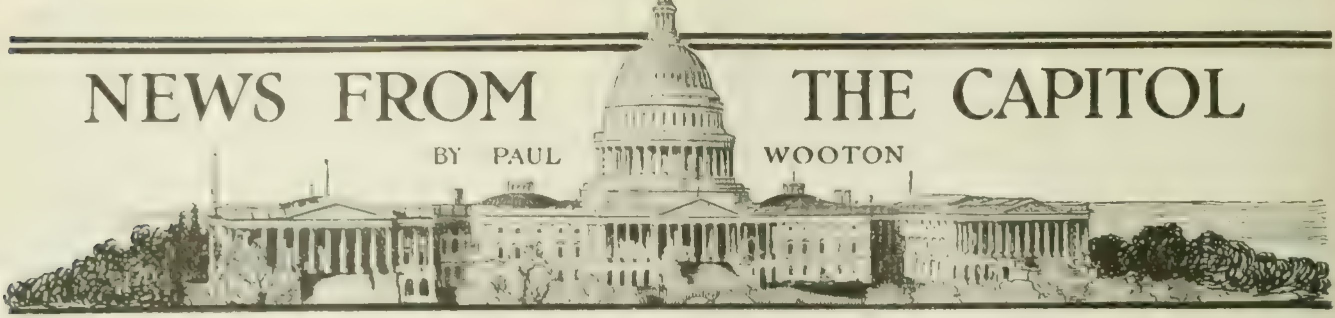
But this was only the beginning of the campaign of "Do Without." It was followed by many others of which everyone approved, but what is difficult of understanding is why the condition continues. Why should the mines have to do without cars, the people to do without coal and the miners to do without work? Simply because we have declared that expenditures must be made without due profit and services rendered without meet compensation. Men might be found willing to lend money without return, but they will not run the risk of losing their money unless some hope of reward is given that will overbalance the risk.

In the cities men are doing without street-car service and are walking the pavements because inadequate returns are being allowed the street-car companies, which are drifting, or have drifted already, into bankruptcy. Our schools are being closed or taught by inefficient teachers because a fair compensation is not paid to the instructors.

Sugar is scarce because the rewards provided were not adequate to make the public build more mills. All things are in short supply and this is so, in part at least, because the railroads fail under inadequate rates to meet the need for transportation facilities. Nothing "does without" except labor, and the luxury industries. The two are getting the savings that should vitalize the railroads and other public utilities.

The married couple that fails to raise a family lives easily on its income. Nevertheless childlessness marks the closing days of any nation. So the workman who is allowed to consume all he makes, soon puts an inglorious end to the national growth. No man who uses all he produces for his own advantage holds in his hand any gift to aid the progress of the nation. We must always remember that as we grow in numbers we must provide for larger output and that can only be done by national saving.

NEWS FROM THE CAPITOL



BY PAUL WOOTON

Mineral Leasing Bill Near Passage

House Expected to Adopt Conference Report on the Measure

THE OIL and Coal-Leasing bill, agreed to in conference and ready for final action of Congress, in the opinion of Representative Frank W. Mondell, Republican House leader, is the "greatest triumph of the cause of proper conservation of public resources up to this time," and represents real constructive legislation. The House is expected to adopt the conference report.

By its terms coal under 50,000,000 acres of land, gas and oil in the remaining public domain of 700,000,000 acres and the phosphate and sodium in the public domain would be reserved in public ownership. The rights to develop these minerals would be given to individuals under leases, and the proceeds of rents and royalties would be divided between the states in which the minerals are found and the Federal Government. The latter's share is to be placed in the reclamation fund for future development along irrigation lines in the Western States.

Many Bills Had Been Presented in Congress But None Had Become Law

"For more than ten years," said Mr. Mondell, "the question of providing legislation which would retain in the hands of the government the title to the remaining public coal, oil and oil shale, gas, phosphate and sodium lands, and the deposits of these minerals that have been reserved in lands to which a limited title has passed, and the adoption of a system of development under leases controlled and supervised by the Federal Government, has been before the Congress, and bills proposing such a policy, to a greater or less degree, have passed both Houses several times, but the bills did not satisfy the friends of real leasing legislation and failed to become law.

"Under the provisions of the bill the minerals referred to, and to a certain extent the lands which contain them, will be leased to citizens of the United States in limited areas at royalties which, in a large measure, are to be determined by public bidding, and under conditions which insure the mining and utilization of the minerals without unnecessary loss and under conditions favorable to the health and safety of those engaged in these enterprises.

Present Bill To Safeguard the Public

"The bill is a decided improvement over the legislation that has preceded it, because it is strictly a leasing measure and its provisions safeguarding the public interests are more carefully guarded than heretofore. Its provisions affecting the rights of those now claiming under the present land laws containing these minerals are believed to be just and equitable."

Payne Chosen for Secretary of the Interior

Shipping Board Chairman Selection as Lane's Successor; Ex-Senator Shafroth Slated for the Place

John Barton Payne, chairman of the Shipping Board and formerly general counsel of the Railroad Administration, will become Secretary of the Interior March 1, succeeding Franklin K. Lane, whose resignation becomes effective on that date. While White House officials declined confirmation, it was understood that former Senator John Franklin Shafroth, of Colorado, has been offered the place vacated by Mr. Payne.

Chairman Payne said tonight that he would accept the appointment to the Cabinet because it was the wish of the President, but "my heart is in the Shipping Board."

Mr. Payne said he would ask the President that he be permitted to stay on at the Board for a few weeks to enable him to leave a comparatively clean slate for his successor by disposing of the immediate business before the Board, including the sale of the former German passenger ships and the reorganization policy now being effected.

Bureau of Mines Asks for $20,000 Appropriation

In addition to the $576,877 which already has been appropriated for investigating mine accidents and operating mine-rescue cars, Dr. Van H. Manning, the director of the Bureau of Mines, has asked for a deficiency appropriation of $20,000. This is intended largely for the printing of miners' circulars. The need of these circulars, as explained by Dr. Manning, has been laid before the Committee on Appropriations.

Coke Producers Protest Fixed Prices

Coke producers are pointing out to officials here the injustice of having the limits maintained on coke prices while iron rises to $40 a ton. This, it is claimed, gives the steel interests an additional profit at the expense of coke manufacturers. A modification of the order is asked so as to permit contract prices to be in effect as in the case of coal where it exceeds the Government price.

Railroads Refuse to Change Contract Price

Refusal of the Railroad Administration to readjust contract prices when the price exceeds the government level has resulted in a vigorous protest by the National Coal Association. A large number of operators are affected.

DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

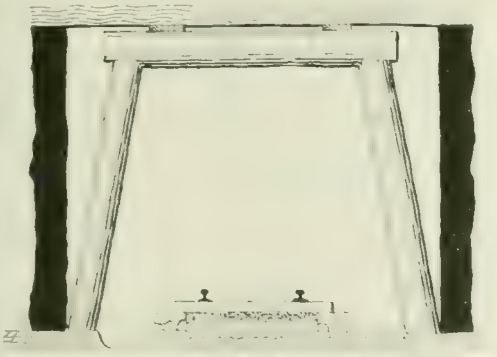
Ballasting Mine Tracks

Letter No. 2—I read with much interest the excellent letter of Jerome C. White, *Coal Age*, Nov. 6, p. 756, giving his experience in the use of broken stone for ballasting mine tracks. Kindly permit me to add a few lines describing my own practice in mine trackwork.

First, a good mine track is very necessary to obtain the best results in either mule or motor haulage. A straight road, with easy curves and light grades is also an essential factor wherever conditions will permit. In any case, however, it is of the utmost importance to have and maintain a good solid roadbed that is well drained and ballasted with material that will hold the track in line and prevent low joints.

One of the chief requirements in mine haulage is that the rails shall be supported on solid wood ties of a size that will hold the track in place and prevent derailment of the cars through the spreading of the rails. The best wood for track ties, in mines, is oak, tamarack, or hemlock. Track ties should be slabbed on two sides, so as to give a flat bedding for the ties and rails. The bark is preferably left on the remaining two sides. It is my belief that this method will give the best results.

The size of mine-track will depend on such conditions as the kind of haulage employed, weight and size of mine cars and locomotives in use, character of roadbed and floor of the seam, conditions regarding drainage and care and maintenance of the tracks, all of which must be considered in the selection of good ties.



PROPOSED METHOD OF BALLASTING TRACK

In a small mine employing mules and where the haulage is light, the ties should have a thickness not less than 3 in. and a width of 4 or 5 in. Under a heavier service employing mechanical haulage, either rope or locomotive haulage, the track ties should be at least 5 or 6 in. thick and from 6 to 8 in. wide. The size should be uniform throughout, as ties of different dimensions should not be placed on the same roadway. Mine-track ties should be spaced, say 16 ties to a 30-ft. rail, or 18 ties to a 33-ft. rail, under fairly normal conditions of roadbed and bottom.

Much interesting information is given on the selection of material and the laying of mine tracks, in a little book entitled "Mine Tracks, Their Location and Construction," by McCrystle. Speaking of ballasting the tracks, Mr. McCrystle gives the preference to the use of the following: 1. Broken stone, which he regards as excellent. 2. Cinders and ashes from the power house, good. 3. Breaker slate, only fair. 4. Coal slack and other refuse, poor.

The same author states that all rock used for ballast should be broken to a size that will pass through a 3-in. ring. He also says that there should be at least 3 in. of ballast on all roads, and this should be thoroughly tamped, particularly under those portions of the tie directly beneath the rails.

The practice described in Mr. McCrystle's little book agrees with that recommended by Mr. White to whom I referred previously. It also conforms to my own experience, in respect to the use of crushed stone for ballast. In connection with this subject, I have introduced a little sketch intended to illustrate what I have found equally good as ballast and often cheaper than broken rock. As shown in the figure, stone, or a good quality of slate, is built on each side of the track and the middle portion of the bed filled in with coarse gravel. I have found that this makes a very good roadbed whenever such material is available for use.

Rawdon, Quebec, Canada. C. McMANIMAN.

Labor and Democracy

Letter No. 4—The readers of *Coal Age* are to be congratulated on the opportunity presented for the discussion of the present relation of labor to democracy. I was greatly pleased to read the letter of "Loyal Worker," which appeared in the ussue, Dec. 25, p. 938. The writer of that letter could not have stated more plainly and concisely my own convictions as derived from personal experience.

In commenting on what the "closed shop" means to an honest workman, this writer makes the following statement, which is well worth repeating: "In the closed-shop plan, the worker is not his own master. He is not free to express himself if his thoughts are opposed to the ethics of the leaders. The very atmosphere of the shop breathes fear and distrust in the worker." Many who have passed through these experiences can vouch for the truth of this statement. The worker in a closed shop most assuredly has a rope about his neck and, as our friend has expressed it, must "watch his step" if he would avoid difficulty.

INJUSTICE DONE AN HONEST MEMBER OF MINERS' LOCAL

The same writer speaks of the man committing a "breech" that gives the watchful committee their longed-for opportunity to recommend his discharge. I could give an instance where it is not necessary for the worker to commit a breech to bring him into disfavor with the committee, and others can probably do the same, as such instances are of common occurrence. For nearly two years, to my knowledge, a certain honest worker has fought for his rights and for justice.

Some time ago, this man was charged with committing an act that merited a penalty as a member of the local to which he belonged. His act was right in accordance with the Washington agreement, made in 1918, and the penalty was wrong under the Lever Act of Congress. When the penalty was imposed on this worker, he requested of his local to be informed where he had violated the district contract or local bylaws.

The member making the complaint assured the man that there was an entry on the minute book of the local that he had violated. For two years, however, this honest worker has been on record as having requested to be shown the minute of the local that it was claimed he had violated and for which he was penalized to the amount of $5 and other expenses, without receiving any satisfaction in answer to his request.

Fairness and Justice a Chief Requirement

In the same letter, "Loyal Worker" states: "Conservative forces will always accept a solution that is tempered with fairness and justice." In the instance to which I have referred, the penalized member deserved justice at the hands of the District Executive Board to which he applied. His claims, however, were met with perjured rebuttal and forged signatures, which perverted the ends of justice and caused the Executive Board to misjudge this suffering member.

The readers of *Coal Age* can judge for themselves as to the course to be pursued in securing justice. Appeal to the War Labor Policy Board, in this case, brought the suggestion that it was a matter to be placed before the Fuel Administration. In the opinion of the assistant attorney-general, it was not the class of business that concerned the Department of Justice. The only satisfaction the suffering member received was that the Fuel Administration thought he must have violated some law of the U. M. W. of A.

To make a long story short, repeated requests made of his local and appeals to the district president to be informed as to what part of the contract he had violated, or what bylaw of the local he had broken, have met with no response. In view of these facts and numerous others of like import, my opinion is that labor is fast becoming an autocratic government over its members. My advice is that all honest workers should fall back and line themselves with democracy if they desire a healthy development of labor conditions in the future. It goes without saying that no one, of his own free will, would desire to be under autocratic rule or a member of an organization where justice is preached but not practiced. W. H. Luxton.

Linton, Ind.

Health and Industry

Letter No. 1—Some time ago I recall reading an excellent Foreword in *Coal Age* [Vol. 15, p. 519], entitled "Health and Industry." At no time have the suggestions made in that Foreword been more timely than at the present, and I wish to emphasize a few of the points mentioned and urge their application in combatting the present condition that prevails to so large an extent in the coal industry, today.

The author of the Foreword, Floyd W. Parsons, makes the following statement: "The degree of health that employees enjoy determines largely their degree of happiness, contentment and efficiency." Few who have been close observers of industrial conditions in coal mining will deny that those workers who enjoy physical health perform more efficient and valuable services to the companies who employ them, than those who suffer from ill health or are physically weak. The healthy man looks on life from a different viewpoint. He is contented and happy, while the less able-bodied man is discontented and often unhappy. The results of these two conditions in the health of the worker are plainly evident to their employers.

Sanitary Conditions Promote Health

Coal operators who neglect or refuse to consider the physical health and the sanitary and social environment of their employees make a vital mistake. There is no question but that wholesome and pleasant environment promotes health and happiness, which mean contented and efficient workers. This being true, it is of prime importance that mine officials make every possible provision for the health, comfort and enjoyment of their miners. By this means they may be won over more successfully to higher and better methods of living and become more efficient workers and better citizens.

The question of contentment among workers is an important factor in the operation of coal mines. There are diseases of the mind as well as ailments of the body, and the former are often more baneful and more to be dreaded than the latter. The diseased mind is fertile soil for sowing the seeds of radical socialism, unrest and discontent, which if unchecked will develop into Bolshevism. The disease is contagious and spreads rapidly, bringing strikes and labor disturbances. The most effective cure for a diseased mind is more desirable living conditions and a healthier social environment.

Moral and Social Atmosphere Important

In addition to the consideration of the health and contentment of workers, there is another important factor, namely, the moral and social atmosphere surrounding them. It will not be denied that moral and sober men make a better class of miners.

Compare the miner who cleans up for Sunday, attends church and Sunday School with his family, with the man who shuffles out from his home every Sunday morning and spends the day loafing about town. Is there any question but that the former type of individual makes a more reliable, constant and efficient worker than the latter? The one learns to respect himself, which develops a high regard for others, while the negligent and careless habits of the other engenders a lack of selfrespect and a disregard for others.

In my judgment, all efforts to educate and train mine workers and improve their living conditions along the lines suggested cannot fail to prove a paying proposition. To the extent that a man sets a higher value on himself and his fellows, to that extent he becomes more valuable as a workman.

Practical Religion the Need of the Hour

The report of Roger W. Babson, who made a careful study of the social, economic and political problems confronting the American people today, contains this statement: "The need of the hour is more religion." He states, "The solving of the labor situation is wholly a question of religion." He would have the reformation start with Congress and follow down the line to factories and mines. I believe his conclusions are right and that the differences between capital and labor depend on the honest application of the Golden Rule.

In my opinion, there is enough religion in the world, but it is of a kind that goes no farther toward changing and reforming the life than subscribing to some creed and having one's name enrolled on the church record. Such religion is mere hypocrisy and will never settle labor troubles by the Golden Rule.

A SOUND MIND IN A SOUND BODY

Referring once more to the Foreword, we read in the closing paragraph the following: "Above all things, at the present moment, we need sound minds, and these we cannot have unless first we have sound bodies." Nothing can come nearer to the truth than that a sound and vigorous mind, free from selfishness and actuated by a Christian spirit, will rightfully adjust all differences between capital and labor.

Let employer and employed each remember that an honest day's work calls for an honest wage. The worker who possesses a Christian spirit and whose life is measured by the Golden Rule will give an honest day's work, and the employer of like spirit will reward him in the same measure. Strikes and lockouts will then be a thing of the past and labor troubles will be ended.

JOHN ROSE,
Dayton, Tenn. Former District Mine Inspector.

Maximum Coal Extraction

Letter No. 1—To those who have studied the problem of obtaining a maximum extraction of the coal from a given seam, in the light of practical experience, it is often surprising that the methods employed in certain districts yield the percentage claimed.

The discussion just closed relating to the extraction of 50 per cent of the coal in one of the important coal fields of this country is an illustration of the need of studying carefully the conditions before deciding on what method to employ for working out the coal.

The study of the conditions affecting extraction, in a mine where the recovery is low, will generally show that in order to reduce the loss of coal in that mine a radical change in the method of working is very necessary. In many instances it will appear surprising that the loss has not been greater.

MINE SQUEEZE THE DESTRUCTIVE FACTOR

The big factor to be considered in most cases is the squeeze and the elements producing it, and, having done this to apply some system of mining that will offset these destructive elements.

Squeeze or creep is generally due to a weak floor, small room pillars and often to some extent, to the structure of the coal which may rash easily at some point in the seam. The height of the seam too aggrivates a squeeze after it has once developed. Comparitively speaking the roof strata may be good, and yet other conditions that exist may be such as to invite squeeze in the working of the mine.

It frequently happens, that too much ground is opened up at once. The panels are laid out too large, and too much time is consumed in development, before room pillars are extracted. In such cases, a whole year may be required to drive a panel entry and the same length of time consumed in driving the rooms which means that the pillars adjacent to the panel entry have to stand for two years approximately before they are extracted. Should it happen that the room pillars are too small, it would not be surprising if a squeeze developed before the rooms are completed and the pillars drawn back to the entry.

In mines where the conditions are quite favorable it is not considered good mining practise to leave room pillars in place for a great length of time. Speed in extraction is one of the essentials to a good recovery, and pillars must be extracted, as soon as possible after the rooms are driven up, and the roof strata allowed to cave behind so as to reduce the overhead pressure.

TOO RAPID DEVELOPMENT INVITES FAILURE

When the attempt is made to work up a large output as quickly as possible the really important features, which enter into the ultimate success of the mine, have been lost to sight. As stated previously, before deciding on the method of mining to be adopted in any mine, it is essential that the nature of the overlying strata, the underlying strata, depth of cover, character of the coal and the area to be extracted should be fully considered.

The latter information is highly essential and can be had by sinking a series of boreholes, at various points on the property, before any development work is attempted. It may appear to some that this would mean a high initial cost, which will be true in some cases; but if the area to be mined out is large the information gained from the drillhole records is invaluable and will in the long run save money.

It is a mistake, under most conditions, to open too many rooms at once, as such a method brings on an excessive overhead pressure which can not be relieved until the room pillars are extracted and the roof strata allowed to cave. If the floor strata is weak that fact, combined with small room pillars left in, will add considerably to the causes producing squeeze and incidentally lower the recovery.

THE WORKING OF PILLAR COAL

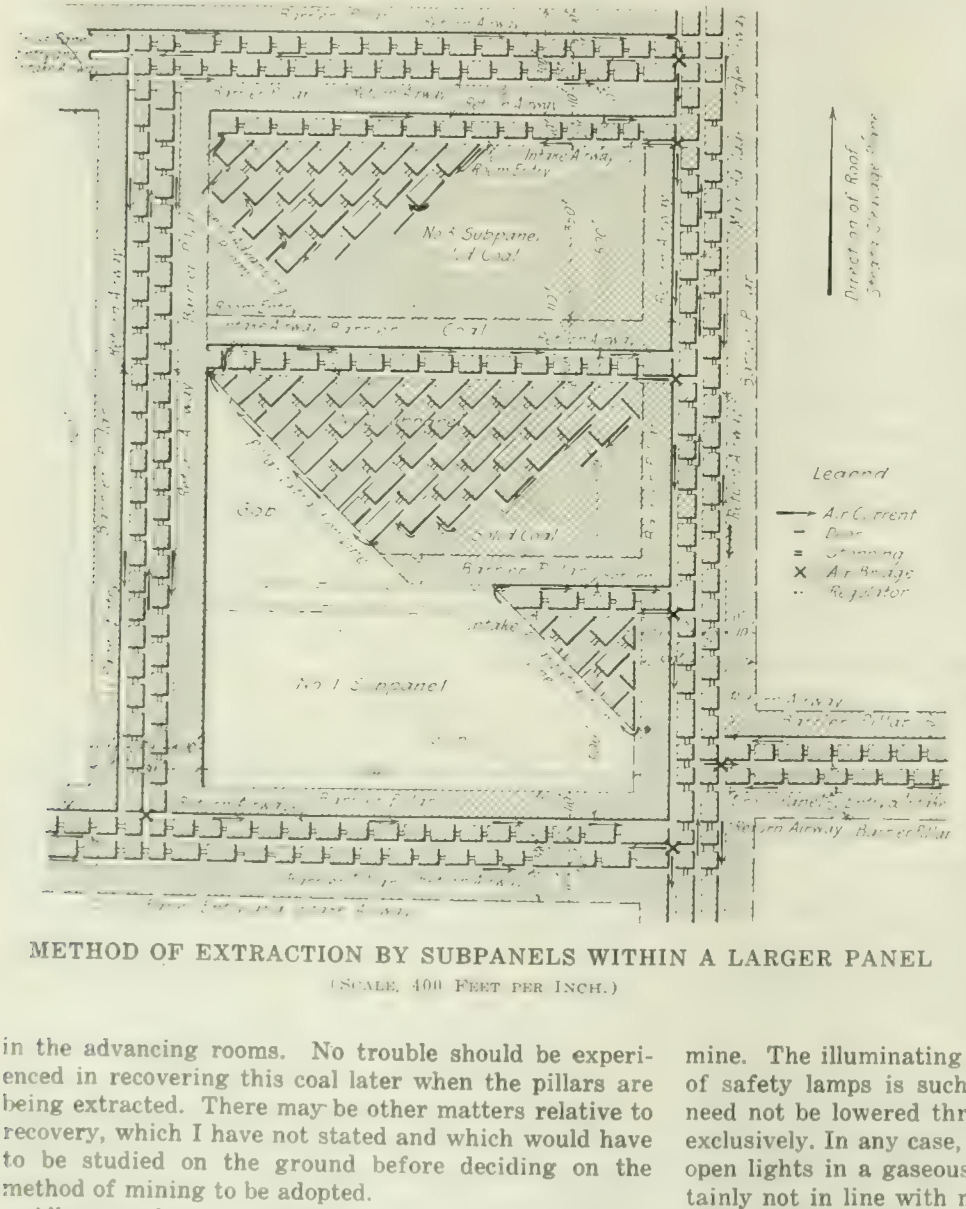
Under ordinary conditions, pillar coal should be mined as economically as the room coal or narrow work. If the pillars are made large and not left in place too long it should be possible to mine part of the pillar by machine and take out the pillar butts left in against the gob, by hand. The roof strata should be made to cave as early as possible after a few of the pillars have been extracted. If it does not do so some means should be adopted to start a cave, so as to preserve the pillars adjacent to the gob, which will not be possible if a large standing arear is maintained in the gob.

In the latter case when the roof breaks over a large area it is more than likely that it will ride over several of the pillars adjacent to the pillar-extraction line, which may start a slight squeeze on the advancing rooms, causing delay and considerable expense. Except under extraordinary conditions of the roof strata, no serious trouble should be experienced in getting the roof to cave almost when and where desired.

I also favor reducing as far as practicable the width of the rooms, in order to develop more quickly. Any increase in per-ton cost that might result from doing so will be more than offset by the increased recovery and ultimate saving effected by mining on the retreating method. By adopting this method it will not be necessary to wait until all the rooms are completed, before commencing to extract the pillars. The pillars in this case can be extracted immediately when each room is finished. It can also be arranged to have the rooms completed slightly in advance of the pillar-extraction line. In each case, the room and the pillar-extraction line should cross the roof-strata cleavage planes, say at an angle of 45 degrees.

DESCRIPTION OF A PANEL SYSTEM IN WHICH THE COAL IS TAKEN OUT IN SUBPANELS

By following this method, the pillar extraction line can be more uniformly maintained and the roof strata will be less liable to break in the advancing rooms. In mining a thick seam it is well to leave the top coal up in the advancing rooms. No trouble should be experienced in recovering this coal later when the pillars are being extracted. There may be other matters relative to recovery, which I have not stated and which would have to be studied on the ground before deciding on the method of mining to be adopted.



METHOD OF EXTRACTION BY SUBPANELS WITHIN A LARGER PANEL

(SCALE, 400 FEET PER INCH.)

Allow me, here to present the plan shown in the accompanying figure, which I have used and found to work successfully, in mining 6- to 8-ft. coal overlaid with a hard shale roof, at a depth of 500-ft. below the surface. It will be observed that, instead of having one large panel, there are three subpanels, which are worked out as seperate units. The cross- or room entrys are driven to the boundery or barrier before any rooms are turned off. As soon as the first few rooms are completed in No. 1. subpanel the pillars in those rooms are immediately extracted.

It will also be observed that the rooms reach the boundary slightly in advance of the retreating pillar-extraction line, and in this way the pillars are not allowed to stand for any length of time before being extracted. The extraction line of No. 1 subpanel is kept in advance of No. 2. subpanel extraction line; and No. 2, in turn, in advance of No. 3 extraction line.

Barriers are left in against No. 2 and 3 subpanels, which are later mined out in line with the room pillars, in each case. Barrier pillars are also left in against the north and south and the east and west panel entrys, which can be mined out as the management sees fit and proper. The size of the panels and subpanels, the width of rooms, and the dimensions of room pillars, also the general ventilating system, are clearly outlined in the plan shown in the figure.

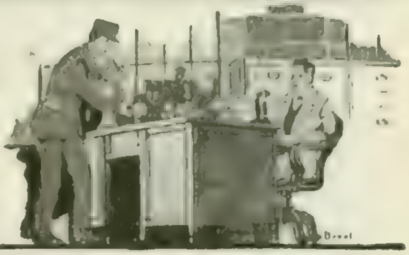
In closing let me say one matter that deserves consideration is the cutting of the coal. In mining domestic coal, it is desirable to have as large a percentage of lump as possible. In that case the cutting should be done in the bottom coal, but if that is quite hard I would suggest mining in the softer coal, which in any case will go into the fines. The type of machine in use may be an undercutter, however, and in order to cut in any other part of the seam than the bottom it may be necessary to install a new machine. In that case the matter would require to be fully considered before any change is made.

When working a mine generating much explosive gas and subject to squeeze the use of open lights and safety lamps, to my mind, is not consistent with the safety-first idea and should be discontinued and only locked safety lamps used throughout the mine. The illuminating power of the more recent types of safety lamps is such that the efficiency of working need not be lowered through such lamps being adopted exclusively. In any case, the practice of using closed and open lights in a gaseous mine is dangerous and is certainly not in line with modern coal-mining practice. In conclusion let me say, it is the duty of all mining men to conserve the natural resources of the country. I am of the opinion that the time is not far distant when the state will take this matter in hand.

J. H. McMILLAN,
Jasper Park Collieries, Ltd.
Pocahontas, Alta., Canada.

INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD



Semianthracite vs. Semibituminous Coal

Several times, recently, I have been asked to explain the difference between semianthracite and semibituminous coal. This question answered in *Coal Age* would interest many. Sage Coe.

Scranton, Pa.

The change that takes place in the formation of coal from vegetable deposits is slow and continuous, from the peat bogs to the anthracite beds and the still harder graphite. Semianthracite and semibituminous are grades of coal between anthracite and bituminous, the former containing from 7½ to 12½ per cent volatile matter, and the latter from 12½ to 25 per cent. Any greater percentage of volatile matter classifies the coal as bituminous, although this is merely an arbitrary distinction, there being no exact line of division.

Dead-End in Trolley Haulage

I have been studying a course in coal mining and cannot find where it tells how close the trolley line should be carried to the face of a heading when the heading is being driven and the coal hauled out by a trolley locomotive. I was asked this question the other day by an electrician and also by a wireman.

As I understand it, at the end of a trolley line, an anchor bolt is driven to hold the trolley wire. The question is, how near to the face of a live heading should this anchor bolt be placed? Some say it should be about 30 ft. from the face, while others state that the dead-end of a trolley line should not approach the face closer than 50 ft. As I am a reader of *Coal Age* and appreciate the help given inquirers, I would like to ask for information on this question.

Rawl, W. Va. Assistant Foreman.

It must be rather exceptional practice to carry a trolley line beyond the last parting or sidetrack where the trips are made up to be hauled out of the mine. It is customary, in mine haulage using the trolley system, when the gathering haul is made by mules, to carry the power line to the inby end of the last parting on the haulage road. Where a trolley gathering locomotive is used, the trolley wire can be extended a distance further, so as to permit the locomotive to proceed to the head of the rooms turned off the entry.

As a rule, however, the rooms for a good distance back from the face of the heading will not have been driven to such a depth but that the locomotive can reach the face, by the use of its own cable unwound from the reel. In any case, replying directly to the question asked, we would say that the dead-end of the trolley line should not approach closer to the face of the heading than the length of the cable on the locomotive.

It is a great advantage, in electric mine haulage, to employ a storage-battery locomotive for use on the gathering haul. A storage-battery locomotive can proceed to any point on the entry and enter the rooms, under its own power, thereby avoiding the use of a reel and cable and the added annoyance of frequently extending the trolley wire. Let us hear from others.

Location of Regulators in a Mine

Allow me to ask the following questions: A shaft mine lying at a depth of 550 ft. below the surface is ventilated by an air current of 200,000 cu.ft. per min. The mine is very extensive and generates an abundance of gas in the gobs. The air current is divided into four separate splits, and the number of men working in each split is practically the same. It is necessary, however, to use regulators to divide the air between the splits.

The questions I want to ask are: 1. Is there any choice in placing the regulators in the different splits in a mine? 2. What advantage or disadvantage, if any, results from placing the regulator; (*a*) at or near the intake or mouth of a split; (*b*) at a point somewhere midway between the mouth and the inby end of the split; (*c*) at the last open crosscut in a split?

Perryopolis, Pa. R. W. Lightburn.

Theoretically, it makes no appreciable difference whether the regulator is placed at the beginning, midway, or at the inby end of a split. The pressure on the return side of a regulator is always the natural pressure concerned in moving the air, while the pressure on the intake side is greater than this by the amount required to pass the air through the regulator. As a consequence, the density of the moving air is slightly greater before it reaches the regulator than after passing through the opening.

Although this increased density of the air may act to increase the frictional resistance of the current, the effect is very slight and wholly inappreciable. On this score, therefore, the location of a regulator in an air split is quite immaterial.

Viewed from the practical side, however, the case has a different aspect, as a regulator should always be placed where it will least obstruct the operation of the mine. It has been the general custom to place the regulator on the back entry of a pair, outby from the last crossover through which coal is being hauled.

The objection to placing a regulator in the last open crosscut in a split would be that it would have to be moved from time to time, as the entries are advanced. A location must always be chosen that will be the most permanent and prove of the least hindrance to the daily operations of the mine.

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Miscellaneous Questions

(Answered by Request)

Ques.—What must be the sectional area of a square airway that is required to pass 50,000 cu.ft. of air per minute under a 1-in. water gage, the length of the airway including the return being 5200 ft. Use Fairley's coefficient of friction, $k = 0.00000001$, in the solution of this problem.

Ans.—First, write the formula for the water gage in terms of the quantity of air passing and the dimensions of the airway; thus,

$$w.g. = \frac{p}{5.2} = \frac{k\ l\ o\ q^2}{5.2\ a^3}$$

Calling one side of the square airway d, its area is $a = d^2$; and its perimeter, $o = 4d$. Then, for a square airway, the expression,

$$\frac{o}{a^3} = \frac{4\ d}{(d^2)^3} = \frac{4}{d^5}$$

Now, substituting for the expression o/a^3, its value just found, $4/d^5$, we have, for the formula for finding the water gage, in a square airway,

$$w.g. = \frac{4\ k\ l\ q^2}{5.2\ d^5}$$

Solving this equation with respect to d, we have, for the length of one side of the required square airway,

$$d = \sqrt[5]{\frac{4\ k\ l\ q^2}{5.2\ w.g.}}$$

Now, substituting the given values in the last formula, we find the length of one side of the required airway; thus,

$$d = \sqrt[5]{\frac{4 \times 0.00000001 \times 5200 \times 50{,}000^2}{5.2 \times 1}}$$
$$= \sqrt[5]{100{,}000} = 10 \text{ ft.}$$

The sectional area of the required airway is, therefore, $a = d^2 = 10 \times 10 = 100$ sq. ft.

Ques.—Calculate the centrifugal force developed by a mine ventilating fan making 100 r.p.m., assuming a cubic foot of air in the fan weighs 0.0766 lb., the outer and inner diameters of the fan being 16 ft. and 9 ft., respectively, and the width of the fan blades 4 ft.

Ans.—The area of a circle corresponding to the outer diameter of the fan is $0.7854 \times 16^2 = 201$ sq. ft. The area of the central opening of the fan is $0.7854 \times 9^2 = 63.6$ sq. ft. Subtracting the area of this opening from that of the full circle of the fan gives $201 - 63.6 = 137.4$ sq. ft., which is the area of the annular space covered by the sweep of the blades. Multiplying this area by the width of the fan blades gives for the volume of the fan, $4 \times 137.4 = 549.6$, say 550 cu.ft. The weight of the revolved air within the fan is, then, $550 \times 0.0766 =$ say 42 lb.

In order to calculate the centrifugal force developed by the revolution of this air in the fan, it is necessary to first find the radius to the center of gravity of the air contained in a single compartment of the fan and its velocity, in feet per second. Calling the outer and inner diameters of the fan D and d, respectively, and the radius to the center of gravity, R_g, we have for the length of this radius, in feet,

$$R_g = \tfrac{1}{3}\left(\frac{D^3 - d^3}{D^2 - d^2}\right) = \tfrac{1}{3}\left(\frac{16^3 - 9^3}{16^2 - 9^2}\right) = 6.4 \text{ ft.}$$

The velocity of this center of gravity, at a speed of 100 r.p.m., is then $v_g = 100\ (2 \times 3.1416 \times 6.4) \div 60 =$ say 67 *ft. per sec.*

Now, calling the total weight of air revolved within the fan W, the force of gravity g (32.16 ft. per sec.), the required centrifugal force developed at the given speed, F, we have,

$$F = \frac{W\ v_g^2}{g\ R_g} = \frac{42 \times 67^2}{32.16 \times 6.4} = 916 \text{ lb.}$$

Ques.—Assuming the efficiency of the fan, in the previous question, to be 60 per cent, find the quantity of air it will deliver, at the given speed (100 r.p.m.), when operating under conditions where the mine resistance is such as to give a 2-in. water gage, in the fan drift, where the sectional area is 80 sq. ft.

Ans.—For an efficiency of 60 per cent, the force applied to move the air in the fan drift is $0.60 \times 916 = 549.6$, say 550 lb. The mine resistance is $80\ (2 \times 5.2) = 832$ lb. Since the ratio of the acceleration (f) due to a force, to that due to gravity, is equal to the ratio of the accelerating force (KF), to the resistance (pa), we have for the acceleration of the ventilating current, in this case,

$$f = \frac{K\ F}{p\ a}\ g = \frac{550}{832} \times 32.16 = 21.26 \textit{ ft. per sec.}$$

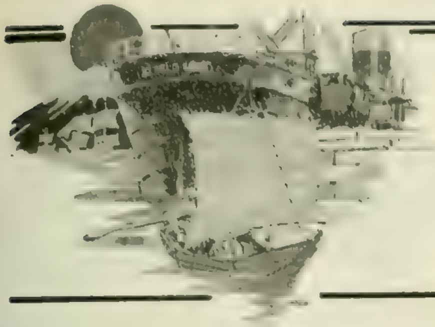
The quantity of air the fan will deliver is then found by multiplying the total force (KF), applied to move the air, by one half the acceleration ($f/2$), and dividing that product by the unit pressure (p), which gives for the quantity of air delivered per minute, by the fan, under the assumed conditions,

$$Q = 60\left(\frac{K\ F}{p} \times \frac{f}{2}\right) = 60\left(\frac{550}{10.4} \times \frac{21.26}{2}\right)$$
$$= 33{,}730 \textit{ cu. ft. per min.}$$

Ques.—Find the horsepower required to drive the fan, mentioned in the two preceding questions, at the given speed (100 r.p.m.), and under the assumed conditions.

Ans.—The power required to drive the fan is the power applied to the crankshaft. For an assumed efficiency of 60 per cent, this power is

$$H = \frac{Q\ p}{K} \times \frac{1}{33{,}000} = \frac{33{,}730 \times 10.4}{0.60 \times 33{,}000} = 17\tfrac{3}{4} \textit{ hp.}$$



FOREIGN MARKETS AND EXPORT NEWS

Irish Coal Fields Assuming Greater Importance

Within the last few years Ireland's coal resources have assumed an unexpected importance A few years ago British coal could be delivered at Irish east coast ports at a cost of from 10s. to 15s. a ton, and coal for domestic use was correspondingly cheap. At the same time, owing to lack of transport facilities, the transport charges alone on coal from the Irish collieries delivered at coastal towns exceeded the cost of imported coal.

As the majority of Irish industrial works are located along the coast, it was evident that there was only a very limited field for the use of Irish coal. However, when sea freights had now increased some five-fold, and imported coal at the Irish ports had advanced to three times its pre-war price, the question of developing Irish coal resources to the fullest extent becomes a very important and pertinent one

There has not been any geological or mining survey of Ireland which would suffice to determine her coal reserve within a reasonable degree of accuracy

There is, however, a substantial reserve of coal in Ireland, which, under existing conditions will well repay exploitation. There are coal measures under about 1,800,000 acres—beds of coal have been found in Antrim, Donegal, Tyrone, Fermanagh, Monaghan, Cavan, Leitrim, Roscommon, Westmeath, Kilkenny, Carlow, Clare, Dublin, Queen's County, Limerick, Cork, Kerry and Tipperary.

Coal fields and collieries worthy of consideration are the Castlecomer Collieries, Kilkenny, Wolfhill Collieries, Queen's County; Coalisland Collieries, Tyronne; Arigna coal field, Roscommon and Leitrim, and at Slieveardagh in County Tipperary. The lignitebeds at Murlough, Bay and Ballycastle, County Antrim and in the Lough Neagh district, and at Rossmore, Carlow, might also be profitably worked, though they are of lesser importance. The coal fields which have been proved, or closely estimated are; Leinster, 152,000,000 tons; Tyrone, 97,000,000 tons; Antrim, 14,000,000 tons; Tipperary, 20,000,000 tons; and Connaught, 9,000,000 tons. These figures are probably all under-estimates especially in the case of Connaught.

The estimated coal reserves in the Castlecomer fields is 60,000,000 tons; in Wolfhill, 60,000,000, tons; in Coalisland, 10,000,000 tons; in Arigna, 20,000,000 tons; and in Slieveardagh, 10,000,000 tons. Though the figures seem modest they mean that the coal practically in sight would suffice Ireland at her present rate of consumption for 35 years, even if no coal were imported, and no other power resources developed.

Ireland imports from Great Britan some four and a-half million tons of coal a year, the purposes for which it is used being approximately: Domestic consumption, 2,155,000 tons; industrial works, 1,400,000 tons; and electrical works, 125,000 tons. There is also in addition a considerable quantity of peat used, almost exclusively for household purposes. The coal consumption of Great Britain is about 185,000,000 tons per year, or 4.4 tons per head of the population; or 2,068 tons per square mile of area. Ireland consumes one ton per head of the population, and 142 tons per square mile of area.

New Rates on Coal to South American Ports

Further changes in the shipping rates on coal and coke from Atlantic and Gulf ports to South Emergency Fleet Corporation were issued last week by the U. S. Shipping Board. Effective Jan. 9, to destinations on the east Coast of South America, rates are $16 to $19.50 per ton of 2,240 lb., while the rates to West Coast ports vary from $12 to $32.50 per ton. The new rates on coke to West Coast ports are $18 per ton.

The new coal tariff, No. 23-A, replaces coal tariff No. 23, which has been cancelled.

RATES OF FREIGHT ON COAL AND COKE FROM UNITED STATES ATLANTIC AND GULF PORTS TO SOUTH AMERICA

COAL

East Coast —	Per ton of 2240 lbs	Guaranteed daily discharge (In tons)
Bahia, Brazil	$16.00	500
Bahia Blanca, Argentina	17 50	1000
Buenos Aires, Argentina	16 00	1000
Buenos Aires, Argentina	17.00	750
La Plata, Argentina	16 00	1000
La Plata, Argentina	17.00	750
Montevideo, Uruguay	16.00	1000
Montevideo, Uruguay	17.00	750
Pernambuco, Brazil	16.00	500
Rio de Janeiro, Brazil	17.00	1000
Rio Grande do Sul, Brazil	19.50	500
Rosario, Argentine	19.00	750
Santos, Brazil	17.00	1000
Santos, Brazil	18.50	600
West Coast —		
Guayaquil, Ecuador, to Talcahuana, Chile, inclusive	$12.00	750
Punta Arenas, Chile	32.50	500

COKE

West Coast —		
Guayaquil, Ecuador, to Talcahauna, Chile, inclusive	$18.00	525

Conditions—Coal: Loading 1,500 tons daily; discharge as above indicated, with time counting 24 hours after arrival of vessel, whether in berth or not, Sundays and holidays only excepted. If loading and discharge is not completed within the time specified, demurrage to be paid at the rate of $1 per net registered ton per running day, payable day by day. Coke: Loading 800 tons daily; discharge as above indicated, with time counted and demurrage payable under same conditions as apply on coal.

South African Coal for France

Extreme scarcity of fuel in all parts of France is causing much disorganization of business, many factories and works of all kinds being brought to a standstill for lack of steam power. The latest expedient, however, is the purchase of 5,000 tons of South African coal for delivery at Marseilles from the port of Durban, Natal, on which the freight alone is £7 10s. per ton.

The Natal collieries have for some time been supplying the coaling depots in Eastern waters, Perim, Colombo, &c., but this is the first recorded instance of a cargo shipment to Europe.

Japanese Coal Trade Increases

Production of coal during the six years 1915-18 in Japan aggregated 141,392,580 metric tons. The output in the first year totalled 21,315,962 tons, but while there was an increase to 22,293,419 tons in 1914, the following year witnessed a fall to 20,490,747 tons, the smallest out-turn of the series.

In 1916, however, there was a recovery to 22,901,580 tons, which was followed by an expansion to 26,361,420 tons in the ensuing year, and a further increase to 28,029,452 tons in 1918. The exports during the period under review amounted to 18,427,108 metric tons. The first year, 1913, showed the largest figures, at 3,870,600 tons, and, with the exception of a slight recovery to 3,016,947 tons in 1916, there was a continuous decrease until, in 1918, the shipments were approximately only 2,215,201 tons.

The coal arriving in Japan during the same period totalled 4,192,487 metric tons. The yearly figures show great irregularity. The 1913 imports were 576,772 tons; those of 1914 jumped to 614,677 tons, and in 1916 a further shrinkage to 556,110 tons. There was a substantial upward movement to 713,080 tons in 1917, and the country's receipts of coal from abroad were again enlarged in 1918, when 774,189 metric tons were imported.

1,187 Ships Built in First Half of 1919

During the first six months of the current fiscal year, beginning July 1, 1919, the output of American shipyards was 1,176 vessels of 2,213,448 gross tons, not including 11 vessels of 17,000 tons built for foreign owners. The output consists chiefly of vessels built with funds from the United States Treasury for the Shipping Board and is the United States' largest output for a six-month period.

Oil Fuel Projects in South Wales

There are signs that Lord Fisher's prophetic vision of the general adoption of oil as fuel for steamers may find speedier ful-

Anthracite Shipments for December, 1919

The shipments of anthracite for December, 1919, as reported to the Anthracite Bureau of Information at Philadelphia, made the largest record for that month since 1915. The tonnage sent out in December, 1919, amounted to 6,138,460 gross tons, against 5,971,671 tons in November, an increase of 166,789 tons, and, as compared with December, 1918, when the shipments were 5,736,260 tons, a gain of a little more than 400,000 tons. As compared with 1916, the latest normal years, the shipments in December showed an increase of something over 550,000 tons. Shipments by initial carriers for December, 1919, compared with December, 1916, were:

Railroads	December 1919	December 1916	Coal Year 1919-1920	Coal Year 1916-1917
Philadelphia & Reading Railway	1,442,571	1,040,645	10,741,052	9,424,306
Lehigh Valley Railroad	1,057,627	964,007	9,689,287	9,038,756
Central Railroad of New Jersey	506,840	527,080	4,798,731	4,781,181
Delaware, Lackawanna & Western Railroad	907,119	953,565	8,109,167	7,875,133
Delaware & Hudson Company	674,172	591,874	6,068,559	5,368,560
Pennsylvania Railroad	414,155	449,052	3,747,576	4,114,390
Erie Railroad	679,827	634,190	5,801,163	5,609,681
New York, Ontario & Western Railway	171,465	147,007	1,535,828	1,431,156
Louisville & Nashville Railroad	284,684	275,329	2,619,218	2,025,214
	6,138,460	5,582,787	53,110,381	49,668,357

fillment than has been generally expected. In view of these possibilities, considerable importance attaches to some recent commercial developments.

An agreement was recently entered into between the Scottish-American Oil Co., and Messrs. L. Gueret, Ltd., one of the most important coal-exporting firms in Great Britain, with coaling depots at ports in France, Algeria and South America. It is felt that the price of coal will remain high for a long time and that bunker supplies will not be so steady as in the past. Under these circumstances Messrs. Gueret feel it imperative that their various coaling depots should be able to offer oil as well as coal to ships.

Messrs. Williams, Corey and Son, coal distributors, have entered into arrangements with leading shipping and oil firms with the object of using their widespread organization for oil distribution. It is suggested that there may be some dramatic surprises in the next few months, for events are moving rapidly. The steady boom of the shares in William Cory and Son is one indication.

William Cory & Son, Ltd., represent an agglomeration of interests connected with the distribution and selling of coal. The company was registered in its present form in 1896 to take over the English business of coal factors, merchants, lightermen, etc. of a number of firms.

The result of various transactions is that the company, besides holding a commanding position in the home trade, has very large bunkering steamships at foreign ports. So important is its position in this respect that it is generally understood that it is now largely bound up with the P. & O. Co., which holds a considerable proportion of its capital. Dividends have ranged from 8 to 10 per cent, of which one-half was paid tax free.

Britain's Coal Output in 1918

The total value of the minerals raised in Great Britain during 1918—the figures for which are only now available—amounted to £257,079,792, an increase of £33,145,803, as compared with 1917.

The total output of coal was 227,748,654 tons, and the value £238,240,760, showing a decrease in output of 20,750,586 tons and an increase in the value of £30,433,866 on the figures of the previous year. The average price of coal for 1918 was 20s 11.06d. per ton, and for 1917 16s. 8.08d. per ton.

The quantity of coal exported, exclusive of coke and manufactured fuel, and of coal shipped for the use of steamers engaged in foreign trade, was 31,752,904 tons. Of these, France received over 16½ million tons, Italy over four million tons, Egypt nearly 1¾ million tons, Gibralter over 1½ million tons, Norway over 1¼ million tons, Malta nearly 1¼ million tons, and Sweden and Norway each over 1 million tons.

The amount of coal remaining for home consumption was 184,358,158 tons, or 4,385 tons per head of the population; 39,954,974 tons of coal were used in the manufacture of coke and briquettes, as compared with 40,981,757 tons in 1917; and 2,806,840 tons of coal and 11,286,680 tons of coke, which together are equivalent to 21,417,973 tons of coal, were used in the blast furnaces for the manufacture of pig-iron as against 2,816,318 tons of coal and 10,961,734 tons of coke, or a total equivalent of 21,085,875 tons of coal in the previous year.

During the past forty-six years (1873-1918) 9,192,072,000 tons of coal have been raised, and of this amount 2,219,868,000 tons, or more than 24.1 per cent of the total production, have been shipped abroad as exports in the form of coal, coke, and manufactured fuel, and as coal used for steamers engaged in foreign trade.

The percentage of the output of coal shipped abroad in each quinquennial period from 1873 to 1917 and the percentage for the year 1918 was as follows:

	Per Cent
1873-1877	13.8
1878-1882	16.1
1883-1887	19.0
1888-1892	21.2
1893-1897	23.0
1898-1902	25.7
1903-1907	29.5
1908-1912	32.4
1913-1917	26.16
1918	19.1

Of the metallic minerals raised in the United Kingdom iron ores is by far the most important. During the year the output of ores of this metal was 14,613,032 tons, valued at £7,106,656. The ore yielded 4,581,772 tons of iron, or more than half of the total quantity of pig-iron made in Great Britain.

Nitti Shudders at Italy's Plight

Premier Nitti, in a speech to the Senate shortly before his departure for Paris, said he was quite certain Europe could not expect any more financial assistance from America. Consequently, he added, Italy must be prepared to stand almost alone.

"We are in a situation which makes one shudder," he said. "Coal, which before the war cost 30 lire a ton is now more than 600 lire. A pound of coal is now worth more than the pre-war price of a pound of rice. Italy must depend almost exclusively on her own resources since in September last not only the foreign Governments but foreign banks refused her credit."

Coal and Coke Exports from the Port of New York in 1919 Compared With 1918

In 1918 the total amount of anthracite that was shipped from the port of New York was 82,477 tons which valued $584,087, as compared with 70,984 tons shipped in the next year (1919), amounting to $624,809.

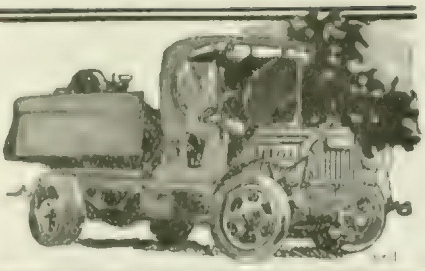
In 1919, $200,706 worth of bituminous coal was shipped which was the value of 29,286 tons. Italy, Danish West Indies and the Netherlands received the largest amount of this coal as compared with shipments to other countries.

The following table shows the tonnage, value and countries to which anthracite, bituminous coal and coke were shipped from the port of New York during 1919, and for purposes of comparison the same figures for the year 1918.

Coal and Coke Export Shipments from the Port of New York

	Anthracite				Bituminous				Coke			
	1918		1919		1918		1919		1918		1919	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value
Argentina	50	$500	25	$275	3,750	$27,471	2,892	$20,660	1,219	$28,422	76	$1,285
[illegible]			185	2,248			212	1,585			497	4,765
Barbados	137	1,965	304	4,764	225	1,734						
[illegible]							200	1,300				
Bermuda	229	2,102	131	1,360			50	550	100	2,800	4	102
Brazil	482	3,736	1,691	13,757	29,065	207,022	1,620	12,492	54	1,630	513	7,749
British Guiana			30	474								
British So. Africa									15	420	23	480
British West Indies									2	56		
Canada	68,763	482,834	46,570	402,787	192	1,770	524	4,223				
[illegible]			50	850					132	2,045	348	6,910
[illegible]	36	503	207	1,280	14	145	170	1,545	66	1,570	35	898
Costa Rica	1	23			20	290			45	1,400	35	1,107
Cuba	4,469	37,959	91	1,295	1,776	16,808	390	2,353	151	4,387	362	8,842
Danish West Indies							4,268	28,108	7	231	2	35
[illegible]							435	2,392				
Dutch East Indies											100	2,632
Dutch West Indies					2,408	17,875	851	6,383				
Ecuador									99	1,925	60	1,473
[illegible]							1,500	10,500				
[illegible]	220	1,508										
[illegible]					3,565	20,854						
France	4	40	2,527	29,297			681	4,053	7,140	79,940	4,791	71,452
[illegible]					10	80						
French West Indies									191	4,955	54	1,720
[illegible]			20	217			3	15				
[illegible]							300	1,400				
Guatemala									5	182	27	701
[illegible]			2	34	20	123					2	25
Italy	260	[illegible]	421	3,237			4,430	32,376	427	8,200	6,024	40,459
Jamaica			5	42			11	91	2	38	55	1,210
Mexico	10	210	1	25	60	600	376	4,345	157	4,565	94	2,236
[illegible]			183	1,645								
Netherlands			1	12			4,468	24,519				
[illegible]	5,487	[illegible]	9,279	81,556	152	875	2,600	19,175				
[illegible]					107	1,220			10	275	3	60
[illegible]			2	50			1,176	6,900	....		327	6,216
[illegible]			81	947	1	14			2	50		
[illegible]	16	90			247	1,456	100	355	742	22,043	15	366
Paraguay											3	115
Peru			400	4,500			130	2,455	144	4,048	287	7,860
[illegible]			204	1,671								
[illegible]							316	2,370				
[illegible]									5	135		
[illegible]									75	2,149	17	429
[illegible]	[illegible]	[illegible]	7,488	64,000	3,988	28,296	702	4,223	37	769	62	1,300
[illegible]			680	4,150			600	3,600				
[illegible]			[illegible]	1,200								
[illegible]			2	30	57	586	75	853			12	155
[illegible]			91	1,285								
[illegible]			[illegible]	706			200	1,700				
Uruguay					2,550	18,800			75	756	18	140
[illegible]			2	25	510	3,350	6	125	25	682	564	15,304
[illegible]	82,477	$584,087	70,984	$624,809	48,727	$349,369	29,286	$200,706	10,937	$173,674	14,410	$186,026

COAL AND COKE NEWS



Charleston. W. Va.

Number of mining communities in grip of influenza. Would have cut production if there had been cars to load. Many mines idle more than two-thirds of week. Export permits not to be granted for present. Whole situation so unsettled, little done on next year's contracts. Influenza most serious on Cabin Creek and Coal River in Kanawha field. Worst car shortage in New River region for last two years.

While serious inroads would have been made on the production of coal in this section of West Virginia, during the first seven days of February, owing to the fact that a number of mining communities were in the grip of the influenza epidemic, yet the appearance of that disease had less effect on production than would otherwise have been the case, owing to the fact that there were no cars to speak of into which to load coal. The car shortage, in fact, in the areas covered by the Chesapeake & Ohio, was more discouraging than was even the case during the last week of January. Between 1,200 and 1,300 cars was about all the road was able to place on an average throughout the week, with the possible exception of Monday, when cars were equal to about 85 per cent of requirements. The general average supply for the other five days of the week was about 33 per cent.

In many instances mines were idle more than two-thirds of the week, and in some cases no cars were secured by mines until the very end of the week. Not only was the supply of cars on the Chesapeake & Ohio almost down to zero point but the supply on the Kanawha & Michigan was equally meagre, as was also the case on the Kanawha & West Virginia. Of course production suffered to some extent in the New River field owing to the strike there, but, even when that was settled, there was no increase in production because there were no cars to load.

Promises made by executives of the Railroad Administration at Washington, for improvement in transportation facilities, had given rise to the hope that there might be more cars available, but the benefits promised failed to materialize, nor did there appear to be any prospects of improvement. Operators in this area found it difficult to understand why there should be such an acute car shortage, in view of the fact that there was no congestion on the Chesapeake & Ohio, yet not only was the supply limited, but at the same time some operators at least were notified that no more permits (for the time being) would be granted as to exports. Otherwise no embargoes were in effect as to the shipment of coal from this section.

Producers were running far behind as to contract deliveries, although customers were demanding that they be given at least a portion of their fuel supply, a demand with which it was impossible to comply. Not only has the transportation breakdown affected operators adversely from a financial standpoint, but it has caused much friction between them and their customers, and it is said the present situation will have an important bearing on the making of contracts for next year. The situation generally is so unsettled that little has been done toward arranging for next year's contracts.

Mines in the Kanawha field at the outset of February labored under the double handicap of a car shortage and sickness. The car shortage was, however, more general than the influenza which incapacitated many miners for work. It had not appeared in as severe a form as during 1918 and it had just begun to make its presence felt during the first week of February, the greatest number of cases being reported on Cabin Creek and on Coal River. There were at least 100 cases of influenza, however, among the miners at Sharon, on Cabin Creek.

Of course with cars scarce, a reduction in working forces made less difference than would otherwise have been the case, and cars were indeed extremely scarce in the Kanawha field during the period already mentioned—more so than during the previous week. In fact the general average covering the week was in the neighborhood of 33 per cent, the inevitable result being suspension for several days at a time at the majority of plants in the region. Production on the third was about 24,000 tons but by the middle of the week loadings were down to 10,000 tons a day, although there was a slight recovery on the sixth. For some reason not explained, permission to export coal from the Kanawha field was withheld. No embargoes were in effect, however, at least during the greater part of the week. Operators stated that they believed there were less loads on the line of the Chesapeake & Ohio than at any time in six months.

While a strike in force in the New River field might have accounted for the greatly restricted production in that field during the first half of the week ended Feb. 7, yet it had nothing to do with the greatly curtailed production during the latter half of the week for the strike had been called off. Nevertheless, even under the changed status of affairs and with miners ready to report for work, there was no increase in production, unless possibly it was on the seventh, owing to the most pronounced scarcity of cars yet felt in the New River region during the last two years. The strike referred to was adjusted through a return to the "check-off" and "closed-shop" system in the New River field, miners agreeing to go back to work, but as stated it had no effect on production. With the car supply averaging a little more than one-third of normal, there was much idleness among the mines in the New River section. New River shipments, for instance, on the fourth reached a total of only 12,850 tons and on the fifth shipments amounted to only 9,000 tons. With total shipments so small, naturally little coal was going to tidewater for export, nor to domestic markets either for that matter. The existing unstabilized conditions of course have left the contract situation for the coming year very much up in the air, mines being far behind with deliveries for the current coal year.

Fairmont, W. Va.

First week of February sees worst car shortage in northern West Virginia since winter of 1917-1918. Some 161 mines idle in Fairmont region alone. Influenza interfered with train operation. Railroad fuel contracts must be completely filled before all other contracts are honored. Operators fear wholesale confiscation by Baltimore & Ohio.

Pessimism among the operators of the northern West Virginia mining regions was much in evidence when the worst car shortage observed since the winter of 1917-1918 developed in that part of the state during the first week in February. It had been believed that the supply could be no worse than that furnished during the final week of January, but there was a more alarming shortage at the opening of February than has been witnessed at any time during the last year.

There was a fairly adequate supply on Monday, Feb. 2, but by Wednesday the supply had slumped to 25 per cent, and there were, for instance, in the Fairmont region on that date only 341 cars available. From that time until the end of the week the supply was such as to daily increase the number of idle mines. Wednesday, the fourth, saw 140 mines shut down. The following day only 373 cars were available and 132 mines had to suspend operations. There were only 453 cars available on the sixth, with 131 mines not able to operate. With only 425 cars available, there were 161 mines in the Fairmont region alone unable to operate. The same conditions prevailed elsewhere in northern West Virginia and producers were becoming desperate, while at the same time miners were unable to earn enough to meet their living expenses.

While the influenza had not affected mining operations to any appreciable extent, limited as they were, yet it had interfered with train operation; railroads in the northern part of the State were reporting a shortage of crews, so that there is a possibility that if loadings had been anything like adequate, it would not have been possible to handle them with any degree of promptness.

Railroad fuel contracts must be filled before any other class of contracts, according to word received in the northern West Virginia fields, instructions to that effect having been received from Director General Hines. In other words, companies having railroad fuel contracts will be required to fill their entire railroad contract requirements before attempting to fill any commercial contracts; in order to enforce such instructions, railroads (it has been understood) have been directed not to accept billing, notwithstanding the marked shortage of cars. Operators charge that the railroads are resorting to this method of extorting their pound of flesh in preference to confiscation, which would require that coal be paid for at the price paid by other consignees. Protest has been lodged by the Northern West Virgina Operators' Association against the proposed plan of the Director General.

It is reported, however, that the Baltimore & Ohio has resorted to confiscation of coal for railroad use in some instances, and operators generally are apprehensive lest there be wholesale confiscation. There is a tendency, northern West Virginia operators believe, for the railroads to confiscate coal indiscriminately; this has not only resulted in much confusion but has worked a hardship in view of the inability of commercial consumers to secure even a small supply of coal. Shipments from all northern West Virginia points were extremely light during the first seven days of February, although customers were clamoring for supplies and there continued to be, as was natural, quite an acute demand.

Piedmont, W. Va.

Acute car shortage in Piedmont and western Maryland fields. U. S. Senators and Congressmen appealed to for relief. Miners leave coal fields in search of work.

Failure of the Baltimore & Ohio to move coal cars on its lines has resulted, it is charged by operators in this section and in western Maryland, in quite an acute car shortage; a shortage so serious in fact that producers have found it necessary to appeal to U. S. Senators and members of Congress for relief. Until the loaded cars, which now almost choke sidings, are moved, operators contend, it will not be possible to secure an adequate supply owing to the lack of empties available. With cars so scarce, lines have been working on a half-time basis, this having resulted in a wholesale migration of miners from the coal fields of this section to Akron, Ohio, and Detroit, in search of employment.

Norton, Va.

Railroads confiscating 60 to 70 per cent of coal produced in Virginia. Protests filed. Coal production dropping from week to week. Labor affected.

Wholesale confiscation of coal is being resorted to at mines in Virginia, the coal so taken being utilized as railroad fuel. The railroads, in other words, are confiscating from 60 to 70 per cent of the coal produced in this section for fuel, and this autocratic exercise of power, which the operators claim is not vested in the railroads, has created widespread indignation throughout the Virginia mining fields; the result has been the filing of rather sharp protests with the Railroad Administration, none of which appear to have done much good. The railroads have resorted to the practice of going direct to the mines and of helping themselves to fuel, without regard to the rights of commercial customers; refusing to accept commercial billing.

There was a decline in production in the Virginia fields during the week ended the seventh, owing to a growth in the car shortage, the production dropping from 176,000 to 160,000 tons, a loss of 45,000 tons being attributed to a scarcity of cars. The precentage of loss from lack of cars is being increased from week to week.

The labor situation has been and is still being affected because of the fact that the operation of mines is becoming more irregular, this making for a feeling of unrest.

Ashland, Ky.

Production gains slightly in northeast Kentucky, but output only 40 per cent of capacity. Car shortage still serious. Operators desperate. Railroad Administration introduces "overage" adjustment in car distribution. Influenza cripples operations at one or two points. Kentucky legislation noted.

Slight gains were recorded in the northeast Kentucky district during the first week of February, but the car shortage was just as large, in proportion to total production, as it had been in previous weeks. The output reached 106,700 tons, that representing 46 per cent of a total potential capacity of 232,000 tons. During the week ended January 31, production amounted to 91,000 tons or only 40 per cent of capacity, so that there was a gain of 15,000 tons or about 6 per cent. The total loss was cut down about 12,000 tons, or from 137,000 to 125,300 tons. Yet of that loss the car shortage was responsible for 122,000 tons or 52 per cent all told.

During the first week of February, 1919, the total production was 112,070 tons, but at that time "no market" losses were the principal handicaps against a full production, so that last year's loading cannot be taken as a criterion of conditions. As perhaps illustrating somewhat more clearly just what conditions existed during the week ended the seventh, out of a total of 918 mine-days, there were 500 mine-days when mines were without cars.

Transportation facilities afforded mines in the northeast Kentucky field continue to be so poor that operators in that field are becoming desperate. They cannot conceive why it is that after three weeks of normal weather, there still should be such a pronounced shortage, as no reasonable excuse exists for such a shortage any longer. Repeated attempts to secure relief from the Railroad Administration have failed, and the stage has been reached where they cannot even secure acknowledgments of communications addressed to this Federal department.

Complaint is general in the northeast Kentucky field that operators are being penalized and discriminated against through adjustments of what the Railroad Administration is pleased to call "overage." In other words, at a time when every car is precious, the railroads are deducting from the supply, for excess cars furnished the mines during the "no market" slump, during the shopmen's strike and at other periods when cars were not so badly needed; yet for these conditions the mine owners were not responsible. For instance, 900 cars were deducted from the January supply, to cover "overage" for November and December, or the period of the strike.

Influenza has reached the northeast Kentucky field and has seriously crippled operations at one or two points, being complicated by other diseases. The epidemic appeared in its worst form at Seco, Ky., where the Southeast Coal Co. has a splendid plant. While here three nurses had been secured, it had not been found possible to secure the number of physicians desired.

Bills had been introduced early in the second week of February in both branches of the Kentucky Legislature, proposing a production tax of 2c. a ton on all coal produced. Measures are also now pending [illegible] per cent in the Workmen's Compensation rates. Still another bill has been introduced making the construction of wash-houses compulsory.

Dallas, Tex.

Increased output of northern central Texas mines since strike settlement. Railroads taking greater part of output. Fuel shortage at communities near mines. Great development of Texas lignite in next few years forecast. Predicted discontinuance of oil as fuel. Cheaper lignite to be substituted.

Bituminous coal mines in the Strawn and Thurber districts of Texas have increased their output since the settlement of the coal strike to such an extent that a total of 1,400 tons is being mined daily, according to reports from mines in these sections. At Thurber, coal is worked in only two shafts, and the daily output there is 900 tons, while Strawn is turning out 500 tons a day.

Most of the coal mined in these two districts is being contracted to Texas railroads, the Texas & Pacific and the Missouri, Kansas & Texas taking a large portion of the output. The Wichita Valley lines, the Abilene & Southern and the Roscoe, Snyder & Pacific are getting their coal supply from the Strawn district. Some of the coal is being sold for domestic consumption, but the output is far below the demand and many communities adjacent to the mines are experiencing fuel shortage.

Mines at Newcastle are also working at full capacity, but the supply from these mines is also being taken by railroads, the Rock Island using a large part of it. Little of the Newcastle output is reaching domestic users.

Great development of the vast lignite beds of Texas within the next few years is forecast by James Z. George, vice president and general manager of the Texas Chamber of Commerce. Mr. George, speaking before a gathering of business men from all parts of the state in Dallas, a few days ago, pointed out the great possibilities along this line and predicted early development of lignite mines in Texas.

"Twenty-three billion tons of lignite lie in a belt running from Texarkana southwest to the Rio Grande, and passing within a few miles of Dallas," said Mr. George. He added that any industrial community must have cheap fuel close at hand, and predicted that at no far distant date the use of petroleum as fuel would be discontinued. A cheaper fuel will be found, and that fuel will be the lignite taken from the vast beds in Texas. Mr. George said the time was near at hand when practically all industries in Texas would be operated with lignite.

PENNSYLVANIA

Anthracite

Pottsville—That the stubborn fire in the inside workings of the Wadesville colliery, of the Philadelphia & Reading Coal Co. has been conquered was evidenced on Feb. 1, when officials, protected with smoke helmets, entered the mine and found the last vestige of the flames extinguished. By tightly sealing the area that was burning, the fire was effectually smothered.

Bituminous

Uniontown—It is being freely reported around the Connellsville coke region that considerable stock of the Tower Hill Connellsville Coke Co., has lately been changing hands and it is thought that one of the large steel companies is responsible therefor. This is in line with the action recently taken by some of the steel companies to gain a foot-hold in the region The Tower Hill company operates two large coal and coke plants in Fayette County between Uniontown and Brownsville. The main office of the company is in Uniontown.

Indiana—The Clearfield Bituminous Coal Corporation has under course of development and construction new mines at a town to be known as Commodore, in Indiana County. The new town will adjoin Lovejoy and is situated on the Dixonville & Cherry Tree R.R., which is an outlet for both the New York Central and Pennsylvania railroads from the western end of Indiana County. There will be two openings to develop the 5,000 acres of coal available and it is said that it will be one of the largest plants in central Pennsylvania. Power will be furnished from the company's central power plant at Sample Run.

Johnstown—At the annual meeting of the stockholders of the Imperial Coal Corporation, held in the Johnstown Trust Building, officers were named as follows: President, Charles A. Owen; vice president, James P. Thomas; secretary, Frank D. Baker; treasurer, Philip E. Thomas; general superintendent, James M. Cook; assistant superintendent, E. H. Zimmerman and assistant secretary Harry A. Ling. The directors re-elected are: Charles A. Owen, of Atlantic City; James P. Thomas, Philip E. Thomas and Harry A. Ling, all of Philadelphia; Frank D. Baker and James M. Cook, Johnstown and E. H. Zimmerman, New York. The company was formed in July, 1919, by the merger of the Shade Creek, Diamond Smokeless, Cambria Smokeless and Imperial coal companies.

Brownsville—The Redstone Coal & Coke Co. has been organized as a subsidiary of the Wierton Steel Co. to operate the Thompson-Connellsville No. 1 coke plant at Republic, Fayette County, Pa., recently taken over by the former company. The Thompson-Connellsville plant is on Redstone Creek.

The Superior Coal Co., on the Monongahela R.R., in Fayette County, Pa., between Uniontown and Brownsville has been taken over by the American Coke Corporation; the latter company is controlled by the Reilly-Peabody interests of Pittsburgh, Pa., recently formed to take over the Orient Coke Co. and supposed to be holding this company in the interest of one of the large steel companies. The Superior company owns one large mine, but though located in the Connellsville coke region has no coke ovens.

Connellsville—Thousands of employees of the H. C. Frick Coke Co. and their families are to be inoculated against influenza and pneumonia. Already five of the company's doctors are at work and are meeting with gratifying success. Influenza has not yet gained a foothold in the coke region. Officials of the company hope, through inoculation, to prevent the slowing down of production which they feel would follow an epidemic. No charge is made for the treatment.

That only 44 fatal accidents occurred in the last two years in the mines of the H. C. Frick Coke Co., which employs about 30,000 men, was the statement made by William H. Glasgow, assistant superintendent of the Frick company at a big banquet given here. It was stated that the number of tons of coal mined by the Frick company, per fatal accident, is larger than any in the state with two exceptions — both small concerns. Mr. Glasgow said the accidents were preventable, due to poor judgment, bad practices and disobedience to the company's rules and state laws. A renewed campaign for safety was urged.

WEST VIRGINIA

Logan—About 30 officials and employees of the Lundale Coal Co. organized the Lundale Mining Institute at a meeting held at Lundale on Jan. 30. Practical problems in connection with mining will be discussed at monthly meetings. The officers of the temporary organization selected were: J. M. Schweitzer (general superintendent of the Lundale company), president; W. R. Foglesong, Jr., secretary.

Bluefield—Fire recently totally destroyed the tipple and fan house of the No. 1 mine of the Thomas Coal Co., on Crane Creek, in Mercer County. It was not learned just how the fire started. There was no interruption to operations, the company having a connection between its No. 1 mine, where the fire occurred, and its No. 2 mine, coal being removed through the mouth of the No. 2 operation.

Huntington — The annual meeting of officers of the Logan Coal Operators' Association was held here on Feb. 2, the principal feature of the session being the election of officers. The officers elected are as follows: J. J. Ross, of the Logan Mining Co., president; A. R. Beisel, of the Island Creek Co., first vice president; W. R. Thurmond, Thurmond Coal Co., second vice president; C. W. Jones, treasurer; W. P. Ellis, secretary. One of the principal features of the annual meeting was an address by J. D. A Marrow, vice president of the National Coal Association, dealing with the general coal situation.

Charleston—The appointment of traffic managers for each of the several district coal associations in West Virginia has become necessary as a result of the continued serious car shortages. That such traffic managers would be appointed for the purpose of giving special attention to car shortages, ascertaining the causes thereof and taking the necessary remedial action, was the statement made on Jan. 30 by T. L. Lewis, secretary of the New River Operators' Association; the appointment of a traffic manager by the Kanawha Coal Operators' Association followed on the heels of Mr. Lewis' announcement. The association selected as its traffic manager, A. R Yarborough, of Charleston, demurrage claim agent of the Kanawha & Michigan Ry. Mr. Yarborough entered upon the discharge of his duties on Feb. 2.

Grafton—The Tygarts Valley Mining Association was formed here recently, its membership including superintendents, mine foremen, fire bosses and others engaged in mining. The object of the institute is the study of mine problems and securing of greater efficiency in mining. The meeting was called by W. H. Sandridge, inspector of the Second Inspection District of West Virginia; both Mr. Sandridge and W. Samples urged the organization of an institute for the study of mining problems and to insure a greater degre of co-operation between mine officials and the West Virginia Department of Mines, not only in averting accidents but in bringing about improvements in mining methods. W. Samples was elected chairman of the association, W. H. Sandridge, of Grafton, president and J. R. Lennon, of Independence, secretary. The association will hold its second meeting on March 6, at Grafton, arrangements for that meeting being in charge of W. H Sandridge, G. H. A. Kunst and J. R. Lennon.

KENTUCKY

Louisville—J. N McCormick, head of the Kentucky State Board of Health, reports a light but general epidemic of smallpox in the Harlan fields of southeastern Kentucky, and is threatening to place a quarantine on the county to prevent spread of the epidemic throughout the fields. Mr. McCormick stated that his only reason for not embargoing the county was the drastic need for coal throughout the country. He charged that the mine operators are not co-operating properly, and are not showing proper interest in the situation. The influenza epidemic is getting worse in the larger cities of the state, but is not causing much trouble in the mine districts.

ALABAMA

Birmingham—Work on the $3,000,000 plant of the Birmingham Coke & Byproducts Co. has been completed and the ovens were fired for the first time recently. Coke and chemical byproducts will not be producd for about a month, says the *Iron Trade Review*. The plant, which is located just outside of Birmingham, between Boyles and Tarrant City, is to be the center of a big industrial section, as a number of industries which will use the coke and byproducts of the ovens will locate on the land reserved especially for that purpose by the owners of the Birmingham Coke & Byproducts Co. The plant now has 50 Koppers ovens, and was built so that 150 more ovens, in units of 50, may be added.

R. A. Terrell, a local capitalist and banker, has been appointed umpire under the Garfield agreement to pass upon questions of dispute between miners and operators in this district. Miners and operators presented to Federal Judge W. I. Grubb six names each, from which to make a selection, Mr. Terrell being on the coal-men's list. Mr. Terrell's appointment has been approved by Attorney General Palmer, but he has not yet signified his acceptance of the position. Judge H. C. Selheimer, former umpire, resigned on account of ill health.

At the semi-annual examinations of applicants for certificates of competency as mine foremen and fire bosses, held by the State Mining Board recently, certificates were granted to 29 first class and 20 second-class foremen and to nine fire bosses.

OHIO

Toledo—Some improvement in the congestion on the railroads at this place is reported by traffic officials. The more favorable weather that has been prevailing has enabled traffic men to move some of the loaded cars which have been blockading the Toledo gateway. But there is still bad congestion and embargoes on many of the roads entering Michigan still prevail. Special permits are necessary to ship to many Michigan points.

INDIANA

Evansville—The St. Bernard Mining Co., with mines in Webster and Hopkins counties, Kentucky, a few miles south of this city, has announced that a deal with Drexel banking interests of Philadelphia has been called off. The officials of the mining company state that the mine is not for sale. It was reported at one time recently that the Drexel interests would finance a large coal-mining deal in this vicinity.

La Fayette—The Monon Route handled 220 carloads of coal in its Linton district on a recent day, the largest in any one day in the road's history. Activity in this coal district has increased steadily since the mine strike ended. The Little Giant and the Gould mines, two of the largest in the Linton field, have had an average daily output of 1,250 tons each since the big strike ended, and the Monon has been handling an average of 200 carloads daily in this time. The major part of this output is transported to points in Indiana, Illinois and Michigan. The Monon road requires for its own consumption, for stationary power and locomotive uses, from 25 to 30 carloads daily. The entire daily output of coal in the Linton field, including the two large mines mentioned and the 29 others, is averaging 11,000 tons, the largest in the history of the field.

Petersburg—An important deal in Indiana coal fields has been consummated at this place, the transaction involving the leasing of several thousand acres of coal land; the coming spring and summer should see increased activity in the coal fields of northern Pike County and southern Daviess and Knox counties. The oil development in this part of Indiana has brought to the attention of coal operators what is said to be one of the best fields in the Central West, with five workable seams. The seam here is said to average from 2 to 5 ft. in thickness. Thousands of acres of land underlaid by No. 6 coal is being bought for stripping purposes at from $70 to $150 an acre. Furthermore it is reported that 25,000 acres of land containing No. 5 coal has been bought in the last few months, the Pike County Coal Co. alone having purchased 10,000 acres. The American, Indiana Creek, Globe and other companies are leasing tracts of coal land. No. 5 coal is found at depths ranging from 80 to 150 ft., in seams from 5 to 11 ft. thick; and the coal is said to be free from gas. No. 4 coal is found in Pike County in seams ranging from 4 to 7 ft. in width, at depths ranging from 250 to 450 ft. No. 3 coal seams are found at a depth of 500 ft., and are from 10 to 14 ft. in thickness.

ILLINOIS

Belleville—Ninety miners have been enrolled in the free night school just organized at the Belleville Township High School. Thomas Wright former county mine inspector, and a deputy state mine inspector, is the instructor. The purpose is to make miners more practical in their work. Sparrows and mice are being trapped to be used in testing gases encountered in mines. The chemists of the high school will prepare samples of carbon monoxide and other gases similar to those originating in mines, for experiments

Duquoin—The Madison Coal Corporation, one of the big coal mining companies of Illinois, is planning to sink a new mine near Blairsville, seven miles southeast of here. Plans call for a steel tipple to be erected at the new mine, and all equipment will be modern. The mine will be served by several roads, including the Illinois Central and the Iron Mountain, both of which run close to the site. Construction work on the new mine, which has been planned, will begin just as soon as the weather opens up and it is expected that by fall the plant will be well under way. The company owns most of the coal, which will be mined, a small part being held under lease. The field where this mine is to be sunk is one of the best in southern Illinois, the large Kathleen mine of the Union Colliery Co., is only about four miles from the spot. Several weeks ago representatives of the Southern Gem Coal Co., of Chicago, optioned 6,000 acres of land joining the Madison tract, and it is said as many as three or four mines will be sunk in that district during the next three years.

Jesse Diamond, president, and Herman Rea, secretary of the Southern Gem Coal Co., were in this city recently taking options on 6,000 acres of coal land five miles southeast of town. It was stated that the options were being taken up with the view of sinking shafts on the property in the near future. The Southern Gem Coal Co., which was organized only last summer, now owns or has under option or lease many thousands of acres of coal land in Franklin, Perry, Jefferson and Williamson counties. The same company is also contemplating the purchase of the Victory mine at Tamaroa, ten miles north of here, owned by the Victory Collieries Co. This mine is now being operated successfully and the purchase of it by the Southern Gem will make that company the owner of five mines, all of which have been bought during the last six months, the other four being at Winkle, West Frankfort and two at Sesser, respectively. The land which the company optioned near this city is directly adjacent to the holdings of the Union Colliery Co., of St. Louis, on which was sunk the large Kathleen mine.

Extensive improvement have been completed at Mine 2 of the Franklin Coal & Coke Co., of Chicago, located at Royalton, south of here. Owing to power trouble the mine has, for the last few months, been using current furnished by the Central Illinois Public Service Co., but this power has proved unreliable, causing the company to install new generators. Two 100-kw. Ridgway engine-generator units have been installed and will be used in connection with two 200-kw. synchronous-motor generator sets which are located in the mine. The power will be used for mining machines and haulage motors. These installations are in a way only temporary; later on the company intends putting in two 400-kw. Ridgway engine sets which will furnish power for mines 1 and 2, and also for the city.

The Bell & Zoller Mining Co. is excavating a large reservoir at Mine 1 near Zeigler, the work of excavating being done by one of the largest machines in the country of the type which was used digging the Panama Canal. The reservoir is expected to hold over 1,000,000 gallons of water

Obituary

George W. Erwin, 40 years of age, a prominent coal operator connected with the Midland Mining Co., of Perry County, in the Hazard field, Ky., died in New Mexico recently, where he had been endeavoring to regain lost health. The body was brought to Hazard for interment.

Horace T. Knight, formerly superintendent of the Madison district mines of the Keystone Coal & Coke Co., at Greensburg, Pa., died recently from influenza. Mr. Knight was 45 years of age. He was a graduate of Mercersburg Acadamy and Lafayette College. He had been in Greensburg 18 years.

Samuel Matthew Robins, for many years a prominent figure in connection with the coal mining industry of British Columbia, died on Nov. 4, 1919, in Devonshire, England, where he took up his residence after the Vancouver Island Coal Co.'s holdings on Vancouver Island passed into the hands of the Western Fuel Co. This happened in the year 1901. It was in 1884 that Mr. Robins took charge of the old company's business in this province making his home at Nanaimo, B. C.

Alexander Ewart, pitt boss in the Middlesboro coal mines, at Middlesboro, B. C., was murdered on the evening of Jan. 19. He returned to the mine to assist in straightening out some trouble the rope-riders were having with the cables. He had just reached his objective when a masked man stepped out from the darkness and discharged two revolver shots at him from point-blank range killing him instantly. Mr. Ewart had been engaged in the coal-mining business in the province for some time.

Personals

Edward Bottomley, superintendent for the Kathleen mine at Dowell, five miles south of Duquoin, Ill., has resigned to accept a more responsible position with the Peabody Coal Co. since the sinking of the Kathleen shaft, over two years ago.

Charles McKay has resigned as superintendent of the Republic coal mine of the Republic Iron & Steel Co., at Republic, Fayette County, Pa., effective April 16, 1920. He was succeeded by William Fowler, mine-foreman of the same mine.

W. Bruce Wagner, former county commissioner of Indiana County, Pa., has been appointed lumber and timber inspector for the Rochester & Pittsburgh Coal & Iron Co. Mr. Wagner's headquarters will be at Indiana, Pa.

H. M. Rogers has been named as store manager of the Consolidation Coal Company stores at Monongah, W. Va., having succeeded C. E. Bartlett, resigned; the latter was store manager for the company for a period of 28 years or until forced by ill health to resign.

J. B. Johnston, formerly manager of the ordinance department. Crucible Steel Co of America, Harrison, N. J., has been appointed general manager of the Standard Scale & Supply Co. Pittsburgh, Pa. This company specializes in the building of railroad track scales, coal and heavy duty industrial scales.

W. G. Stanton has accepted a position with the Ohio Brass Co., of Mansfield, Ohio. For the last 20 years Mr. Stanton has been identified with the electric industry, having started with the General Electric Co. and remaining with this corporation for a period of 18 years in the testing, engineering and sales departments.

C. E. Jaycox, formerly connected with the Central Illinois Traffic Bureau, has been appointed to fill the position, made vacant by the resignation of Percy F. Kuhleman, as traffic manager for the Rutledge & Taylor Coal Co., Chicago. Mr. Kuhleman resigned recently to accept a position in the distributing department of the Sterling-Midland Coal Co., of Chicago.

Clarence Patterson has resigned as superintendent of the Revere, Pa., plant of the W. J. Rainey company. He has accepted a position with the Grasselli powder company. At a farewell dinner given by W. J. Rainey officials at their club rooms at Revere, Mr. Patterson was presented with a cash gift by the employees at the Revere plant.

Thomas D. Thomas, superintendent of the Lucerne mines of the Rochester & Pittsburg Coal & Iron Co., at Homer City, Pa., has been promoted to the position of private mine inspector for all the mines of this company and its allied interests. F. R. Vinton has been made chief private mine inspecter in charge of all the mines of these companies in Indiana and Jefferson counties.

Guy M. Freer, secretary of the Central Coal Association, has been appointed director of the National Industrial Traffic League, with offices in the Tacoma Building, Chicago. His duties will be to look after and protect the interests of shippers with the return of the railroads to private ownership. **R. R. Glover**, assistant secretary of the Central Coal Association, has been named successor to Mr. Freer.

James A. Burns, Jr., has resigned as assistant to George P. Bell, executive vice-president of the Northern West Virginia Coal Operators' Association. Mr. Burns' resignation was announced Feb. 6. He is succeeded by **C. M. Stubbins**, of Grafton, W. Va. Mr. Burns will take charge of a branch office of the Cortright Coal Co., of Pittsburgh, Pa., which is being opened in the Professional Building, at Charleston, W. Va. Mr. Stubbins was formerly superintendent of fuel loading in the Allegheny district of the U. S. Fuel Administration.

F. P. Truesdale, former division freight agent of the Pennsylvania R.R., with offices in Uniontown, Pa., has launched a coke brokerage business in Pittsburgh, Pa., under the name of the Snowdon Fuel Co. Associated with him in the new enterprise are G. H. Snowdon and C. L. Snowdon. Offices have been opened in the Oliver Building. Since leaving Uniontown more than a year ago, Mr. Truesdale has been engaged in the selling end of the coke industry for other firms and has now launched into business for himself.

Charles L. Snowdon, of Pittsburgh, is part owner and former president of the Snowdon Coke Co., operating near Brownsville, Pa., and his son George H. Snowdon, also of Pittsburgh, is part owner of the Franklin Coke Co., operating in Somerset County near Somerset, Pa.

Coming Meetings

Material Handling Machinery Manufacturers' Association will hold a convention Feb. 26 and 27, at the Waldorf Astoria Hotel, New York City. Secretary, Z. W. Carter, 35 West 39th St., New York City.

Canadian Mining Institute will hold its annual meeting at the King Edward Hotel, Toronto, Ontario, Canada, on March 8, 9 and 10, 1920. Secretary, H. Mortimer-Lamb, 503 Drummond Building, Montreal, Quebec, Canada.

New York State Retail Coal Merchants' Association will hold its annual meeting Feb. [illegible] at the Pennsylvania Hotel, New York City. Executive secretary, G. W. Woodside, Albany, N. Y.

American Chemical Society will hold its annual meeting at St. Louis, Mo., April [illegible] Secretary, Dr. Charles L. Parsons, 1709 G St. N. W., Washington, District of Columbia.

New England Dealers' Association will hold its annual meeting March 24 and 25, at Springfield, [illegible] President, W. A. Clark, 141 Milk St., Boston, Mass.

Pennsylvania Bituminous Mine Inspectors' Advisory Association. A meeting has been called by [illegible] K. Adams, president, of all the bituminous mine inspectors of the state, together with the other members of the mine foremen's examining boards, to be held at the Seventh Avenue Hotel, Pittsburgh, Pa., Friday, March 5.

National Retail Coal Merchants' Association. Executive meeting will be held in Philadelphia, Pa., March 5. Annual meeting is to be held in Detroit, June 10, 11 and 12. Secretary-manager, Ellery Gordon, Philadelphia, Pa.

Industrial News

Charleston, W. Va.—There is a movement on foot in this city among coal men of the New River, Kanawha, Winding Gulf and Elk fields, adjacent to Charleston, to erect a large office building here, such a movement having been planned at a recent meeting of the Charleston Coal Exchange.

Pittsburgh, Pa.—At a meeting of the board of directors of the Pittsburgh Coal Co., on Jan. 28, A. K. Oliver was elected a director to take the place of Henry R. Rea, who died recently, and James Carstairs, of Philadelphia, was elected a director to take the place of J. J. Fisher, who died some time ago.

Centrallia, Wash.—The Lincoln Coal Co., a new corporation, has taken over the mines of the Lincoln Coal Mining Co., at Galvin, west of this city. The mines at present have a daily capacity of 150 tons, but this will be increased to 500 tons immediately. The officers of the new company are T. E. Martin, president, and J. O. Humbert, secretary-treasurer.

Pittsburgh, Pa.—H. D. Mason, Jr., secretary of the Coal Mining Institute of America, announces that all material for the bound proceedings is now in the hands of the printer and that books will be mailed within the next month. A feature of this year's book will be the including in the proceedings of the banquet addresses.

Wheeling, W. Va.—Youngstown, Ohio, interests identified with a large new steel industry, it was announced here tonight, have acquired for $1,250,000 the mines and 2,000 acres of Pittsburgh seam coal in Belment County, Ohio, near here, from Burgess Lewis and the Industrial Coal Co. It is said that the property will be developed on a large scale.

Gordon, Pa.—The Hillone Coal Co., Scranton Life Building, of this place, in Schuylkill County, is having plans prepared for the construction of a new coal washery at its local operations. The structure is estimated to cost about $25,000. Frank B. Davenport, Coal Exchange Building, Wilkes-Barre, Pa., is engineer.

Wilton, N. D.—The tipple of the Washburn Lignite Coal Co., at No. 2 mine, of this place, was recently destroyed by fire. The Roberts & Schaefer Co., of Chicago, was awarded the contract for the re-construction work. A modern steel tipple, which will have incorporated in it a Marcus picking-table screen, will be erected.

Mallory, W. Va.—The Faulkner Coal Co., of this place, plans to start work at once on houses for its employees also to instal motors and to be in the market for rail. The plant operates a drift mine and the improvements are estimated to cost $150,000 when finished and the ultimate capacity of 500 tons a day is realized. S. E. Scholl is the superintendent in charge.

Toronto, Ont.—The Canadian National Railways will be arranging shortly for their supplies of locomotive and other fuel, for the coming year. Inquiries should be addressed to A. L. Graburn, General Fuel Agent, Toronto, Canada, quoting prices at the mines for ¾ lump and run-of-mine and giving present freight rates to Lake Erie points for water shipment and all rail rates to Toronto, Cobourg, Ottawa, Montreal and St. Hyacinthe.

Madisonville, Ky.—An option placed with the Drexel banking interests of Philadelphia, for the sale of the property of the St. Bernard Mining Co., with the largest operations in western Kentucky, expired on Jan. 30, and the St. Bernard people will continue operating the properties as heretofore. It is reported that an extension of the option was asked, but not given. The properties are said to be valued at $2,500,000.

Mullens, W. Va.—With a branch of the Virginian Ry being projected from Mullens into the Laurel Fork region of Wyoming County, coal resources of that part of the county are undergoing rapid development. Not less than 600 miners' dwellings are being constructed near McGraw's post office. Development of the section named will materially increase the annual tonnage of Wyoming County during the coming year.

Chicago, Ill.—The Edmund T. Perkins Engineering Co., announces the centralizing of all branches at the First National Bank Bldg., Chicago. Having a complete corps of engineers, this company is prepared to carry on a general engineering practice, including reports and valuations, irrigation, drainage, flood protection, river regulating, water-power and topographic mapping.

Wheeling, W. Va.—A deal has been closed by the Goodyear Tire & Rubber Co., of Akron, Ohio, it is understood, in the name of the International Coal & Coke Co. for 2,000 acres of coal land in eastern Ohio near Harrisville. The property is on a branch of the Wheeling & Lake Erie R.R., and the consideration is said to be between $2,000,000 and $3,000,000. Included in the purchase are going mines. Extensive improvements are contemplated with a view to materially increasing the capacity of the mines, and 1,500 houses are to be built for the use of miners.

Pana, Ill.—The Smith-Lohr Coal Mining Co., of this place, has contracted with Roberts & Schaefer Co., of Chicago, for a complete steel tipple and re-screening plant to be built at its mine at this place. The tipple will be complete with a Marcus picking-table screen, "Rands" shaker loading booms, and rock-disposal machinery. The plant will also have incorporated in it facilities for cleaning and crushing run-of-mine coal. The re-screening bins will be built of re-inforced concrete and steel, and will be equipped with special facilities for careful handling of coal into the bins, and the loading of coal into the railroad cars.

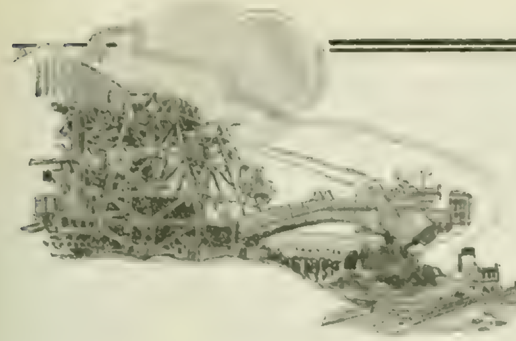
Charleston, W. Va.—Having taken over leases covering 10,000 acres of coal land in Greenbrier County, in the smokeless area, Charleston coal men and others have also secured control of the Greenbrier & Eastern Ry. and have reorganized that road, John B. Lang, of Lewisburg, having been elected president. The company is evolving plans now for the development of land under lease. Those associated with Mr. Lang in this venture are: W. E. Deacons, of Hinton; A. B. Crichton, of Charleston; J. W. Bell, of Bellwood; Henry Blackman, W. S. Wood and Quin Morton, of Charleston.

Pittsburgh, Pa.—Colonel G. A. Burrell, formerly Chief of the Chemical Warfare Service, U. S. Army, has organized the Burrell Technical Supply Co., with offices in the Chamber of Commerce Building, Pittsburgh, Pa. Colonel Burrell is president of the company, the other officers being, J. T. Ryan, vice president; G. H. Deike, treasurer; G. C. Nelms, secretary. The personnel also includes G. H. Burrell, E. H. Kellogg and R. P. Mase, formerly Chemical Warfare Service men. The company will conduct a general laboratory and technical supply business and will issue catalogues in the near future. Work on the new buildings in Pittsburgh, which will give this company greatly added facilities, is being rushed to completion.

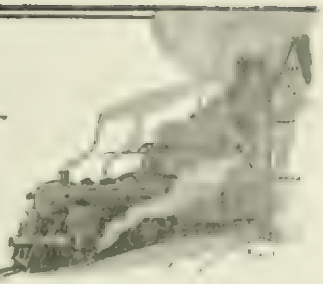
Chicago, Ill.—The Chicago Pneumatic Tool Co. on Jan. 21 and 22 held a general conference of executives, plant and branch managers and salesmen at its Detroit plant, on the occasion of the formal opening of a large five-story addition. At this conference the expansion program of the company for 1920 was outlined, calling for largely increased production not only at Detroit but at the five other American plants of the company. It was reported that much of the proposed increase in production was already absorbed by orders for future deliveries. The plan of nation-wide chain of service stations which the company has opened and supplied with complete stocks of spare parts, machinery and tools and provided also with facilities for handling territorial repairs for users of the company's products, was also outlined in detail.

Nelsonville, Ohio—The Echo Coal Co., of Columbus, recently chartered with a preliminary capital of $10,000 has purchased the East Hill Coal Co., operating a modern mine on the Hocking Valley Ry. near this place. A modern tipple was erected last year. It is planned to increase the output from 300 tons to about 800 tons daily. The product will be handled by the Essex Coal Co., of Columbus. S. Cottingham is president and Fred Essex, secretary and treasurer of the comapny.

The operating mine of the Hazelton Coal Co., located near Nelsonville, has been purchased by the Essex Coal Co., of Columbus, which is operating it and selling through the Columbus office. The property is known as the old Gem mine. Harry Spencer was president and F. M. Spencer, secretary of the Hazelton Coal Co.



MARKET DEPARTMENT



Weekly Review

Operators Complain of Continued Car Shortage—Milder Weather Aids Distribution—Frozen Cars Prevent Dumpings—Demand for Both Bituminous and Anthracite Brisk.

MINE operators still continue to complain of their car shortage, especially in that district of Kentucky located along the Louisville and Nashville Ry. lines where the car supply has fallen as low as 10 per cent of capacity. Although the railroads have made an effort to improve conditions, they have not been able to remedy them materially.

Almost all the districts that were affected by the heavy fall of snow found other difficulties confronting them when the downfall ceased. The milder weather of the daylight hours thawed the snowy coating, making the coal wet and ready to freeze hard in the cold and windy nights. Once frozen through, it was almost impossible to dislodge it from the cars at dumping points.

When coal is frozen solid, as is the case with recent anthracite shipments in and around New York piers, unloading is delayed by the time required to put the coal through the thawing process, and this is especially annoying where inadequate thawing facilities are provided. Because of the ice in the river, boats in the harbor have also been held up. The only possible solution of the tied-up condition is a spell of milder weather.

At Hampton Roads, there has been observed a slight improvement. Although the embargo on exports still continues to be enforced, bunkering is allowed to continue, and boats, where coal has been contracted for early, are loading what is considered a fair volume. This class of trade does not fall, however, to wholesale dealers.

Demand for bituminous coal has shown some slight signs of weakening in view of the possibility that milder weather may soon set in, but most of the coal now to be obtained is consumed by the railroads. Though the Railroad Administration is being besieged by representatives of the districts which complain of small stocks of coal, the railroads still continue to confiscate and divert shipments.

Diseases which have interfered recently with the activities of the coal industry have now become less prevalent, but while the number of cases of influenza has not been greatly increased, more deaths have been reported. Smallpox, both in Canada and Harlan County, Kentucky, still continues to be a menace.

The prices of bituminous coal are still those ordered as a maximum by the Government, and as a result there is not much coal offered in the spot market. More attention is being paid to contract consumers, on which the wage advance of the miner is added to the price. No decision has been reached by the commission investigating wages and prices in Washington, D. C.

Demand for anthracite has been satisfactory, but the dealers complain of poor deliveries. Local conditions such as cold and the snow prevent timely deliveries to the domestic consumer.

Expectations as to production were not realized in the Connelsville coke region for, although 413 ovens were added to the active list the week previous, these are being hampered in production because the coke cannot be removed from the oven wharves by reason of poor car supply. Operations throughout the Connellsville district worked practically with the same degree of halting uncertainty as during the week previous, iron and steel plants securing an inadequate supply of coke.

WEEKLY PRODUCTION

The weekly report on the production of bituminous coal, anthracite, and beehive coke, compiled by the Geological Survey, Department of the Interior, Feb. 14, 1920, states that the cumulative effect upon transportation of continued snow, sleet, and storms, caused the production of soft coal to decline again during the week ended Feb. 7. The total output, including lignite and coal made into coke, is estimated at 10,004,000 net tons, a decrease of 597,000 tons, or 5.3 per cent, when compared with the preceding week.

For the first time this year the line of current production has fallen below the curve of 1918, although it remains above those of 1917 and 1919. The output for the corresponding week of 1917 was 9,769 tons; of 1918, 10,424,000 tons, and of 1919, 7,946,000 tons.

The decline in production was admittedly due to transportation disability, which in turn was caused by continued bad weather. After a month or more of favorable weather in December and early January, an extended period of snow and cold set in. The week of Jan. 24 was market by exceptionally heavy rain, snow, and sleet. It was followed by a cold wave affecting the Middle Atlantic States, and especially New England. During the week of Feb. 7, the falls of sleet returned, accompanied by high winds along the Atlantic Coast. Drifting snow blocked the roads and interfered greatly with rail transportation as well.

The production of beehive coke during the week ended Feb. 7 is estimated on the basis of rail shipments, at 433,000 net tons. This was a 9 per cent decrease when compared with the preceding week. The decrease was general throughout the principal producing districts.

That the demand for coke is still very active is evidenced by the willingness of blast-furnace operators to pay the dollar premium on 72-hour coke allowed in certain cases by the Government prices. Shortage of cars, particularly in the Connellsville region, is at present the limiting factor in the production of beehive coke. The total output since the beginning of the year now amounts to 2,410,000 tons, a decrease of 533,000 tons, or 18.1 per cent, when compared with 1919.

Atlantic Seaboard

BOSTON

New England embargoed. Wholesale confiscations continue. Extremely light movement all-rail. Coal Committee gets busy again. New York and Philadelphia piers short of supply. Hampton Roads situation shows slight improvement. Anthracite domestic sizes still in strong demand. Better request for steam sizes.

Bituminous—Following closely upon restrictions placed against the movement of steam coal to tidewater, the Regional Director at New York announced a general embargo against all coal to New England all-rail, anthracite and bituminous, railroad fuel alone excepted. The reason given is that this territory has in transit a very large volume, ample for immediate needs, and that other sections are in greater need. Meanwhile, Governor Coolidge of Massachusetts has been exchanging telegrams with Mr. Hines, who has promised that everything possible will be done "to meet the situation."

Could New England steam users be assured that coal en route would be protected against seizure there would be measurable relief, but so far as we are advised there have been no steps taken in this direction. It was rumored that the Washington authorities were anxious that the railroads should not be in the position of turning over to private owners any larger reserves of fuel than would safely be required for this time of year, but at the rate coal has been confiscated the past four weeks for railroad supply one might suppose the roads were trying to stock for the whole spring. March 1 cannot come too soon, in the judgment of the trade, if thereby we shall have some relief from the fast and loose methods that have lately been employed.

It should be remembered that confiscations lately have also been in favor of large utilities, particularly those in the vicinity of New York City. The consumers have been at a decided disadvantage because of slow movement to the piers and the great difficulty in handling frozen coal.

The Sub-Coal Committee, for this district, is again issuing broadsides of advice and promising all manner of assistance, but to the trade there is apparent an increasing lack of co-ordination between different branches of the Railroad Administration. While members of the committee besiege Washington for increased shipments, the Regional Director takes steps to shut off what we have. The press gives prominence to efforts of the committee which were said to result in 70,000 tons extra from Hampton Roads for distribution to New England industries but several of the agencies take serious exception to this. Coal at, or en route to the piers through usual channels and already destined for New England, with ships waiting, has now been seized for dumping into other ships for distribution in New England through other agents; wherein New England is the gainer is more than the trade can figure out. From the publicity given it might be supposed that 70,000 tons would run New England for at least four months.

Because of adverse weather and all the conditions incident to it there is great difficulty getting even a minimum of tonnage dumped over the Philadelphia and New York piers. At the latter the situation is very serious and, in spite of all efforts, only the most urgent requirements can be met. The piers are sadly lacking in thawing facilities and it is taking hours instead of minutes to dump cars. There is much confusion over permits for bunkering, and seizures of commercial coal are made regularly from day to day.

At Hampton Roads there is observed a slight improvement. Boats for New England are loading in four to six days and, so far as contracts are concerned, a fair volume is moving in this direction. Agencies who are confining themselves to bunker and export trade are giving no attention to this market, but yet they are more often the channels through which the authorities expect emergency coal will be satisfactorily distributed. On the Virginia roads there are the same difficulties with regard to car supply, but movement is much better than in Pennsylvania.

Anthracite—Retail dealers are still exerting pressure to get forward domestic sizes, especially stove and chestnut. Egg is not much in demand, although there are signs of better request for March delivery. Household trade is very active, but deliveries are difficult and for that reason stocks are not being moved as would otherwise be the case. It is apparent also that the larger dealers, especially, are making every effort to increase their receipts because of the probable advance in freights, both water and rail, when the railroads are turned back. There is reasonable certainty also that coal itself will cost more at the mines when the new adjustment is made in the spring. Discussion is once more general about a possible re-sizing. Some of the companies are considering this seriously and doubtless will fall into line, if it can be shown that the plan can be carried through uniformly with all the shippers. Retail dealers are generally in favor of the scheme and it only remains to be seen how the public will view the possible change.

Before the embargoes were put on the trade was developing a much better request for steam sizes. Some of the regular shippers of the junior sizes have fallen off in deliveries and this has caused somewhat more inquiry than usual. There is nothing like the broad demand, however, that was anticipated and, this is another point in favor of the argument that the great urgency for bituminous in New England is really confined very largely to the railroads themselves.

NEW YORK

Shortage of anthracite possible unless improvement comes in harbor situation. Unloading at piers extremely slow. Dealers' yards becoming bare of domestic sizes. Embargoes resorted to for congestion relief. Bituminous production very low as car shortage becomes critical. Some mines receiving only 10 per cent supply. Railroads running short of coal. Public utilities stocks also running low. Many plants closing for want of coal.

Anthracite—While there is plenty of anthracite coal at the lower ports dumping is being carried on so woefully slow that [illegible] cargoes many days, and any shipper with a loaded boat to offer, which is seldom, can quickly secure premiums on egg down to the buckwheats.

From the dealers' viewpoint, all has been going out and little coming in. True, the disastrous condition of New York's main thoroughfares prevents large deliveries of coal, but nevertheless dealers are receiving less coal than they are delivering to householders, causing their stocks to become depleted. Stove and chestnut are particularly short, and stocks of egg coal, which retailers have been taking in order to secure prompt shipments of stove and chestnut, are now finding a ready market.

Last week the congestion at the piers became so marked that the Central Railroad of New Jersey placed an embargo on all shipments east of Bound Brook. At the same time, the Pennsylvania R.R. issued an embargo restricting all shipments east of Trenton.

Current quotations for company coals, per gross ton, at the mines and f.o.b. tidewater, at the lower ports as follows:

	Mine	F.o.b. Tidewater
Broken	$5.95	$7.80
Egg	6.35	8.20
Stove	6.60	8.45
Chestnut	6.70	8.55
Pea	5.30	7.05
Buckwheat	3.40	5.15
Rice	2.75	4.50
Barley	2.25	4.00
Boiler	2.50	4.25

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—The greatest setback to increased production is the very poor car supply, which from week to week places the mines in a worse plight. Dispatches this week from the regions indicate that very little improvement is in sight. Many mines report that the total of their car supply for the week averaged around 10 and 15 per cent, while the majority has been approximately 25 per cent of normal, and the best to be reported has been around 50 per cent.

At the present rate of production, the railroads consuming their normal volume of coal could use the entire present production. Incidentally, the railroads are said to have but little coal on hand, and the large storage accumulations put by last fall are showing heavy signs of depletion.

At New York harbor the bituminous movement is very restricted. The handicapped condition of the piers is bringing a dangerously close fuel famine. Many of the smaller consumers who have been so unfortunate as to secure but negligible shipments during the past month, are on the point of closing down their plants. Some are resorting to the smaller sizes of anthracite coal, but to burn these satisfactorily over 50 per cent soft coal must be used, which many of the plants have not got. The bulk of the coal now being dumped at the piers is for the traction interests and public utilities who are having first call for coal in this territory.

No spot business is being carried on around New York. Bunkers are easily commanding their premium of $1.35. Government prices prevail on all coal not shipped on contract, which are as follows:

	Mine-Run	Prepared	Slack
Central Pennsylvania	$2 95	$2 95	$2 95
Western Pennsylvania	2 35	2 60	2 35
Fairmont (Gas) ..	2.50	2 75	2 25
George's Creek, Upper Cumberland and Piedmont fields,	2 75	3 00	2 50

PHILADELPHIA

Anthracite retail deliveries held up by snow. Scarcity of large sizes gives pea slight boost. Premiums still effective on prepared coal. Consumers' stocks need replenishing. Pea wholesale price of pea cut. Car supply fair. Consumers place orders for spring. Buckwheat active. Steam size, rice and barley fair with prices cut. Bituminous trade in wretched shape. Car supply unimproved.

Anthracite—While the weather so far as temperature is concerned was far from rigorous, the dealers nevertheless have been severely handicapped on account of the great quantity of snow on the ground. The thermometer has been mostly above the freezing point, which softened the snow until deliveries were next to impossible to make. In addition it has been extremely difficult to keep the men at work under conditions wherein pretty nearly every load of coal has to be carried.

The demand from the consumer continues extremely brisk, with the burden, of course, being on stove and nut sizes. Due to the extremely slow deliveries from the mines quite a few dealers are at the lowest point on these sizes, and many a one has no coal of these sizes at all. Yet with it all the tonnage received has been just about as much as the dealers could deliver.

With the stronger tone in the market for the three prepared sizes, the individual producers and brokers are still in position to demand good premiums on these sizes. Among the more conservative of the independents they are holding strictly to the 75c. differential over company, while other houses are asking prices around $7.40 for egg, $7.80 for stove and $7.90 for nut. Even at these prices most of the smaller shippers are still insisting that pea accompany the larger sizes at the premium price. Oftentimes when shippers are hard pressed for orders on pea coal they are known to sell this size as low as $5.40, and in some few instances there have been cuts about 25c. below that. However, in those cases it is believed to have been due to cars standing on demurrage, and quick disposition was necessary.

In the steam trade buckwheat remains the real active size. The big companies have about all they can do now to fill orders for this size, and the smaller shippers are less inclined to cut from the $3.40 price. This has all been due to the bituminous situation being unrelieved. To a much lesser degree rice and barley have been affected. As a matter of fact the company price of $2.75 on rice is frequently cut as low as $2.40 and barley has been sold down as low as $1.50.

Bituminous—The bituminous trade is in a wretched state. Stocks of coal which many consumers thought sufficient to carry them for long periods are dwindling fast, as new shipments fail to arrive. All the blame for the present situation seems to be placed against the car supply, although some producers are reaching the point where they openly declare this cannot be the sole cause and insist that mismanagement must be playing a part in the situation.

The point has now been reached where plants have been shut down for portions of the week from the lack of coal, and these have not always been the smaller plants, either. Public utilities, of course, are being taken care of, but in some instances only by the diversion of coal from other consignees. The situation has entered the serious stage and in various communities consumers have been taking joint action by appealing to the Government for relief.

If anything, less coal has arrived here last week than during the previous period. Prices for such coal as reaches the consumer are around $3 30, as all of the production is being applied on contracts, where the wage increase applies. The only business at tide is bunkering, as the authorities still withhold permits for export business.

BALTIMORE

Very little government-priced coal but coal is offering here above the maximum on round that it is a "fair profit sale." Car supply and movement poor. Hard coal men talk of poor preparation and enter protest.

Bituminous—The market here is fairly tight but there is no real suffering. Coal is not in as liberal supply at tide as it was a week since, and there have been repeated diversions of coal from the terminals to all-rail points. For instance, the daily average of around 1,200 cars at Curtis Bay recently has been cut within the past week to 500 cars a day or less on reserve there. From the mining regions come reports of a car supply that runs as low as 30 to 40 per cent on some days.

While reports come of a big national production the movement east is far below normal because of poor car supply. The movement on the Baltimore & Ohio division has dropped to around 1,500 cars a day, or less, against the normal of some 3,500. The weather is now more open, however, and there has been promise of improvement from the Railroad Administration in response to some hot telegrams of protest from western Maryland, in which business men and operators declared that miners were deserting the regions by the score because they could not keep up work in the face of the poor car movement.

There is very little Government-priced coal offered and it is an acknowledged fact that some coal is offered for sale considerably above the Government maximum. It is claimed by some operators that their books will show that they can not sell coal at the Government price without a continued loss, and that, as the Lever Act provides for a fair margin of profit, they can sell at such a fair margin. Coal under this idea is offering in the open market at from $3.50@$4.00 per ton.

No action has been taken by the government so far to prevent such selling. The export movement here is dying out as the export permits expire. A few more loadings will terminate this permit list apparently, unless there is modification of the ban, and there are strong rumors that such modification is coming in a few days.

Anthracite—The hard coal dealers report that the supplies are now coming through fairly well. There is considerable complaint as to preparation by many operations. Many letters have been sent out of Baltimore on this subject, and it is learned that the National Retail Coal Merchants Association has been asked to aid in securing a better run of hard coal to this section. Lack of grading of sizes, burdensome slate runs and general lack of preparation in many cases is charged. The quality of hard coal coming here is called "worse than that received under the Fuel Administration in war days."

Eastern-Inland

PITTSBURGH

Coal operators are still looking for better car service.

There has been somewhat of a loss in coal production owing to the inability of the railroads to measure up to the car-supply situation, although there are signs appearing of some relief very soon. It had been hoped that at least a 70 per cent movement would be brought about, but this is not so, although buyers are picking up coal in fairly large-sized quantities.

While there is a larger volume of coal moving in the open market, buyers are not disposed to be satisfied with the tonnage or the quality either. With the approach of spring, when the weather conditions normally are better, and the fulfillment of promises by railroad men, added to the increased demand for consumption, an easy market condition is expected to develop. There is no change in the market quotations, as follows: Slack, $2.10; mine-run, $2.35; screened, $2.60, per net ton at mine, Pittsburgh district.

COLUMBUS

Reduced output in all mining fields in Ohio is still reported. Car shortage and railroad congestion are holding down production to about 45 per cent of normal. There is a good demand for all grades.

No improvement in car supply is reported in any field of the Buckeye State and as a result production is still below the 50 per cent mark. Operators are making strenuous efforts to better this condition, but they are powerless, as the railroads are in bad shape as far as equipment and motive power is concerned. With prospects for a trainmen's strike, large steam users are trying to accumulate some surplus stocks, but conditions so far have prevented any especial reserves, and many of the large users are operating from hand to mouth. The tone of the market is not satisfactory, although demand for all grades is good.

Domestic business is strong in every regard. Producers and shippers have a large number of orders booked on which they are unable to make shipments. Dealers' stocks generally are low, and in many localities retailers are compelled to limit orders to make the available supply go around. With a severe winter and the failure of the natural gas supply, demands from the householder have been quite strong. Consumption is estimated at 10 per cent over normal years and about 25 per cent more than last winter.

Deliveries have been hindered by the ice on the streets and roads but that condition is rapidly passing away. Retail prices are slightly higher, permitted by the higher cost of handling. Hocking lump is selling at $6.50 while mine-run is quoted at $5.75. West Virginia splints sell at $7.25 for lump and $7.75 for mine-run. Pocahontas lump is not offered, but mine-run sells in the neighborhood of $7.50. Lump would be around $8.25 if available. Pomeroy lump sells at $6.50 and Jackson lump around $7. Practically no anthracite is offered on the Columbus market.

CINCINNATI

Determination of the Mine Workers' Union to unionize the open fields of southern West Virginia may cause trouble and hamper production. This region, which furnished practically all of the bituminous coal for this territory during the strike and some time afterwards, comprises five of the largest bituminous fields in the country.

Operators are of the opinion that if the intention of the union is carried out, it will mean a general strike. The operators are determined, however, they will not submit to the organization without a struggle, and for that reason it is almost certain trouble is ahead.

Every phase of production and shipments in Ohio at present is conducive to a large production, except transportation systems; the total inadequacy of the car supply is playing havoc not only with production but at the same time bringing the market and consumers nearer and nearer an acute shortage of coal. Not only was a serious car shortage still seriously crippling operations in the Kanawha field from which the local market draws the bulk of its fuel, but influenza made its appearance in certain parts of the region about the middle of the week and joined hands with a car shortage in cutting further holes in the output. It is hoped that conditions will improve next week.

Southern

LOUISVILLE

General demand good, but deliveries running low due to car shortage. Retail demand slackening off somewhat, and demand for block coal showing effect of mild weather. Steam coal active.

Kentucky producers are badly disgruntled over the continued discrimination in placing cars with the Louisville & Nashville Railroad, on the part of the Railroad Administration, which is resulting in steady shortages at the mines, and many mines are doing well to get in two days full time per week. Threatened suits against the Railroad Administration may bring some relief, but it is doubtful.

At the present time the operators have a demand that will take care of full production if cars are available. However, it is alleged that due to the discrimination they are unable to take advantage of the demand, and that it is injuring the market, and driving buyers into other fields. It is claimed that the operators in the Kentucky field are practically out of the market at a time when there is a strong demand which means that if they ever do get cars it will be at a time when other fields no longer need them and when there is no demand to keep them going.

BIRMINGHAM

Good market for all grades coal. Production and movement retarded by shortage of equipment for loading. Labor deficiency, caused in some instances by an unusual amount of sickness among mine workers, also cuts down output.

The requirements of the trade for coal from this district are holding up well and market conditions are active. Ample business is offered and in hand to take care of all the coal that can be mined and there is no delay in the movement of fuel except that occasioned by a shortage of cars. The Louisville and Nashville R. R. is furnishing a lower percentage of requirements than any other lines, and other roads have instructions to furnish a 75 per cent supply of equipment to mines on their rails, any surplus to be turned over to the Louisville & Nashville to bring up their average as much as possible.

The Tennessee Coal, Iron & Railroad Co. has been in the market lately for considerable tonnage, an effort being made to close some six-month contracts needed to supply the requirements of its furnace and other operations. This company has not mined sufficient coal for its needs for some months, and is now preparing to open "Hamilton Slope" on the Mary Lee seam, from which a production of 1,000 tons per day is expected.

Domestic trade is easy, receipts being light but sufficient to meet the requirements of the retail trade, which has been buying sparingly.

Labor at a number of operations in the district has been short and irregular the past week due to pay days and the prevalence of considerable sickness in the camps. The output for the week ending Jan. 31, as compiled by the Alabama Operators' Association, was 355,000 net tons, which was about 13,000 tons short of the previous week.

Lake Region

BUFFALO

Cars better distributed. Would have been much trouble otherwise. Storm troubles did not reach here. Enough trouble without them. Protesting against confiscation. Anthracite slow, but enough to go around.

Bituminous—The situation is slowly improving. Some shippers still fail to see any improvement, but the two weeks of soft weather must have its effect. This district did not get the big storm, and the snow is not deep here, but the wind and cold for a time made it difficult to move trains even here so nobody wonders at the stoppage in places where the snow fell heavily to add to the difficulty. It is to be hoped that so many adverse conditions will not come together again right away.

Add to all this the fact that neither the coal output nor the car supply is up to the normal at the best and anyone will wonder why there was not real distress in many parts of the Northern districts. As it is it will be some time, with good service, before the supply is really good. There is dispute as to the reason for the light movement from the mines. The Government authorities have said that the mining was light, but members of the bituminous trade agree generally that there would be more coal shipped if cars were to be had in plenty.

All bituminous prices remain on Government basis, $4.70 for Allegheny Valley sizes, $4.50 for Pittsburgh and No. 8 lump and three-quarter, $4.25 for all slack, $4.60 for smokeless, $4.70 for Pennsylvania smithing, all per net ton f.o.b. Buffalo.

Anthracite—The trade is tranquil. There is no teasing for coal and there is not likely to be any, for spring cannot be far away and the idea is that the supply is sufficient, which means a great deal in the trade. At the same time, there has been some shortage at times, due mostly to the scarcity of cars and the storms. Sometimes the motive power would run short and the sidings would fill up with loaded cars. The true gauging of the state of the trade is in the way independent anthracite sells. As a rule the premium that can be obtained is small, sometimes nothing, though it was sometimes $3 a ton before the public became convinced that there was coal enough.

The consumer complains of the high price of anthracite, but it is claimed by operators that prices have not advanced as much as in case with other things. It is observed here that gas-house coke, which used to sell for $4.50, is now bringing $9 a ton delivered. Experts say that the owners of anthracite mines would lose money unless present prices are kept up and that they are pretty sure to be higher before long.

It does not look as if there would be any anthracite surplus for loading into Lake vessels before spring. Heavy ice would be likely to prevent movements. The harbor was seldom frozen up as completely as now, especially as the usual winter grain fleet is absent, so that the work of navigating the ice has been less than usual.

TORONTO

Conditions in Toronto have not been satisfactory both to the dealer or to the consumer.

Most of the coal that is sold is largely to contract consumers. Cold weather prevents dumpings. Retail prices are as follows:

Anthracite, egg, stove, nut and grate	$12 75
Pea	11 25
Bituminous steam	9.00
Slack	8.00
Domestic lump	9.00
Cannel	12.50
Wholesale, f. o. b. cars at destination—	
Three-quarter lump	6.75
Slack	6.00

CLEVELAND

Fuel supplies in this district are the lowest in months—not even excepting the period of the strike. Weather conditions are better, but inability of railroads to get cars back to southern and eastern Ohio mines is the sticking point. Steam coal prices have been advanced sharply.

Bituminous—Typical of the present stringency in steam coal in Cleveland and northern Ohio is the fact that the largest public utility company, always the first to have its wants taken care of, is down to a two-days supply. When the coal strike broke on Nov. 1 this interest had more than 50,000 tons stored. This reserve, it appears, has been all but wiped out, and the local coal committee is diverting to this plant a large part of the steam coal arriving in Cleveland. This has worked a hardship on industrials, and the number of plants operating on a day-to-day basis is larger than ever before. The trade so far has been enabled to keep all plants going, even if on a hand-to-mouth arrangement, but the cracking point appears to have arrived.

Domestic bituminous-coal prices stand, but steam coal prices all have been revised upward sharply on the basis of January sales. Generally speaking, slack is bringing around $6 a ton, while mine-run ranges from $6.30 to $6.85, depending on whether it is for factory or other use.

Lake Trade—Great Lakes bituminous shipments in the season of 1919 went to the following districts, figures now show: Head of Lake Superior, 8,395,982 tons; Portage district, 776,194 tons; Fort William and Port Arthur, 1,357,943 tons; See river, 1,157,047 tons; Georgian Bay, 741,190 tons; Milwaukee, 3,109,226 tons; Chicago district, 1,811,310 tons; Other Lake Michigan ports, 1,763,711 tons; Lower rivers, 713,188 tons; and St. Lawrence river, 949,650 tons. Movement of this coal off the upper lake docks continues good, and the opening of navigation will see demand heavy, the head of Lake Superior will take at least 12,000,000 tons in the 1920 season, or over 3,000,000 more tons than in 1919, it is believed.

Pocahontas and Anthracite—Receipts of anthracite in the past week have been quite fair, the best in six weeks. Receipts of Pocahontas have been fair. Demand continues so large, however, that dealers still are rationing their supplies. Dealers have ceased quoting forked Pocahontas. With both anthracite and Pocahontas, the minimum of the spread is the ruling quotations, only small tonnages now bringing the maximum. This makes $9 the market for shoveled lump and $8 for mine-run Pocahontas, $12.20 for egg and grate anthracite, $12.40 for stove and $12.50 for chestnut.

Prices of coal per net ton delivered in Cleveland are:

Anthracite—Egg, $12.20@12.40; chestnut, $12.50@12.70; grate, $12.20@12.40; and stove, $12.40@12.60.

Pocahontas—Shoveled lump, $9.00@9.25; and mine-run, $8.00@8.25.

Domestic bituminous — West Virgina splint, $8.30; No. 8 Pittsburgh, $6.85@7.00; Massillon lump, $7.40@7.65; Cannel lump, $11.00; and Coshocton lump, $7.35.

Steam coal—No. 6 slack, $5.75@6.00; No. 8 slack, $5.80@6.00; Youghiogheny slack, $5.95@6.10; No. 8¾, $6.35@6.60; No. 6 mine-run, $6.30@6.85; and No. 8 mine-run, $6.30@6.85.

DETROIT

With the transportation outlook clouded by the prospective strike of the United Brotherhood of Maintenance-of-Way Employees and Railway Shop Workers scheduled for Feb. 17, Detroit consumers and the coal trade in Detroit find that the Railroad Administration has raised a new obstacle to free movement of bituminous.

Bituminous—From mines in the bituminous districts comes the report that an order has been issued effective from Feb. 7, forbidding the loading of coal for Detroit or Michigan, billed to pass through the Toledo gateway. As very little bituminous coal comes to Detroit by any other route, the order virtually cuts off shipments and amounts to an embargo. According to the information received by the Detroit trade, it is to continue in effect five days or longer.

It is an interesting detail that the existence of the order is not made known through representatives of the Railroad Administration in Detroit, but by notifications from the mines. While the congestion of freight on tracks in Toledo is given as the occasion for the order, jobbers are of the opinion that more coal is needed by the railroads, perhaps in preparation for the threatened strike.

Anthracite—With weather conditions moderate, the demand for anthracite has eased off somewhat. While some of the retailers have a fair amount, others are short of supply. Severe cold weather for a few days would likely create a demand from household consumers that would soon exhaust the supply.

Middle West

MIDWEST REVIEW

Coal market in the Middle West continues strong, in spite of the fact that we have had a spell of very mild weather. We have heard of one or two cases where retail dealers have cancelled high-priced orders placed before Oct. 30, but the number of cancellations coming in is so negligible it does not affect the market.

Manufacturers appear to be a little more comfortable so far as coal is concerned, than they were a week or two ago. While but few steam users have a reserve supply of coal on hand, nevertheless they have received enough coal during the past week or so to to assure them of fairly good running time. Practically all of the buying which is done in this market lately is done by manufacturers, and steam users, rather than by the domestic trade.

The car situation continues to be the topic of the day. Old timers, who have been in the coal business for years, almost since coal operating was put on a commercial basis in Illinois and Indiana, claim that they have never experienced a time when the car supply was poorer. A statement came out in the Chicago daily papers a day or so ago to the effect that the railroads were going to discontinue the practice of pooling their cars, as soon as they were back under private ownership.

This statement met with great approval from the Illinois and Indiana operators, as in a great number of cases, especially in Illinois—and on the Chicago, Burlington & Quincy, for instance—the coal can be mined, and shipped out to western Iowa, without leaving the rails of the original road. This, of course, will mean a better car supply on some of our Western roads which tap the coal fields in Illinois, and at the same time extend in the West to Iowa, Minnesota and Missouri. The Chicago, Burlington & Quincy has been a loser under the car-pooling system. This road, before the war, had enough coal-carrying equipment to take care of its mines, while some of the other railways, serving the same territory, had but a meager supply.

CHICAGO

Retail trade complains that the public are buying but little coal. It appears that although the average householder has only a small supply of coal on hand, nevertheless he is unwilling to make additional purchases, at this time, as he perhaps believes prices are a little too high, and will be reduced soon.

Dealers think that if the railroad strike ties up the traffic of the country, there will be a great many householders whose homes will be too cold for comfort. The retail trade who buy most of the Eastern coal moving into this territory are beginning to realize that they will have to pay more for their West Virginia splint and Kentucky block than they have for some time.

It is stated that operators on railroads in the East, with tide-water connections, are having no difficulty in selling mine-run at figures as high as $3.50 per ton for export. These mines, of course, prepare their coal which moves into the Western market, and which will now have to be sold around $4.00@$4.50 per ton, to compete with the export market.

C. M. Moderwell, general manager of the O'Gara Coal Co., McCormick Building, Chicago, has addressed the following letter "To the Trade." It is dated Feb. 8. It may be noted that the Government price for Harrisburg coal is $2.55 f.o.b. mines.

"The Fuel Administration, acting under the Lever Law, granted the miners in the Central Competitive field an advance of 14 per cent in wages, and on Dec. 12 the miners went to work on this basis. Previously the Fuel Administration had fixed certain prices on coal, in the Central Competitive field, known as Government prices. This action was taken under the section of the Lever Law which reads as follows:

" 'In fixing maximum prices for producers, the commission shall allow the cost of production, including the expense of operation, maintenance, depreciation and depletion, and shall add thereto a just and reasonable profit.'

"Since the above action was taken, the Fuel Administration has ceased to function, and there is nobody to whom we can appeal to see that we receive a just and reasonable profit. This company has now had nearly two months' experience operating under this regulation. This experience has shown that we are not able to make a just and reasonable profit as provided by the law. Inasmuch as we have found that we cannot operate at a profit under the prices so fixed, and inasmuch as there is no regulatory body to whom we can appeal, we have decided to make the following prices, f.o.b. cars at mines, effective Feb. 9, and until further notice:

6 in. Lump....	$3.10	6 x 2 in. Egg..	$3.10
3 in. Lump....	3.10	3 x 2 in. Nut...	3.10
6 x 3 in. Egg..	3.10	2 x 1¼ in. Nut..	3.10

"Prices on other grades will be quoted on application. This letter is sent you so that you may have advance information as to our policy. If you desire to cancel any of the orders placed with us, please advise us at once; otherwise, please acknowledge receipt of this letter, and we will then ship and bill in accordance with the above prices. In this connection, we desire to say that we have considered this matter carefully, and are acting, as we believe, entirely within our rights and are prepared to take full responsibility for our action."

MILWAUKEE

Scarcity of popular grades of coal and poor transportation conditions make business unsatisfactory. Coke advances in price.

The coal situation at Milwaukee and its dependent territory is far from satisfactory, owing to exhaustion of stocks and insufficient transportation facilities. There is a lively demand for coal, which dealers find difficult to meet.

The supply of anthracite is now limited to the egg and pea grades, chestnut and stove being sold out. Only mine-run Pocahontas is now available.

Coal prices remain unchanged, but coke has been advanced 50c per ton. Large sizes now sell at $12.50 and pea coke at $11.25. Mild weather conditions alone prevent the coal situation from being serious.

ST. LOUIS

Anticipated railroad strike creates steam demand temporarily. Domestic demand easy, generally speaking, on account of mild weather. Car supply averages about two days a week. Demand for everything that exceeds the supply.

Locally the St. Louis market is easy, excepting for an unusual demand for steam sizes. This is on account of the threatened railroad strike. If it were not for this, conditions would be easy. Mild weather prevails and the domestic call is lighter than usual.

Country demand for domestic coal is better than for steam, but steam sizes find a ready market in Chicago and the Northwest. In the Standard district the car supply averages two days a week on all roads. This, however, comes to the mines in half-day periods. The railroad tonnage still continues quite heavy.

The conditions in the Mt. Olive field are somewhat similar to those in the Standard district, although the car supply at times is somewhat better on some roads. Embargoes were effective at different times on the Western roads, caused by congestion of the St. Louis terminals. One of the principal reasons for the car supply in this territory is the lack of motive power and the failure to utilize the available motive power to its maximum.

In St. Louis proper no smokeless is coming in and practically no anthracite. Shipments of coke on commercial orders are unusually good. The wholesale prices are the same as last week.

Prices per net ton bituminous coal f.o.b. mine today, are as follows:

	Williamson and Franklin Counties	Mt. Olive and Staunton	Standard
Prepared sizes (lump, egg, nut, etc.)...	2.55@2.70	2.55@2.70	2.55@2.70
Mine Run ...	2.35@2.50	2.35@2.50	2.35@2.50
Screenings ...	2.05@2.20	2.05@2.20	2.05@2.20

Williamson-Franklin rate to St. Louis is $1.10, other rates $0.95.

Coke

CONNELLSVILLE

Connellsville region adds more ovens to active list, but under existing conditions as to car supplies there is no advantage gained.

Connellsville coke operators always have something to hope for, and at this time it is a better supply of cars. A policy of "quiet waiting" has been adopted, and patience is expected to be rewarded very soon, with the coming of better weather and a probable shakeup in railroad circles as soon as the roads are turned back to their original owners.

Figures last week did not bear out the prediction previously made of a further increase in production and larger movement of coke, but the signs this week have been more encouraging. For the first three days of the week car supply kept around the 50 per cent mark, a matter of 10 per cent better than the same three days of the previous week. Indeed, there were several days last week when the supply of cars dropped to 30 per cent, but the average was better at the end of the week. Demand continues as before.

BUFFALO

The complaint comes from the ore docks that movements are slow on account of the snow, so that shipments out by rail are light. Furnaces are running as strong as they can, for the trades report a bad shortage of supplies.

CURRENT PRICES—MATERIALS & SUPPLIES

IRON AND STEEL

PIG IRON—Quotations compiled by the Matthew Addy Company

	Current	One Month Ago
CINCINNATI		
No. 2 Southern	$44 60	$36 60
Northern Basic	42.80	31.05
Southern Ohio No 2	43.80	31 55
NEW YORK, Tidewater delivery		
2X Virginia (silicon 2 25 to 2 75)	47.65	39.40
Southern No. 2 (silicon 2.25 to 2.75)	47.70	41.40
BIRMINGHAM		
No. 2 Foundry	41 00	33.00
PHILADELPHIA		
Eastern Pa., No. 2 x 2 25-2 75 sil.	45.35 46 35*	38.10*
Virginia No. 2	43.25*	39.10*
Basic	43.00†	34.60†
Grey Forge	42.50*	34.60*
CHICAGO		
No. 2 Foundry Local	43.25	36.25
No. 2 Foundry Southern	46.60	38.00
PITTSBURGH, including freight charge from the Valley		
No. 2 Foundry Valley	43.65	..
Basic	42.90	34.40
Bessemer	43.40	35.40
MONTREAL		
Silicon 2 25 to 2.25%	43 25	

* F. o. b. furnace. † Delivered.

STRUCTURAL MATERIAL—The following are the base prices, f o b mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

	Mill Pittsburgh	New York Current	New York One Year Ago	St. Louis	Chicago
Beams, 3 to 15 in	$2.45	$3.47	$4.27	$3.54	$3 47
Channels, 3 to 15 in	2.45	3.47	4.27	3.54	3 47
Angles, 3 to 6 in.; ¼ in. thick.	2.45	3.47	4.27	3.54	3.47
Tees, 3 in. and larger	2.45	3.52	4.27	3.54	3 47
Plates	2.65	3.67	4.52	3 54	3.67

BAR IRON—Prices in cents per pound at cities named are as follows:

Pittsburgh	Cincinnati	St. Louis	Birmingham
4.00	3.50	3.44	4.25

NAILS—Prices per keg from warehouse in cities named:

	Mill Pittsburgh	St. Louis	Chicago	Birmingham	San Francisco	Dallas
Wire	$4 50	$4.50	$4 15	$5.75	$5 50	$6 90
Cut	4.925	5.40	7.00	....	6.90	7 40

TRACK SUPPLIES—The following prices are base per 100 lb. f.o.b. Pittsburgh for carload lots, together with the warehouse prices at the places named:

	Pittsburgh	Chicago	St. Louis	San Francisco	Birmingham
Standard railroad spikes $\frac{9}{16}$-in and larger	$3.35	$3.62	$4.44	$5.65	$4.75
Track bolts	4.90 5.00	4.62	Prem.	6.65	7.00
Standard section angle bars	2.75	2.75	3 44	4 60	...

COLD FINISHED STEEL—Warehouse prices are as follows:

	New York	Chicago	Cleveland	St. Louis
Round shafting or screw stock, per 100 lb. base	$5.50	$4 90	$5.50	$5.00
Flats, squares and hexagons, per 100 lb base	6 00	5 40	..	5 50

HORSE AND MULE SHOES—Warehouse prices per 100 lb. in cities named:

	Mill Pittsburgh	Cincinnati	Chicago	St. Louis	Birmingham
Straight	$5 75	$7.50	$6.75	$7.25	$7 00
Assorted	5.85	7.50	6.90	7.50	7.25

Cincinnati—Horseshoe nails sell for $4.50 to $5 per 25-lb. box.

CAST-IRON PIPE—The following are prices per net ton for carload lots:

	New York Current	New York One Month Ago	New York One Year Ago	Chicago	St. Louis	San Francisco	Dallas
4 in	$70 30	$65.30	$70.70	$72 80	$71.00	$88.55	$70.30
6 in. and over	67.80	62.30	67.70	69.80	68 00	85 55	67 30

Gas pipe and 16-ft. lengths are $1 per ton extra.

STEEL RAILS—The following quotations are per ton f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5c. per 100 lb. is charged extra:

	Pittsburgh Current	Pittsburgh One Year Ago	Chicago Current	Chicago One Year Ago
Standard Bessemer rails	$45.00	$55.00	$45.00	$65.00
Standard openhearth rails	47.00	57.00	47.00	67.00
Light rails, 8 to 10 lb.	2.585*	3.135*	2.585*	3.135*
Light rails, 12 to 14 lb.	2.54*	3.09*	2.54*	3.09*
Light rails, 25 to 45 lb.	2.45*	3.00*	2.45*	3.00*

* Per 100 lb.

OLD MATERIAL—The prices following are per gross ton paid to dealers and producers in New York. In Chicago and St. Louis the quotations are per net ton and cover delivery at the buyer's works, including freight transfer charges.

	New York	Chicago	St. Louis
No. 1 railroad wrought	$28 00	$26 00	$27.00
Stove plate	25.00	30.00	25.00
No. 1 machinery cast	32.00	37.00	34.00
Machine shop turnings	15 00	12 00	14.50
Cast borings	18 00	15.00	16.50
Railroad malleable cast	25 00	29.00	24 00
Rerolling rails	33 00		
Relaying rails	[illegible]		

COAL BIT STEEL—Warehouse price per pound is as follows:

New York	Cincinnati	Birmingham	St. Louis	Chicago
$0 10	$0 16½	$0 18	$0 11	$ 15

DRILL STEEL—Warehouse price per pound:

	New York	St Louis	Birmingham
Solid	14c	13c	15c
Hollow	16c	..	

PIPE—The following discounts are for carload lots f.o.b. Pittsburgh, basing card of Jan. 1, 1919 for steel pipe and for iron pipe:

Inches	Steel Black	Galvanized	Inches	Iron Black	Galvanized
BUTT WELD					
⅛, ¼ and ⅜	50½%	24%	¾ to 1½	30½%	23½%
½	54½%	40%			
¾ to 3	57½%	44%			
LAP WELD					
2	50½%	35%	2	32½%	18½%
2½ to 6	53½%	41%	2½ to 4	34½%	21½%
BUTT WELD, EXTRA STRONG PLAIN ENDS					
⅛, ¼ and ⅜	46½%	29%	¾ to 1½	39½%	24½%
½	51½%	39%			
¾ to 1½	55½%	43%			
LAP WELD, EXTRA STRONG PLAIN ENDS					
2	48½%	37%	2	33½%	20½%
2½ to 4	51½%	40%	2½ to 4	35½%	23½%
4½ to 6	50½%	39%	4½ to 6	34½%	22½%

Stocks discounts in cities named are as follows:

	New York Black	New York Galvanized	Cleveland Black	Cleveland Galvanized	Chicago Black	Chicago Galvanized
¾ to 3 in. steel butt welded	47%	31%	43½%	34½%	57½%	44%
3½ to 3 in. steel lap welded	42%	27%	39½%	30½%	53½%	41%

Malleable fittings. Class B and C, from New York stock sell at list + 22½%. Cast iron, standard sizes, net.

WIRE ROPE—Discounts from list price on regular grades of bright and galvanized are as follows:

	New York and St. Louis
Hercules red stand, all constructions	20%
Patent flattened strand, special and cast steel	20
Patent flattened strand, iron rope	5%
Plow steel round strand rope	35%
Special steel round strand rope	30
Cast steel round strand rope	22½%
Iron strand and iron tiller	5
Galvanized iron rigging and guy rope	+12%

San Francisco Galvanized, less 5%, bright less 25%.
Chicago, +17½ on galvanized, 35 off on bright

STEEL SHEETS—The following are the prices in cents per pound from jobbers' warehouse at the cities named:

Blue Annealed	Large Mill Lots Pittsburgh	New York Current	New York One Year Ago	Cleveland	Chicago
No 10	3 55-4 00	5 32-7 00	5 17	5.35	5 27
No. 12	3 60	5 37-7 10	5 22	5 40	5 32
No 14	3 65 4 10	5 42	5 27	5 45	5 37
No. 16	3.75-4 20	5 52	5 37	5 55	5 47
Black					
Nos. 18 and 20	4 15-4 65	6 80 7 30	6 02	5 95	6 30
Nos. 22 and 24	4 20-4 70	6 85-7 35	6 07	6 00	6 35
No. 26	4 25-4 75	6 90-7 90	6 12	6 05	6 40
No. 28	4 35-4 85	7 00-8 00	6 22	6 15	6 50
Galvanized					
No. 10	4 70	6 90	8 22	5 05	6 65
No. 12	4 80	6 95	8 27	5 10	6 70
No 14	4 80	7 10	8 42	5 25	6 85
Nos. 18 and 20	5 10	7 40	8 72	5 55	7 15
Nos. 22 and 24	5 25 5 75	7 80	7 12	6 95	7 55
No. 26	5 40 5 90	7 95	7 27	7 40	7 70
No 28	5 70 6 20	8 25 9 00	7 57	7 50	8 00

SHOP SUPPLIES

NUTS—From warehouse at the places named, on fair size orders, the following amount is deducted from list:

	New York Current	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago	St. Louis Current
Hot pressed square	+$2 00	$1.00	$1.25	$1.45	$0.98	$2.25
Hot pressed hexagon	+ 2 00	1.00	1.05	1.45	0.78	2.25
Cold punched square	+ 2 00	1.00	.75	1.05	1.00	2.25
Cold punched hexagon	+ 2 00	1.00	75	1.05	1.00	2 25

Semi-finished nuts, 9/16 and smaller, sell at the following discounts from list price:

	Current	One Year Ago
New York	6 %	50–10%
Chicago	50%	50%
Cleveland	60–10%	50–10%
St. Louis	45%	....

MACHINE BOLTS—Warehouse discounts in the following cities:

	New York	Cleveland	Chicago	St. Louis
¾ by 4 in. and smaller	2 %	50%	35–5%	50–5%
Larger and longer up to 1 in. by 30 in	1 %	40%	25–5%	40–5%

WASHERS—From warehouses at the places named the following amount is deducted from list price

For wrought-iron washers

New York........ $1.50 Cleveland........ $4.50 Chicago........ $3.00

For cast-iron washers the base price per 100 lb is as follows:

New York........ $7.00 Cleveland........ $3.75 Chicago........ $4.25

RIVETS—The following quotations are allowed for fair sized orders from warehouse:

	New York	Cleveland	Chicago
Steel 7/16 and smaller	30%	55% off	4 %
Tinned	3 %	55% off	4 %

Boiler, ¾, ⅞, 1 in. diameter by 2 in. to 5 in. sell as follows per 100 lb

New York..$6.00 base Cleveland..$4.00 Chicago..$4.97 Pittsburgh..$4.72

Structural, same sizes:

New York..$6.10 Cleveland..$4.10 Chicago..$5.07 Pittsburgh..$4.82

CONSTRUCTION MATERIALS

LINSEED OIL—These prices are per gallon:

	New York		Cleveland		Chicago	
	Current	One Year Ago	Current	One Year Ago	Current	One Year Ago
Raw, 5-bbl lots	$1.80	$1.49	$2.05	$2.10	$1.93	$1.65
5-gal. cans	2.00	1.74	2.25	2.25	2.23	1.86

WHITE AND RED LEAD—Base price.

	Red				White	
	Current		1 Year Ago		Current	1 Year Ago
	Dry	In Oil	Dry	In Oil	Dry and In Oil	Dry and In Oil
100-lb. keg	15.00	16.50	13.00	14.50	15.00	13.00
25 and 50-lb. kegs	15.25	16.75	13.25	14.75	15.25	13.25
12½-lb. keg	15.50	17.00	13.50	15.00	15.50	15.50
5-lb. cans	17.00	18.50	..	..	17.00	15.00
1-lb. cans	18.00	19.50			18.00	16.00

500 lb. lots less 10% discount. 2000 lb. lots less 10–2½% discount.

COMMON BRICK—The prices per 1000 in cargo or carload lots are as follows:

Chicago........ $14.00 Cincinnati........ $19.00

St. Louis, salmon........ 14.00 Birmingham........ 15.00

PREPARED ROOFINGS—Standard grade rubbered surface, complete with nails and cement, costs per square as follows in New York, St. Louis, Chicago and San Francisco.

	1-Ply		2-Ply		3-Ply	
	C.l.	L.c.l.	C.l.	L.c.l.	C.l.	L.c.l.
No. 1 grade	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25
No. 2 grade	1.70	1.95	2.15	2.40	2.50	2.75

Asbestos asphalt saturated felt (14 lb. per square) costs $17.00 per 100 lb.

Slate-surfaced roofing (red and green) in rolls of 108 sq.ft. costs $3.00 per roll in carload lots and $3.25 for smaller quantities.

Shingles, red and green slate finish, cost $7.25 per square in carloads, $7.50 in smaller quantities, in Philadelphia.

ROOFING MATERIAL—Prices per ton f.o.b. New York and Chicago:

	Carload Lots		Less Than Carload Lots	
	N. Y.	Chicago	N. Y.	Chicago
Tar felt (14 lb. per square of 100 sq.ft.)	$84.00	$82.00	$86.00	$84.00
Tar pitch (in 400-lb. bbl.)	21.00	18.00	22.00	19.00
Asphalt pitch (in barrels)	34.00	34.00	37.50	37.50
Asphalt felt	88.00	88.00	90.00	90.00

HOLLOW TILE—Price per block in carload lots for hollow building tile:

	4x12x12	8x12x12	12x12x12
St. Paul	$0.087	$0.158	$0.248
St. Louis	.12	.23	.31
[illegible]	.09	.175	.30
[illegible]	.082	.154	.236
New Orleans	.165	.22	.325
[illegible]	.065	.115	
[illegible]	.09	.163	
Cincinnati	.101	.1925	.2864
[illegible]	.108	.192	..

[illegible], 4, 8 and 10 [illegible]

LUMBER—Price of pine per M in carload lots:

	1-In. [illegible] 10 In. x 16 Ft.	2-In. T. and G. 10 In. x 16 Ft	8 x 8 In. x 20 Ft
St. Louis	$53.00	$46.00	$42.00
Birmingham	52.00	53.00	50.00
Cincinnati	60.00	60.00	55.00

EXPLOSIVES—Price per pound of dynamite in small lots and price per 25-lb. keg for black powder:

	Low Freezing 20%	Gelatin 40%	60%	80%	Black Powder
New York		$0.27	$0.30		$2.20
Boston	$0.225	.245	.25	$0.35	2.40
Kansas City	.185	.2275	.2525	.29	2.35
New Orleans	.2375 (50%)	.2275	.2475		
Seattle	.1675	.1925	.2125	.2775	2.25
Chicago	[illegible]	.24	.2825	.325	2.25
St. Paul	[illegible]	.2275	.2525		2.25
St. Louis	[illegible]	.2275	.2325	.295	1.80
Los Angeles	[illegible]	[illegible]	.35	.275	2.95

MISCELLANEOUS

GREASES—Prices are as follows in the following cities in cents per pound for barrel lots:

	Cincinnati	St. Louis	Birmingham
Cup	7–8	3.7 3.8	8.5
Fiber or sponge	7	7.2	8.5
Transmission	9–10	14.	8.5
Axle	5	5.	4.5
Gear	5	6.5	8.5
Car journal	5	4.7	8.5

BABBITT METAL—Warehouse prices in cents per pound:

	New York		Cleveland		Chicago	
	Current	One Year Ago	Current	One Year Ago	Current	One Year Ago
Best grade	90.00	87.00	70.00	80.00	70.00	75.00
Commercial	50.00	42.00	20.00	21.50	15.00	15.00

HOSE—Following are prices of various classes of hose:

Fire

	50-Ft. Lengths
Underwriters' 2½-in.	75c. per ft.
Common, 2½-in.	40%

Air

	First Grade	Second Grade	Third Grade
¾-in. per ft.	$0.50	$0.33	$0.22

Steam—Discounts from list

First grade........ 30% Second grade........ 40% Third grade........ 45%

LEATHER BELTING—Present discounts from list in cities named:

	Medium Grade	Heavy Grade
New York	2 %	25%
St. Louis	3 %	35%
Birmingham	35%	15%
Chicago	45%	40%
Cincinnati	30–5-2½%	40 2½%

RAWHIDE LACING—25% for cut: 86c. per sq.ft. for ordinary.

PACKING—Prices per pound:

Rubber and duck for low-pressure steam	$1.00
Asbestos for high-pressure steam	1.70
Duck and rubber for piston packing	1.00
Flax, regular	1.20
Flax, waterproofed	1.70
Compressed asbestos sheet	.90
Wire insertion asbestos sheet	1.50
Rubber sheet	.50
Rubber sheet, wire insertion	.70
Rubber sheet, duck insertion	.50
Rubber sheet, cloth insertion	.30
Asbestos packing, twisted or braided, and graphited, for valve stems and stuffing boxes	1.30
Asbestos wick, ½- and 1-lb. balls	.85

MANILA ROPE—For rope smaller than ¾-in. the price is ½ to 2c. extra: while for quantities amounting to less than 600 ft. there is an extra charge of 1c. The number of feet per pound for the various sizes is as follows: ½-in., 8 ft.; ⅝-in., 6; ¾-in., 4½; 1 in., 3⅓; 1¼-in., 2 ft. 10 in.; 1½-in., 2 ft. 4 in. Following is price per pound for ¾-in. and larger, in 1200-ft. coils:

Boston	$0.30	Birmingham	$0.29
New York	.26	Atlanta	.295
St. Louis	.265	Kansas City	.265
Chicago	.265	New Orleans	.255
St. Paul	.275	Seattle	.25
San Francisco	.24	Los Angeles	.285

PIPE AND BOILER COVERING—Below are discounts and part of standard lists:

PIPE COVERING		BLOCKS AND SHEETS	
Pipe Size	Standard List Per Lin.Ft.	Thickness	Price per Sq Ft.
1-in.	$0.27	½-in.	$0.27
2-in.	.36	1 -in.	.30
3-in.	.45	1½-in.	.45
4-in.	.60	2 -in.	.60
6-in.	.80	2½-in.	.75
8-in.	1.10	3 -in.	.90
10-in.	1.30	3½-in.	1.05

85% magnesia high pressure........ List

For low-pressure heating and return lines........ { 4-ply........ 58% off; 3-ply........ 60% off; 2-ply........ 62% off }

WIRING SUPPLIES—New York prices for tape and solder are as follows:

Friction tape, ½-lb. rolls	48c. per lb.
Rubber tape, ½-lb. rolls	60c. per lb.
Wire solder, 50-lb. spools	46c. per lb.
Soldering paste, 2-oz. cans	$1.20 per doz.

COPPER WIRE—Prices per 1000 ft. for rubber-covered wire in following cities:

	New York			Birmingham		
	Single Braid, Solid	Double Braid, Stranded	Duplex	Single Braid, Solid	Double Braid, Stranded	Duplex
14	$12.00	$13.90	$28.50	$12.50		$29.00
10	18.30	23.85	41.50	25.10		55.50
8	25.54	32.70	56.70	34.75		70.50
6		51.40		57.50		
4		70.00		81.65	95.50	
2		101.80			140.20	
1		131.86			190.90	
0		160.00			231.33	
00		193.50			281.23	
000		235.20			343.22	
0000		288.60			416.80	

Cincinnati 12c base

FREIGHT RATES—On finished steel products in the Pittsburgh district including plates, structural shapes, merchant steel, bars, pipe fittings, plain and galvanized wire nails, rivets, spikes, bolts, flat sheets (except planished), chains, etc. the following freight rates per 1000 lb. are effective:

Boston	$0.30	New Orleans	$0.385
Buffalo	.17	New York	.27
Chicago	.27	Philadelphia	.245
Cincinnati	.23	St. Louis	.24
Cleveland	.17	St. Paul	.495
Kansas City	.59	Pacific Coast (all rail)	1.25*

Note—Add 3% transportation tax *Minimum carload, 80,000 lb.

COAL AGE

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Our Time-Honored Industrial Democracy

BY R. DAWSON HALL

TIME was when consultation of the men with the management on the conduct of a plant would not have been considered any unusual practice, certainly not one to be dignified as Industrial Democracy. Every workman discussed matters with the boss, and the man in charge did not feel it his duty to say how every item of work was to be done. He left quite a little of the management of materials, time and labor in the hands of the workman and then confidently expected results.

Because we have drawn away from our old habits, when the employee sat down with the boss and talked over affairs and tackled every problem with a sense of teamwork, we have now got to organize what before was instinctive and for this reason we give it a name "Industrial Democracy." When we have to conjure up something with a name, a plan and a blue-print, it is an indistinct ghost of the real thing when it appears.

The old industrial democracy which rested on a complete mutual understanding was something far better than the formal schemes that have supplanted it. In those days the workman called round in the evening to talk matters over and he found the boss perhaps surrounded by his family and perhaps toiling in his office but wherever he was, he could be relied on to talk the matter over, ready to take advice and prepared to give a reason.

And to-day it need not be different where men are English-speaking. The big man perhaps may be hard to reach by all his hundreds of employees, but each of the subordinates at least, should be willing to listen to suggestions, to recognize them when meritorious and give credit for them when adopted. There has arisen an idea that orders, orders, orders shall be transmitted from the man above to the man below. Every detail must be regulated by authority.

The workman knowing his greater knowledge of some details, whether by reason of great experience in that specified work or because of a certain understanding of the local conditions resents orders that only muddle and do not advance the work, given solely in many cases because the man must justify his tenure of office rather than because the orders facilitate the work.

A willingness to cooperate will do as much in most cases as elaborate machinery for conferences participated in by men, who are usually, whether employers or employed, better workers than talkers. The welfare creed, as preached by most expositors, makes an extremely dull sermon. If however, we could restore the old personal touch, if we could infuse with simplicity our whole system of little boss, big boss, bigger boss, and biggest boss, the problem would be well solved. It can be done. Personality can go all the way down the line, however resistant some individuals may be to its impress. Friendliness is said by some to be undignified and undermining of discipline but, persisted in, it will do much to bring back the natural, unaffected, industrial democracy of early days—and you don't need logarithms and the binomial theory, a chart or a blue-print to put it into operation.

Welfare Work at an Anthracite Colliery

A Man's Efficiency Is Affected by His Surroundings—Anything That Fosters Contentment Among Employees Aids the Coal Company—Much Work Has Therefore Been Done Along Welfare Lines

By Dever C. Ashmead
Tarrytown, N. Y.

UNFORTUNATELY the coal mining company that has adopted the welfare measures here depicted is too modest and retiring to permit me to use its name. It is possible, however, that some readers may recognize the plant in question from the description given and the photographs presented.

This company has been studying welfare work and putting into operation the results of this study for more than 18 years. It has not gone into this for the pure sake of welfare, the primary purpose of its existence being of course to mine coal. The fact that a coal mine is naturally in an isolated community, however, of necessity means that something must be done for the employees in order that the best results may be obtained both for the men themselves and for the company.

Good Working Conditions Make Good Workmen

Anything within reason that improves the working and the living conditions of the men is to the advntage of the company. Good working conditions make the men better satisfied while at work, and therefore afford them less opportunity to grumble, while better living conditions have a tendency to keep the men at home during the evenings. This means that there is less chance for the talking over of imaginary complaints which are naturally magnified in discussion.

Too much work without a proper amount of enjoyment is also bad for the men and their families. Some play properly organized makes much better workmen and gives them something to think of and to discuss other than themselves or their work. This recreation is not only necessary for the men but also for their wives and other women folks. Dissatisfied home life has a bad reaction upon any human being and therefore interferes with his work.

Not only do the grownups need recreation, good living and working conditions but the future miner and his wife (the children of the present miners) need these much more than do their parents. Furthermore they need the education to raise them to a higher plane of living and to so train their minds that they can understand economic conditions. Thus their relations with this company or some other when they will go to work will be on a higher plane than that of their fathers.

The first point to consider is therefore how this company provides for the children. From the child the man is made and as the child is so the man is apt to be.

Through the school the child can be reached much better than through the home and through the child the home and its conditions can be improved. The better method is to have the best in the school that can be procured.

The company does not contribute anything in cash to the maintenance of the school, its upkeep or its operation, but it does contribute a large amount in services and advice Through a personal arrangement with the township board of education the president of the coal company selects the teachers and the very best teachers that can be secured at the stipulated salary are obtained. The township in which this colliery is located is probably the most liberal in the state in the matter of salaries.

As the teachers are so will be the children, for by their example the children are influenced. The teachers are much more important than the environment. Much more is expected from these teachers than from the ordinary pedagogue and they are as a rule much more efficient. The one main attribute that the president of the coal company particularly insists on is a high moral view point. Not only must they have a high moral view point but they must be efficient, know their subjects thoroughly, be able to enforce discipline and still be pleasant. In other words they must be as near perfect as possible and from my talks with them and after seeing their work I believe that they fit the conditions almost perfectly.

Next to the teachers comes the environment. It is possible with the aid of a good teacher for a child to acquire an education in dirty unattractive school rooms, but with an attractive environment and a good teacher also much better results can be obtained. The first step in providing the proper setting for a school is the location, next the attractiveness of the building and lastly the interior arrangements. These latter are probably the most important of all.

The school at this colliery is built on a side hill. On the up-hill side the second floor comes to about the level of the street. That is the reason only two stories can be seen whereas there are actually three stories. In the basement (which is really no basement at all but so called because the main entrance is on the second floor) there are four rooms. One room is the class room for the third and fourth grades, another is the study hall for the fifth, sixth, seventh, and eighth grades and the other two are recitation rooms for the pupils of these grades.

On the main floor of the building there are only two rooms, one the kindergarten and the other the first and second grades. The latest up-to-date methods are employed in the kindergarten and the two teachers in charge are graduates of an excellent Chicago school for this type of instruction. There are 38 pupils in this class between 4 and 6 years old and they have the very best of equipment. In the first and second grade room the same system is used as in the kindergarten and in the afternoon a connecting class is conducted for the older pupils in the kindergarten to prepare them for their promotion to the first grade. The kindergarten is used to spread interest among the parents and get them interested in the school and the children.

Much that is somewhat out of the ordinary is done for the pupils of this school. Emphasis is laid upon the standard subjects and much more attention is given to fundamentals than to such subjects as drawing, music and elocution, although these are taught according to the state law.

Modern methods are exclusively employed at this school. Thus geography is taught by lantern slides. The two higher grades, the seventh and eighth, use the *Literary Digest* for the study of current events. Every week some of the officers of the coal company give talks to the pupils in the higher grades and pay particular attention to economic subjects. A small but well selected library is furnished for the use of the pupils, and their reading is directed as much as possible by the teacher.

MODERN EQUIPMENT USED AT THE PLANT

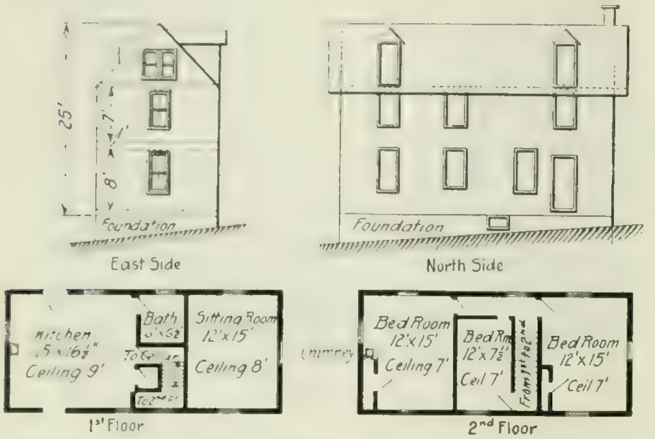
The pupils are taught, by daily practice punctuality, regularity, discipline, and thoroughness. Good records are emphasized. Prizes are given for attendance and for high standing and the great desire to secure these prizes and to get their names on the honor roll aids in securing the high standard desired.

Besides the school studies, pleasure and recreation is furnished the children. Every evening the kindergarten room is open and two teachers are in attendance who start the children playing games and see that they are conducted properly. Besides this playtime for the children there are two sewing classes for the girls, a boys' club, a girls' gymnasium class, a girls' glee club, a once-a-week story hour and a nature study class. In the spring, summer and fall the open air playground which is well equipped is open to the children. The school is now arranging to open a woodworking department in the basement in order to give the older boys manual training.

There are 130 pupils in this school in charge of seven teachers. The average pupil has a higher average standing than the average attained in other schools in the same district. And since this is one of the best districts in the state it follows that the average of the pupils is quite high.

ONE HUNDRED AND THIRTY PUPILS IN THIS SCHOOL ARE IN CHARGE OF SEVEN TEACHERS

Probably the feature of community life second in importance to the school is the community club. This is open to all adults for it deals with the mothers particularly, but is commencing to get the fathers interested. The meetings of this club are held on the top floor of the school house in a room attractively decorated and furnished with large wicker chairs, two large library tables, a piano, a circulating library of about 400 volumes and copies of the current magazines. This community club has 80 members at the present time and is growing rapidly. Meetings are held every two weeks and if those present have the "feed" on every occasion that I heard ordered over the 'phone for the meeting held the twentieth of January (6 gal. ice cream, 5 turkeys, etc.) I should think the whole town would join.



A WELL-DESIGNED ONE-FAMILY HOUSE

As every one will agree a healthy community is usually an industrious one. Proceeding on this assumption the company has engaged a trained nurse to safeguard general health. Every afternoon at 3:30 the nurse and doctor are at the hospital at the top of the manway and conduct a dispensary for minor injuries that the miners may have received during the day. Small cuts are cleaned and treated and as a result there is comparatively little trouble arising from infection at this plant, therefore little time is lost on account of minor injuries. Every pupil at the school is carefully examined once a year. During the day the nurse visits the homes of the miners, tends to all cases of sickness and gives instructions to the mothers concerning the care of their children and the general health of the community.

There is a well equipped dispensary and dental office in one end of the school building where the nurse gives attention to the needs of the school children and to the women of the community. The nurse's living quarters are in connection with the dispensary, so she can be reached at any time in case of emergency. The men are taken care of at the mine hospital at the top of the man shaft as described in the previous paragraph.

The company has built an excellent wash house, as may be seen in the photo. This is constructed of brick and is four stories high. The first two are used for a wash house and the upper two for other purposes. The showers are arranged along the long side of the room and lockers are provided for the use of the men. There are in all 15 showers and lockers provided for 362 persons. This wash house permits the men to go home clean and therefore relieves the women of much unnecessary work.

An excellent club house has been provided for the men and although the building is old it still serves its purpose. The company, however, is not satisfied with it and will start construction in the spring on a new club house and the old one will be turned into an amusement hall. Membership in the club is open to all the men and boys in the community. The new club house is to be large but not elaborate. There will be a spacious lounging room and dancing floor 40 x 70 ft., a kitchen, library, and reading room on the first floor; on the second floor there will be a 40 x 100 ft. basketball court. In the basement there will be the pool tables, bowling alleys, shower baths, etc. When the old club house is turned into a permanent hall it will be used for moving picture shows, plays and entertainments of various kinds exclusively.

Next to the treatment and working conditions accorded the men at the mines the store that supplies the necessities of life probably affects their feeling of satisfaction or dissatisfaction more than any other one element. If expenses are high it means wages are low. A certain rate of wage may be satisfactory or not depending on the cost of living. This coal company has adopted the principle that it is mining coal, not operating retail stores, and that its profits should come from the sale of coal, not from the sale of merchandise. The store is only an accommodation for the men, not a thing of profit for the company.

As a result of this decision and realizing the effect on the miner of unnecessarily high prices the coal company organized the store on a co-operative basis. The prices charged are so fixed that they conform as nearly as possible to the average for that section of the country. At the end of every six months the profits are calculated and a dividend declared which is paid to the miners according to the size of their purchases for the preceding half year. If a miner leaves before the six months period is up he forfeits his right to a dividend on the profits and his share is put in the general fund for

AN EXCELLENT WASH HOUSE HAS BEEN BUILT

division among the balance of the miners. A newcomer to the community is treated the same as a customer who has been there the full period and receives the same percentage on his purchases. This system encourages the men to stay at the mines so that they will not lose their dividends. This store has 1,200 accounts at a mine employing 500 men.

The store itself is well equipped and is divided into separate and distinct departments, such as shoes, dry goods, groceries, hardware, furniture, and butcher shop. The butcher shop is exceedingly sanitary in its equipment. The ice box is fitted with a refrigerating machine. Large and well equipped storerooms permit the purchase of stock in large quantities, thus allowing the store to take advantage of special prices. The store employs seven persons to attend to the wants of customers and operates two delivery wagons.

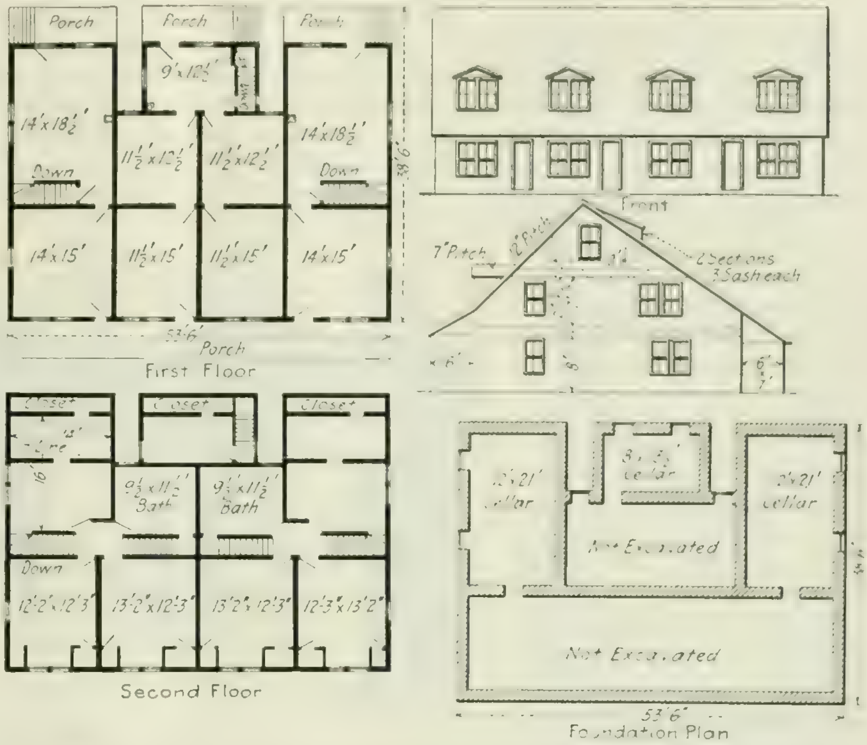
In this community as in most others throughout the country there are a number of under-nourished children, and since the children make the future race, everything possible should be done to better their health. As it is extremely difficult because of the character of the country to have a dairy, the company is making arrangements to install a milk making machine. This takes milk powder, and adds water and butterfat and produces a good milk, enough of which will be made to let every child have all that he or she needs.

As a number of the miners own homes in other districts they have to travel back and forth on the trolley line. The miners' wives also sometimes desire to go to town and it is necessary for them also to use the trolley. This is over a mile from the camp, so the company has established automobile service between the camp and the car line.

As has been above explained, excellent working conditions are provided for the men, satisfactory store arrangements are made, entertainment is provided, their children are furnished with an excellent grammar school education, their health and that of their families taken care of, but this all means little if home conditions are not good. The men are in the mines only eight hours a day, but they are in or in touch with their homes sixteen hours a day. A dirty, nasty home either outside or inside does not make satisfactory surroundings.

Unkempt home surroundings not only affect a man's feeling through the eyesight but they make the wife careless, shiftless, grouchy, the children cross and ugly and the husband disgusted with everything. The company has realized this and is building new and attractive houses. These are of two types, one, a one-family house and the other built for either one, two or three families, depending on the size of the family or families. This latter house is rather unique in its interior design. If this building is to be used for a three family house it is arranged exactly as shown. The center outside door opens into an apartment of five rooms, while the bath room for this apartment is on the second floor over the kitchen.

The two extreme outside doors open into separate houses having two rooms each on the lower floor, with a stairway to the second floor, and there are four rooms for each of the side houses. The two middle rooms are directly over the apartment on the first story. If the family is too large for one of these apartments the wall between the two front rooms on the lower floor between either end apartment and the center apartment is removed. This makes this into one large room and adds three rooms to the apartment. If the number of rooms is still too small for an exceedingly large family a door is cut in the corresponding wall to that which was removed between the first two named apartments. This throws all the rooms in the entire house together.



MUCH CARE WAS GIVEN THE DESIGN OF THIS THREE FAMILY HOUSE

On p. 384 is shown the plan of the single family house. Ordinarily the third floor is unfinished, but if the family is large enough the company finishes the top floor. In the design of all its houses the company insists on a large kitchen, since the ordinary foreigner makes this his living and dining room. The ordinary parlor is usually shut up for state occasions. The company charges a reasonable rent for all its houses, at the rate of $1 per room per month.

The company goes on the principle that, give a man something to live up to and he will do it. The miners after they move into these interesting houses take considerable pride in them and soon a better grade of furniture arrives and not only is the house itself more attractive but the furnishings improve also.

Besides doing all that has been described for its employees and their families the company goes a step further in its dealings with the men. It is giving them the best possible working conditions, good air, clean mine roads, rapid hoisting, timber promptly supplied and no delay. The company takes away the excuse for not working. It endeavors to make the men like the mine and their work. Previously the men lost much time. Men do not ordinarily leave the employ of the company, but remain with it for sometime.

Some Advantages In Establishing Demonstration Coal Mines*

Experimental Mines Established in Various Coal Fields Would Do Much to Advance Mining Practice. Many Costly and Intricate Problems Influencing Safety and Production Could be Experimentally Determined by Them

By J. J. Rutledge†
McAlester, Okla.

At Bruceton, Pa., the U. S. Bureau of Mines established in 1909, an experimental mine, for the purpose of testing the means available for preventing and limiting the force of mine explosions. During the last ten years numerous explosions have been caused to originate in this mine for investigative purposes and the rate of propagation of the explosion wave, the pressure developed per unit of area by the explosions, and the general results of the explosions have been carefully studied and recorded. Means of preventing mine explosions or of limiting them to the area in which they originate have been developed. Much valuable information has been derived from the work in this mine and much more useful and valuable data will be obtained in the future. I would plead, not for the opening of experimental mines in all the important coal-producing fields in the United States, but for the opening of demonstration mines, or mines in which experiments could be made upon the various details of coal mining.

IF WE HAVE THIS

The U. S. Department of Agriculture has established, in nearly every state, stations that undertake experimental work for the benefit of agricultural interests. In addition, small demonstration plots are set aside, in suitable locations throughout the farming districts, where various crops are grown under scientific direction so that the farmers in the neighborhood can note the results obtained and profit thereby. Something of a similar nature should be done for the coal-mining industry. If experimental or demonstration mines were established, methods of operation adapted to local conditions could be worked out.

Small Capitalization Makes New Methods Impossible

Owing to competition, small capitalization, or low profits, it may be an utter impossibility for any one company to try a new method of mining. Labor conditions may prevent the trial of a new method of working. It may be impossible or inadvisable to disturb existing working conditions for fear of causing trouble among the miners through real or fancied changes in the scale of wages.

The first and most important investigation to be undertaken in these demonstration mines would be the trial of various methods of working until a satisfactory plan had been demonstrated for each particular district. It would doubtless be necessary to carry on the work for several years before an acceptable method of working was evolved. The various details of mining associated with such a method could then be experimented with and the best methods demonstrated.

If a certain method or plan of working had been shown to be the safest and most efficient, public opinion would force coal operators to adopt it and, if they did not do so voluntarily, public opinion would furnish moral support to the operators in overcoming any opposition that the miners or other employees might manifest toward the installation of the new and better procedure.

If a new method was found to be safer and more economical than the one in use, the authority of the state could be invoked to support any operator who desired to adopt it. Few coal-mine operators would dare run counter to public opinion even were they to ignore the financial benefits to be derived from the adoption of the new plan. Compensation insurance companies, through their mine inspectors, would give credit to those operations that adopted the new methods, with the result that their liability insurance would be materially reduced in cost.

It is well known that coal miners flock to new mines and new camps, where the housing and living conditions are as a rule better than in the older camps, and the miner's working conditions underground can be made satisfactory from the inception of mining operations.

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*Paper presented before the February meeting of the American Institute of Mining Engineers. Published by permission of the Director, U. S. Bureau of Mines.

†Mining Engineer, U. S. Bureau of Mines.

A new and better method of mining would not compel the miner to walk long distances to his working place, through poorly brushed haulageways or manways—perhaps up and down steeply pitching seams.

The new plant would take him to his working place, either by means of a safety car or a mantrip, or by a short walk through well-brushed roadways or manways, with a minimum amount of exertion. He would then be in condition to perform a good day's work, as he would not be tired by his long journey. The ventilation, also would be such that the employees would be able to do a good day's work. The operator who adopted the new plan would have his choice of the miners and their work would be efficient.

It seems strange that coal operators will expend large sums of money for improved mining machinery and fail to make conditions, both under and above ground, such that the employees will be able to perform efficient labor. It is time that technical skill was employed in the underground workings of coal mines to something like the extent to which it has been employed in planning and equipping the surface plant. The most costly surface plant will be useless unless commensurate engineering skill is employed to develop and maintain the underground workings.

WHY NOT THIS?

Most Companies Are of Small Capitalization

No mine can long operate unless a profit is made. Generally speaking, coal-mining companies are of relatively small capitalization and must have an immediate return on the investment—there can be no long wait for dividends, as there is in some other lines of business, No mining company can afford to abandon old prevailing methods and try out new ones, no matter how promising, for fear that the new methods will prove to be unsuccessful and no dividends will accrue. Again, owing perhaps to close competition, one or more of the mining companies may not be on good terms with the other coal producers in the same field, and hence may hesitate to try out a method of working that may prove to be successful and that eventually will be adopted by the competitor, who will reap the benefits of the new method without having expended either time or money in trying it out.

A demonstration mine, on the other hand, operated under government supervision, supported by government funds—perhaps augmented by financial support from the coal operators of the vicinity—can try out various methods of mining and by experiment find which ones are best adapted to the field. In this way, each method of working would be given an impartial trial under disinterested engineers and miners, whose only purpose would be to learn what plan of working was best suited to the region; coal-mining men, including miners with a practical working knowledge of improved methods of working as carried out in other fields, could be used as a supervisory consulting board. Each person on the board would have a voice in determining the plan adopted and in putting it into execution.

Demonstration Mines Would Be Untrammeled

Since such a mine would be under government supervision and the sole purpose for its operation would be safety and efficiency, it would probably be free from some of the onerous working conditions frequently incorporated in the wage agreements of some of the coal fields. The actual true working efficiency of man and machine could be ascertained without the result being subject to either doubt or criticism. If results of value were secured, the entire coal-mining industry in the field where the demonstration mine was located would profit thereby, since the information would be free to all. In like manner, if negative results were obtained the entire coal field would be informed so that commercial producers would not try a plan already proved defective.

Inquiries among coal operators in various fields seem to indicate that they would support such demonstration mines both morally and financially. Indeed, it is believed that were such mines to lack financial support from the government, the various mining companies in their neighborhood, who would be most interested in the results obtained, could be persuaded to furnish the funds necessary to carry out the desired experimental work, the amount necessary being raised by a voluntary assessment on each firm interested. There would be some revenue from the coal produced in the demonstration mine so that some of the money advanced would be returned to those companies that subscribed to the fund. The coal mined would probably be of such grade and quality that it would bring a good price since it would be produced under careful supervision.

Since coal beds differ in character and the same seam may greatly change its nature within the distance of a mile or so, and, moreover, since the nature of the roof or bottom may, and many times does, change within a very short distance so that a method of operation successfully followed in one mine may not be at all adapted to the conditions found in a mine a mile distant, it is, in many cases, necessary to develop plans of working suitable for each particular district.

Various methods of mining can be tried out to ascertain whether or not they are adapted to the conditions in the field where they are tried. If the work in the demonstration mine proves successful, from both an engineering and a business standpoint, the methods can, and doubtless will, be adopted by the other mines in the field where the demonstration mine is located.

Among some of the experiments that could be tried are the following:

Some satisfactory means for preventing the slacking of mine roof during the summer, by the use of gunite or some other form of protective coating.

By experiment find what method of mining is best suited to the field: If pillar and room, whether double entry, entry and air course, or panel system; best width of rooms and pillars; most economical depth of rooms, most satisfactory width and length of room necks, rooms turned off entries at right or at acute angles, or concentrated workings. If longwall, whether advancing or retreating. If advancing, whether Scotch or 45° system, or face track; by hand mining or by machine. If retreating, angle face or straight face, conveyor or face track.

A suitable method of timbering entries and air courses; details of longwall advancing, determination by experiment of the angle of break for machine and hand mining and distance between the lines of break in both methods, and the amount of subsidence.

Best methods of timbering roadways and airways in any special coal field; control of squeezes; best methods of causing roof to break; suitable means for combating bottom heaving; proper explosives; most satisfactory mining machines; method for reducing the depreciation of mining properties; improved methods of haulage; better ventilation systems; generation and distribution of power, especially electricity; most efficient pumping arrangements; safer shotfiring methods; mechanical loaders; underground dragline systems for loading coal into mine cars.

Military Engineers' Society Is Being Organized

Association of Technical Men With Service In Any Branch of Army, is Approved by Chief of Staff

A NATIONAL association of present and former officers of engineers and civilian engineers who have served in any arm or branch of the U. S. Army—Engineers, Ordnance, Signal Corps, Infantry, Cavalry, Artillery, etc.—to be called the Society of American Military Engineers, is being organized by a committee in Washington appointed by the Chief of Engineers. The society's objects are to promote the science of military engineering and to foster the co-operation of all arms and branches of the service, and of civilian engineers, in that science. The objects and a provisional constitution of the society have been approved by the Chief of Staff.

A board of engineers was appointed Nov. 1, 1919, by the Chief of Engineers, to consider and report on the feasibility of a technical organization of officers and civilian engineers experienced or interested in military engineering. At the same time the Chief of Engineers required a letter-ballot for or against such an organization from all Corps of Engineers—officers and temporary engineer officers then in the service. The vote was overwhelmingly in favor of the proposed society.

The board then resolved itself into a committee on organization. Its members are: Colonels F. V. Abbott, Charles Keller, and G. A. Youngberg; Majors George B. Pillsbury, George R. Spalding, P. F. Bond, Max C. Tyler, John C. Kingman, and David McCoach, and Captain Douglas L. Weart.

Following a canvass of representative opinions which showed reserve officers and others who had been in the engineering service during the war to be strongly favorable to such an organization, the committee drafted a provisional constitution and created a temporary board of directors from its membership. This constitution is already being submitted for approval or comment to individuals who are known to be interested in the organization and eligible to membership; its more important features follow:

The annually elective officers are to be a president and first and second vice-presidents. The president is to be an officer of the Corps of Engineers on the active list. There is to be a secretary, an editor and a treasurer chosen by an executive committee, the first two from the regular army. A board of directors, to have eighteen members, is to be elected by the three divisions of active membership, as follows: six by the regular army; six by the National Guard and reserve forces, and six from the membership exclusive of the foregoing two groups. There is to be an executive committee consisting of the president, the two vice-presidents and not to exceed three others to be elected annually by the board of directors from its own members. Other standing committees are: Rules and ethics; auditing; finance; membership, nominations and necrology; service relations and military policies.

The annual meeting is to be held in Washington, and its date is fixed with reference to that of the American Society of Civil Engineers in order to make possible attendance of members at both meetings. The dues are fixed not to exceed $5 per per year, those for the present year being $4.50.

The Society is to publish bi-monthly a journal to be called "The Military Engineer," which will supplant "Professional Memoirs" heretofore published by the Corps of Engineers.

Further information regarding the society may be secured from Col. G. A. Youngberg, Office, Chief of Engineers, U. S. Army, Washington, D. C.

Monongahela River Great Carrier of Coal

The value of the Monongahela River as a transportation medium for the Pittsburgh district of Pennsylvania is evidenced by figures made public recently by the U. S. Engineers' Office. It was shown that, starting in 1898, when the Government took over the locks and dams in the river, the coal tonnage carried on the Monongahela has increased from a little less than 6,000,000 tons a year to more than 14,000,000 tons in 1919. An average of more than 1,000,000 tons a month are transported on the river and locked through the dams of the stream.

In addition to the coal tonnage carried, during the past year (1919), 3,000,000 tons of building material were carried by boat to points along the river. The coal tonnage record, it is said, would have been 1,000,000 tons greater last year had it not been for the coal strike which sadly interferred with production during the latter part of the year and also because the ice in December held up traffic to a marked degree.

Planning A Mine So As To Secure Maximum Recovery*

By W. B. Riggleman† and Evan L. Griffiths‡
Clarksburg, W. Va.

RECOVERY of coal is an important problem, and before any coal property is developed it should be surveyed, mapped and the entire property projected, and all haulage entries laid off to the best advantage.

This does not mean that every entry driven in the property is to be projected when the operation is first opened, but it does mean that the general plan of the mine must be worked out and definitely adopted. To project mines so as to insure the greatest possible recovery from property, there are several considerations that must be carefully weighed. Among these are: The location of mine, haulage, drainage, actual method of working, and others. The first proposition is to locate the opening and next the main entries, face entries and butt entries, provided these passages are to be driven on the faces and butts of coal. This is customary in the Pittsburgh bed, particularly in the northern section of West Virginia.

In order to secure a high percentage of recovery it is necessary to develop the mine upon a carefully planned projection or as nearly so as circumstances will permit. The nature and depth of the coal as well as the quality or tenacity of the roof and floor must be taken into consideration in deciding on the mine layout or projection.

Main entries are laid off and the face entries turned from the mains at regular intervals. From the face entries, butt entries are turned at the proper places, depending upon the length of the rooms. It is generally the practice in opening coal mines to prosecute development as soon as the main entries are started since this will allow some coal to be produced. This procedure invariably causes a mine to be worked in an improper manner and almost always gives trouble in the end. I have always found that it is the best policy to leave from 200 to 300 ft. of barrier pillar on each side of the main entries and from 150 to 200 ft. barrier pillars on each side of the face entries. Some may argue that it is unnecessary to leave a 200 to 300 ft. barrier pillar on each side of main entries, but after a mine is fully developed and main entry pillars are being drawn one can readily see where this coal would be highly advantageous to the mine.

Large Entry Pillars Give Good Finish

It would simply mean driving rooms both ways from the main entries when the entry pillars are being drawn. This would allow the output to be kept up until the entire property was worked out.

Face entries should be turned off the main entries at intervals of 1,200 to 1,800 ft., depending on the area to be worked. Some may contend that the distance should be increased to 2,000 ft., and indeed there are a number of arguments in favor of this system, especially in a bed that dips 1½ to 3 per cent. Pillars should be started at the top of a butt entry with two to three butt entries to a panel. Rooms should never be driven until the pillars can be removed as soon as the rooms are completed.

This, of course, applies to mines where good mining rights were obtained when the coal was purchased; otherwise there would be no necessity of driving entries to their limit and driving top rooms first.

Assuming that good mining rights have been purchased, I would recommend driving room entries to their limit, then at least the top seven or eight rooms should be started and finished. When these rooms have been driven out pillars should be drawn immediately and stepped off so as to be on an angle of approximately 45 degrees. This also applies to advancing rooms on the entry as they should advance on the same angle. It is good policy to have at least two butt entries and possibly three in a panel and have the work handled in such a way as to allow no rooms to be driven until the drawing of pillars can be started. This can be done if proper attention is exercised. The room centers, of course depend considerably on the amount of cover over the coal, but where the cover is not too heavy 60 ft. centers can be worked.

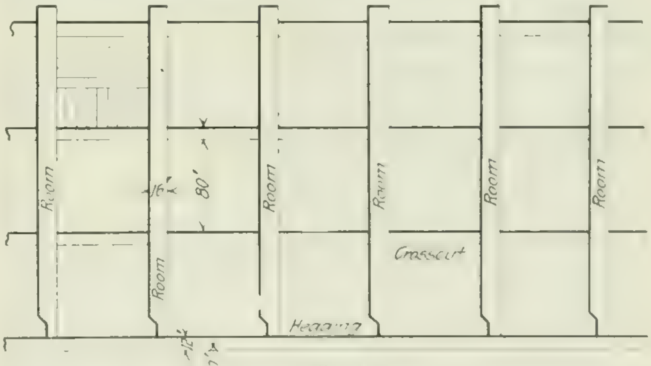

FIG. 1. RELATION OF PILLARS AND ROOMS AND A METHOD OF ROBBING ROOMS

Sixty-foot room centers can be worked to good advantage in the Pittsburg bed where cover does not exceed 250 or possibly 300 ft. Of course, trouble will be encountered if pillars are not properly stepped while removing the coal.

Where the cover runs from 250 to 500 ft. or even 600 ft., I would recommend that the block system of mining be used. This means that entries would be driven in the usual way, on say 35 or 40 ft. centers.

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*Paper presented before the West Virginia Coal Mining Institute, Huntington meeting, December, 1919.
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‡Inspector Third District, Clarksburg, W. Va.

and rooms turned off every 90 ft. Cross cuts should be driven between rooms so as to make a block of coal 80 ft. square. The rooms are driven in the usual manner and when their limit is reached the pillars are removed.

It is customary to remove the pillars from two different points, one place being driven through the pillar from the room and one driven through the pillar from the cross cut. It is customary in working the block system of mining in the Fairmont field to drive rooms on 96 ft. centers with rooms 18 ft. wide and cross cuts 13 ft. wide.

When a system of this kind is followed there is little likelihood of a squeeze since the large blocks of coal will practically prohibit it. In fact if pillars are properly lined and not too many rooms opened in advance of the pillar work, there is absolutely no chance of a squeeze taking place.

The above system has been tried out extensively in the Fairmont field during the past five years and in a large number of mines it is being worked satisfactorily, especially in mines where the cover over the coal is extra heavy. It would be practically impossible to mine the coal and obtain a good recovery in some operations if the block system of mining had not been adopted. This is because of the fact that otherwise there would be considerable coal lost on account of squeezes.

The block system of mining affords considerable machine coal, as practically all the output can be undercut with machines, except small stumps that are removed by pick work. I do not mean to say that we could not mine coal in a number of mines in the Fairmont field without the block system, but it has been found that better results are obtained with this system in the deeper mines.

Of course no system will afford a good recovery unless it is given careful attention and worked properly. What is meant by careful attention is seeing that entries and rooms are driven on points and that these openings together with cross cuts are driven the proper width. Furthermore, when pillar work has been started it should not be stopped nor the pillars allowed to get too close to each other.

It has been said that 90 per cent is a fair recovery in the Pittsburgh bed. This is indeed a high figure and to obtain this percentage of coal requires that a mine be operated on a first-class system.

Improper Methods Cause Great Loss

The loss, most of the coal not removed from mines, arises from improper methods of working which invariably cause squeezes. It is indeed unfortunate to lose coal in a mine from a squeeze since such settlements can be eliminated if a mine is laid out and worked in a proper manner.

We are convinced that in order to obtain the greatest percentage of recovery from any property it is necessary to lay out the mine as suggested above, deciding on the thickness of barrier pillars, and working according to projections. A large number of mines are cut up badly because projections were continually changed.

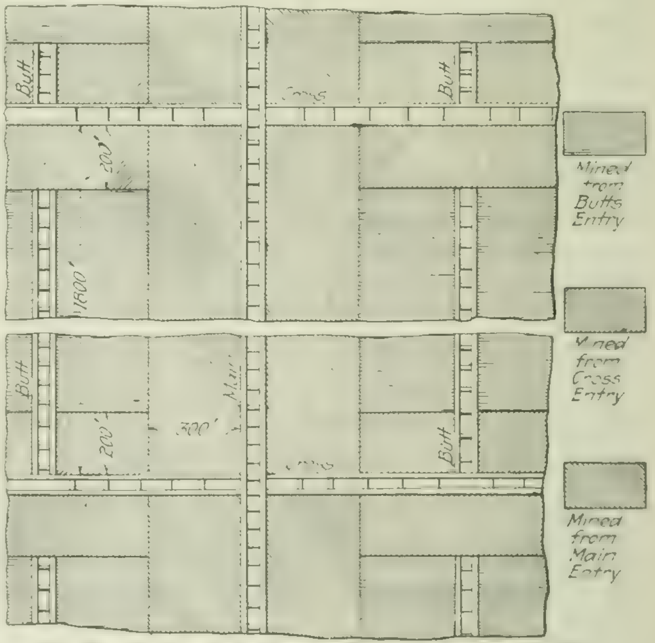
The best idea is to decide on a definite plan and see that the projections are followed unless something unforeseen develops which, of course, would necessitate making changes. Many projections are changed unnecessarily.

In some sections pillars cannot be removed on account of roof conditions. This of course could not be taken into consideration in recovery of coal, as high recovery can hardly be expected where the full bed cannot be removed.

Leaving Blocks of Coal Around Oil or Gas Wells Makes Recovery Difficult

There are again a large number of mines where coal is worked and according to leases (or deeds) conveying the coal the surface cannot be broken. This indeed is unfortunate, but in some cases pillars are required to be left for protection of surface upon which houses or other buildings have been constructed. There is also considerable coal left around oil and gas wells, especially in the Fairmont field. This aggregates a large amount but is necessary in order to properly protect the mines. The leaving of blocks of coal around various oil and gas wells is dangerous, since a block of coal as much as 200 ft. square may be required in a section of pillars. When pillars are approaching a block of coal of this kind it always gives considerable trouble and interferes with recovery.

The roof and bottom conditions in coal mines vary considerably and this always has much bearing on the size of pillars to be left. The smaller beds which are worked more extensively in the southern part of the state have a good roof, one in fact that is much better than the roof over the Pittsburg bed of coal in the Fairmont field. The recovery per acre in the thinner seams such as the Sewell, Welch, Fire Creek, Pocahontas, etc., should be excellent, provided the mines are laid off on a proper plan. It is almost always found, however, that the pillar work in a low seam is allowed to get behind and pillars are not drawn at the proper time.



No attempt is made to show [illegible] on Haulage Roads

FIG. 2. SHOWING THE AMOUNT OF COAL TO BE REMOVED BY VARIOUS METHODS

To recover a good percentage of coal in any bed requires that a mine be laid off on a good plan and that sufficient pillars be left so that pillar sections can be started where desired.

It has been noted in a large number of operations that entries and rooms have been driven after a plan that calls for the removal of pillars some time in the future. This may be satisfactory but will never allow a good recovery of coal, especially where the proper size of barrier pillars have been left. Pillar strength should be figured to carry its own burden plus the weight that will be added as the adjacent pillars are removed in their regular turn.

The size of pillars must naturally depend upon the nature of the material, since soft coals are more liable to chip or split off, weakening the pillar. When the bottom and roof are of different character, the pressure on the pillars will show by their being forced into the softer of the two materials.

Pressure and Stress Increase With Bed Depth

In laying off a mine preparatory to development it is well to remember that the pressure, as well as the stress on the pillars, increases with the depth of the bed below the surface. The basis for estimating the size of pillars that may be safe with 500 ft. cover will not apply where the cover is 1,000 ft., neither does the same ratio hold good at 1,500 feet.

No mention has been made concerning timbering in connection with recovery of coal, but it is understood that timbering is a separate consideration, since practically all mines require a different rule for supporting the roof in working places. It is advantageous to determine a plan for timbering in each mine and follow this out with no change whatever. This means that timber will be set in all working places in accordance with a regular system, regardless of whether or not it is actually necessary, and that the same method of timbering will be carried out all over a mine. In some places timbering will be done where it is not necessary, but this will, of course, give assurance that adequate timbering will be done where needed.

In conclusion it should be stated that in order to recover a fair percentage of the coal from any property the mine should be laid out on a good plan, leaving sufficient barrier pillars and driving rooms in sections so that the pillars can be removed immediately after the rooms are finished. In no case can a good recovery percentage be realized unless some such plan is followed.

Plant at Lynch, Ky., Is Rapidly Nearing Completion

THESE are busy days at Lynch, Ky.,—the scene of the latest of the United States Coal & Coke Co.'s operations. Construction on the plant buildings and the town itself is going forward at a pace that suggests the thought that some active dynamic force is overseeing each individual operation. Activity is manifest everywhere. In fact, the scene with its army of workers recalls similar ones in France in the spring and summer of 1918 when army base hospitals and concentration camps were springing up over night. Locomotives are busy switching to and fro; in the quarries on the hillsides, the sound of exploding dynamite is heard; steamshovels take a fitting place in the general arrangement, while no less workmanlike is the sound of the riveter's hammer and the buzz of the saw.

The latter part of 1917 witnessed the initial step in the transformation of this Kentucky wilderness. Some day in the early future Pullman porters will announce Lynch as one of the few stops on the direct line to Louisville or Cincinnati, for Lynch is destined to become a city just as surely as "hoe-cake" is found on the menu cards as soon as the Mason & Dixon line is left to the northward.

Eleven drift entrances are already well advanced. These are located on either hillside with the town lying in the valley. Already 7,000 tons of coal passes over the tipple daily. All of the development work is at present confined to one bed. This is the "C" of the Pottsville Conglomerate Series, known in other localities as the Roda or Elkhorn. Nearly 45,000 acres of coal will eventually be developed of which it is planned to load the tonnage from 20,000 acres over one tipple at the rate of 10,000 tons daily. And even this remarkable figure will be by no means hard to attain, for the tipple has been designed to accommodate a daily output of 18,000 tons if necessary. This is truly a marvelous capacity when a comparison is made with the 3,000- and 4,000-ton capacity plants of the present or even with some of the larger Illinois mines where large tonnage is accepted as a matter of course.

Each year the coal industry points with particular pride to some individual mine with a large output and immediately the conclusion is reached that here is the limit. Yet who shall say that Lynch is to be the last word in highly concentrated mining methods when rotary dumps and the skip method of hoisting are still in their infancy, to say nothing of the possibilities of belt conveying from the working face?

From present indications it will be next fall before the plant buildings will have all been completed. One has to be in Lynch today to appreciate the vast amount of work that has been done in a relatively short space of time. The tipple, a square building of reinforced concrete and native stone construction, is equipped throughout with electrically operated shaker screens, picking tables and loading booms. However, most of the coal that will be loaded will be mine-run, for it eventually is to be coked in the byproduct ovens of the United States Steel Corporation.

The power house is of the same type of construction as the tipple and contains three Stirling boilers with an aggregate horsepower of 2,200. The steam is superheated 100 deg. and carried at a pressure of 200 lb. per square inch. Two 1,500 kw. steam turbine driven General Electric, alternating current generators will produce 6,600 volts. Three concrete substations have been constructed underground where General Electric rotary converters will produce the direct current at 250 volts after it has been stepped down by transformers. From the power plant the high-tension lines are carried underground by conduit.

The machine shop is of steel and wire glass construction which gives an admirable natural lighting effect. It will be electrically equipped throughout.

The scheme of developing the mines is purely a United States Coal & Coke Co. idea. This is a subject in itself and will not be taken up until such a time as the surface buildings have been completed and *Coal Age* is able to offer to its readers a more detailed description of the operation at Lynch. Half of the pillars are robbed advancing and the remainder in retreat. The haulage roads are solidly built and in such a manner as to guarantee a maximum of use. All room entries are double tracked and locomotives place the cars at the room necks. Much needless switching is thus avoided and considerable time saved. The thickness of the bed is expected to average 5½ ft. throughout the tract.

Low-Temperature Carbonization of Coal*

By S. W. Parr† and T. E. Layng‡
Urbana, Ill.

THE low-temperature carbonization of coal involves the carrying out of the coking process under conditions wherein neither the coal mass nor any of the passageways through which the volatile products pass are heated above 700° or 800° C. (1,252° to 1,472° F.). For convenience in this discussion, the single number 750° C. (1,382° F.) will be used to designate the maximum range. This temperature is not selected arbitrarily; it is the result of certain natural conditions that are inherent in the substances involved. Two of these conditions are sufficiently pronounced to suggest a line of demarcation at this point, and are as follows: (1) Below 750° C. all the heavy hydrocarbons are expelled, which means that, at lower temperatures, the illuminants, the gases of high calorific value, and the condensible oils are discharged; above 750° C. there are given off the lean, non-illuminating gases consisting for the most part of hydrogen and marsh gas and having no condensible constituents. (2) Below 750°, there is substantially no secondary decomposition; above 750°, the volatile products are readily decomposed, forming tars, naphthalene, free carbon, etc.

TABLE I. COKE FROM LOW-TEMPERATURE CARBONIZATION

No.	Sample	Moisture, Per Cent.	Ash, Per Cent.	Volatile Matter, Per Cent.	Fixed Carbon, Per Cent.	Sulphur, Per Cent.	Heat Value in B.t.u.
125	Herrin, Williamson Co., Ill ..	0.11	13.48	6.01	80.40	1.89	12,627
128	Harrisburg, Saline Co., Ill....	0.55	10.65	6.15	82.65	1.78	13,154
129	Harrisburg, Saline Co., Ill....	0.25	9.50	11.70	78.55	1.94	13,267
140	Georgetown, Vermilion Co., Ill......................	0.22	15.59	5.02	79.17	1.47	.....
130	Fairmont, W. Va., Pittsburgh Seam, high volatile	0.63	11.11	11.64	76.62	1.17	13,624
131	Fairmont, W. Va., Pittsburgh Seam, high volatile.........	0.61	10.31	5.52	83.36	1.00	13,916
132	Fairmont, W. Va., Pittsburgh Seam, high volatile	0.31	10.03	4.12	85.78	0.90	13,851
135	"Jenner Coal," Somerset Co., Pa., C Prime Seam, low volatile......................	0.29	6.75	3.83	87.69	0.77	14,430
136	"Jenner Coal," Somerset Co., Pa., C Prime Seam, low volatile	0.18	8.00	4.15	87.67	0.75	14,281

It is not intended to maintain that no secondary decompositions occur below 750° C. Many recent studies have demonstrated the practicability, especially in the presence of catalytic substances, of cracking certain of the hydrocarbon compounds; but at these lower temperatures the step is a moderate one, as, for example, from xylene to toluene or from toluene to anthracene. These changes are moderate in amount. Not only do the reactions proceed slowly but the gases are subjected to the decomposing conditions for only a short time. This is evident when it is recalled that at these initial temperatures the decomposition of the coal is rapid and, if anywhere near a neutral pressure is maintained, the movement of the evolved gases is lively and reduces, correspondingly, the time of their retention in the passageways where these milder decomposing conditions exist.

TABLE III. TEMPERATURE READINGS AT CENTER OF MASS

No.	Sample	End of First Hour, Degrees C.	End of Second Hour, Degrees C.	End of Third Hour, Degrees C.	End of Fourth Hour, Degrees C.	Total Time of Carbonization
125	Herrin, Williamson Co., Ill.................	300	420	590	760	4 hr. 30 min.
128	Harrisburg, Saline Co., Ill.................	300	430	660	790	4 hr. 15 min.
129	Harrisburg, Saline Co., Ill.................	275	390	590	770	4 hr. 30 min.
140	Georgetown, Vermilion Co., Ill.............	330	375	580	800	3 hr. 45 min.
130	Fairmont, W. Va., Pittsburgh Seam, high volatile................	330	430	590	750	4 hr. 45 min.
131	Fairmont, W. Va., Pittsburgh Seam, high volatile................	290	390	610	750	4 hr. 45 min.
132	Fairmont, W. Va., Pittsburgh Seam, high volatile................	320	395	550	730	5 hr.
135	"Jenner Coal," Somerset Co., Pa., C Prime Seam, low volatile.............	320	420	505	610	6 hr.
136	"Jenner Coal," Somerset Co., Pa., C Prime Seam, low volatile.............	320	450	570	730	5 hr.

It is acknowledged that the maintenance of these temperature conditions at the present time has only an ideal and not a practical status. Actual operations under these conditions, as an industrial accomplishment, is still in the experimental stage. However, many tendencies and many experimenters, not to say promoters, are working toward this goal and the topic is certain to be

TABLE II. ANALYSIS OF COAL

			Proximate			Ultimate					
No.	Sample	Moisture Per Cent	Volatile Matter, Per Cent	Fixed Carbon, Per Cent	Ash, Per Cent	Sulphur, Per Cent	Hydrogen, Per Cent	Carbon, Per Cent	Nitrogen, Per Cent	Oxygen, Per Cent	Heat Value in B.t.u.
125	Herrin, Williamson Co., Ill.	6.07	33.60	50.23	10.10	2.79	4.74	69.26	1.47	5.78	12,663
128	Harrisburg, Saline Co., Ill.	4.83	35.32	52.87	7.00	2.11	5.01	70.94	1.59	8.52	12,840
129	Harrisburg, Saline Co., Ill.	4.02	35.33	54.31	6.34	2.20	5.1	71.20	1.59	8.55	12,839
140	Georgetown, Vermilion Co., Ill	15.09	32.76	42.65	9.50	1.61	4.18	59.83	1.26	8.53	10,782
130	Fairmont, W. Va., Pittsburgh Seam, high volatile	3.38	35.34	54.01	7.27	1.28	4.94	75.84	1.50	5.59	13,624
131	Fairmont, W. Va., Pittsburgh Seam, high volatile	1.32	35.62	55.78	7.28	1.40	4.73	78.15	1.49	7.03	13,916
132	Fairmont, W. Va., Pittsburgh Seam, high volatile	3.14	35.30	54.41	7.15	1.0	4.88	77.95	1.51	4.37	13,698
135	"Jenner Coal," Somerset Co., Pa., C Prime Seam, low volatile	1.84	15.81	75.55	6.80	0.78	4.10	82.24	1.41	3.83	14,243
136	"Jenner Coal," Somerset Co., Pa., C Prime Seam, low volatile	1.43	16.21	75.61	6.75	0.72	4.21	82.06	1.39	3.44	14,283

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‡Associate in Chemistry, University of Illinois.

TABLE IV. TYPE OF GASES PRODUCED FROM LOW-TEMPERATURE CARBONIZATION

No.	Coal Sample	CO_2	O_2	C_2H_4	C_6H_6	H	CO	CH_4	C_2H_6	N
125	Herrin, Williamson Co., Ill.	5.0	1.1	1.4	1.1	44.1	6.6	38.2	...	2.0
128	Harrisburg, Saline Co., Ill.	4.7	0.7	1.9	1.4	48.1	4.5	33.0	3.1	2.1
129	Harrisburg, Saline Co., Ill.	4.6	0.7	1.6	1.4	47.8	4.7	29.5	4.7	5.0
130	Fairmont, W. Va., high volatile	3.9	0.8	1.5	1.6	47.3	4.3	33.2	4.5	5.0
131	Fairmont, W. Va., high volatile	4.4	0.8	1.7	1.8	44.0	5.1	32.8	5.4	4.0
132	Fairmont, W. Va., high volatile	3.2	0.7	1.3	1.7	37.5	4.8	29.5	6.8	4.5
135	"Jenner Coal," Somerset Co., Pa., C Prime Seam, low volatile	1.1	0.6	0.5	0.8	58.5	2.4	29.0	2.8	4.3
136	"Jenner Coal," Somerset Co., Pa., C Prime Seam, low volatile	0.6	0.6	0.3	0.7	65.1	0.2	28.4	0.2	3.9

one of great interest until we have come much nearer the ideal in practice. It is not the purpose of this paper to discuss possible methods whereby this end may be attained. Any industrial process has in the main only negative results to report when it is in the development stage; otherwise it would not be in that stage. There is a definite value, however, in setting forth in quantitative terms, so far as they may have been determined, the factors that represent the normal yield to be expected if conditions are maintained as planned. An added reason for offering such data is the tendency to make extravagant and unwarranted statements regarding the value and quantities that accompany the low-temperature process.

TABLE V. TARS FROM LOW-TEMPERATURE CARBONIZATION OF COALS

No.	Sample of Coal	Yield per Ton, Gallons	Specific Gravity, 15.5° C.	Free Carbon Per Cent.
125	Herrin, Williamson Co., Ill.	19.75	1.065	1.8
128	Harrisburg, Saline Co., Ill.	22.00	1.059	0.5
129	Harrisburg, Saline Co., Ill.	23.56	1.057	0.5
140	Georgetown, Vermilion Co., Ill.	13.85	1.07	0.5
130	Fairmont, W. Va., Pittsburgh Seam, high volatile	28.33	1.061	0.5
131	Fairmont, W. Va., Pittsburgh Seam, high volatile	25.00	1.06	0.5
132	Fairmont, W. Va., Pittsburgh Seam, high volatile	29.25	1.06	0.5
135	"Jenner Coal," Somerset Co., Pa., C Prime Seam, low volatile	7.15	1.1	5.5
136	"Jenner Coal," Somerset Co., Pa., C Prime Seam, low volatile	7.0	1.1	10.7

The apparatus employed in the experiments from which the data here presented was secured is capable of handling from 25 to 35 lb. of coal at a charge. The heat is applied by means of an electric current, the amount of resistance wire being so adjusted as to produce a temperature not over 800° C. The cross section of the retort is 7¾ in. Pyrometer readings are taken at the center of the mass and next to the wall of the retort. The coals employed were mainly from Illinois but the experiments were extended to include samples from Indiana, Kentucky, West Virginia, and Pennsylvania. As already noted, it is the purpose of this paper to give as nearly as possible what may be looked upon as a normal value for the different products obtainable from the various coal samples employed. In this particular, therefore, it is supplementary to bulletins already published by the Engineering Experiment Station of the University of Illinois, wherein chief attention was given to methods of manipulation and where quantitative data as to byproducts were meager and occasionally in error.[1]

The results in the tables are sufficiently specific and a further discussion must be reserved for a bulletin wherein it is hoped that additional data will be available concerning the composition of certain of the byproducts, especially the tars. Attention may be called to certain items as follows:

(1) The temperature conditions were maintained consistently throughout so that uncertainty on that point is eliminated.

(2) The yield of byproducts from a given type of coal is sufficient in form to afford strong presumption as to the fact that these are the normal values that may reasonably be expected under low-temperature carbonization conditions.

(3) The tars are of unusual interest and require further study to arrive at full information concerning this product. The high content of free carbon in the last two samples of Table 6 is due to dust mechanically carried over and not to secondary decomposition.

(4) The gas yield represents unusually high calorific values. The columns A, B and C, Table 7, represent the first, second, and third cubic foot of gas discharged per pound of coal.

TABLE VII: GAS FROM LOW-TEMPERATURE CARBONIZATION

		Yield, in Cu.Ft. Per Lb.	Heat Value in Each Foot, B.t.u.			Sulphur in Each Foot-Grain Per 100 Ft.		
No.	Coal Sample	of Coal	A	B	C	A	B	C
125	Herrin, Williamson Co., Ill.	3.0	967	685	435	244	44	12
128	Harrisburg, Saline Co., Ill.	3.2	900	628	428	391	200	96
129	Harrisburg, Saline Co., Ill.	3.2	892	676	443	303	206	93
140	Georgetown, Vermilion Co., Ill.	3.4	845	541	465	198	122	28
130	Fairmont, W. Va., Pittsburgh Seam, high volatile	3.4	995	685	462	404	254	34
131	Fairmont, W. Va., Pittsburgh Seam, high volatile	3.3	950	631	430	444	235	34
132	Fairmont, W. Va., Pittsburgh Seam, high volatile	3.3	946	678	450	318	59	52
135	"Jenner Coal," Somerset Co., Pa., C Prime Seam, low volatile	3.2	632	421	362	11	2	0
136	"Jenner Coal," Somerset Co., Pa., C Prime Seam, low volatile	3.7	745	564	410	19	13	0

(5) The behavior of the sulphur is, in some respects, the most important of all the data. It will receive more detailed discussion in the larger publication.

(6) The coke is, in many respects, the most interesting product of all and will be discussed more fully in the proposed bulletin.

TABLE VI. TYPE OF TARS FROM LOW-TEMPERATURE CARBONIZATION

				Per Cent Distillation				Per Cent Fractions up to 300° D. C.		
No.	Coal Sample	Specific Gravity 15.5° C.	Free Carbon, Per Cent	Up to 190° C.	190° to 300°	300° to 360°	Pitch	Tar Acids	Amines	Paraffins
125	Herrin, Williamson Co., Ill.	1.065	1.8	2.8	33.8	24.4	38.9	45.0	3.6	8.0
128	Harrisburg, Saline Co., Ill.	1.059	0.5	1.4	41.3	32.8	24.5	45.0	3.0	10.0
129	Harrisburg, Saline Co., Ill.	1.057	0.5	1.5	44.9	33.8	19.8	47.0	4.0	10.0
130	Fairmont, W. Va., high volatile	1.061	0.5	2.0	41.0	31.0	26.0	40.0	4.0	12.5
131	Fairmont, W. Va., high volatile	1.06	0.5	2.0	36.5	31.0	30.5	36.0	4.0	12.4
135	"Jenner Coal," Somerset Co., Pa., C Prime Seam, low volatile	1.093	5.5	0.0	29.4	30.9	39.7	20.0	8.0	12.0
136	"Jenner Coal," Somerset Co., Pa., C Prime Seam, low volatile	1.148	10.7	0.0	24.0	33.2	42.8	20.0	6.0	10.0

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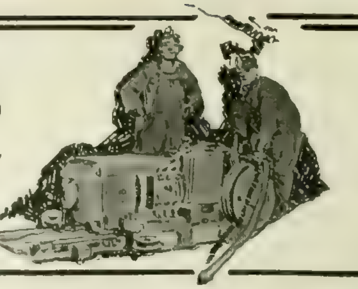
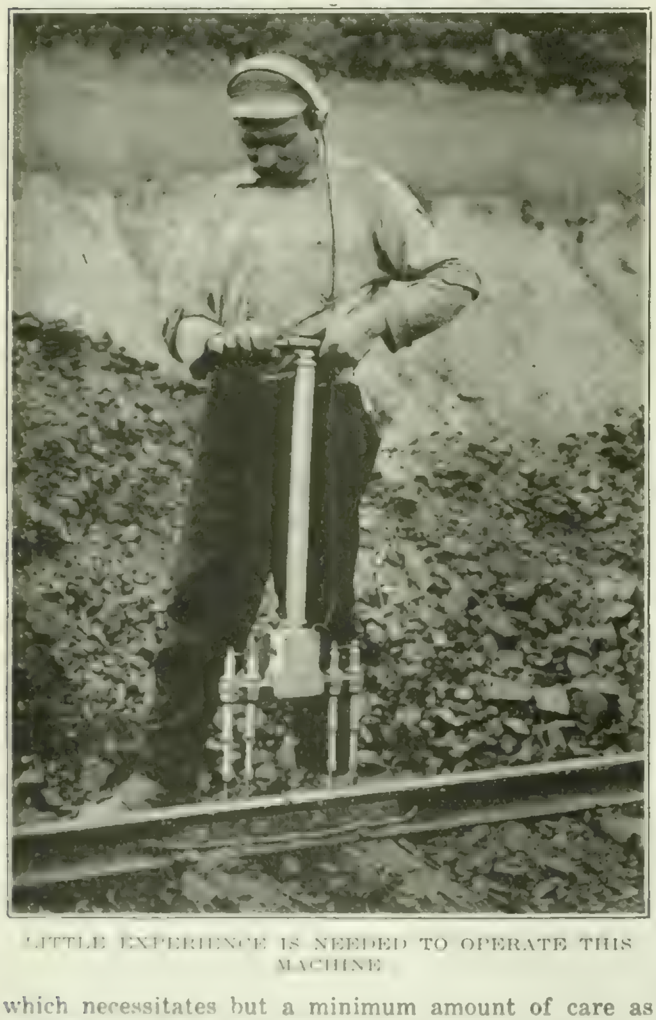
[1] S. W. Parr and H. L. Olin: "The Coking of Coal at Low Temperature." *Bull.* 60 and *Bull.* 79 (1913, 1915).

NEW APPARATUS AND EQUIPMENT



An Electric Bond Tester

One of the new pieces of apparatus being manufactured by the Joy Machine Co. of Pittsburgh, Pa., is an electric bond tester. This is of rugged construction and built to withstand the rough usage that such devices receive around coal-mine plants. This tester is self-contained and does not depend upon any return current in the rail for its operation.



LITTLE EXPERIENCE IS NEEDED TO OPERATE THIS MACHINE

Energy is supplied by a dry cell battery which is incased in the handle. The simplicity of construction which necessitates but a minimum amount of care as well as experience to operate this machine makes it a valuable piece of apparatus around a coal mine. Faulty bonding is an evil that does much toward increasing transportation difficulties.

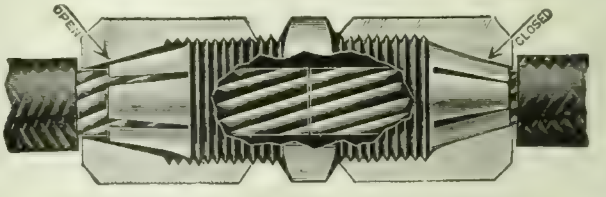
In using the instrument, it is placed in position as shown in the accompanying illustration. A pair of drill bits used as contact points bear upon each abutting rail. The switch in the handle is then closed and by means of a downward pressure, the drill points rotate and cut through any rust or other extraneous material on the surface of the rail until the current is set up through the rail joint.

The lower part of the instrument incases a buzzer which operates if the current is not closed between the two rails. If the bond is defective, a buzzing sound will be heard in the receiver, the intensity of which gages the degree of imperfection of the bond. In the case of a perfect bond, the circuit between the contact points will be closed and the buzzer will not operate.

The only part of this device subject to rapid deterioration is the dry cell inclosed in the handle. It may be necessary to replace this battery every six or eight weeks, depending upon the amount of use given the apparatus. An ordinary flashlight battery is employed. This may be obtained from any merchant handling the proper size. The cell is placed in the battery-case with the zinc end upward so as to bear against the contact spring.

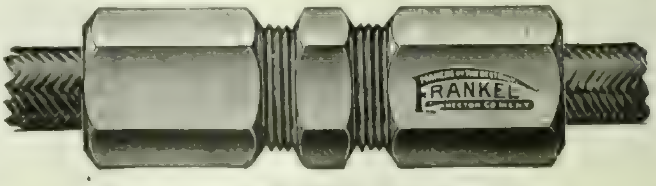
Solderless Connectors

The Westinghouse-Frankel solderless connectors recently placed on the market represent a new method of splicing electrical conductors which combines reliable service with high efficiency and marked economy. These connectors are simple in design, strong, and easily installed. They are made in various styles and sizes for adaptation to all types of splices with all varieties of wire.



CROSS-SECTION SHOWING CONSTRUCTION

In making use of a two-way connector, the insulation is removed from the ends of the cable or wire, to be spliced for a distance equal to half the length of the connector. The bared ends are then inserted into the connector so that they meet at the center, after which the compression nuts are tightened. These nuts are so constructed that they force inward a set of jaws at each end of the connector, causing them to grip their respective conductors firmly, forming a perfect joint. Splices with the other styles are made in the same manner as with the two-way type.



A COMPLETED SPLICE

Considerations Influencing Mine Ventilation

By R. Z. Virgin
Pittsburgh, Pa.

PRESENCE or rather the absence of restrictions or obstacles in mine airways are of vital importance. Such obstructions offer resistance to the air current that it is necessary to keep flowing through the mine workings, in order to insure the health of the workmen and comply with various state laws. This resistance means friction and an increased cost of power expended in ventilation.

The power required to drive the air through the mine is largely consumed in forcing it through the headings, entries and other passages of small or limited cross sectional area. Unfortunately in many mines such restricted passages are used as man- and haulageways as well as airways.

Modern coal mines are projected upon such a plan as to provide multiple entries, generally sufficient in number and cross sectional area to permit the passage of sufficient ventilation independent of the haulageways. Older mines, opened and worked upon the double entry plan, do not as a rule afford the unobstructed passages necessary to efficient ventilation. Consequently as the haulages grow longer the volume of air transmitted becomes less, the expense for ventilation power becomes greater and costs go up.

It is often the case that high ventilation cost is not rightly chargeable against the superintendent's efficiency as a manager. This is however rarely considered when comparative cost sheets are examined. It is frequently necessary therefore for the mine manager to do the best he can with the means at hand. This can, in a measure, be accomplished first by keeping all airway passages clean and in good condition and second by permitting cars to stand in airways as little as possible.

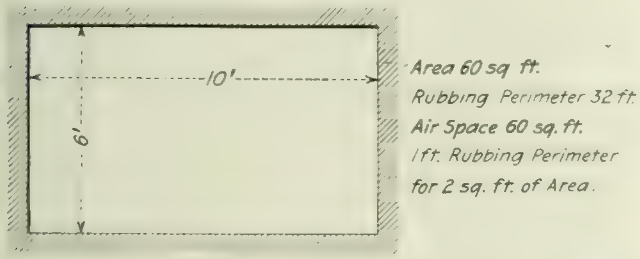


FIG. 1

KEEP ALL PASSAGES CLEAN AND IN GOOD CONDITION

The significance of the latter suggestion is well shown by reference to the accompanying illustrations. Fig. 1 shows an entry 6 x 10 ft., or one having a cross sectional area of 60 sq.ft. The perimeter or line of rubbing contact is 10 + 10 + 6 + 6 = 32 ft. Let us assume that a certain quantity of air is passing through this airway and that a water gage of 2 in. is required to force its passage. This is equivalent to a pressure of 2 × 5.2 = 10.4 lb. per square foot necessary to propel this air through this passage.

Fig. 2 shows the same size of airway after the introduction of a standing car or trip. This car has dimensions, as shown, of 4 x 5 ft. or an effective "obstructional" area of 20 sq.ft. This, substracted from the cross sectional area of the entry, leaves 60 — 20 = 40 sq.ft. of effective area. The peculiar circumstance about this type of obstruction, and a factor that is seldom given consideration is that while the area for the passage of air has been reduced 33 per cent the actual rubbing surface encountered by the air current has been increased by the perimeter of the car or 18 ft. making a total perimeter of 32 + 18 = 50 ft.

Fig. 3 shows a fall of rock in the same airway. For purposes of illustration this fall has been assumed to have the same cross sectional area as the mine car. On account of its nature and location however it does not offer as effective an obstruction to the passage of air, since its rubbing surface is less.

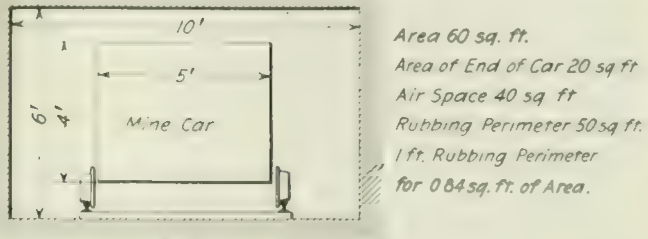

10'
5'
6'
4'
Mine Car
Area 60 sq. ft.
Area of End of Car 20 sq ft
Air Space 40 sq ft
Rubbing Perimeter 50 sq ft.
1 ft. Rubbing Perimeter
for 0.84 sq. ft. of Area.

FIG. 2

MINE CAR IN SAME AIRWAY AS SHOWN IN FIG. 1

In this figure the available free cross section is 40 sq.ft. as before but the rubbing perimeter is in this case only 45 sq.ft. This clearly shows that a fall of rock with a total cross sectional area equal to that of a car is less detrimental to ventilation power costs than a car. This, of course, assumes that the length of the fall is the same as that of the car or trip as the case may be.

The first law of air friction shows why this is the case. This law states: The pressure required to overcome friction varies directly as the rubbing surface. We have assumed above that the pressure required to force a given quantity of air through the unobstructed airway is equal to 2 in. of water or 10.4 lb. per sq.ft. In the second case, other things being equal, the necessary pressure would be found as follows: 32: 50:: 10.4: X.
or X = 16.25 lb. per sq.ft.

In the second case the necessary pressure would be found similarly: 32: 45:: 10.4: X
or X 14.62 lb. per sq.ft.

These increased pressures require increased power and increased power means additional expense. If, on the other hand, increased power is not available the volume of air flowing will be decreased. In either case explanations may be necessary from the management.

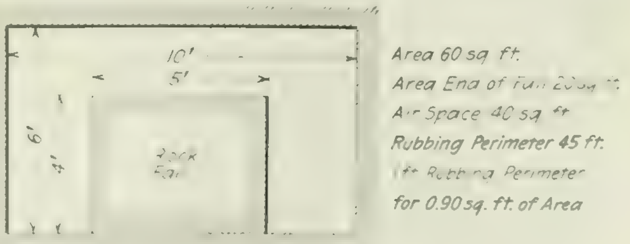


FIG. 3

RUBBING PERIMETER IS LESS THAN IN FIG. 2

Problems of the Coal Industry*

Miner, Operator, Railroad and Consumer Are All Dissatisfied With Existing Conditions in the Coal Industry—The Interests of Each Must Be Safeguarded

By Van. H. Manning†
Washington, D. C.

COAL and petroleum are two great sources of power, and the state of these two industries may be compared at this time with interest. Today we face a serious shortage in our petroleum resources, and are looking to foreign fields for development in order to keep pace with our domestic demands. Foreign nations have adopted strong nationalistic policies that hinder or prevent the exploitation of petroleum resources by other nationals.

On the other hand, foreign nations are short on a supply of coal. The United States is, therefore, in a position of possessing a dominance in coal, but a dependency in oil.

Coal and oil in one form or another are used in every household in the civilized world. Therefore, it is not unreasonable for the consumer to wonder when the price of either goes up. The welfare of any industry must be considered in connection with the welfare of the people. Capital and labor cannot disregard the public.

Therefore, the public must be represented and be given due consideration. The November, 1919, coal strike was a concrete example of what the public has to suffer when the employer and the employees fail to adjust their difficulties and production is brought to a standstill.

Many Problems Demand Solution

The problems of the coal industry are many, and some of them are exigent. The four parties at interest: the miner who digs the coal, the operators who own the properties and manage the industry, the railroads that transport the coal, and the consuming public which finally pays for the joint product of the other three, are all dissatisfied with conditions as they are at the present day.

Some of the problems, those that are most clearly defined and seem to offer the most promising field for definite action, are being discussed at length, but I want to paint in a background for them by briefly referring to some fundamental conditions which obtain and which powerfully affect the situation as it exists today.

The largest factor in coal mining are the wage-earners; for 70 per cent of the cost of coal as mined is paid over to the miners as wages. Who are these wage-earners and what are they like? The census figures of ten years ago indicated that over 60 per cent of them were foreigners and the proportion is doubtless larger now, since the general tendency is for the foreign-born to displace the native in coal mining.

What kind of people are these aliens when they come to us; are they experienced coal miners, men who know their job? On the contrary, in his 1916 report, the Chief of the Pennsylvania Department of Mines says, "Most of the new miners come from southern Europe, many from the agricultural regions populated by the Slavish race, and are without any knowledge of mining and possess little knowledge in other directions." It has been estimated that three-fourths of them cannot speak the English language, and yet is is only recently that there has been any marked interest in the education of the foreign-born. And, strange to say, the present interest has been created chiefly by agencies outside the industries that employ the foreign-born worker.

Miners Fail to Understand Orders

A manager who would not operate an automobile with a carburetor out of adjustment, or a lathe with a dull tool, permits the condition to exist that miners who might seriously endanger the lives of their fellow-workers and the property of their employer go to work, though barely able to understand the instructions given them by their foremen. What good are safety signs printed in six languages to a man who cannot read in any language?

And what efficiency is there in giving instructions to a man who cannot understand half of what you say? Any manager of a coal mining company who is not urging his local board of education and every other agency to furnish proper educational facilities for the adult illiterate has only himself to blame when ignorance among his employees manifests itself to his disadvantage.

More significant than this is the racial origin of these foreign-born workmen. Do you realize that of the 15 million immigrants who came to the United States in the past 20 years, two-thirds came from countries where the people have for centuries been oppressed by their rulers?

Oppression and Injustice Are Expected

There are over 300,000 of such people at work in the coal mines. They have come to us with a background of experience that all they can expect from those in authority over them is oppression and injustice, and that there is no way to achieve their liberty but to fight for it. They come steeped in Old-World superstition and ignorance, many with under-nourished bodies and untutored minds, and we think we have performed the full measure of our duty toward them if we give them a job and the protection of the common law.

They do not understand our form of government and institutions; they are no more qualified to understand them without help than an Indian "medicine man" is to understand modern medicine. Among them are many in whom the native level of intelligence is high, but this may in some instances prove a hindrance, for misdirected intelligence is more dangerous than incapacity.

I have read in the public press that the enemies of organized government in this country have 2,500 paid lecturers who devote their whole time to work among the foreign-born. Have there been 2,500 at work to explain to immigrants what their opportunities and obligations are in this land that has opened its gates to them?

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*[illegible] meeting of the American Institute [illegible]

†[illegible]

The Bureau of Mines has co-operated with the employing companies in protecting them from accident and disease; we have taken care of their bodies, but who has taken thought for the mind that directs their bodies?

It is astonishing that the managers of mines are not more concerned with the dangers and drawbacks of such a situation.

When recreation and amusement facilities have been provided in mining communities, it has usually been done in order to increase the labor supply in that community, and not with the thought of bettering the quality of that labor supply. A way may be found to keep the mines supplied with cars wherewith to move coal, but until a way also is found to keep the mines supplied with miners who understand the language of the country they live in, who have some reasonable idea of its government and their opportunities and obligations under it; who, in short, are members of the community and not an alien element, like sand in sugar or emery in a bearing, the industry will not be on a stable basis.

Much time, effort and money have been expended by local, state and national agencies in protecting the life and health of mine workers, but precious little has been done to improve or correct false ideas and incorrect or pernicious habits of thinking. It is as necessary to protect the ignorant alien's mind from the unscrupulous agitator as to protect his body from disease.

It is thus imperative to take steps to remedy this condition. Until a more intelligent and systematic effort is made to train the miner for his job, and to give him a clear understanding of the general problem of the business he works for and the community in which he lives, the mine operator cannot hold himself free from blame for conditions such as exist today.

FEW ENGINEERS FOLLOW COAL PRODUCTION

More than 50 years have passed since schools for the training of mining engineers were first established in the United States, and in that period a great number of technically educated men have gone out to take their places in the industry. Remembering that over two-thirds of the people employed in the mining industry are engaged in the mining of coal, it might be reasonable to assume that two-thirds of these technically trained engineers would be found in the coal mining industry; but we all know that that is not the case, and except in the case of those few schools that because of their geographical situation, have unusually close relations with the coal mining industry, it is the exception rather than the rule for the technically trained mining engineer to go into coal mining.

I will not attempt to go into the reasons why this is so, but I want to point out that it is a great disadvantage to the coal mining industry that such a condition exists. Coal mining needs the services of the best engineering talent to solve its many problems.

A short time ago, one of the Bureau engineers prepared at my request a syllabus of problems in the coal industry which need investigation, and it is significant that the majority of these are engineering problems. If then we have the situation that the problems of the coal industry are largely engineering ones, and that the coal industry is utilizing the services of less than its due proportion of technically trained men, something is clearly wrong.

In many instances we find the men immediately in charge of actual operations are men with only limited education, who have worked their way up through the school of experience to the responsible positions they now occupy. The man who has had only practical training performs important functions in any industrial organization, but there are many others that he cannot adequately perform because he lacks the breadth of knowledge and the sound grasp of the fundamental principles of engineering that are essential to the really efficient direction of an important and complex enterprise. It is not a matter of salary, because trained engineers on the average are not a highly paid group, and it has been the experience of general business that the economies which an engineer is able to effect more than repay the cost of his services. In my opinion, it will be necessary for the coal-mining industry to make a definite attempt to draw into its ranks more trained engineers who will attack its problems with the impartial and scientific method of thought that the engineer is trained to exhibit.

The third thing I want to bring to your attention is the relation of the coal mining industry to the public. Less than 20 per cent of the annual production of coal is used by the domestic consumer, but that 20 per cent governs nearly 100 per cent of the public contact with the coal industry. More than ever before that third party to all industrial adjustment, the public, has to be considered in the solution of any industrial problem.

I have a great faith in the essential fairmindedness of the American public. I believe that at heart the public thoroughly subscribes to the golden rule, and that it is prepared to accord to miners a living wage and to the operator a reasonable operating profit, whatever price of coal that may make necessary, providing the public is convinced that the adjustments made are reasonable and proper.

At present the public does not know what to think. It has an uneasy suspicion that there is something wrong somewhere, but does not know where to place the blame. In a recent public address, the editor of one of the leading New York papers said, "What are the essential merits of the coal strike? Do you know? If you do, you are very fortunate. I don't although I have spared no effort to get at the facts, many of which lie further underground than the coal itself."

According to individual circumstances, some of the public sympathize in a general way with the employer, and others sympathize in an equally vague way with the miners; but none have any clear understanding of the real facts of the case.

One of the things that is most needed in the present situation is an impartial investigation and a lucid exposition of all the factors of the coal industry, so that the public may be informed as to the real facts. Once it is convinced that the prices asked for coal are reasonable and fair, the public will be willing to pay whatever may be necessary to afford it a regular and assured supply of its source of heat and power.

The engineers of the Fuel Administration are on record as stating that their investigations show that the management of the average coal mine has no adequate knowledge of what its costs of production actually are. I am not speaking of the large, well-managed mines, but of the average mine. A statement like this filtering through to the public is not calculated to convey to the public mind an impression that the coal mining industry is so well managed that there is no room for improvement.

OPPORTUNITY FOR A BIG QUESTION MARK

I should like to call attention to another simple situation. The average citizen calls up his coal dealer and asks him to deliver some anthracite coal, say of nut size. The dealer tells the citizen that this will cost him between $12 and $13 a ton (supposing the place in question is Washington, D. C., and a corresponding figure if a different city is involved). This intelligent citizen turns to the report of the Engineers Committee of the United States Fuel Administration and finds chart No. 121, showing the cost of production of anthracite coal during the months of December, 1917, to October, 1918, inclusive. He sees there that over 95 per cent of the anthracite was produced at a cost of $4.10 per ton or less, and 50 per cent of it was produced at a cost of $3.60 per ton or less.

It seems clear to me that these two sets of facts will create in any normal mind a large question mark. Who is getting the difference between $4.10 at the mine and $12.50 on the sidewalk outside the cellar? Perhaps this citizen has some familiarity with the retail selling of coal, and may even have seen some recently published figures of a large retail firm, which show that yard expense amounts to about $1.20 a ton, handling losses at $0.25 a ton, and delivery cost to the customer at $0.90 a ton; or a total of $2.35 as the handling cost of the retail dealer.

But this only adds up to about $6.50 a ton, or about one-half the price paid by the consumer. He knows it costs something to move coal from the mines to the retail dealer, but he has no definite idea of how much it amounts to.

IT IS TIME TO EXPLAIN FACTS

I do not know of any systematic attempt on the part of anybody to explain to the public where the price that it pays for coal goes, and who gets it. Perhaps no one has ever felt that it was their business to do so. It is true that the retailer is the man who is most closely in contact with the general public, but manufacturers in general business long ago came to realize that the problems of the retailer are also their problems, and are undertaking to help the retailer out of his difficulties.

I believe it would be well worth while for coal operators to undertake a publicity campaign for the sole purpose of explaining to the domestic consumer of coal why it costs him as much as it does, for the purpose of removing from his mind the suspicion that someone somewhere is making an undue profit out of his necessities.

I have touched thus briefly on three fundamental factors in the present-day problem of the coal industry. I could go on much longer in the same vein, but it is not possible to here hope to deal effectively with more than a few definite matters. I have no doubt but that many problems which have arisen and will arise will be adequately dealt with, but after they have been disposed of there will still remain an immense field of work that will continue to demand, and for which I wish to urge, careful consideration.

Some Kansas Coal Fields

ALL mines in the Crawford-Cherokee field of Kansas are operated on the room-and-pillar system. In the southern or Cherokee County portion, the mines are generally wet and non-gaseous, while in Crawford County or the northern section of the field, a contrast is found, in that the mines are generally dry and gaseous. Accidents from gas explosions have been reduced to a minimum in this field through the strict surveillance of the mine inspection department and the absolute enforcement of the state laws relative to gas.

However, some of the miners are still careless about the preparation of their shots and some of the shot-firers are equally as careless about firing them. On the other hand, no shots are fired until all men except the shot-firers are out of the mines at night. No mechanical shot-firing devices of any kind are used, and most of the shots are tamped by the miners. The law requires copper or wood-tipped tamping bars, and prohibits the use of coal drillings for stemming. Shot-firers' accidents have been fewer in the past three years than ever before.

A new coal field is developing in Kansas and it promises well for the future. This is the Le Cygne field in Linn County. It has two beds of coal, each about 30 in. in thickness, one being at a depth of 50 ft. and the other about 30 ft. below the surface. These measures are being worked on the longwall system. The Pleasanton field in Linn County also has promises of a good future. Mining machines and electrical equipment are being installed in the mines in this region, and some excellent longwall work is being prosecuted.

In Leavenworth County there are two or three large mines operated by the longwall system and in Osage County a considerable amount of coal is mined even though the field is on the decline. Some coal is also mined in Franklin and in Neosho Counties by drifts driven into the sides of hills. Wooden rails are used and two or three men work in each drift. Coal is mined in this small way for local consumption in the immediate vicinity.

Kansas coal as a general rule is a good quality of bituminous, and a considerable demand for it always exists. This is evidenced by the fact that when Iowa, Illinois, and other states were only working two or three days a week during the past summer, the Kansas mines were working practically every day.

LIABILITY FOR MINE FOREMAN'S NEGLIGENCE—The owners of a mine operated under the Pennsylvania Anthracite Act by a mine foreman and his assistants, who are required to see that working places are safe, are not liable for injuries to a mine laborer engaged in driving a gangway, where the accident is attributable to an error in judgment by an assistant mine foreman in assuming that a rock in a roof would not fall before the timbering should reach it. (New York Court of Appeals, Iwanauskas vs. Philadelphia & Reading Coal & Iron Co., 124 Northeastern Reporter, 157.)

Fluctuations in Coal Production—Their Extent and Causes*

The "Load Factor" of Coal Production Is "Bad," Particularly in Spots, and the Social Loss Involved Is as Great as That of Universal Military Training—Coal Prices and Freight Discounts Might Correct This

BY GEORGE OTIS SMITH† AND F. G. TRYON**
Washington, D. C.

AN ELECTRICAL engineer has supplied us with the phrase that best expresses what's wrong with our coal industry—it is the "bad load factor." Whether we refer to full rated capacity or to average output, the operation of the soft-coal mines of the country from year to year, from month to month, and from day to day presents a load factor that has been too wasteful of plant and labor and too productive of high costs and uncertain supply. Engineering is needed to determine first how bad the load factor actually is in this basal industry and next how that load factor can be bettered; and with both inquiries there must be combined publicity of a high order.

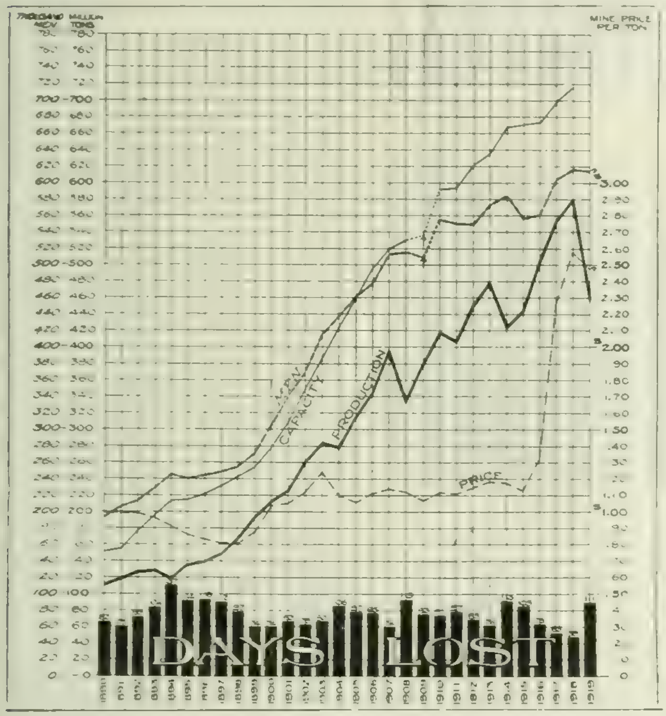

FIG. 1. PRODUCTION, CAPACITY, MEN EMPLOYED, MINE PRICE PER TON AND DAYS LOST AT BITUMINOUS COAL MINES—1890-1919

Those fluctuations in coal production can be regarded as *annual*, which in a large way reflect nation-wide business conditions; as *seasonal*, which express conditions of market and distribution; and as *daily*, which express conditions of labor and car supply. An analysis of this ever-changing rate of output of coal can well begin with a long-range view of the variation through a period of years. In Fig. 1, the facts of coal production, labor supply, mine capacity, and average return to the industry per ton produced, are set forth in curves for the 30-year period 1890-1919. At the base of the diagram is a graphic statement of lost time in mine operation, which is the measure of wasted opportunity for the economic use of both plant and labor.

The statistics thus presented are weighted averages for a greater industry spread over a large country and carried on under conditions that are widely divergent from place to place; these are the facts from the national point of view. Locally the conditions were far better or even worse; yet an exhibit of the trend of bituminous coal production as a whole must necessarily precede any detailed discussion. The 30-year period includes the growth of an industry from an output in 1890 of 111 million tons, from mines whose aggregate capacity

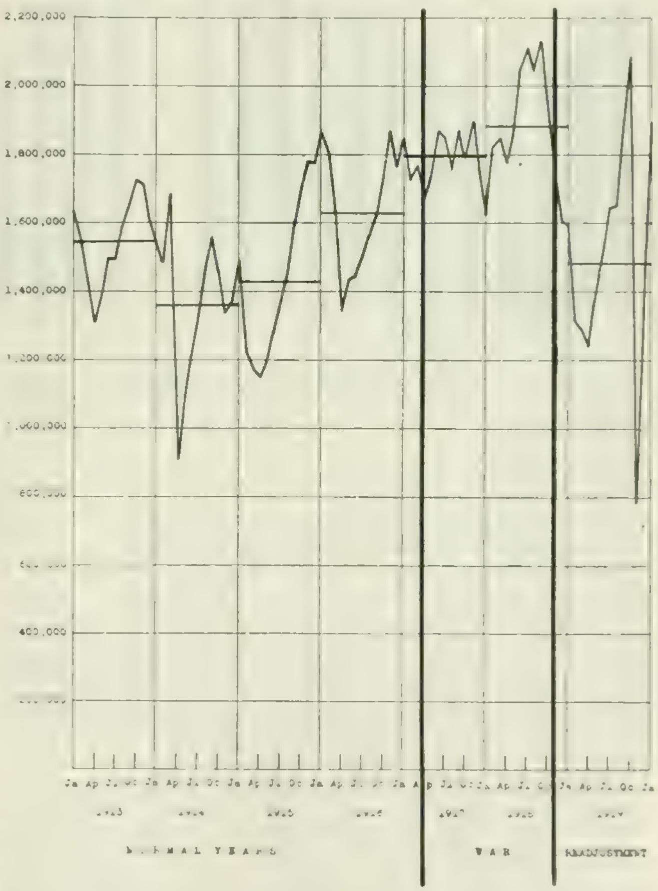

FIG. 2. MONTHLY FLUCTUATIONS IN COAL PRODUCTION

The curve represents the average production per working day for each month from 1913 to 1919. The straight horizontal line across each year is the daily average for the year. The diagram illustrates a combination of two types of fluctuations, annual and seasonal. It also shows how the war demand buoyed up production during the summer of 1917 and 1918.

Note the peaks just before the strikes of April, 1914, November, 1919.

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*Paper presented before the American Institute of Mining Engineers, New York, Feb. 17, 1920.

†Director, U. S. Geological Survey.

**Fuel Statistician, U. S. Geological Survey.

was estimated at 152 million tons and which employed 192,000 men, to the top figures of 1918, when the output was 579 million tons, the mine capacity was probably 715 million tons, and the mine workers numbered 615,000.

A few only of the outstanding facts may be pointed out in the preliminary study of these graphs. First of all, the coal curve shows more frequent and greater fluctuation than the man curve. The general trend, however, of both these lines, representing coal output and labor employed, has been steeply upward, and the curves have fortunately converged, indicating the greater productivity of the average mine worker. The production curve definitely marks the years of general business depression, 1894, 1904, 1908, 1911, and 1914.

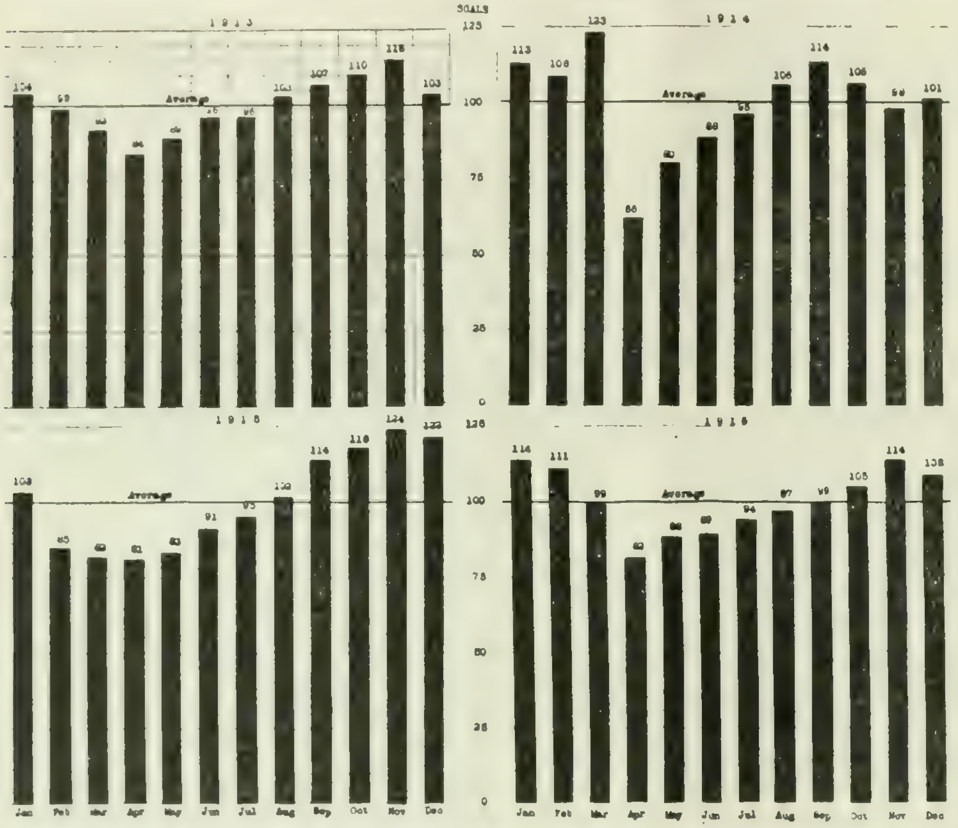

FIG 3. SEASONAL FLUCTUATIONS IN THE DEMAND FOR SOFT COAL, 1913-1916

The seasonal demand for bituminous coal causes in normal years a slump in production during the spring and a peak of forced production in the fall and early winter. The rate from month to month is here shown as a relative, the base of 100 being taken as the average per working day for the year.

Mine capacity is seen to have kept well in advance of output, a relation in large part attributable to ever-increasing expenditures in mine equipment, which also largely account for the increase in average production per man from 579 tons in 1890 to 942 tons in 1918. That capacity curve, is far above even the emergency output of the war period, suggests strongly that the industry has become overequipped and overmanned.

The curve indicating average price f.o.b. mine seems to show relatively little influence by the other facts set forth in this diagram. Prior to the world war the only marked deviation from a smooth curve was the 12-cent rise in 1903, which was apparently due to the anthracite strike of the previous year. A similar lag is shown for most of the years of general industrial depression, the employee's curve being a year behind in registering the effect of decreased demand. In other words, the exodus from the mine to other employment is not immediate but shows itself in the year following the short-time year.

Most significant for the purpose of the present discussion are the blocks at the base of the diagram, representing lost time in the soft-coal industry. In only seven of these 30 years was such lost time less than 25 per cent of the working year. The fact that coal mines are idle for many days each year is familiar to everyone acquainted with the industry in the United States, but what is not generally realized is the amount of time lost. During the last 30 years, out of 308 possible working days a year, the bituminous mines of the country were idle on the average 93 days. Ten times during that period the time lost exceeded 100 working days. The greatest loss was in 1894 when the average for all mines in the country was 137 days, or 44 per cent of the working year. The smallest loss occurred in 1918, the year of record production, yet even during that year the mines were closed down for one cause or another for the equivalent of 59 days out of 308—nearly one-fifth of the time. These figures for lost time show only the days that the mines were not operated, and absenteeism of a part of the force when the mines were running still further reduced the output below that desirable maximum which would be profitable to miners and operators alike. That is, the figures of "average number of days worked and lost" refer to mine operation but do not necessarily represent the days worked or lost by the average miner. They show only the average opportunity offered to labor by the mines, not the extent to which the individual miner took advantage of his opportunity. The statistics upon which these statements are based are found in the records of the U. S. Geological Survey's annual canvass of mineral producers, running back for many years.[3] Each mine operator is asked to state the number of days his mine was operated, reducing part-time days to the equivalent in whole-time days. By weighting the replies to this question by the number of men employed the Survey obtains averages for the state and the country. The figures for days lost are believed to be low, if anything.

Returning to the consideration of the 30-year curves we may detect some discordance between production and capacity. The inevitable lag in time between development and active exploitation has a decided bearing upon working time. It means that during the initial period of a time of depression the disparity between production and capacity, which is the cause of poor working time, increases rather than diminishes. The diseased industry is thus carried by its own inertia into a condition which further aggravates the disease.

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[3] The records of the Geological Survey are sometimes at variance with the reports of the state mine inspectors. The cause of at least certain discrepancies is that some of the state averages are not weighted but count all mines alike, regardless of size.

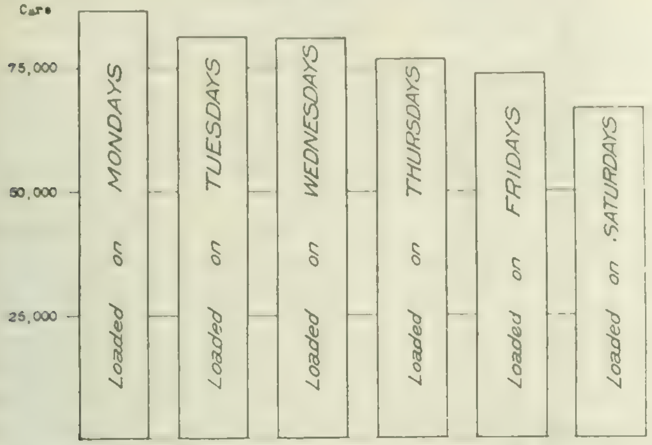

FIG. 4. DAILY FLUCTUATIONS IN PRODUCTION

Not only are there typical seasonal fluctuations in coal production, but there is also a typical fluctuation from day to day during the week, which prevails throughout periods of active demand and is determined by the car supply. The diagram shows the number of cars loaded on each day of the week along the Pennsylvania Lines West, May 20, 1918, to May 3, 1919, excluding holiday weeks. The total number of cars loaded was 472,235.

The fact seems established that there are periodic though irregular fluctuations in working time, resulting first from general business depressions, and second from simple inequalities of growth during periods of unbroken general prosperity. It remains to attempt an estimate of the magnitude of these causes in restricting working time.

It is noteworthy that with two exceptions none of the annual periods of time lost, as shown by the diagram, has been shorter than 74 days during the 30 years covered by the record. The exceptions were the war years, 1917 and 1918, which must be excluded as abnormal. It is also noteworthy that there is a certain regularity about the heights of the columns during the prosperous years. A value of 74-78 occurs seven times, and a value of 82-83 occurs three times. These values point significantly to a figure around 78 or 80 days as the measure of the minimum loss which no ordinary increase in general prosperity is likely to remove. Is not the conclusion justified, then, that losses above this figure are the measure of the effects of annual fluctuations, and that losses below this figure are attributable to some other cause? Expressing the idea another way: if we imagine all the columns beheaded at the 78-day line, the sum of the cut-off ends would be the measure of the loss caused by annual fluctuations and the truncated stumps below the 78-day line would be the measure of losses due to other causes and these may be called the seasonal and daily losses.

This division of lost time means, then, that out of the average loss of 93 days a year, 16 days were due to extraordinary annual fluctuations in demand, chiefly fluctuations following business depression. This amount of annual as distinct from seasonal fluctuation is not confined to the coal industry, and no help can be found for it short of doing away with business cycles of good and bad years.

There remains, however, that residue of lost time from which no normal year is free. This as yet irreducible residue, as already noted, is from 76 to 80 days, and light on its causes must be sought in the study of seasonal fluctuations in the daily rate of production of bituminous coal, by months, from 1913 to 1919, shown in Fig. 2. For convenience the average for each year is shown as a horizontal line. The general trend may be read by comparing the height of these average lines, and this trend, with its sags in 1914-1915 and 1919, is an example of the annual fluctuations which depend on charges in general business conditions. Superimposed upon this big cycle are a set of smaller fluctuations determined by the seasons. For the pre-war years 1913-

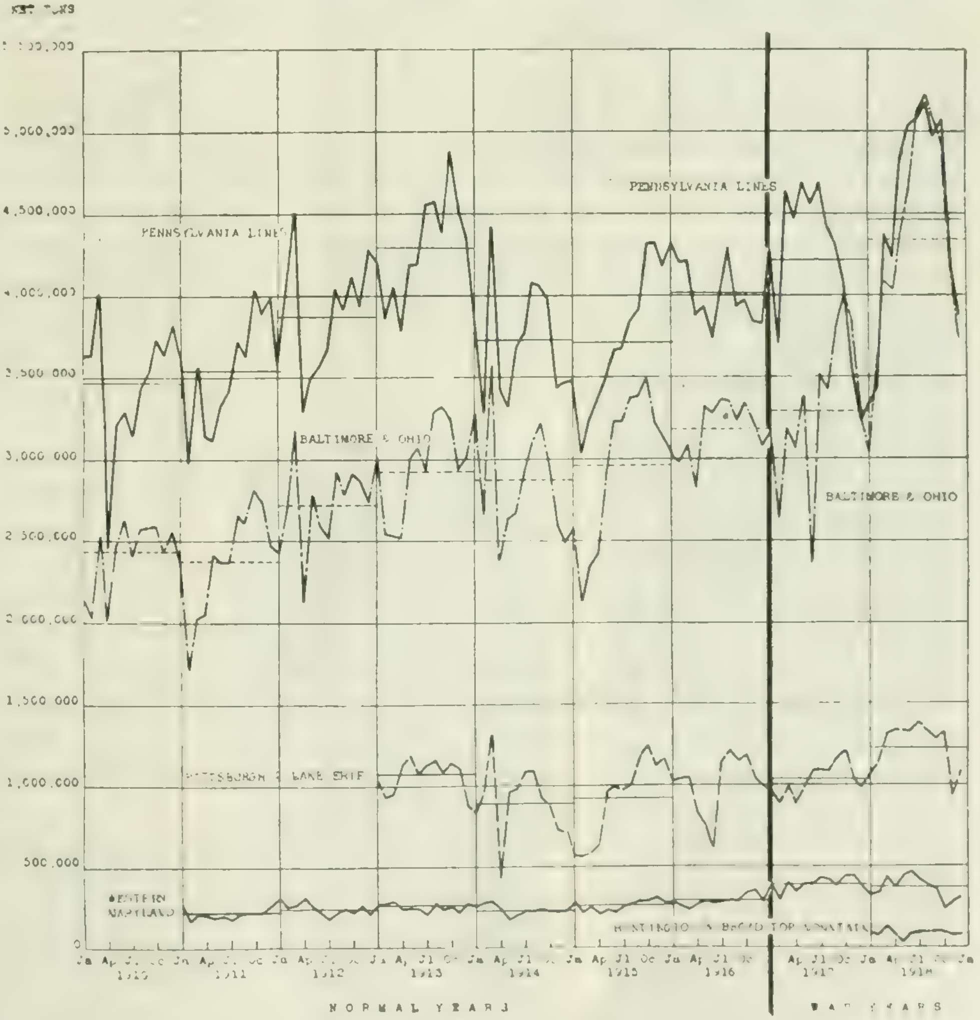

FIG. 5. SEASONAL FLUCTUATIONS IN SOFT-COAL SHIPMENTS, 1910-1918

The movement out of the Northern Appalachian region is here illustrated by shipments on certain carriers. Although demand in this region is steadied during the summer by shipments to the Lakes, it has a decided seasonal rhythm. In normal years the market sags in April and thereafter rises gradually to a peak in October, November and December. Another peak of forced production occurs in March of the even years, reflecting apprehension of purchasers over the outcome of the biennial wage negotiations.

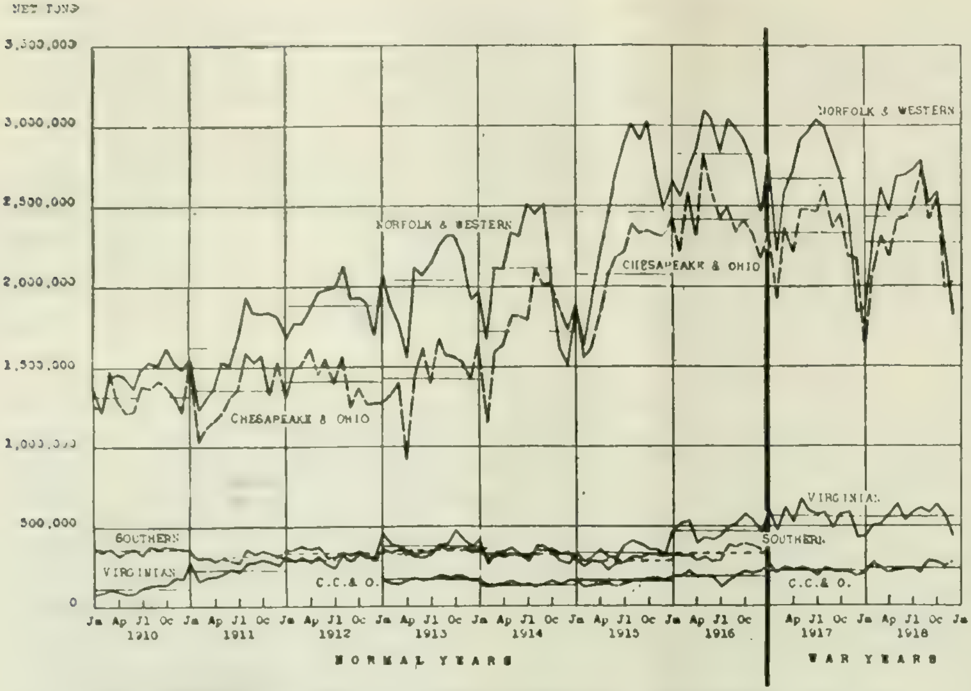

FIG. 6. SEASONAL FLUCTUATIONS IN SOFT-COAL SHIPMENTS, 1910-1918

Movement out of the Middle Appalachian region is here illustrated by shipments on certain carriers. As the region is largely non-union the monthly shipments do not show the rugged March peak and profound April sag characteristic of union fields in the years of the biennial wage negotiations. Demand is steadied by the relatively constant movement to tide for export overseas. The typical curve of demand for the region rises from a low in December, January, and February, to a rounded high in May to October. The locus of the high is determined by the tidewater shipments to New England and the heavy movement to the Lakes.

1916 the seasonal movement is regular and exhibits the familiar summer slump in demand.

In 1917 the war demand obliterated the seasonal slump; the curve of monthly production zigzags now above, now below, the line of the annual average. The year 1918 shows a marked seasonal fluctuation, but in a direction contrary to the rule. Instead of declining from January to April, the curve of production rises without a serious break to a peak in July, August, and September and then falls. In that year the summer stretch of the curve was buoyed up by the extraordinary war demand and by the special measures taken by the Fuel and Railroad Administrations to improve the car supply. Further, the two extremities of the curve were depressed, in the first quarter of the year by bad weather and consequent transportation difficulties, and in the last quarter by the slackening demand. The year is interesting because it gives a type curve of maximum production. Our war experience showed that, given the necessary demand, it is physically possible to push the rate of coal production up during the summer even to a point much in excess of the maximum winter rate.

The 1919 curve is in part true to type, in part exceptional. It exhibits the spring and summer depression, accentuated by the necessary readjustment of business after the armistice. Its October peak was both hastened and steepened by the knowledge that a strike was threatening. The profound collapse of November-December was of course the effect of the great strike.

In order to study the seasonal fluctuations more easily Fig. 3 has been prepared, from which the annual fluctuations have been isolated and cast aside, leaving only the monthly changes. The two pre-war years 1913 and 1914 are typical. Each black column shows the rate of production per working day for the month represented, expressed as a percentage of the average for the year. Thus the figure 104, at the top of the column for January, 1913, means that the rate of production during that month was 4 per cent above the average for the year.

The greatest extremes shown in the diagram occurred in 1914, when the rate of production rose in March to 123 per cent and fell precipitately in April to 66 per cent. The high was thus nearly twice the low. In that year two influences were at work: the normal seasonal fluctuation was intensified and distorted by the biennial wage negotiations. The normal April slump was aggravated by strikes, in anticipation of which there had been a period of anxious buying in March. The

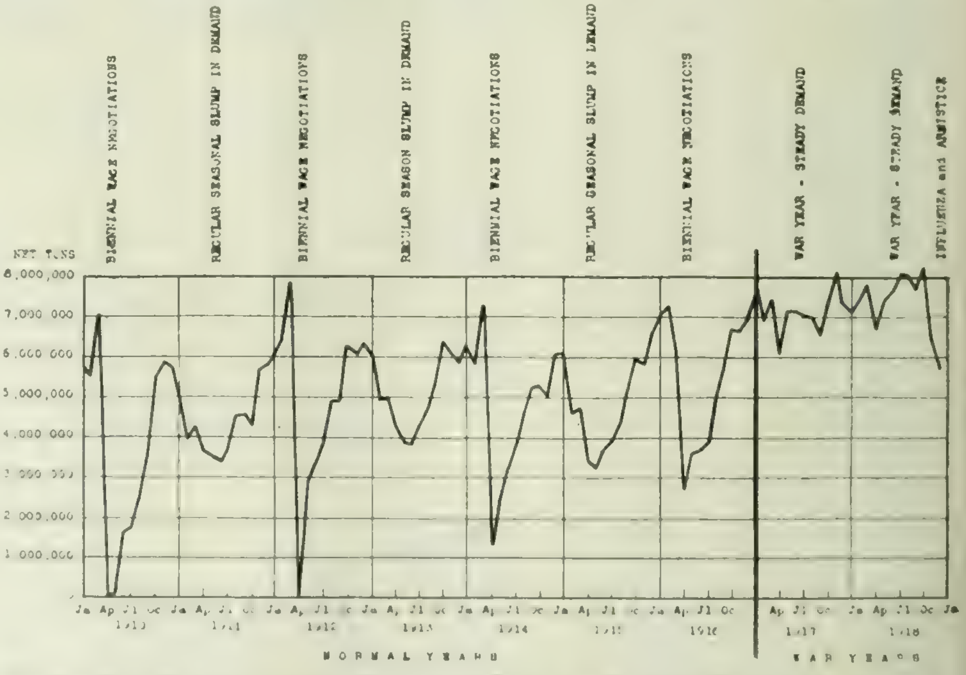

FIG. 7. SEASONAL FLUCTUATIONS IN THE DEMAND FOR ILLINOIS COAL, 1910-1918

Demand for Middle Western coal is here illustrated by the monthly production of Illinois. Middle Western producers are not benefited by the movement to the Lakes and to tide which steady the demand for the Northern and Middle Appalachian coal. In consequence they have to meet a peak of forced demand from September to January, followed by a terrific depression from April to July. In the years of the biennial wage negotiations this April depression often reduces production to zero. It is then preceded by a month of feverish buying in March year may be taken as a somewhat exaggerated type of the fluctuation to be expected in an "even" year—the year of biennial wage adjustment. In one respect, however, 1914 was not typical. The autumn peak came in September and was followed, in the last quarter of the year, by a depression which marks the effect of the outbreak of the European war. In other years the peak was reached in November. In 1916 the peak measured 114, in 1913 it reached 115, and in 1915 the rush of Allied war orders carried it up to 124. The month of smallest production in each year was April. Except in 1914, when strikes carried it down to 66, this April low has been about 82.

The year 1913 may be accepted as a fair type of the odd year, when monthly variations represent seasonal fluctuations in demand only, uninfluenced by labor disturbances. In such a typical year the capacity required during the month of maximum demand will be from 35 to 40 per cent greater than in the month of minimum demand. In other words, a mine capacity and a labor force, if working full time, sufficient for November, would be employed in April only 70 to 75 per cent of the time; and as in actual practice the mines never attain 100 per cent, or full time, even in November, but under the very best conditions reach only 80 per cent, the time of employment which may in fact be expected during April is about 58 per cent.[2]

To put it another way: even in years of active demand the present inequalities in the summer and winter buying of coal render inevitable a long period in which the labor and capital engaged in the industry can not work more than 27 to 30 hr. out of a 48-hr. week. Let no one regard this as a condition to be accepted as the measure of working time necessary to meet demand. As a matter of fact the 30-hr. week is the spring ailment of the bituminous coal industry, not its cure.

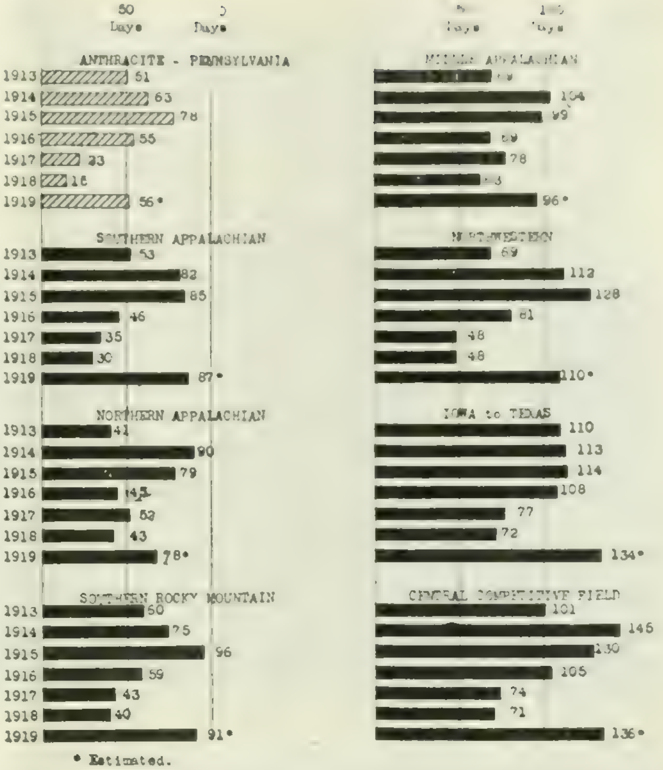

FIG. 8. DAYS LOST PER YEAR—ANTHRACITE AND SEVEN BITUMINOUS REGIONS

Losses in working time vary greatly from one field to another. In this diagram anthracite and seven great groups of bituminous mines are compared. Each bar represents the number of idle days for the field and year in question. Sundays and holidays are not counted.

In addition to the annual and seasonal fluctuations in production, a third set of variations is exemplified in Fig. 4. The railroad works seven days a week; the mines work six days. Over Sunday the carrier catches up in its work of placing cars, and in consequence the car supply on Monday is by far the best of the week. As a result the miners work longest on Monday, but later in the week their hours of labor show a gradual decline, which is accentuated on Saturday by holiday absenteeism. Even if the mines should attain full time on Monday they could not under the circumstances expect to work more than 86 per cent of the time on Friday and 79 per cent on Saturday. But of course the Monday rate never in practice gets up to 100 per cent, and the performance on the later days of the week is correspondingly defective.

The data on seasonal fluctuations so far presented apply to the country as a whole. The typical curve of production for the United States is in fact a composite of a large number of other curves, which differ widely from field to field.

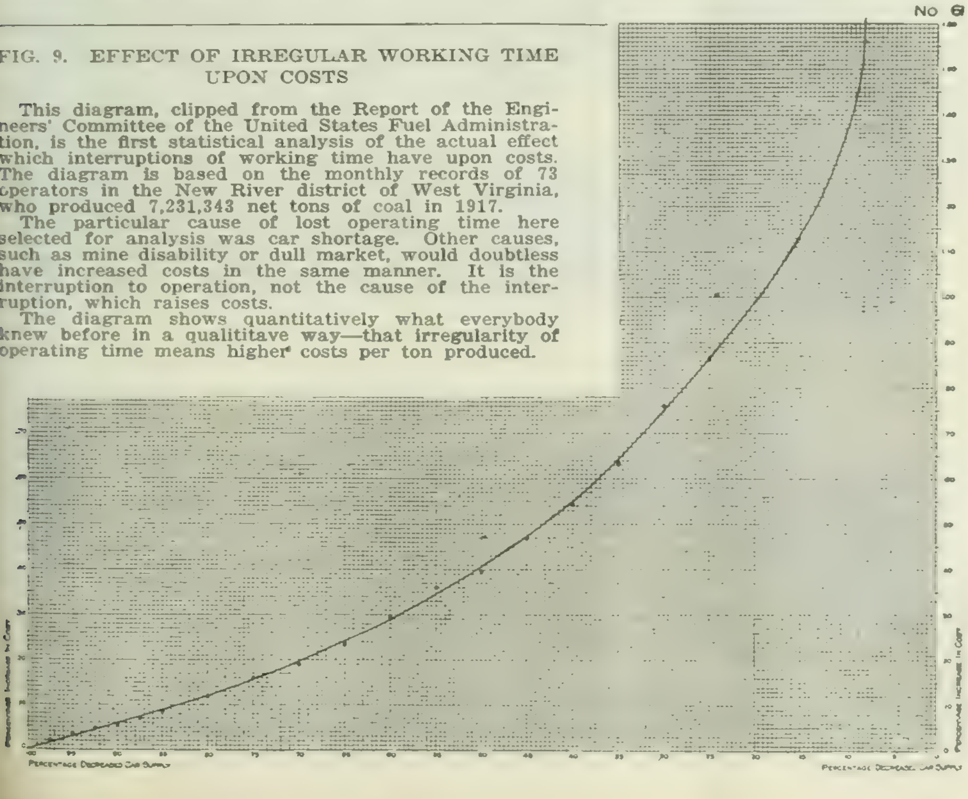

FIG. 9. EFFECT OF IRREGULAR WORKING TIME UPON COSTS

This diagram, clipped from the Report of the Engineers' Committee of the United States Fuel Administration, is the first statistical analysis of the actual effect which interruptions of working time have upon costs. The diagram is based on the monthly records of 73 operators in the New River district of West Virginia, who produced 7,231,343 net tons of coal in 1917.

The particular cause of lost operating time here selected for analysis was car shortage. Other causes, such as mine disability or dull market, would doubtless have increased costs in the same manner. It is the interruption to operation, not the cause of the interruption, which raises costs.

The diagram shows quantitatively what everybody knew before in a qualititave way—that irregularity of operating time means higher costs per ton produced.

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[2] The rate in April, 1919, was only 50 per cent of full time, or 24 hr. out of a 48-hr. week. The highest percentage of full time ever averaged by the bituminous mines of the country for one week was 86.8, during July 7-13, 1918. The average for that month was 84.4 per cent. In September, 1918, an average of 84.9 per cent was reached. In November, 1917, however, when demand was intense but the zone system and other features of war-time control of distribution were not in force, the percentage averaged was only 75.3. It does not seem probable that with present transportation facilities the percentage of operation attained in November will be much in excess of 80.

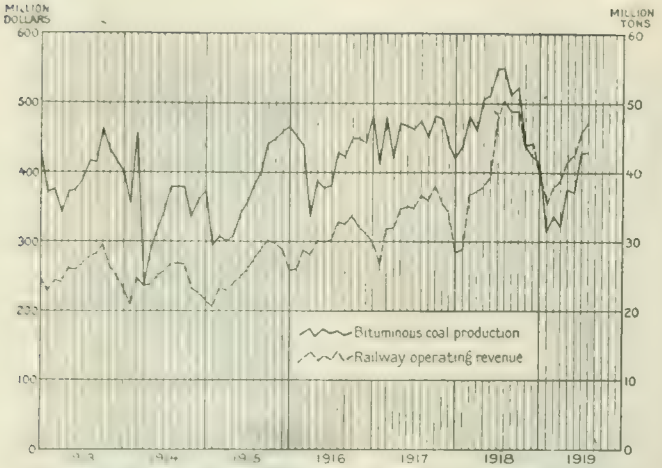

FIG. 10. RAILWAY REVENUE AND BITUMINOUS-COAL PRODUCTION

Railway operating revenues for Class I roads and large switching and terminal companies are represented by the dotted line; production of bituminous coal by the solid line. The monthly fluctuations of the two show a close correlation. The correlation is due partly to the influence of common causes affecting both, but very largely to the fact that soft coal contributes about one-fourth of the ton-miles carried and a sixth of the total freight revenue.

Improving the "load factor" for the coal mine would improve the railroad's "load factor" as well. It would furnish more equal employment for the one and a third billion dollars invested in coal cars.

Some of these differences are only matters of degree, the curves of some districts showing a more pronounced slump than those for others, but in still other cases the curves are unlike and the differences tend to neutralize one another and so to smooth out the composite graph.

Figs. 5, 6 and 7 give type curves for the northern and middle Appalachian regions and for the State of Illinois, and a comparison of these curves suggests how much more accute the problem of seasonal demand is in some districts than in others. Contrast for example, the great valleys and peaks of the Illinois curve (Fig. 7) with the even curve for mines along the Western Maryland Ry. (Fig. 5.)

A further contrast distinguishes the union from the non-union fields. Illinois and much of that part of the northern Appalachian region covered by Fig. 5 show in the even years a profound drop in April, which marks the biennial wage negotiations. The slump is regularly preceded by a period of active buying, which often makes the March production the highest of the year. This effect is largely absent from the curves of the railroads of the middle Appalachian region (Fig. 6) which serve for the most part non-union mines.

Another notable fact is the manner in which the fluctuations for different regions tend to neutralize one another. The Chesapeake & Ohio and Norfolk & Western curves, for example, seem to start upward in February and March, at the very season when the Illinois curve has begun its dive downward. To combine the two in the course of getting a composite curve for the country would yield a much flatter graph than either exhibits alone. The average for the country thus does not at all reveal the full extent of the disease from which the industry suffers. We have merely charted the average temperature of a number of patients in which the severe chill of one patient is offset by the high fever of another. This all-country curve seems discouraging enough but it in fact conceals much local trouble, and any remedy that is to better the operating conditions of both the miners and the owners must be applied in terms of local, not national fluctuations. To find this remedy further study of the district fluctuations is therefore essential.

The peculiar shape of the middle Appalachian curve is determined largely by the movement of coal to the Lakes for consumption in the Northwest. The Lake movement has as its limits April 15 and Dec. 1, and this necessarily exercises a wholesome influence on working time in Ohio, western Pennsylvania, West Virginia, and to some extent, eastern Kentucky.

The curve for Illinois (Fig. 7) illustrates seasonal fluctuation at its worst. During the "odd" years the demand in the slack month sinks to half what it reaches at the peak, and during the "even" years the production in April approaches zero. The causes of the summer slump are twofold. In the first place, the natural market

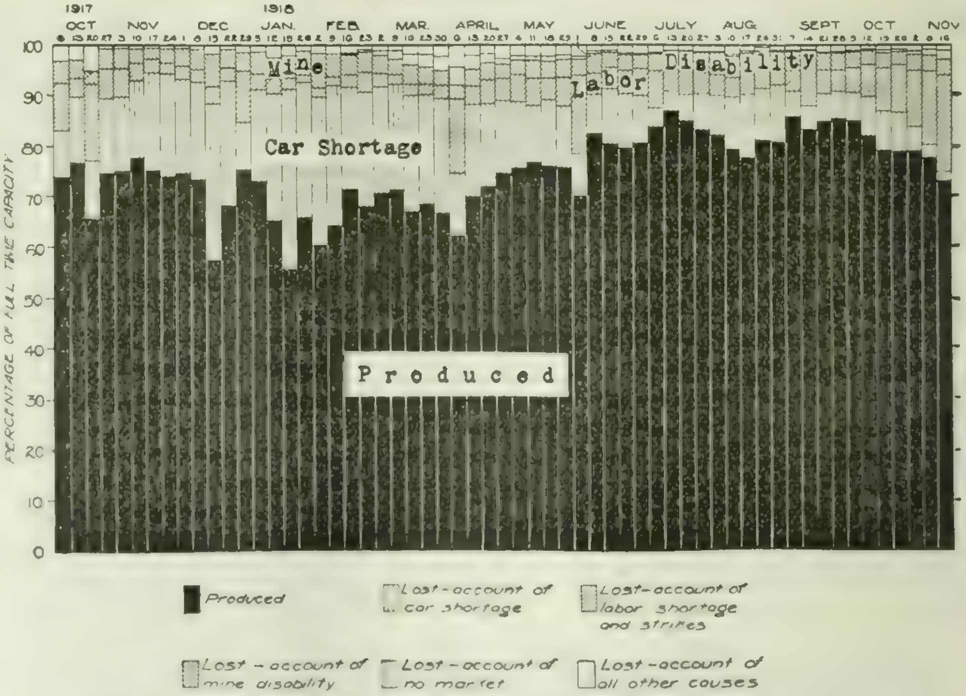

FIG. 11. THE CAUSES OF LOST TIME—WHEN DEMAND IS ACTIVE

The diagram summarizes operating conditions as reported weekly by bituminous producers in the United States from October, 1917, to the Armistice. Full time of 48 hours is represented for each week by an upright column. The black segment is the per cent of full time worked. The shaded segments represent per cent of full time shut down for specified causes.

The period covered was one of very active demand. No market, as a factor limiting production, affected the West only. It appears as a narrow lens, beginning in February, widening slightly in March and April, and contracting again to a mere slit through the summer months. A further softening of the western market began just before the Armistice.

Losses due to labor were generally small, seldom exceeding 4 or 5 per cent. Larger losses occurred in the following weeks: October 20, 1917—strikes in Illinois; December 29—Christmas; April 6, 1918—miners' holidays and Liberty Loan Day; June 1—Memorial Day, and July 6—Independence Day. The influenza epidemic accounts for the broadening of the labor zone in October and November, 1918.

The limiting factor over the period as a whole is revealed in the broad zone of car shortage and other transportation disability.

The record for the period was attained in the week ended July 13, 1918, when the mines worked 86.8 per cent of full time. On the basis of a 48-hour week this was an average of 41.6 hours.

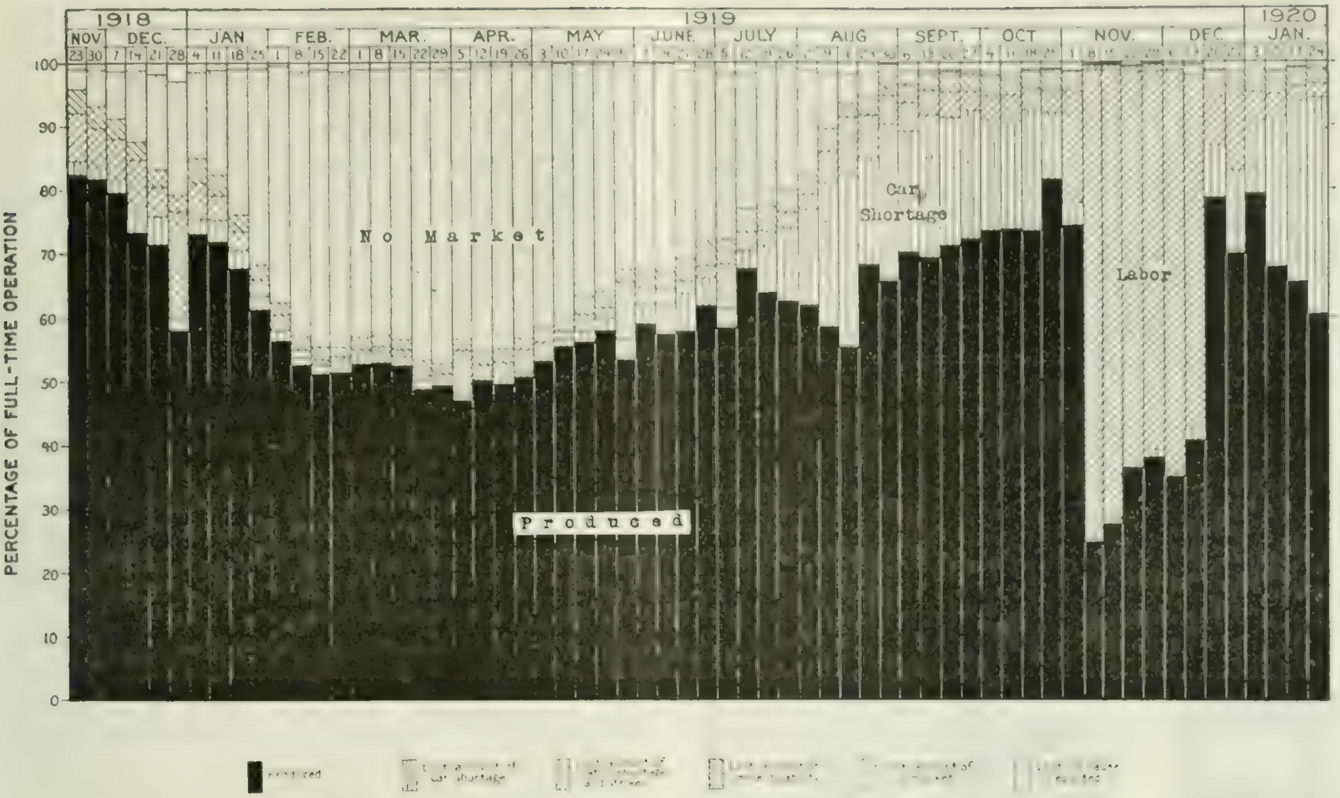

FIG. 12. THE CAUSES OF LOST TIME—WHEN DEMAND IS SLACK

The diagram summarizes operating conditions reported weekly by bituminous producers from the Armistice to January 24, 1920. The outstanding features of the period were the pronounced slump in demand which followed the war and the great strike. Transportation disability did not assume significant proportions until August, 1919. Since then, except for the strike period, it has been the dominant factor limiting production.

for Illinois coals, as limited by transportation costs, is one in which domestic consumers rely largely on bituminous coal, and of all classes of demand that of domestic consumers fluctuates most with the seasons. Into that market, unfortunately, the steadying effects of the Lake and New England movements and of overseas exports do not enter. In the second place, the nature of Illinois coals places them at a disadvantage in competing even within this, their natural market. They do not store easily, and up to the present time they have not found favor with coke makers and therefore do not feel the steadying influence of the demand for coke.

Any industry that offers its labor and its capital an employment as irregular as that expressed by the Illinois curve is laboring under a great handicap. And yet the Illinois curve is roughly typical of the production for the whole Mississippi Valley region, from Indiana to Iowa and south to Arkansas. Some 175,000 miners and 28 per cent of the mine capacity of the country operate under a curve of this type.

The statement of lost time by districts further emphasizes this regional variation. Fig. 8 shows the averages for the seven grand subdivisions of the bituminous fields, to which is added, for comparison, the anthracite region of Pennsylvania. The figures given represent the real losses of potential working time, each day lost meaning a cut in the actual productive capacity of both mine and miner.

It is perhaps significant that there is a rough relation between the loss of working time and the degree of unionization. Those bituminous regions in which interruptions to operation are most pronounced show a tendency to become union territory. The presence of the union is both cause and effect. Wage disputes cause lost time; but, on the other hand, irregular employment is in itself a prime incentive to unionization.

During the seven years shown in the diagram each of the bituminous regions has lost more time than the anthracite country. By regions the 7-year average has been as follows, arranged in order of time idle:

Region	Days Worked	Days Idle
Anthracite	260	48
Southern Appalachian	248	60
Northern Appalachian	247	61
Southern Rocky Mountain	242	66
Middle Appalachian	225	83
Northwestern	223	85
Iowa to Texas	204	104
Central competitive field	199	109

The fact of irregularity in working time is thus indisputable, and its extent is shown to be everywhere great, while everywhere it reacts unfavorably upon all

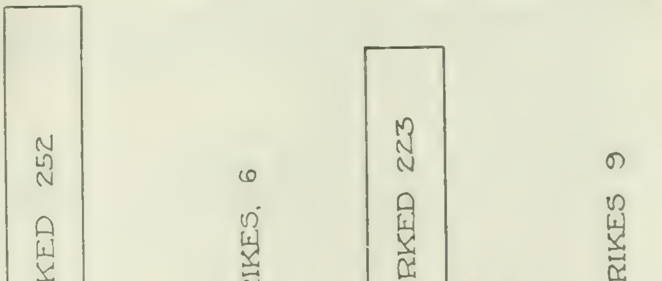

FIG. 13. STRIKES IN BITUMINOUS AND ANTHRACITE MINES, 1910-1918

This shows the average for all bituminous and all anthracite mines in the United States during the nine years, 1910-1918. Days idle include strikes. Ten and seven-tenths per cent of the time lost in anthracite mining was due to strikes, and 10.6 per cent in bituminous mining.

who have a share in producing soft coal and all who have a share in consuming it. Its injurious effect is perhaps most evident on the welfare of the miner. To him it means a direct and immediate loss of wages. In long periods of idleness following a business depression it drives him to seek employment elsewhere, in other industries, as was shown in Fig. 1. The fact that we find the same large labor turnover and the tendency to migration in other industries should not blind us to the fact that these are causes as well as symptoms of industrial unrest. The question may even be raised whether irregular employment is not largely responsible for the failure of coal miners to take full advantage of the opportunity to work when the mines are open. Regular employment breeds regular habits and irregular employment breeds irregular habits.

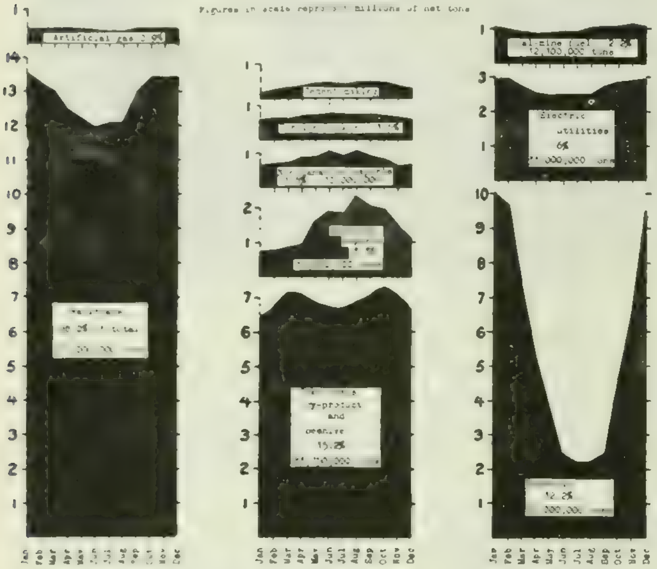

FIG. 14. TYPICAL CURVES OF MONTHLY BITUMINOUS CONSUMPTION

The above diagrams suggest the probable monthly consumption of soft coal by certain users during a year when the total production amounts to 550,000,000 net tons. They are presented as tentative and *subject to sweeping revisions.* Although much is known of the total annual consumption of coal by individual industries and by localities, very little is definite known as to how the annual total is distributed over the 12 months of the year. The Geological Survey offers these curves simply as a basis for discussion and as an example of a type of inquiry which it is believed will be of value and which the Survey hopes to pursue further.

The basis for the curves presented is briefly as follows:

Railroads—Monthly consumption records, Fuel Conservation Section, U. S. R.R. Administration, 1918-19.

Electric utilities—Studies of Division of Power Resources, U. S. G. S.

Artificial gas plants—Estimate, U. S. G. S.

Coal-mine fuel—2.2 per cent of monthly production.

Coke—Monthly fluctuations to correspond with seasonal (as opposed to annual) changes in pig-iron production during last 12 years.

[illegible]—Average, 1913-17.

Foreign bunker—Average, 1913-19.

Domestic fuel—Total consumption to correspond with monthly domestic consumption of natural gas, as reported by two large [illegible]

The diagrams account for 72 per cent of the total consumption. The remaining 28 per cent is industrial consumption and its curve falls somewhere between the domestic type and the electric-power [illegible]

Figures in scale represent millions of net tons

The case of the miner against irregular operation has already been forcibly set before the public. What is not so generally realized is that the case of the operator is just as damaging to him. When his operation is shut down his capital is idle, and his mine equipment instead of benefiting by a rest, is rapidly depreciating. Although the mine shuts down, his fixed charges run on—not only interest charges and salaries, but a host of maintenance charges as well. And in the end the coal consumer pays the bill for the idleness of both miner and mine.

In this connection we may find instruction in an exceedingly valuable study made by Messrs. Garnsey, Allport, and Norris of the costs of production as affected by interruptions of working time. Fig. 9 is taken from their "Report of the Engineers' Committee of the U. S. Fuel Administration, 1918-19." It represents an analysis of the monthly records of 73 operators in the New River district of West Virginia. The diagram shows that there is a mathematical relation between cost of production per ton and decrease in working time. The special cause of irregular working time selected for analysis was car shortage, but any other cause of loss would presumably have affected in the same way the cost per ton. The reason for the increased cost per unit of output is, of course, that the smaller the number of tons produced the larger the share of the fixed overhead expenses which must be borne by each ton. Francis S. Peabody, testifying before the Frelinghuysen committee on Sept. 4, 1919, stated that "the earnings of the laborer and the cost of coal depend entirely upon continuous work. Our costs will vary from month to month, dependent upon the running time of our mines. There will be a variation of between 50 and 60 cents a ton from month to month, depending upon the number of hours the mines are idle."

The effects of fluctuation in coal production on our transportation system can readily be appreciated. The coal mine is the railroad's largest shipper, and the railroad in turn is the largest consumer of coal; in fact it has been remarked that coal is the nucleus around which our railroad system is built.

When the operator experiences a car shortage he is prone to blame the railroad for what he regards as a failure to meet its obligations. He does not realize, perhaps, that the railroad suffers from the seasonal fluctuations in coal production as well as the coal-mining industry, for in its business of selling transportation to the coal producer the railroad meets the same seasonal demand that the producer meets in selling coal to the retailer. An investment in coal-carrying equipment sufficient to transport all the coal that the mines can produce in November would in large part lie idle during the slack season of summer. The depreciation of a coal car standing idle on a siding is perhaps no less serious than the depreciation of the idle mine. When we remember that there are approximately 925,000 coal cars in the country, and that the capital invested in these cars is roughly one and a third billions,[3] we can visualize the cost to the railroads of a long period of car unemployment. If the mine owner has his car shortage, the railroad man has what might be called his "freight shortage." The capital investment in coal-carrying equipment alone is of the same order of magnitude as the capital investment in coal-mining, and it is no less desirable to provide constant employment for railroad capital than for mine capital.

The relation between the monthly volume of coal shipment and the corresponding level of railway earnings is shown in Fig. 10. The dotted line representing railway-operating revenue shows a seasonal periodicity that closely follows the peaks and valleys in the curve of bituminous coal production. The marked correspondence between the two curves is in part at least to be attributed to the effect of common causes at work upon both. But when it is remembered that coal is about one-third of the total tonnage carried by the railroads, and that about one-fifth of their total freight revenue is derived from it, the conclusion is unavoidable that seasonal fluctuations in coal production affect profoundly the earning power of the carriers.

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[3] The railroad statistics here presented are in part estimated, and were employed after consultation with the Bureau of Railway Economics, Washington, D. C.

A complete analysis of the effects of the irregular operation of the coal mines would include references to the coal dealers, both wholesale and retail, but the consumer is of course the one whose purse suffers most, for in the long run he pays for all the wasteful practices. He must support the miner for not only the 215 days that coal is coming from the mines but also for the 93 possible working days when the mines are closed.

The immediate causes of these seasonal fluctuations are car shortage, labor shortage, mine disability, and "no market." The varying values to be assigned to all these causes are shown in Figs. 11 and 12.

STRIKES ARE COMPARATIVELY UNIMPORTANT

The minor importance of strikes in affecting the amount of lost time is shown in Fig. 13. The average number of days lost by reason of strikes for the mines of the whole country, both anthracite and bituminous, during the 9 years 1910-1918, was less than 11 per cent of the whole time lost. This is not, of course, a measure of the losses incurred locally in certain years, but it shows that other causes have had wider and more persistent effect upon the working time of the mines.

Any statement of the extent and causes of the fluctuations in coal production lacks vision unless it at least faces the search for a remedy. The limits of the statistical summary permit only suggestions, and these, although not novel, are probably worth the attention of everyone who attacks the problem of stabilization. Plainly fluctuation in production expresses to some extent fluctuation in demand.

An attempt to study the degree to which different consumers affect the seasonal market yielded the group of consumption curves given in Fig. 14. The seasonal fluctuation in locomotive consumption is seen to be a factor, for the railroads consume 28 per cent of all soft coal mined. An even larger offender in degree is the domestic consumer, although the amount involved is much smaller. The general industrial user doubtless ranks next as a contributor to the seasonal fluctuations, but the public utilities present a much more even curve, and the curve for the iron industry is somewhat the same.[4] Fortunately, in the case of certain other consumers, such as the cement and clay-products industries, the summer coal consumption exceeds the winter and the effect on the general production curve is beneficial. Export and bunker trade and the Lake shipments likewise tend to smooth out the seasonal curve.

The line of attack for the betterment of seasonal demand therefore seems to be narrowed down to a few classes of consumers. The problem of improving the load factor for the coal mines thus becomes a problem of encouraging the summer buying of coal. Two methods of solving this problem have been suggested: Seasonal discounts of the coal price and seasonal freight rates. Both methods seem economically sound and both will doubtless be fully discussed. Fig. 15 presents a comparison of lost time in the anthracite and bituminous mines since the summer discount was introduced for anthracite. It will be noted that the present advantage of the anthracite mines did not immediately follow the new system—the consumer has to be educated even to serve his own interests. A seasonal discount in freight rate seems wholly justified by the railroad's interest in its own load-factor; it too can afford to bid for summer traffic in preference to the more expensive winter haul.

But these or any other methods of increasing summer buying of soft coal cannot be considered apart from the question of storage; to what extent can storage be made practicable and to what extent can it be made attractive to the consumer, large or small?

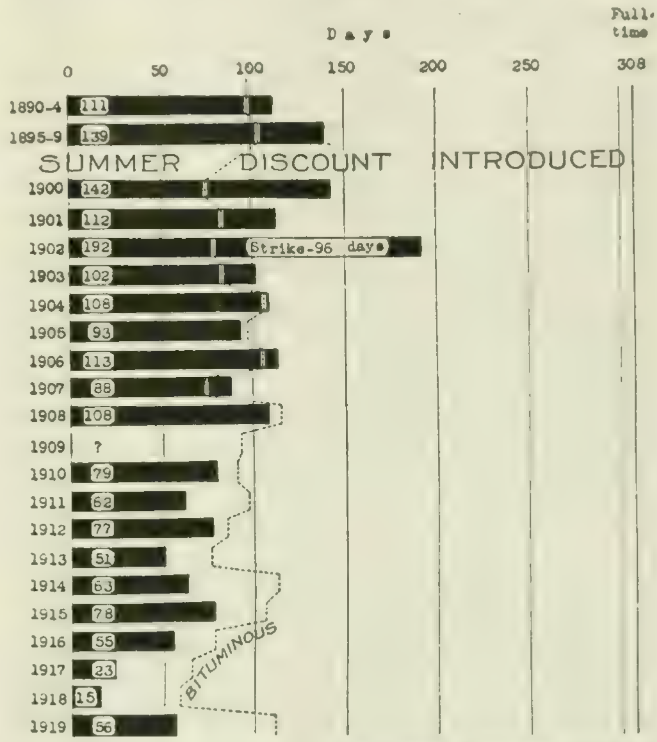

FIG. 15. DAYS LOST IN ANTHRACITE MINING BEFORE AND AFTER THE INTRODUCTION OF SUMMER DISCOUNT

In 1902 the "companies" in the anthracite region inaugurated the policy of announcing a summer discount on domestic coal. A gradual reduction in time lost followed. In the diagram the black bars represent average number of days lost. The zigzag line shows the losses in bituminous mining over the same period.

The general interest of our whole nation in bettering the load factor of the soft coal industry is large. Irregular employment is both a loss in man-power and a cause of social unrest. Society can not view with equanimity the spectacle of an excess mine capacity of 150,000,000 to 200,000,000 tons, and an excess labor force of perhaps 150,000 men. We hear talk of the social cost of universal military training. The cost of the man-days of enforced idleness in bituminous mining, during an ordinary year, is as great as that which would be involved in giving the year's class of all the young men of the country three months' military training.

To stop this industrial leak, together with its attendant evils, is the task of the engineer.

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[4] The curve for the iron industry represents only the average seasonal fluctuations for the last 12 years. The annual fluctuations caused by variations in general business activity have been isolated and cast aside. As the annual changes are far more pronounced, the seasonal changes are often obscured.

Conference Seeks to Cure All Mine Ills

Describing the Coal Industry as "One Which Functions Badly," the A.I.M.E. Boldly Accepts the Responsibility of Setting It Up on Its Uncertain Feet

By R. Dawson Hall

PERHAPS few sessions of the American Institute of Mining and Metallurgical Engineers have been more full of interest and instruction, or more generally attended, than those which were held in the auditorium of the Engineering Societies Building on Feb. 17 and 18.

It is hoped by Herbert C. Hoover, the president of the American Institute of Mining and Metallurgical Engineers, that as an outcome of the movement started by this discussion of the situation by engineers the stabilization of the coal-mining industry may be effected and so be a source of prosperity to the country and of increased welfare to the workingman.

Mr. Hoover declared that the coal industry was a trade which was "functioning badly." That may well be admitted. But it is only natural for the coal-mining interests of all kinds to question whether the other mining interests are functioning any better.

The gold mines are, if we may use the expression, "shot to pieces" by the price at which gold is exchangeable for goods and services. The copper industry has been working extremely short time. It is a grave question whether the mineral industry as a whole has passed through the past year as successfully as has the coal industry from the point of view of the regularity of employment on the part of the workingman. However, there is little question that any investigation which may be made at the instance of Mr. Hoover of the American Institute of Mining and Metallurgical Engineers will be of a sympathetic and helpful character.

Functioning badly is a common fault of all industry, in which the coal business is only one of many partakers. And the metal industry is just now functioning even less acceptably than the coal trade. However, there are some ills that need correcting. The fact that they are somewhat common does not mean that they should be accepted without attempt at redress. A suggestion that Mongol labor would rectify the problem did not meet with a single expression of approval. It would probably be as unfortunate here as in other countries where cheap labor has peonized the Anglo-Saxon mine worker.

When some institution like the A.I.M.E. is preparing to do the industry a favor I suppose the industry should not be too careful to see from whom the gift comes, or to deny that it is a gift, just simply because the persons who tender it are in need of like help themselves. There is no question but that the metal industry in general needs to look into its situation as carefully as it does into the status of the coal industry. We may look confidently to a time when it will be the duty and privilege of the coal-mining industry to show the copper, zinc, lead, gold, silver and precious metals, and other like industries, how they can best arrange their affairs so as to keep their equipment busy and their miners steadily at work.

One cannot but feel that the trouble in the coal industry arose from two sources (1) the scarcity of demand for coal and for the work of the miner during the early months in the year, and (2) the plentitude of demand for coal and for the labor of the miner during the final months of the year. Men do not complain until they see that economic conditions are such that it is perfectly safe for them to rebel.

In the metal industry there is such a small demand for the minerals which are now being produced that the metal miners are perforce obliged to be satisfied, but just as soon as there is a shortage of product in comparison with the amount used, we shall find that the metal miners can make as much complaint as anybody about the shortness of time which was vouchsafed to them in the year 1919. Then we shall learn that the metal industry is functioning badly.

H. C. Hoover opened the meeting on Tuesday, Feb. 17, at 2 p.m., with Horace C. Winchell presiding. He outlined the needs of the industry in a broad way, being followed by Van H. Manning, who made an address under the title of "Problems of the Coal Industry." His address appears in this week's issue. This was followed by a presentation of the fluctuations in coal production, their extent and causes, delivered by George Otis Smith and prepared by him in collaboration with F. G. Tryon. As this is also a matter of record in another part of this issue, it is entirely unnecessary to make any reference to it here. Sidney J. Jennings, a past president of the American Institute of Mining and Metallurgical Engineers and president of the United States Smelting & Refining Co., while not taking issue openly with Mr. Smith on the question of the excess of mine labor in the United States at the present time, stated that during the war he was much troubled with the fact that at many of his mines most of the coal was mined by foreigners who belonged to 27 different nations and spoke 8 different languages. What was worse, many of them were enemy aliens. In consequence he had expected that there would be much difficulty in providing the mines with a sufficient and willing labor force.

He stated that there was difficulty in getting men to supply the increased tonnage which was demanded year by year, and he suggested that, in China, men could be obtained who would do the rough work of mining. He stated that during the war he had offers from representatives of the Chinese in this country who volunteered to provide men should the Government permit their introduction. He mentioned the success with which the Chinese had been brought into the mines of South Africa for a limited period of time, the understanding being that they were to stay not less than three years and not more than six. He thought that the arrangement which was made in the Transvaal might be one which the United States could advantageously follow.

While Mr. Thacher succeeded Mr. Jennings, perhaps it would be well to delay comment on his remarks, to state that Mr. Hoover protested against the introduction of Chinese into this country under any contract or no contract. He said it was impossible to mix the yellow race with the white, and that the question was not one of economics but one of real national existence.

In Natal Asiatics had been brought in, and as a result there are now three classes—a sort of patrician class, an Asiatic class and persons who might best be described as "white trash." There was no question but that it had caused stratification of the people of the Province of Natal, creating a patrician class and a body of citizens whose misfortunes and standing were of the character which branded them as "peons."

METAL MINE WORKER MAKES 10-TON DAY

Arthur Thacher of St. Louis, Mo., who operates zinc and lead mines in Wisconsin, stated that the coal mines in Illinois were producing only about four tons per man, whereas the zinc mines in Wisconsin were producing ten tons per man per shift. He stated that this was due to the lack of co-operation between the coal miners and their employers, and stated that though coal was twice as bulky as ore the miners could, if they wished, produce much more coal per day.

He stated that in certain districts where the union did not have the authority that it had in the more important mining sections, the miners would put out about 20 tons per man per day. In those sections of the country each man did the best he could, but in others they limited their production so as to have an excuse for raising the rate of pay. He added that in his zinc mines he had a man 53 years old. Asking him how much he had loaded, he was informed that he had placed in the cars that day 75 tons. He had done as much the day before, and his neighbor had loaded 100 to 110 tons, 112 tons being his highest record. One man in one year loaded 15,000 tons.

George Otis Smith stated that the Asiatics in South Africa loaded 15 tons in 25 days, and that in view of such a record as that he thought that there would be very little advantage in the introduction of Asiatic labor. Asiatics do not seem to have the capacity which is to be obtained from workingmen such as North America and Europe will provide.

ARGUES THAT LOWER TONNAGE IS JUSTIFIED

Edwin Ludlow, consulting engineer of New York City, was of the opinion that a lower production should be expected of coal loaders than of metal muckers. He stated that much of the coal in the Illinois region was cut a few inches above the bottom in order to avoid impurities which were found in the base of the bed. As a result, the miner had hard shoveling and not a smooth surface on which to work. For this reason, Mr. Ludlow said, the output was obtained with greater difficulty than would otherwise be the case.

He said that it should be remembered, when a tonnage of about four tons per man was figured, that it was based on the whole labor force of the mine and the whole tonnage resulting therefrom. Consequently the tonnage per man was a unit not of coal extraction or coal loading, but a unit of output, in which the numerator is the whole output of the mine and the divisor the number of employees of every kind employed therein.

He stated that the real difficulty which confronted the coal industry was the large number of "officers," or would-be "officers," around the mining regions. The mining army was one which lacked persons who were willing to serve as "privates" and perform the actual labor at the coal face. This difficulty was growing, especially in view of the fact that so many of the men who had hitherto done the rough work at the face were now taking boat, or had already taken boat, to Europe.

DECLARES COAL MINING A SELECTIVE PROCESS

Edwin M. Chance stated that coal mining was in many ways different from the mining of ore of the type described by Mr. Thacher. He said that the mining of coal was largely a selective process, and in consequence it was necessary in many cases to employ a large number of men on the picking table, or to require the miner himself to make the most careful selection of the coal fit for market. There is considerable difference between the undercutting and careful shooting of coal followed by its careful preparation from a system in which the material is all shot down without any care and then loaded in bulk into the cars, the separation of the ore and gangue being regarded merely as a mill process.

R. V. Norris declared that low production per man arose to a certain extent from the number of farmer mines and high-cost mines of other descriptions. He stated that in every district there were five to fifteen per cent. of the operations which were of such a character that they should not be operating. These mines not only reduced the production per man but tended to decrease the record number of the days worked in the year, because such mines were operated by farmers and by men who only worked in the mines when high prices for coal were paid.

RICE DEFENDS LOW EUROPEAN COAL TONNAGES

George S. Rice declared that the figures which were given as averages of the regular days in the mines of any state were simply averages, as the word indeed implied. Many railroad mines and mines connected with steel mills worked much more steadily than "custom mines," while those collieries that depended on trade in general were idle. Much of the hard feeling which had existed resulted from the fact that one mine might be working with a comparative degree of steadiness, while another one a mile or so away might find it extremely hard to get in one day or two days a week.

He declared that here in the United States we should not take too much credit to ourselves because our tonnage was so much larger per man. It must be remembered that in Europe the mines were of greater depth and had often extremely bad roofs. Furthermore, it must be remembered that in many countries it was practically obligatory to fill in the measure with hydraulic or other filling as fast as the coal was removed. Thus, he said, there was a double operation—the removal of the coal and its replacement with filling. He might also have said that there was a treble operation, because the filling itself has to be extracted in the first instance. He called attention to the fact that much of this filling material had to be carried quite a long way on the railroad. All these things, he said, prevented the European countries from getting out as much coal per man as was obtained in the United States.

Mr. Hudson remarked that 40 per cent. of the operators were "economic mistakes" and should not be in the business of producing coal, because they had not the knowledge or the equipment to produce it cheaply. He stated that this 40 per cent produced about 20 per cent of the coal on the market and had a great deal to do with the fact that the mining of coal as an average was not as profitable as it ought to be. His remarks closed the first session of the conference on the stabilization of the coal-mining industry.

On the morning of Wednesday, with Edwin Ludlow presiding, Prof. H. H. Stock read an interesting paper on Coal Shortage with lantern slides to illustrate his subject. He quoted Abram S. Hewitt to show how irregular work at an early date made severe difficulties for the coal industry. Mr. Hewitt was president in 1876, but his presidential address seemed as true to today's conditions as to those he was describing at that distant date. He quoted the experience of the Commonwealth Edison Co., which had kept coal in continuous storage for 10 years without the coal once firing.

SHOULD WE VENTILATE COAL STORAGE PILES?

He spoke against the ventilation of coal piles unless the ventilation was made adequate to keep the air cool despite the rapidity of oxidation, which such aëration causes. He stated that Canada had been successful in providing such ventilation without evil result. Pipes were put at 4 ft. centers, instead of as far apart as was customary in United States storage piles. However, Mr. Stock added, Canada has the advantages of a colder climate, and the less torrid summer of that country did not subject the coal to so severe a firing test.

The cost of storage, he said, ran between 2½c. and $1.50 a ton. These were, however, quite exceptional limits. With moderately good mechanical equipment the cost ran between 10c. and 50c. or 60c. per ton. These figures covered only the cost of labor and supplies. Depreciation of the equipment and coal, the spoiling of the coal by mixture with impurities scooped up with the stored material when the bottom was reached, and the cost of the use of the land on which the coal was stored were not included in any such storage charges. A common rule was to estimate 10c. for putting coal into storage and 10c. for taking it out, but the increased cost of every form of service makes it necessary to revise these figures upward.

WATER WILL QUENCH FIRE IF IT PENETRATES

He stated that coal could readily be quenched with water, if only enough of it were used and if it were compelled to enter the coal piles and not allowed to run off without doing its work. Coal which heats gives off a tarry material which causes the fuel to be bound together in such a manner that the water sprinkled on it by sprays runs down on the outside of the heated area and drains onto the ground around without having performed its intended work.

Ralph Bradley, of the Boston & Maine R. R., said that New England always stored large quantities of coal, because it knew that it must store fuel or do without. The B. & M. uses 5,000 tons a day during the summer and 6,000 tons a day during the winter. It stores 400,000 tons of coal in the summer where richer roads that are near the mines have, instead of over two months' supply, only enough for the needs of four or five days. It seemed unfair to him that during the month of November when the strike was going on, his road was allowed no coal at all because it was possessed of so large a stock on hand. There is no reward given to those who lay out their money if the infrugal are to be allowed, when trouble comes, to protect themselves by confiscation.

NEW ENGLAND AND NORTHWEST STABILIZE TRADE

There are, he added, two areas in the United States where preparation to meet the winter needs is provided. These areas are the Northeast (New England) and the Northwest. He advocated that the practice of having the individual coal user store his own coal was expensive both in the use of land and in the installation of storing equipment. He declared that the small consumer dumped coal from the hopper onto the ground and had it laboriously shoveled by hand into a motor truck wasting not only labor but also unnecessarily holding up the equipment of the railroad and of the consumer.

Hence he advocated the creation of central storage plants in control of producers, wholesalers and consumers, capable of storing, on expensive land, large quantities of coal and equipped so as to put the fuel into storage and remove it therefrom with a minimum of expense.

Mr. Bradley's experience convinced him that there was just as much risk of firing when the coal was stored under cover as when it was not provided with any protection. He informed his hearers that he had stored the coal from the Clinch Valley for several months, in piles 30 ft. high, and had never had the least trouble.

ROADMASTER, NOT KNOWING BETTER, IS TO BLAME

Eugene McAuliffe said that his experience had been that when a president of a railroad decided to store coal against a shortage, he gave orders which passed rapidly down the line and the road master or wrecking master finally found the matter left wholly in his hands and piled the coal so that its dumping and reclaiming would give him a minimum of trouble. No care was taken to prevent the spontaneous ignition of the material, for the worthies who stored it had never made that subject a matter of a moment's consideration.

He declared that though there was a certain loss in storage from theft he never failed to get more cars of fuel out of the pile than he put in, because so much soil was mingled with the coal. This remark was given utterance, because Mr. Stoek had stated that in one case the coal instead of being laid on prepared land was actually dumped on the rough surface of a plowed field.

In relation to the notion that the proper place to store coal was at the mines he stated that he was manager of a mine in Illinois (Kathleen), and that last week his men had only 17½ hr. work, owing to the defective car supply. "How," said he, "would my mine workers like to divide up cars with a storage pile that had been accumulated in the summer? Surely," he said "they would want all the cars they could get to make the conditions under which they labored bearable."

S. L. Yerkes' paper followed. The reader will not be satisfied to receive it in inadequate synopsis. He will want it in full and it will be so published. Mr. Yerkes said that it was a commentary on conditions that at one time there were 250,000 cars idle and in 8 months that condition had been changed to one where there was a shortage of 75,000 cars. According to A. Gutheim, who spoke shortly thereafter, the first period was in February and March and the second in August. Mr. Yerkes said that 20,000 locomotives were needed and 600,000 freight cars.

H. M. Chance declared that he did not see how an increased car supply, a larger locomotive equipment or better service in the transportation department would rectify a fundamentally unsound condition in the coal industry. There were too many mines with too large a capacity manned by too many men. Even if the transportation difficulties were all solved there was not in the market demand and place for such a large tonnage of coal as the mines could readily produce. A. Gutheim of the Central Coal Committee made a long extempore address, which if specious was nevertheless interesting and illuminating. He showed that it was necessary to give the railroads the assigned car privilege, or else, what was less desirable, the right to confiscate, for that was the only way for the railroads to get coal during a period of coal shortage. When the turmoil of a coal shortage harassed an unhappy country, only by assigning coal to be loaded for specific purposes could the railroad and other public utilities be assured of getting fuel of the quantity and quality desired.

Railroad stagnation rapidly changes to a severe railroad shortage. Yerkes advocates larger equipment, but Chance declares trouble is more immediate and fundamental—an excess of both men and mines in the coal industry. Gutheim defends commandeering and assigning of railroad cars, while Andrade says storage of coal is generally economically unsound or it, surely, would be more general. McAuliffe covers many industrial ills in presenting his freight-rate differential plan.

All of which is well and good, but why should a nation be pushed to such straits that it must take these high-handed methods of procuring coal when through the greater part of the year the mine operators are clamoring for orders and the mine workers restlessly waiting for an opportunity to work? The railroads and the utilities should not allow themselves to be faced with a contingency which makes it necessary to lay aside those righteous laws by which in the happier past our country was governed.

He admitted that on some roads, as Mr. Yerkes had stated, there were no cars obtainable but "assigned" cars. The consumer who had made contracts with the mine owners had no rights that the utilities were obliged to respect. He declared that when confiscation was resorted to, the cars had practically to be taken from the front end of the train; the draft was therefore neither uniform nor equitable. Sometimes the most needy consumers failed to receive their supply; sometimes high-grade coal was used for low-grade uses. The assigned-car system was the better plan. Perhaps that is so; between one form of unrighteous act and another there may be a degree of difference, but all are alike improper, and Mr. Gutheim, faced with a condition of the railroad's own making, urged the right of the railroad to take the necessary means to meet the situation. Thus may the farmer who has no wheat because he has failed to plant justify himself in an invasion of his neighbor's granary.

Mr. Gutheim declared that before 1917 sporadic shortages of cars, which were of short duration, occasionally occurred. They were largely due, in his opinion, to the slow movement of cars that naturally resulted from the rigors of severe winters, rather than to any real lack of equipment on the part of the railroads.

C. Andrade, Jr., treasurer of the Matlack Coal & Iron Corporation, declared that the coal-export business would stabilize the coal trade. He urged that storage of coal would mean the tying up of large quantities of capital and that would be uneconomical. A rapid turnover was what was wanted. He said that coal would have been stored in quantity had the practice been economically sound.

In opposition to what Mr. Andrade stated, it may be said that unfortunately the loss from idle men is greater than the loss from idle capital, and furthermore if the coal mines are to be equipped to meet in a few months the needs of the whole year there will be a greater economic loss than would result from a liberal amount of storage. Mr. Andrade well said that unless Europe gets coal to set her factories in operation, exchange cannot be brought up to par value, and the present crisis in Europe cannot be mended.

Mr. McAuliffe said that the practice he had followed in buying coal for the railroad had been, not to contract to purchase of any one firm any more coal than it could supply at times when the car supply is at a minimum. In this way he had avoided much friction and had made a more general disposition of orders.

In the afternoon session, Eugene McAuliffe read his paper on the "Stabilizing of the Market," in which he presented the advantages of freight-rate differentials. He stated that at some of the small coal mines, worked during the stress of the war, the coal delivered to the cars contained as much as 50 per cent ash. The methods of loading were such that some cars were held 12 days before their loading was completed.

It was brought out, if not by him, by some one else who was present, that car shortage resulted in high prices, and high prices in the entrance of the high-cost mines with poor facilities into the business. These mines by their inefficient arrangements made the car shortage greater and did not better the situation at all. As soon as the stringency ended the high-cost mines closed down. Thus the railroads from having inadequate equipment came suddenly into a period when cars were idle.

He remarked that just before the strike one mine lost 25.6 per cent. of the time of its men owing to absenteeism. Yet these men faced a long shut down. It is impossible, he said, to get the men to work regularly. Speaking about the high cost of coal, he said that jobbers with a "shoestring" capital spring up whenever there is a coal shortage and go around peddling coal. He had himself signed vouchers to such gentry of $1 per ton delivered. The coal industry needed relief from men of this kind.

(To be concluded.)

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Sulphur Percentage and Fuel Ratios

IT WILL be a surprise to many to learn that the fuel ratios vary quite largely in the coals of the State of Illinois, that the result of dividing fixed-carbon content by volatile-matter content is about 1.5 in Jackson County and only about 1.0 in the Rock Island and Mercer coal field and that the thermal units in Jackson County are 12,488 on the British, or Fahrenheit, standard and only 10,514 in the Springfield-Peoria district, Bed No. 5.

It must be remembered that Illinois though level for the most part is not by any means a State which has not had its period of catyclysms. In the Saline field may be found dykes, faults of 160 ft. throw, and dislocations of less dimension and in the La Salle field tiltings around 45 deg. By no means has all been peaceable and orderly. So much is covered by horizonal measures of later date, glacial drift among other, that it is hard to believe that there was a time when Illinois had severe earthquakes, faulting and lava flows, small of course but existent nevertheless. Such disturbances might explain the variation in the "greenness" of the coal. Some coals apparently have been artificially "aged," and some have merely matured without being toasted by heat.

An interesting table has been calculated from a diagrammatic tabulation contained in "Coal Resources of District V" by Gilbert H. Cady in the well-known series of "Illinois Mining Investigations," the analyses being taken from some 313 tests made by J. M. Lindgren. The figures show, or seem to show, like the figures which investigation develops in the more Eastern States, that there is a relation existing between sulphur content and fuel ratio, the sulphur declining as the fuel ratio increases. The table follows:

Region	Seam No.	Sulphur	Fuel Ratio	B.t.u.	Moisture
Jackson County	2	1.29	1.5015	12,488	9.28
Williamson & Franklin	6	1.53	1.4141	11,825	9.21
Saline County..................	5	2.92	1.3728	12,276	6.75
Danville........................	6	2.55	1.1240	10,919	14.45
Rock Island and Mercer	1	3.59	1.0416	11,036	13.46
S. W. Illinois, W. of Duquoin	6	4.01	1.0265	10,847	11.56
Springfield-Peoria ...	5	3.52	1.0217	10,514	15.10
Danville	7	2.93	1.0120	11,143	12.99
La Salle or Longwall	2	2.89	0.9758	10,981	16.18

The fields are arranged in the order of decreasing fuel ratio, and it will be observed that the sulphur can only be said to increase, in general, with the decrease in that ratio. One hesitates to deduce from such a showing that the ripening of the coal reduces the sulphur content, for look at the Danville No. 7 and the La Salle coals, but remembering that different seams are likely to have different originating flora and therefore different sulphur percentages and that the sulphur content varies from place to place with the same seam, the figures are quite suggestive and add their little mite to the generous confirmation shown in other States. Low sulphur and low volatile tend to occur in the same analysis. Has not anthracite, the lowest volatile constituents and is it not remarkably free from sulphur?

The facts seem to suggest that heat readily drives off that part of the sulphur which is in organic form or that, in ageing, the organic compounds break up and secondary sulphur compounds are liberated. Especially does it appear that this action is more marked when the maturing is rapid than when it is slow.

The organic sulphur may in part be extremely stable but indications are that some of it is not any too strongly held. The action of the loosely combined sulphur is worthy of study as it may be a cause of spontaneous combustion through combination with iron aided by the heat of dissociation from the combinations in which it is found. The study of organic sulphur in coal is still in its infancy and it will be a fruitful field for the investigator for years to come.

Did the Stabilization Conference Settle Anything?

SO MANY branches of a difficult subject were taken up by the conference on the Stabilization of the Coal Industry that it could not be expected to arrive at the basis of any of them. The only enlightening suggestion was one associated in the public mind with Mr. McAuliffe and that suggestion is not exactly new. Differential freight rates were advocated in *Coal Age* on Dec. 2, 1916, in an editorial entitled "Do Your Christmas Shopping Early," and this admonition was made the subject of some remarks by the same author at a meeting of the Coal Mining Institute of America in the same winter.

To quote the editorial: "The railroads themselves should help to smooth the seasonal irregularities. Why, when freight rates are raised, which is sure to happen soon, could not they arrange to put all that increase on the winter service? The railroads would surely gain immensely by regularity of operation, which would enable them to keep their equipment in continued profitable operation and their employees steadily at work. It would also increase their traffic at the one period of the year, when it is conducted at least cost and with least loss."

At a recent conference of the public utilities which use the public streets for their services comes the statement that storage does not pay, that the companies could store more if an inducement were afforded. It may well be conceded that storage must be made to pay if it is to be practiced extensively, and in such measure as to steady the industry, but there seems such a determination to keep coal prices and freight rates down in the winter to a level that will give a bare subsistence that there seems no hope of putting summer rates any lower. Winter rates must be made sufficiently generous as to permit of their safe reduction in the summer. This is true whether the coal industry or the railroads furnish the required differential.

Coal operators cannot be expected to run approximately nine months at either a loss or without a profit, and then be allowed to make only a 6 per cent. per annum return for the short space of three months, which would be an average of only 1½ per cent per annum, even if the summer trade were conducted without profit or loss.

Public utilities may be, and in fact are, near bankruptcy, but their necessities should not be cured by oppression of other utilities any more than of the laboring men who serve them. Their correct means of redress is by fair rates. They will gain nothing by blackening the fair repute of the coal producer or the railroads, which are victims with them of a perverted public sentiment. Recriminations between the servitors of the people will only result in the public having a contempt for all alike and an exalted opinion of those who conduct their business without recrimination, but with great profit—to wit, the non-utility classes of industry.

Dangers of Regulatory Bodies

AT THE meeting of the American Institute of Mining and Metallurgical Engineers, George S. Rice proposed that some syndicate method of providing for the doing away of cut-throat competition—which made the conservation and other important provisions impossible—be adopted and that a commission be appointed to regulate prices in the interests of the public and to prevent the opening of mines which were not needed for the current consumption. He declared that in his belief such a commission would be as fair as was the Fuel Administration after the first few months of its existence.

"A Banner With a Strange Device"

UNCLE SAM DISCARDS HIS ANCIENT HABILIMENTS FOR THE CARMAGNOLE AND THE PHRYGIAN CAP OF SOCIAL CHANGE

Owing to our crippling one of our most essential industries—transportation—in the interest of those who favor state ownership we find food, coal, lumber and paper in short supply.

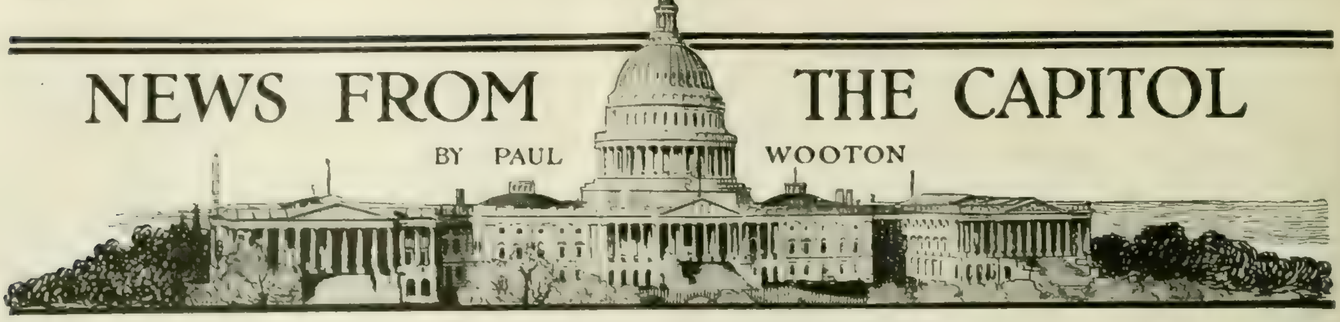
It is true that this Administration during much of the war was fair to the bituminous coal industry but, by its own admission, it was not fair to the anthracite operators, and it cannot be said that its decision regarding the strike was equitable and such as to make any coal operators anxious to revive in peace its war-time activities. It is a fact that every regulative body starts in with a fairly good record. Prices are high when it starts its operation; that is why it is called into being. The Fuel Administration had it arrived a little earlier and established the Peabody-Lane scale of prices would have been hailed as a deliverer, and yet the profits of the coal men would have been quite a little better than merely satisfactory. But after the prices are fixed, trouble quite usually begins. The regulatory body feels it would be quite a shock to the public if it made any increase in prices owing to increased wage or material costs, or to additional expense due either to changed working conditions or to new regulations made for the purpose of securing conservation, safety or health.

As a result the regulatory board becomes readily a repressive body. Pressed by the public it fears to make an unpopular decision. It seeks to excuse itself by imagining that a profit can be made in the business should there be sufficient business activity to reduce overhead, and, if a loss results or there is a failure to duly profit, then the hope is that the times were so abnormal that no unfavorable deductions may fitly be drawn from that highly inconvenient fact.

That most benignant of bodies, the Federal Trade Commission of the Hurley days, did not have regulation but investigation as its aim. It did not have the same occasion as the Interstate Commerce Commission, the Fuel Administration and local public-service commissions to become inimical to honorable business endeavor but nevertheless it took the same course, which shows that there is a dual influence at work—a desire to keep down the cost of living, no matter at what price and a general disposition to demand the profitless operation of all utilities.

With a commission having its life extended through the years, there is always a risk that it will reach a time when unfair influences prevail, and then we shall hear the cry, as we have with the railroads, that there is such a great difference already created between present rates and fair profits that it is obvious that the needed rectification of rates cannot be made without injury to the public welfare. Just now comes an opportunity to an old established regulatory body to support the reputation of all such institutions by just and considerate action. The Interstate Commerce Commission has laid on it the work of fixing freight rates for the railroads on such a level as will make it possible for them to do business and make a 6 per cent return. Will they do it or will they flounder with half measures as has Mr. Hines in his conduct of the Railroad Administration? Herbert C. Hoover well said that any excessive generosity to the railroads might create a revulsion in favor of Government ownership in some new form. But there are intermediate measures that can well be taken. The railroads have been well spanked and put to bed for the Hamilton and Dayton and like offenses, so there is no advantage in spoiling the meals of the railroads by serving up such unpleasant recollections whenever they sit to meat.

Let the Interstate Commerce Commission, if it makes a mistake, make it in the direction of too high a rate instead of one too low. As the returns to the railroads are limited, there will be no loss to the public, and the screws may be brought down later if the public desires.



NEWS FROM THE CAPITOL

BY PAUL WOOTON

Senate Orders Hines To Make Complete Report of Coal Stewardship

In the Senate of the United States, on Feb. 10, Mr. Frelinghuysen submitted a resolution; which was considered and agreed to and reads in part as follows:

Resolved, That the Director-General of Railroads is hereby directed to report to the Senate as soon as practicable:

The extent of the authority, powers, and duties with respect to the shipment, distribution, apportionment, or storage of coal or coke, which were originally delegated to the Fuel Administration under an act entitled "An act to provide further for the national security and defense by encouraging the production, conserving the supply, and controlling the distribution of food products and fuel."

The exercise by the Director-General of Railroads at the present time of the powers so delegated and the extent.

The exact contents of all papers, documents, or memoranda delegating or conferring authority, powers, or duties upon the Director-General of Railroads with respect to the shipment, distribution, apportionment, or storage of coal or coke.

Federal Trade Commission's Report on Illinois Field

Some of the points of particular interest in the Federal Trade Commission's report on the cost of producing coal in Illinois are as follows:

(1) The situation in the bituminous-coal industry in Illinois during 1917-1918 bore a much closer resemblance to that in the Pennsylvania anthracite industry than to that in the Pennsylvania bituminous industry. In Illinois, as in the case of Pennsylvania anthracite, the increases in sales realizations were more nearly proportionate to the increases in costs.

(2) In general, in the different Illinois districts, there was not such a wide difference between the margins prior to the period of Governmental price-fixing and those subsequent thereto. This is in striking contrast to the reduction of the margin in the case of the Pennsylvania bituminous-coal industry, particularly, in the southwestern field, which took place subsequent to August, 1917, when the Governmental price regulation went into effect.

(3) Wide differences in conditions are shown to have existed between some of the Illinois districts. For example, for District 1, in the northern part of the state, where 76 per cent of the output came from mines which produced pick-mined coal only, there was a relatively high labor cost per ton. For District 6, in the southern part of the state, where only 14 per cent of the output was pick-mined coal, and over half of the output was machine-mined coal, there was a relatively low labor cost per ton, as pointed out in the report.

Such differences in conditions involve differences between the districts in the amount of the margin necessary to equally profitable operation. In the one case the investment in mining machinery was relatively small, since the coal was mined chiefly by the direct application of hand labor, resulting in a relatively high labor cost per ton. In the other case, where the coal was mined, chiefly with machines, the labor cost per ton was relatively low. But there was a relatively heavy investment in mining machinery. The margin (i.e., the difference between the sales realization and the f.o.b. mine cost) necessary to a profitable operation should be large enough to include a suitable return on the investment, and in the latter case must provide for a return on the investment, and must provide for a return on the additional investment in labor-saving machinery.

(4) The report presents in detail many figures showing the proportion which the labor cost formed to the total f.o.b. mine cost (exclusive of any return to the capital invested) and the proportion which such labor costs formed of the amount received from the sale of the coal. Thus, in 1918, the labor cost in the different districts was from 75 to 80 per cent of the total f.o.b. mine cost, and was from 61 to 71 per cent of the sales realization."

Ruling on Paying Railroad Claims

Below is a copy of a letter which General Counsel Underwood of the U. S. Railroad Administration has issued to all Regional Directors under date of Jan. 16, 1920, and having to do with the payment of claims on account of shipments moving prior to, and during, Federal control:

"The Interstate Commerce Commission has held in the Decker Case, I. C. C. Docket 10,696, that it does not construe the limitation in the bill of lading as prohibiting the payment after two years and one day of meritorious claims if reasonably filed.

"Claims on account of shipments moving prior to Federal control, if filed within the period prescribed in the bill of lading, should be paid or declined on their merits, notwithstanding the two years and one day clause in the bill of lading, provided that in every case, the consent of the corporation to such payment is first obtained.

"Until further notice, claims on account of shipments moving during Federal control, if filled within the period prescribed in the bill of lading, should be adjusted on their merits, notwithstanding the two year and one day clause in the bill of lading.

"Extreme care should be exercised in the settling of all claims of this class so that there will be no discrimination."

DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

Authority of Shotfirers

Letter No. 8—That is an interesting question raised by a shotfirer of Nortonville, Ky., and which appeared in *Coal Age*, Jan. 3, p. 26, regarding a dispute that arose between the miners and the shotfirers employed by the Norton Coal Company of that place. It seems that the miners wanted the shotfirers to open the ends of the sticks of powder when charging and tamping a hole, claiming that if this was not done the explosion of all of the two or more sticks charged in the same hole was not certain.

On the other hand, the shotfirers refused to fire shots prepared in this manner, claiming that there was danger of the loose powder being ignited by a spark caused by the tamping bar coming in contact with a sulphur ball in the hole, even when using a copper-tipped tamping bar.

The question might be properly asked, Who employs the shotfirers and who pays them, the company or the men; and who will assume the responsibility for their being killed? It is evident that black powder was used in this case, but no mention is made as to whether the coal was undermined or shot off the solid.

What the Mining Law Requires in Blasting

However, setting these questions aside, the fact that there are numerous methods in use for charging and blasting coal, and many accidents occur daily from the careless handling of powder and holes being improperly drilled, charged and tamped, has made it necessary to restrict, by law, the work of shooting coal in mines. In many states the law requires the employment of competent shotfirers and clothes them with authority to refuse to fire any shots that, in their judgment, are unsafe.

My opinion, in this instance, is that where a hole is charged with two or more sticks of powder, the sticks should not be opened but pushed carefully back into the hole with a wooden tamping bar. As each stick is pushed into the hole and forced home, the needle can be used to prick a small hole in the end of the stick. If this is done there will be no danger but that the entire charge will be exploded at one and the same time. Where fuse is used the charge should be made up in a single stick and tamped with a wooden bar after inserting a cartridge or plug of dry clay.

Status of the Mine Committee

The work of shotfiring is dangerous at the best and a shotfirer takes his own chances if he fires a shot that he sees is improperly prepared. While a mine committee always has the right to ask the reason why a shotfirer refused to fire a shot, it has no authority to go further and demand that he shoot the hole. Should the committee decide that the shotfirer has deliberately turned down and refused to fire a shot that they consider safe, all they can do is to ask that the miner be recompensed for the loss of his day's work. The disputed question can only be decided, in that case, by the state mine inspector.

Shotfirers are supposed to know the law and to realize the responsibility resting on them by reason of their position, and no person has any right to question their decision in refusing to fire a shot considered to be unsafe, inasmuch as the shotfirer is employed in the interest of his own safety and the security of the mine.

Let me add in closing, that the use of black powder loose in the hole cannot be recommended, under any condition in shooting coal. Further, a charge of black powder should not exceed two feet in length, in a hole 2¼ in. in diameter. When a charge of black powder exceeds 35 per cent of the length of the hole there is danger that the shot will blow its tamping, and my experience is that these limits should not be exceeded.

Farr, Colo. **Robert A. Marshall.**

Lawful Examination of a Mine

Letter No. 10—At a recent meeting of superintendents, mine foremen, firebosses and others closely related to mine operations, there was organized the "Upper Potomac Mining Institute" of West Virginia, for the purpose of reading appropriate papers and discussing subjects pertaining to mining. The institute is to meet once a month, and the aim will be to discuss points that are not clear and to draw out the unbiased opinions of the members.

There is little doubt but that such meetings will be of exceptional interest along practical, safety and social lines, and that not only the members but all the workers will be materially benefited. In this connection, let me remark that I do not know of a subject that could arouse more interest than this one, or that is of greater importance and more direct benefit to the men engaged in and around the different plants. Indeed, I feel that, after these meetings have been a reality for a few months, there will be a more careful analysis of the methods now used by those making the examinations in our mines, and that more efficient and safe means will be employed.

System Needed in Examining a Mine

I note with pleasure that many of the letters that have appeared in *Coal Age* advocate the three-hour system of examination, as specified in our state mining law. But it has been my contention, for some time past, that a more systematic procedure of examination is necessary in order to have a thoroughly practical and safe mine organization.

In my opinion, a mine should be divided into sections. The opening and ventilation of every mine should involve that consideration at the start. Each section should be of such size that an assistant foreman could have complete supervision of its working places in each shift. At a large mine, all section foremen should meet two hours before starting time, enter the mine at the same time, and again gather on the outside to compare notes of their examinations, before permitting the men to enter the mine. They would then make out their reports, consult with the mine foremen and return to their respective sections, until one hour before the miners quit work.

As a rule, miners do not work to within about an hour of quitting time, and this plan would not keep the assistant foreman away from his men but a short period. He should remain where he will be in close touch with his men and be able to help them in every way possible. In a large mine a night foreman may be necessary, but his presence is not as needful as on the day shift, although the same process of examination should be effective during the night as in the day.

SYSTEMATIC EXAMINATIONS WILL REDUCE ACCIDENTS

A system of this kind with efficient foremen and assistant foremen should reduce the number of accidents one-fourth to one-half. And in time, as the foremen and men entered more spiritedly and honestly into their work, accidents would be a thing of the past.

A mine would then have what I would call a "lawful examination." More practical methods and ideas would come into use. The mining laws and mine regulations would be more strictly obeyed and all workers would exercise greater care. A closer co-operation between men and officials would result. And the slogan "Safety First" would be recognized and more faithfully practiced. With this system working smoothly there would be less chance for accidents to happen, and time and money lost by the men in the past would begin to show on the credit side of their accounts.

A truly friendly atmosphere would surround such a community and the spirit of good fellowship be everywhere in evidence. Let us hope for these results.

Thomas, W. Va. BEN.

Letter No. 11—This subject and that of "Finding a Mine Door Set Open," the discussion of which has just closed in *Coal Age*, are closely associated. The letters presented contain many good suggestions that cannot fail to benefit all who have followed these discussions closely, from week to week.

The experience and judgment of practical mining men make them agree that it would be far better if there were no doors to be left open in a mine. However, all men are human, and we know it is a common thing to find an open door. The door may have been broken by a derailed car and not reported, through neglect, in which case the fireboss will find it open when making his rounds in the morning.

WHAT IS A "LAWFUL EXAMINATION" OF A MINE?

In order to make a *lawful* examination of a mine, the fireboss or mine examiner must comply with every requirement of the mining law. In Illinois, the law requires him to see that the air current is traveling in its proper course and that the quantity of air in circulation is sufficient.

The law specifies an air volume of 100 cu. ft. per man per minute, or 150 cu. ft. if the mine is generating gas, and 500 cu. ft. for each animal employed in the mine, but the mine inspector is authorized to increase this quantity according to his judgment. The law also requires the examiner to measure the air in the last crosscut of each pair of entries, using his anemometer for that purpose and recording the quantity of air measured in a book kept for that purpose. He must examine all places where men are required to work or to pass, and to observe any dangerous condition of roof or accumulation of gas.

Now, in the performance of these duties, the examiner will often be compelled, in actual practice, to do some things he should not do, or act in ways that he would not choose to follow under other conditions. For example, the section of the mine in his charge may chance to have two or more air splits; and the examiner in following up one of these splits, proceeds with the air. Then, to save walking back to the mouth of the second split, he may take a short cut and start to examine the next split, proceeding against the air.

This is a practical condition and one that cannot be avoided if the examiner is to save time and report back to the shaft bottom in time for the men to enter the mine for work. Other instances could be mentioned in which practical conditions control the manner in which the examiner must proceed; but in all cases his examination of the mine must comply with the law or it will not be a lawful examination.

Staunton, Ill. WILLIAM M. CHAMBERS.

Avoidable Degradation of Coal

Letter No. 2—While I support heartily every effort made to produce cleaner coal and a larger percentage of lump, and am fully aware of the difficulties in the attainment of this object, and realize the importance of this matter in respect to marketing the coal, I feel at the same time that we are prone to overlook certain underlying factors that must be considered in determining the miners' just responsibility for the loading of inferior coal, which has long been a trying problem in the industry.

In his letter, *Coal Age*, Oct. 2, p. 586, Richard Bowen has discussed the question so ably that it would seem little remains to be said along the lines he has mentioned; namely, the need of modern machinery for the conveying, washing and sizing of the coal, and the advantage to be gained by adopting a suitable plan of mine and employing methods of working that will reduce the breakage of the coal in the mining and transportation of the product from the face to the tipple.

EFFECT OF THE "CONTRACT SYSTEM" IN THE LOADING OF DIRTY COAL

Mr. Bowen further urges that "more attention should be given the miner, who must be taught to use more judgment and skill in the performance of his work." This is certainly true in that it induces the miner to take a deeper interest in his work and gives a greater degree of safety.

Observation and experience convince me, however, that one vital factor affecting the problem is the contract system of wage payment, under which the miner's earnings depend on the *quantity* of coal he mines. While the contract system is fair and honorable in that it establishes a just basis of payment and promotes smooth relations between the miner and his employer, it cannot be denied that the system possesses one unfortunate feature, which is indirectly responsible for the loading of much dirty and inferior coal.

Realizing that his wages are in direct proportion to the amount of coal he can load, the average miner is possessed with the one desire to increase his output. As a result, he is not always as particular regarding the *quality* of the coal he loads, as he is in respect to the *quantity*.

Now, whatever measures may be taken to produce cleaner coal and a larger percentage of lump, must have a restraining effect on the earning capacity of the miner, under the contract system. It tends to decrease his output, reduce his wages and incidentally increase the cost of production. These, I say, are matters to be considered in determining the miner's responsibility for the degradation of coal.

In respect to improving the quality of the coal produced, the suggestion of teaching the miner to use "more judgment and skill" in blasting his coal, seems to be an idle one, when their interests are made to depend on the *quantity* of their output. Experienced miners will generally question any suggestion that judgment and skill are wanting on their part, while they are using these factors to the extent of their ability to increase their earnings.

Since the miner must purchase the explosive to blast his coal, it is foolish to think that he is not using his best judgment and skill in placing the shots in a manner that will reap the largest harvest. I am not excusing careless, indifferent and incompetent miners, who regard lightly the degradation of coal, and use excessive charges of powder to break it down. Such men must be weeded out and taught better methods of mining.

STUDYING THE QUESTION IN THE LIGHT OF ITS PRACTICAL ASPECTS

The point I would emphasize, however, is that the question of the degradation of coal, as it concerns the miner, must be studied in the light of the conditions that affect his work at the face. It is my belief that the average miner realizes that it is as much to his interest to keep the mine running regularly, as it is to the interests of the company. Also, that the steady operation of the mine depends on the *quality* as well as the *quantity* of the coal produced. It is a broad question and one that requires careful analysis, in determining its right solution.

There is much food for reflection in the concise remarks of a miner who, in speaking of the quantity of dirty and inferior coal sent out of the mine, agreed that it was possible for the miner both to load cleaner coal and obtain a larger percentage of lump. But, in doing this, he claimed that "complications would arise between the miner and the company that would not be for the interests of either party." He argued that both would suffer from a reduced output and an increased cost of production, which would tend to lower the miner's wages or increase the selling price of the coal on the market.

The tendency of the times today is toward co-operation and profit-sharing between operators and workmen, in most all industries. Men prominent in financial and labor circles regard such schemes as means to secure more efficient and profitable operation and believe they point the way to industrial reform. It is generally agreed that the adoption of such schemes would lead to a better understanding between employers and employees, whose interests would become more closely identified with each other, and enable workers to take a broader view of industrial relations and comprehend their own responsibility for the business.

In closing, let me say it is in this direction that the most favorable solution of the question of the degradation of coal can be sought. However, in respect to the *quality* of the coal produced and the miner's responsibility for the same, it cannot be overlooked that the unhealthy competition existing among miners working under the contract system, and the ever-prevailing competition between different coal operations are chief factors in the problem. WILLIAM WESNEDGE.

Ladysmith, B. C., Canada.

Promotion of Ambitious Workers

Letter No. 8—The discussion of this subject has interested me deeply. Like other questions of the kind, there are two sides to the question of promotion. Some writers seem to think that all a writer must do is to go ahead and do his best, and sooner or later his reward will come. This is no doubt true as an ideal condition; but, in practice, the deserving one is often robbed of a just return for the efforts he has put forth.

How often have we seen a good man set aside because the "old man" did not fancy him for some reason; or because the boss had a friend for the place. The friend's capabilities may ill fit him for the position, but that counts little with the big boss. I have known instances where the preference for a friend has cost the company thousands of dollars.

It would seem that some companies rather expect that a new manager or superintendent will make many changes in the official capacities of the men under them. The old bosses who have long been acquainted with the particular conditions in the mines are frequently fired to make room for friends of the new man. I have even seen it appear, for a time, that the change made was for the better; but this was generally due to the fact that the new foreman was reaping the benefit of the practical foresight of his predecessor in office, and the real truth only became known later as the output would fall off and the expense of operation increased daily. These are facts that no practical man can deny. Unfortunately, it is part of the mining game, much as we regret to admit the fact.

AMBITION AND THE WILLING WORKER

I like the way that the matter has been put in the letter of W. H. Luxton, *Coal Age*, Jan. 22, p. 195. Mr. Luxton urges the ambitious worker to "look on the bright side and one's chances of success will be greatly improved." As he has truly stated, it is discouraging to the ambitious worker to see things done in the manner I have mentioned. However, my advice to any young man, in the mining game, is, Do your best and never give up; but show the man under whose orders you work that you have ambition to do the work that comes, in the best manner possible.

If you are sent to the bottom of the second-left entry to clean out a ditch, go to it with a will. The smearing of your hands and clothes is far better than the danger of compromising yourself by showing a dislike for the work in hand. Remember the cleaning of the ditch is as important to the boss as any other work and he will wish it done right. If the boss is the right kind and, thank God, there are many of them, he will regard highly a man's willingness to perform any work given him and do it well. He has his eye on such men for higher positions when the opportunity offers.

It may be well when a man desires a certain place to make his ambition known to his boss; but, having done this, one must let the matter rest there. Should the boss later fill the place by appointing another man, rest assured that there is some good reason for what he does. Do not let that discourage your ambition. Be sure that fitness and capability for performing the work in hand will tell in time and in the end you will reach the place for which you are best fitted.

Not long ago, I overheard the remark of a man who said, "You cannot keep a good man down; he's bound to rise." Sometimes a little pull is a good thing, but my advice is that the ambitious man should not depend on "pull," but get busy and use a self-starter. Discouragement may come once or twice; but, some time, some where, you will find your niche and get your reward.

McIntyre, Pa. THOMAS HOGARTH.

Letter No. 9—This is a question that naturally excites much comment among ambitious mine workers, when a vacancy occurs in some higher position, in the course of the operation of a mine. After the appointment is made, frequent expressions of opinion are heard regarding the wisdom and judgment displayed in filling the position. It is common to hear much adverse criticism.

Instead of emphasizing the strong points of the person appointed to fill the place, the too common practice is to dwell on those points in which the person may be deficient. It can be said with some degree of assurance that these defects are later found to be purely imaginary.

QUALIFICATION AND FITNESS CHIEF FACTORS

To my mind, the most significant factor to be considered in the advancement of an ambitious worker is his qualification or fitness for the office. The question is, Are his qualifications such as to make for real progress in the service of the industry? Personal interest may prompt one to discuss this question in the light of his own experience, whether or not he has realized his expectations.

Another will argue from the standpoint of justice to an ambitious worker who is thought to be better fitted for the place than the one selected. At times, influence or some other characteristic will be the controlling feature of the argument. In all such personal allusions, however, it is evident that the ambition is wrongly directed, in that the merits essential to promotion are overlooked.

SUCCESS VS. DISAPPOINTMENT AND FAILURE

It is one thing to gain promotion, but quite another matter to make a success in a new position, the ambition to reach which has been accompanied by hard work and painstaking effort to overcome the difficulties that beset the way. Large numbers of workers have had their ambition crushed and their ardor dampened by force of circumstances that are beyond their control. Too frequently the desire to excel is practically destroyed by the discouragements and influences that have retarded the progress of the ambitious one. For this reason, words of counsel and encouragement are helpful to all whose aspirations are to fill higher positions than those they already occupy.

There are everywhere disappointments and failures arising from the unfitness of one who has attained a higher position through influence or by reason of some circumstance or fortune, and the advancement of such a one proves a burden. Again, the exaltation of the workman may subject him to worriment through the manifest jealousies of his associates of less marked abilities than his own.

DIFFICULTIES ARISING FROM PROMOTION

Only recently my attention was drawn to the case of a man who had reached the highest position in his particular circle, through diligence and efficient service. His ideals were lofty and his generosity knew no bounds. Success attended his every effort and, for a time, he commanded the respect of his associates. But the cancer of envy and malice grew, in a certain field among his fellow workers, and eventually destroyed all that his ambition had created. Impaired health, through worry, forced this man to resign and shortly afterward he died leaving his family in want and poverty.

The incident shows how a man may sacrifice his all on the altar of ambition. The ancient writer Lucretius, in commenting on the vanity of human ambition, remarked, "Though men try to reach the highest honors, they often render the course of their steps full of trouble and, though they attain their object, envy like a thunderbolt hurls them in time from their pre-eminence and flings them with scorn into the gloom of Tartarus."

I may be wrong, but my observation inclines me to think that a stranger, or some person from a different rank of life than the worker, is more frequently respected when promoted to a higher position in the company, than is the case with one taken from the rank and file. Such resentment on the part of one's former fellow-workers is peculiar. It may be due to the exercise of caution in regard to intimacies and familiarities that prevailed formerly, but are now under restraint. However this may be, it should not destroy the ambition of an honest worker to excel and rise in his chosen calling. The man who would succeed must stand prepared to conquer every difficulty and breast every discouragement. WILLIAM WESNEDGE.

Ladysmith, B. C., Canada.

Tamping Dynamite

Letter No. 2—Referring to the letter of Gaston F. Libiez, *Coal Age*, Jan. 29, p. 244, I fully agree with him that a charge of a low-percentage dynamite should be well tamped, while this may not be so necessary when using a high-grade explosive.

In blasting a vertical hole in rock, or a hole that dips at a sufficient angle, water is frequently used instead of solid tamping. In my opinion, however, it is little better than no tamping at all.

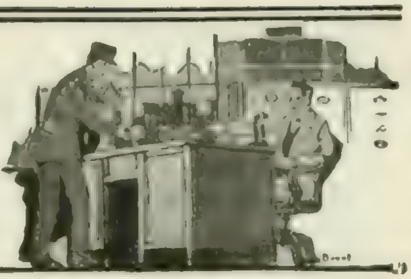
In my experience, all kinds of explosives give better results when some tamping is done. A detonating powder is quicker in its action, and permits of shortening stemming; but black powder, any grade, being slower should always be tamped tight to the mouth of the hole, in order to get the full effect of the explosion of the charge.

In the use of high explosives, it is quite true that the full efficiency of the explosive is not gained without some tamping is done; but care must then be exercised, as there is danger of exploding the charge if the tamping bar is used too forcibly in preparing the shot.

Rawdon, Quebec, Canada. C. MCMANIMAN.

INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD



Carbide Lamps in Pillar Robbing

The work of robbing pillars was proceeding in an abandoned section of our mine when the generation of carbon dioxide increased to such an extent that oil lamps could not be used, and the miners were given carbide lights, which burned more freely in that atmosphere. I want to ask to what danger, if any, were the miners exposed, in the use of the carbide lamps?

Scranton, Pa. MINE FOREMAN.

It is a well-known fact that the carbide lamp will continue to burn, though with somewhat diminished brightness and the flame taking on a reddish tint, in an atmosphere charged with carbon dioxide to such extent that the flame of an oil lamp is quickly extinguished. The presence of the carbon dioxide causes a corresponding depletion of the oxygen in the atmosphere. Careful experiments have shown that where the oxygen content of the air has been depleted by the addition of carbon dioxide, a fatal atmosphere is produced when the oxygen is reduced to 17 per cent, the fatality being due to the toxic effect of the carbon dioxide. At that point the atmosphere contains 17 per cent oxygen, 65 per cent nitrogen and 18 per cent carbon dioxide.

While this atmosphere is generally fatal to life, if breathed but a short time, it will support the burning of the carbide flame, which will give but a faint and frequently unobserved warning of the presence of danger to the men at work and breathing the air. A recently charged carbide lamp will continue to burn, in an atmosphere charged with carbon dioxide, till the oxygen content is reduced to 14 per cent or even less, which is far below the danger point in the support of life. Another danger to which the men are exposed is the possible presence of methane in dangerous quantity.

Working Kanawha River Coal

Having noticed that there have been answered in *Coal Age*, each week, many interesting problems presented by various readers, regarding their troubles, I take the liberty of presenting a proposition that we have had in contemplation for some time. It concerns the best method of attempting the extraction of the coal from three seams, which we understand underlie the Kanawha River bottom, in the territory surrounding Cedar Grove, W. Va., where we are now operating a small mine in a low seam of coal.

According to our information, the three seams mentioned lie at depths of, approximately, 50, 100, and 160 ft., respectively, below the river bottom. As reported by the drillers of gaswells, in the vicinity, the first two of these seams are believed to have an average thickness varying from 3 to 5 ft., while the thickness of the lowest seam mentioned is estimated as varying from 6 to 9 ft., with about 30 ft. of sandrock overlying the coal.

We are now preparing to put down three test holes, with a core drill, and if the results are favorable we want to study out the best and cheapest plan for the extraction of the coal. Without attempting to install too large and expensive equipment, we want to provide a plant that will maintain a daily output of 1,000 tons, in a working day of 8 hours. We contemplate sinking two shafts, 300 ft. apart, as required by law. These will be located at the foot of the mountain, convenient to the railroad and above the high-water level.

Knowing the high character that has marked the discussion of such problems as these by the practical readers of *Coal Age*, who have contributed generously from their own experiences in similar instances, we hope to receive much help and benefit.

Briefly stated, some of the more important considerations, in this case are: The order of extraction of the three seams mentioned, assuming that each of them contains workable coal of the average thickness named and of fair quality. I want to ask, Should the coal be taken from the upper thinner seams and these practically exhausted, before attempting the extraction in the lower seam; or should this order be reversed and the seam lying at the lowest depth be attacked first?

Again, should a shaft or slope opening be employed to give the most satisfactory results with a view to safety and economy of operation? The suggestion has been made of opening the first seam, which lies at a depth of 50 ft. below the railroad, by means of a slope equipped with some sort of conveyor for bringing the coal to the surface. On the other hand, a shaft opening has been advised sunk to the bottom seam and equipped with self-dumping cages or an automatic skip.

In connection with the slope opening, it has been suggested to weigh the coal on the slope bottom. One suggestion, in connection with the slope opening, was to build a concrete storage bin, at the bottom of the slope and having a capacity of 100 tons, and install a conveyor system that would take the coal from this bin and elevate it to the surface.

Lastly, we would much appreciate the suggestion of the best plan to adopt in the working of the coal in these seams. On the surface, the mountain rises to a height of 1,000 ft. above the railroad. The lower seam is probably that known as the "Eagle" seam, which is a gas coal and overlaid with a heavy rock top.

Charleston, W. Va. ARTHUR L. SHELDON.

Coal Age gladly submits this proposition to its practical readers who are in every way fitted to give the best advice on the questions presented. Questions such as these relating to the economic and safe working of coal seams have always enlisted the deepest interest from men whose experiences have furnished them with an ample fund of practical suggestions, and we hope these will be forthcoming from those acquainted with the working of the coal in the Kanawha district.

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Miscellaneous Questions

(*Answered by Request*)

Ques.—The airway in a mine measures 5 x 10 ft., in section, where the anemometer indicates a velocity of 500 ft. per min. If the barometer registers 30 in. and the temperature is 70 deg. F. what is the weight of air passing through the mine in 24 hours?

Ans.—The sectional area of this airway is 5 × 10 = 50 sq.ft. Assuming the reading of the anemometer indicates the average velocity of the air current (500 ft. per min.), the volume of air passing is 50 × 500 = 25,000 cu.ft. per min. At a temperature of 70 deg. F., barometer 30 in., the weight of a cubic foot of air is given by the formula,

$$w = \frac{1.3273 \times 30}{460 + 70} = 0.07513\ lb.$$

The weight of air passing in the mine, in 24 hr., is then,

$$\frac{24 \times 60 \times 25{,}000 \times 0.07513}{2{,}000} = 1{,}352.34\ tons.$$

Ques.—A mine has two airways: A is 6 x 6 ft., in section; B is 4 x 8 ft., in section; what will be their comparative lengths, in order that they shall pass equal quantities of air, under the same pressure?

Ans.—First, write the formula for the unit pressure, in terms of the airway and the quantity of air in circulation; thus,

$$p = \frac{kloq^2}{a^3}.$$

For the same unit pressure and quantity of air in circulation, and the two airways having the same perimeter; $o_1 = 2(6 + 6) = 24$ ft.; and $o_2 = 2(4 + 8) = 24$ ft., it is evident that the length (l) of the airway will vary directly as the cube of the sectional area (a^3). In other words, the length ratio is equal to the cube of the area ratio; thus

$$\frac{l_1}{l_2} = \left(\frac{6 \times 6}{4 \times 8}\right) = \left(\frac{36}{32}\right)^3 = \left(\frac{9}{8}\right)^3 = \frac{729}{512}$$

That is to say, in order that these airways shall pass equal quantities of air, under the same pressure, the ratio of their lengths is as 729 to 512. The first airway having the larger sectional area requires a greater length, to enable it to pass the same volume of air, under the same pressure as the second airway.

Ques.—What weight can be lifted with a jackscrew that requires two revolutions to raise the weight 1 in.? The length of the lever is 20 in. and the force applied at its end, 100 lb. Disregard friction.

Ans.—The circumference of a circle having a radius of 20 in. is 2 × 3.1416 × 20 = 125.66 in. The work performed by a force of 100 lb. applied at the end of this lever, in making two revolutions of the screw, is 2 × 125.66 × 100 = 25,132 in.-lb. Since the screw lifts the weight 1 in. when making two revolutions, the weight lifted, in this case, is 25,132 lb., or 12.566 tons, ignoring friction.

Ques.—What horsepower will it take to hoist 1,200 tons of coal in a shaft 525 ft. deep, in 8 hr., the resistance of the ropes and pulleys being 12½ per cent?

Ans.—Allowing 12½ per cent for friction, the effective work is 100 — 12.5 = 87.5 per cent, and the required horsepower is, therefore,

$$H = \frac{1{,}200 \times 2{,}000 \times 525}{0.875 \times 8 \times 60 \times 33{,}000} = 90.9\ hp.$$

Ques.—If a mule performs 10,000 units of work in one minute, while walking at the rate of three miles per hour, what is the pull on the chain?

Ans.—Walking at the rate of 3 mi. per hr., the mule travels (3 × 5280) ÷ 60 = 264 ft. per min. The pull exerted on the chain is then 10,000 ÷ 264 = 37.87 lb.

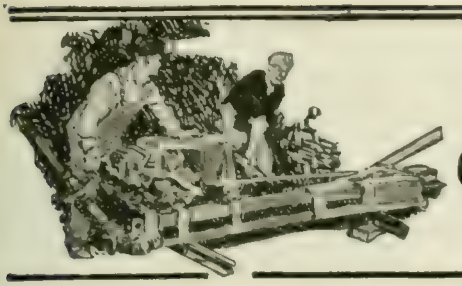
Ques.—If a room, turned at an angle of 30 deg. with the entry, is driven 300 ft. what will be the shortest possible distance to connect the face of the room with the entry; and how far along the entry will the place require to be started?

Ans.—The shortest distance, from the face of the room to the entry, is in a line drawn at right angles to the entry. The length of this line is 300 × sin 30 deg. = 300 × 0.5 = 150 ft. This distance is measured from the center line of the room, at the face, to the center line of the entry, when the length of the room is measured from the center line of the entry to the face. The distance between these two points of measurement, on the entry is 300 × cos 30 deg. = 300 × 0.866 = 259.8 ft.

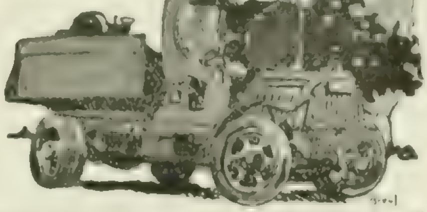
Ques.—A gaseous mine is divided into three sections, A, B, C. Section A contains a firedamp mixture consisting of one part of marsh gas and ten parts of air. Section B is likewise filled with a mixture consisting of one part of marsh gas, with less than ten parts of air. Section C is filled with a mixture consisting of one part of marsh gas and more than ten parts of air. The gas being ignited in Section A, where would you expect to find the most violent explosion, and which section would be the most dangerous to explore after the explosion?

Ans.—The mixture of gas and air, in section A, very closely approaches the maximum explosive point of the firedamp. It is in this section, therefore that the greatest violence would be manifest.

Of the other two sections, Section B would be the most dangerous to explore after the explosion had taken place. The reason for this is that the mixture, in that section, contains less air than what is required to burn all of the carbon in the marsh gas, to carbon dioxide. As a consequence, a greater proportion of carbon monoxide is formed in this section. On the other hand, in Section C, the air being in excess, a larger proportion of carbon dioxide and less carbon monoxide results from the explosion.



COAL AND COKE NEWS



Charleston, W. Va.

Cars from the West permit or slightly larger production during second week of February. Yet mines here work only half-time. Severe weather checks movement of empties. Influenza generally prevalent. Some Kanawha mines receive no cars for week or more. Influenza bad in some sections of Kanawha field. No coal exported. In New River region mines work one-third time. Sickness general here. Does not curtail production with no cars to load.

With a somewhat larger flow of empties from the West during the early part of the second week of the month, more cars were available in this secton; yet by the time all the cars had been distributed in the various fields, served by the Chesapeake & Ohio, the increase was almost imperceptible and yet for a day or so did serve to give impetus to production. This probably resulted in a somewhat larger output than during the first week of the month, though the increase was not such as to inspire any great amount of enthusiasm, since the car shortage was sufficiently serious as to materially limit the operation of mines.

As illustrating how the supply slid downward from day to day, on Monday the loadings on the Chesapeake & Ohio were 139,000 tons; on Tuesday, 82,150 tons; on Wednesday, 71,000 tons; by Thursday they were down as low as 61,000 tons. Aside from the supply for the first two days, cars were only numerous enough for half the requirements of mines, therefore, working time amounted to about half of a full week. Severe weather on the fourteenth, fifteenth and sixteenth checked the further increase in movement of empties from the West. It is now the general belief that there will be little relief from the present car shortage until the weather becomes milder and until export shipments are resumed on a general scale permitting a quick return of cars to the mines.

Influenza was generally prevalent in this section, but in itself it had no direct bearing on the volume of coal produced or not produced, since such working forces as were available were able to load all the cars which were furnished. The epidemic has not proved to be as serious as it was in October, 1918. Railroads have been as much affected by it, however, as have mining operations.

Kanawha Works Half Time

Even though cars were somewhat more plentiful, as far as the Kanawha district as a whole was concerned, during the week ended Feb. 14, there was still a most pronounced shortage of equipment in the Kanawha field during the greater part of the week. With the mines of the field producing only from 10,000 to 15,000 tons a day, it will be apparent that mines were able to work only about half-time or less. It was not uncommon during the week to hear of cases where mines had received no cars for a period of a week or ten days, especially on branch lines. With mines idle so much of the time producers are way behind with their deliveries and this, of course, has brought about a condition in this section at least where there is no free coal. Many mining communities in the Kanawha region were fighting against another influenza invasion, a number of camps on Cabin Creek, Coal River and in the neighborhood of Winifrede reporting quite a large number of cases. Even so much sickness failed to hamper operations materially, owing to the scarcity of cars. No coal from the Kanawha region is being exported at the present time.

New River Small Output

If the car supply was conducive to larger loadings in other fields, such was not the case in the New River district during the week, loadings being leaner there, if anything, than during the week ended the seventh. In fact the car supply was so execrable that on Thursday, Feb. 12, only 5,150 tons of coal were loaded in the large New River field. The large supply of cars on Monday enabling the mines to produce about 23,000 tons was only an artificial supply. It is doubtful if mines worked more than two days out of the six, that, of course, meaning about a 30 per cent car supply. Intances were not lacking where mines had no cars during the entire week. No mines had enough cars for a full day's work at any time and much valuable time was lost. Though it does not seem that there will be any railroad strike in the near future, coal operators believe that conditions could not be much worse even with such a strike in effect. With sickness general among the miners in the New River field, it did not curtail production, owing to there being so few cars to load. Coal for export continues to be shipped from the field but permit requirements make it a cumbersome way of doing business and export tonnage is limited.

Bluefield, W. Va.

Conditions going from bad to worse in southern West Virginia. Serious car shortage. Due to severe winter weather and limited export tonnage. Rapid spread of influenza. Government confiscates West Virginia coal for Pennsylvania R.R. Tug River mines do not work half time. Winding Gulf plants work two days in six. Pocahontas works three days in the week. Considerable influenza here.

The stumbling block to anything approaching a normal production in the mining fields of southern West Virginia during the second week of February was a car shortage of a most serious nature. Transportation conditions were not even on a par with those prevailing during the previous week. General conditions in the southern part of the state have been going from bad to worse almost continuously since the first of the year. Relief now seems remote, even the Railroad Administration admitting it is helpless to afford any relief. Only half-enough cars were supplied, so that for at least three days of the week mines were in idleness.

While not all operations in southern West Virginia felt the serious effects of sickness among the miners, yet the rapid spread of influenza at various mining communities since the first of February has undoubtedly augmented other sources of loss in output as well as affecting railroad operations. That in turn, of course, has been felt in a retarded movement of coal and in a slower distribution of empties.

Two factors are now conspiring to prevent a better car supply in southern West Virginia. One is the severe winter weather beginning on the fourteenth. That prevented a large movement of empties from the West. The other factor is the limited export shipments. Until there is a full run of export tonnage there will be more or less of a short car supply, owing to the longer distance loaded coal cars must travel.

While no confiscation of smbkeless coal is being reported, yet high volatile from southern West Virginia and from southwestern Virginia is being taken, orders, for instance, having become effective on Feb. 9 to confiscate 600 cars of coal from the Thacker and Clinch Valley fields, this being done at the Bluefield scales. Such confiscation is being continued at the rate of 25 cars a day. What is peculiarly significant in this connection, however, is the fact that the coal is being taken for use by the Pennsylvania R.R. West Virginia operators cannot understand why the Pennsylvania R.R., running through a bituminous field, should use West Virginia coal; unless it is that central Pennsylvania operators will not make contracts with the railroad and, further, that they enforce the payment of contract prices when coal is confiscated. There seems to be no reason why the Government should confiscate West Virginia coal for use on the Pennsylvania R.R.

Loadings in the Tug River field for the week ended Feb. 14 amounted to only 66,600 net tons, which is below the loading of the previous week. Cars were so scarce during the period mentioned above that a considerable number of mines in the field were not able to work even half time on account of not having enough empties. The outlook for the third week of February indicated that it would be the slimmest from a production standpoint since the second week of January, when loadings slumped to 55,000 tons.

Winding Gulf Works Two Days

How little and not how much coal was produced in the Winding Gulf field during the second week of the month may be imagined when it is stated that the car supply in that field was not sufficient to keep the mines operating more than two days throughout the week, the supply amounting to about 35 per cent of requirements. According to the operators there does not seem to be any immediate hope of more than a 40 per cent car supply. Both the Chesapeake & Ohio and the Virginian were at fault in the small number of empties furnished. Nearly all Winding Gulf coal is moving eastward at the present time, some of it for export, all export shipments being under special permission, however.

Pocahontas Sharp Decline

A description of conditions existing in the Tug River field also applies with equal force to the Pocahontas district, covering production for the second week of February. There was a sharp decline in the output during that period as compared with the previous week, and a more pronounced shortage of cars than had been in evidence in recent weeks was the principal cause of this sharp decrease. There were not half-enough cars on hand to supply the mines. Consequently, half the working time of the week was lost or, in other words, mines were limited to about three days work for the week. With weather conditions extremely unfavorable no relief from the car shortage was anticipated during the third week of the month. There has been considerable influenza among the miners of the Pocahontas region since the seventh, but while the complement of men at some plants has been greatly reduced by the malady other plants have escaped a visitation

Frankfort, Ky.

Bill introduced in Kentucky Legislature creating a state Geological Survey. Old Department of Geology and Forestry outlawed. New act to fill the breach. Scope of the new survey outlined, duties of the director noted and provision made for proper ass'stance to carry on the survey work. Co-operation with Federal departments arranged for. Reports and publicity of survey work to be authorized.

A bill was recently introduced into the Kentucky Legislature by R. Lee Stewart to create a State Geological Survey. This bill has the following provisions: The Kentucky Geological Survey is to be created and established with a single executive officer, designated as the Director and State Geologist with headquarters at Frankfort, Ky., where are kept the geological collections, records, maps and accumulated property of former state surveys.

The governor of the state is to appoint the director of the survey, subject to the consent of the senate; this officer is to be qualified in a thorough, scientific and practical knowledge of the sciences of geology, mineralogy, hydrography and allied subjects The director shall have had at least six years' collegiate and technical training in geology and shall be a graduate in geology from a recognized university. He shall hold his office for four years, unless removed sooner by the governor for inefficiency, incompetency or misconduct.

It shall be the duty of this director and state geologist to administrate the affairs of the survey; to visit all parts of the State of Kentucky and make himself familiar with the needs of each section; to supervise, outline and edit the work of his assistants; to advance the interests of Kentucky by presenting in person or otherwise, before national geological meetings, authoritative statements of the geological and mineral resources of the state; to undertake such field work as his time will permit, and to perform such other duties as may properly pertain to his office. He shall be responsible for the accuracy of the work of the survey, and make a biennial report to the governor covering the activities accomplished by and proposed for the State Geological Survey.

Activities of the Survey

Should time permit the director may lecture at the state universities on subjects pertaining to the geological and mineralogical development of the state, but without special financial remuneration for such services. Under the direction of the state geologist, careful geological, mineralogical, chemical, physical and soil surveys of the state shall be made; mineral and metalliferous deposits are to be located and specimens of such minerals and metals collected, analyzed and classified.

Provision is made for the employment, by the director, of competent assistant geologists, paleontologists, topographers, surveyors, specialists and such other assistants as may be required for the proper conduct of the affairs of the survey.

The bill directs that the Kentucky survey shall co-operate with the State Experiment Station, the U. S. Geological Survey and other governmental departments; provided first that such departments shall furnish an amount of money equal to that alloted for such work by the Kentucky survey, and second that such co-operative agreements shall prove advantageous to the state of Kentucky. The salary of the director is to be $3,000 per annum.

The reports of the survey shall be prepared as rapidly as possible and shall be reviewed, edited and approved by the director. Furthermore the director is authorized to publish in the daily and weekly newspapers, trade and technical journals, magazines or in pamphlet form any geological discoveries or results of special interest. No reports or maps prepared by the Kentucky survey shall be sold, but nominal charges to cover postage may be made.

For the purpose of carrying into effect the provisions of this act, the sum of $15,000 is to be appropriated annually to cover all field, laboratory and office expenses; the further sum of $12,500 is to be available for co-operation with the U. S. Geological Survey; provided, in this latter case, that if such co-operative work is not being conducted to the best advantage of the state, then Kentucky may withdraw from such an arrangement and the work be continued by the Kentucky Survey.

The law relating to the Department of Geology and Forestry has been repealed at this session of the General Assembly, and there are now no funds available for this work or to support a prospective geological survey; therefore an emergency is declared to exist which is to be met by this act and its appropriations.

Louisville, Ky.

Deplorable coal-car situation in the Southern Appalachian territory. Operators, thoroughly aroused, threaten to shut down and sue Railroad Administration. Conditions on Louisville & Nashville noted and compared with those on other roads. Numerous orders given which would have afforded relief. Orders not enforced and Railroad Administration held responsible.

It is said to be likely that individual operators of the Hazard, Harlan, southeastern Kentucky and eastern Tennessee districts, in that territory known as the Southern Appalachian district, may file [illegible] [illegible] [illegible] the U. S. Railroad Administration, charging discrimination in distribution of coal-car supply. Figures extending back over a period of several months show that operators on the lines of the Louisville & Nashville R.R. have suffered [illegible] through poor distribution of cars and movement of empties into other sections of the country, without providing for the operations of the Louisville & Nashville lines. It is charged that operators on the system in question have lost between $3[illegible] and [illegible] as a result of existing conditions in the past few months.

A telegram sent from Knoxville, Tenn., on Feb. 5, to B. L. Winchell, Regional Director of the U. S. Railroad Administration at Atlanta, asks why railroads in the South have failed to execute administration orders and turn over empties to the Louisville & Nashville at junction points as stipulated in orders. The number of pool and foreign cars turned over has been far below the stipulated figures, and since Jan. 28, the supply has been trifling, the Cumberland Valley division on Feb. 5, receiving but a 40 per cent supply. The telegram further said: "The situation is deplorable, operators threaten shut down and suit against the Administration. We urge mandatory execution of orders."

Operators along the Louisville & Nashville lines recently filed a statement of conditions, and J. E McCoy, secretary of the Southern Appalachian Coal Operators' Association, filed the statement with the Railroad Administration, and made an appeal for removal of the discriminations, as the head of a committee that went to Washington for that purpose. The statement showed that while the car supply last August was 85 per cent for the country as a whole, the Southern region showed but 67 per cent and mines on the Louisville & Nashville had but 59 per cent. The situation was about the same in the following months with the Louisville & Nashville securing the smallest supply in the country. It was charged that the Southern region received 11 to 18 per cent smaller car supply and the Louisville & Nashville mines 20 to 25 per cent less than other sections since August. The supply since Jan. 1 has been the worst ever known, with many Louisville & Nashville mines working but a day and a half a week. It was shown that but 56.88 per cent of cars ordered from Jan. 1 to 17 were delivered to Louisville & Nashville mines, with some districts getting but 41 per cent.

Promises Not Kept

It is claimed that many promises were received, much correspondence handled, and arrangements made to move cars into the section from various gateways, but that the orders were not carried out. It is stated that inasmuch as the Railroad Administration has full charge of motive power and car supply, there is no reason for discrimination, and the operators on the Louisville & Nashville want what is due them.

Operators want relief before the railroads return to private control, and believe, that if present legislation placing direction of equipment in the hands of the Interstate Commerce Commission is enacted, that the discrimination will no longer be practiced. Reimbursement is sought for discrimination and resulting losses since Aug. 1.

It is alleged that railroads north of the Ohio are 1,900 cars short of an agreement to deliver an empty car for each loaded car turned over at terminals at Ohio River crossings, this shortage occurring within three weeks time. The Southern Ry. was ordered to give up 75 empties from car pool movements to the Louisville & Nashville, at Knoxville daily, but seldom has total deliveries amounted to 25 cars a day. At other junction points the condition has been about the same. It is charged that most of the cars that have been turned over are Louisville & Nashville cars and not foreign or pool cars. In fact delivery of pool cars ceased at Middlesboro on Jan. 26.

On Feb. 5, the car supply on the Cumberland Valley division of the Louisville & Nashville was but 35 per cent; Harlan County received no cars and was shut down tight; there were but 250 cars available at Middlesboro on Friday. J. E. McCoy claimed that the Southern Ry. lines have been supplying 60 to 70 per cent of requirements. According to Railway Administration records, there has been a fluctuation of from 88 to 39.59 per cent.

It is claimed that discrimination has resulted in reduced operations, resulting in losses of eight to ten millions of dollars that would have been avoided if the Louisville & Nashville mines had been given a fair percentage of such cars as have been available. Mr. McCoy stated that it was on this account that operators planned to bring suit against Walker D. Hines, as Director General of Railroads, that the suits would probably be filed by the Hazard or Harlan operators but that Tennessee operators on the L. & N., would probably join in. It is stated that litigation is almost certain to be filed if relief is not immediately given.

Mr. McCoy further said: "The operators are being bled to death by the inability to get cars. In fact every industry is suffering severely because of the transportation problem." He stated that it had been developed that empty cars are sent on long hauls instead of being returned to home line roads with freight moving that way. Delivery of pool cars had been expected to offset this condition, but it failed through carriers not complying with orders.

Coal operators claim that the railroads have not been playing fair with the Louisville & Nashville which has been helpless in the matter of securing anything like her net ownership of cars. For months past the road has been constantly short of cars, and the total number of coal cars on her lines has been far below ownership figures. Other lines have accepted shipments, but failed to turn over empties. The Railroad Administration is held to be responsible for not enforcing its orders.

Ashland, Ky.

Northeast Kentucky output half of normal. Car shortage the cause. Railroads grabbing much coal. Mines forced to fill railroad contracts before other orders. Allotment commission mine ratings irritate operators.

Production in the northeast Kentucky field during the second week of February reached only 120,000 tons, or about 50 per cent of the potential capacity (237,000 tons), with car shortages alone representing 122,000 tons, or 49 per cent loss, and mine disability and labor shortage only one per cent. During the same period of 1919, the production was 95,000 tons, with "no market" responsible for the entire loss at that time.

Railroads have begun to confiscate northeast Kentucky coal indiscriminately, especially in the premium grades. Where coal is not being so confiscated, other mines having railroad fuel contracts are being forced to supply the entire contract requirements of the railroads, before furnishing other contract holders with their coal; the operators are under the penalty of having their coal embargoed unless they fall in line. This policy is stamped by operators as wilfully unjust.

The epidemic of influenza at Seco, Ky., where Government assistance was finally afforded, has abated somewhat. Reports from the Big Sandy territory disclose the presence of the disease in light form at scattered points in that region.

Operators of the northeast Kentucky field are quite irritated over the apparent arbitrary action taken by the allotment commission, in refusing increases to mine ratings, although in many cases considerable extension of plant equipment and greatly increased labor forces are shown.

There is an unusually heavy and insistent demand for all northeast Kentucky coal at the present time in all grades; but mines in this field are making no progress in meeting such demand with a car supply only equal to half of requirements and with the railroads literally grabbing all the coal they can get their hands on.

Norton, Va.

Southern Ry. refuses to accept bills of lading. Confiscates coal right and left. Vigorous protest by operators. Production 74 per cent of capacity. Influenza to further curtail output.

The Southern Ry. was still confiscating Virginia coal right and left, during the second week of February, for railroad use and was not permitting any coal to go forward for commercial purposes. This refusal to accept bills of lading and this disposition to appropriate all the coal produced, was denounced in vigorous terms by Virginia operators who protested most strongly against it, as they have been doing right along, but to no avail.

Production during the week amounted to 156,358 tons or only 74 per cent of capacity; losses were entirely due to car shortage, reaching a total of 52,900 tons or 25 per cent of potential capacity. Some 42,000 tons of coal was either coked or stored during the week, or production would have been reduced at least 20 per cent more than was the case.

Promiscuous confiscation of coal was working a great hardship on commercial customers depending on Virginia mines for coal. It was estimated that production would be curtailed to the extent of at least 30 per cent more, during the third week of February, because of the rapid spread of influenza over the field, most operations, in fact, having 30 per cent of their working force out of commission owing to illness of employees.

The output of 156,000 tons, during the second week of the month, represented a loss of about 4,000 tons as compared with the previous week's production.

Indianapolis, Ind.

State Geologist notes improvement in Indiana mining methods. Further saving in coal needed. Chief sources of waste stated. Higher prices tend to utilization of low-grade coal.

Improved methods of mining coal are eliminating much waste in Indiana, but there continues a large percentage of loss, according to a report issued by W N Logan, state geologist Mr Logan estimates that approximately 26,500,000 tons of coal are mined in Indiana annually He says the waste here is greater than in other bituminous fields

"In some states the waste has been reduced to 50 per cent of the coal mined, but the waste has not been reduced to this minimum in Indiana," Dr. Logan says. "And while the waste has been much greater in the past than it is at present, there is need of much greater improvement."

Waste in coal mining may be connected with the system of mining or it may be independent of the system, according to the report. The chief sources of waste in mining coal are: Not robbing the pillars in the room-and-pillar system; unclean mining in the strip-pit method; leaving coal containing partings in any system; producing unrecovered culm, leaving coal around horsebacks, bells, etc., and mining lower beds before upper ones. The principal systems of mining employed in Indiana include strip-pit method, the room-and-pillar system and the long-wall system.

Dr. Logan's report to the Department of Conservation shows that higher prices have had a tendency to decrease the waste of fine coal or culm, now utilized extensively in the industrial plants where there is a demand for coal of low heating power.

Victoria, B. C.

Government mining engineer notes new coal development on Vancouver Island, Canadian Collieries, Ltd., drills property; Canadian Western Fuel Co., Ltd., develops extensively. Nanoose Wellington Coal Co. installs new equipment. Improvement at Cassidy Collieries.

Commenting on the coal-mining development on Vancouver Island, B.C., during the the past year, Wm. M. Brewer, Government mining engineer, observes that two mines have been added to the active shippers. These are the No. 5 mine, at South Wellington, the property of the Canadian Collieries, Ltd., from which coal has been mined on a commercial scale since early in 1919 and the Wakesiah mine on the Wakesiah farm, property of the Canadian Western Fuel Co., Ltd., which began producing commercially about October, 1919.

"Amongst new development or prospecting work," Mr. Brewer continues, "there is the diamond drilling being done by the Canadian Collieries, Ltd, on the Tsa-abl River, which empties into Baynes Sound about five miles southerly from Union Bay in the Comox section of the Nanaimo mining division; also the reopening of the old slope by the Canadian Western Fuel Co., Ltd., on the Wellington seam, southerly from the Harewood mine. The slope of the latter company had been driven about 400 ft. and abandoned by the former management. During the past summer the old workings were unwatered and examined, with the result that General Manager George A. Bowen, ordered that the workings be reopened, extended and the mine placed on a producing basis. This may be worked as Harewood No. 2 mine, with a new railway connection; or the underground workings may be extended to connect with the haulage system in the Harewood mine and the coal transported through that mine to the transportation system now in use."

New Construction and Development

Mr. Brewer also refers to the transfer of the Grant mine, Nanoose Bay, to the Nanoose Wellington Coal Co., Ltd. Since the change of management considerable new construction and development work has been undertaken. This is itemized as follows: Two return-tubular boilers, 125 hp. each; one 150-kw electric generator; one electrically-driven centrifugal pump for coal washery and fire protection, capacity 450 gal. per min.; two storage tanks for fire protection and coal washery, capacity 25,000 gal.; a coal-washing plant including a jig washer, screening plant, picking table, loading boom and bunkers for three grades of coal, the whole to be electrically operated; a new office building, and other structures. The underground development has been pushed steadily (consisting of a main level and a counter level driven approximately 1,800 ft. in the last year) with stalls driven to the rise and a slope to the dip, and with entries turned off east and west The mine is worked on the pillar and stall system

Improvements are being made to the plant of the Cassidy collieries of the Granby Consolidated Mining, Smelting & Power Co. as their necessity becomes apparent. One of the most notable improvements completed here in recent months is a belt conveyor from the bunkers over the wharf to the scows. This makes loading a simple process. The mine is producing steadily, the product being shipped to Anyox for use in the company's byproduct ovens in the manufacture of coke for the smelter.

PENNSYLVANIA

Anthracite

Hazleton—The Lehigh Valley Coal Co., it is said, will connect its Beaver Meadow drainage tunnel with its Spring Mountain workings by a tunnel about 2000 ft. long When completed this new tunnel will take care of the water from the Spring Mountain and Spring Brook workings.

Wilkes-Barre — The newly-constructed $1,000,000 breaker of the Delaware, Lackawanna & Western company, at Edwardsville, which began operations recently, is said to be the last word in breaker construction and will prepare 6,000 tons of coal for the market daily. The building is 165 ft. high and occupies a ground area 210 ft. sq., or a little more than an acre.

Tamaqua—Eventually the use of electricity will become general in the mines of Lehigh, Schuylkill and Carbon counties, according to the statement made by leading officials at the Harwood Electric and the Lehigh Navigation Electric companies. These electric companies say that most anthracite operators now are anxious to electrify their collieries and that only the conditions created by the war and subsequent high prices have delayed the work. Up to this time the Harwood Electric Co. and the Lehigh Navigation Electric Co. have found it difficult to take on new business as the demand for power is so great that the machinery held for reserve cannot be kept idle. The extension of the Hauto plant has already been started, and when it is completed it is expected that every demand can be met.

Bituminous

Pittsburgh—In this district it is often necessary for men to work for sometime in coke ovens, making repairs, or inspecting ovens out of blast On damp days the fumes from such ovens are most noticeable and are not only annoying but positively dangerous to those who must work in them. It has been found quite practicable for men so employed to wear an army gas mask while engaged in work under these conditions.

Brownsville—The Snowdon Coke Co., whose plant is near here, has just had a revolving-car dump installed at its works by the Car Dumper & Equipment Co., of Chicago, Ill. This dump is 265 ft. long and capable of dumping 28 cars in 12 sec., at one operation, without uncoupling or disconnecting the hoisting rope. This is said to be the longest dump of the kind ever installed. The Snowdon Coke Co. has discarded its wooden drop-bottom mine cars and installed new steel-bodied cars with tight wooden bottoms, furnished by the Koppel Industrial Car & Equipment Co. of Koppel, Pa

KENTUCKY

Louisville—A bill before the state legislature to enforce mine operators and manufacturers to install bath houses for miners, has been amended to provide that such installations shall not be necessary where mines will be worked out within a period of two years. The Senate has passed a bill providing for miners to have the power to go outside of their own company to secure a scale inspector. There was a strong fight on this bill, it being alleged by the minority that the scale inspector should be picked from men employed by the mine in question.

OHIO

Columbus—Two important laws were passed at the recent session of the Ohio Legislature which affects coal operators in Ohio. One of the laws provides that all employers must keep their workmen's compensation premiums paid up in full or face receivership proceedings. The other compels companies to make out a full statement of the number of persons employed during the year

Operators in Ohio are making a vigorous fight against the bill pending in the Ohio Legislature providing for a tax of 1 per cent of the market value of all minerals produced in the state. It is argued by coal men that such a tax would put Ohio coal operators at a disadvantage in competition with other states. A hearing on the bill before the house committee was attended by a large number of operators. No action has been taken on the bill and it is doubtful if it will be enacted into law.

ILLINOIS

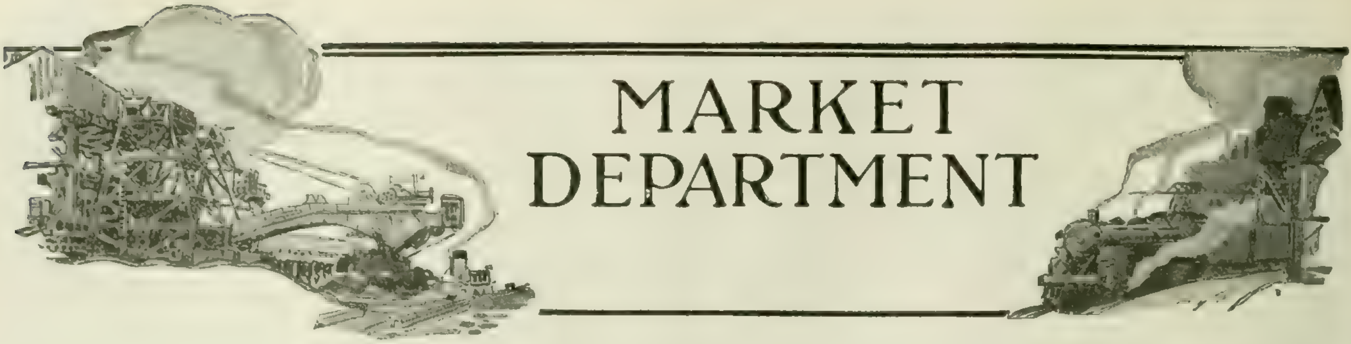
Springfield—A severe car shortage exists in the Springfield mining district. Cars are enroute to western territories and will doubtless be returned to the Central states shortly, when it is expected that the car shortage will be remedied. The railroads are making every effort to minimize the shortage of coal cars. No coal carriers are allowed to be loaded with any commodity other than coal, and this order is strictly enforced in all territories. The result is that every car, when emptied, is immediately filled again with coal and all coal cars are kept constantly on the move. It is said that the Wabash R.R. was able to furnish only 14 cars to its local mines, when about 150 were needed and could have been used. This condition is unusual, however, it was said, and the roads average about a 50 per cent supply and will continue to do so for a number of days yet to come.

How the present conditions will be changed when the railroads are returned to their owners on March 1, is a matter of some concern.

Obituary

James D. Simpson, general superintendent of the Berwind-White Coal Mining Co., died at his residence in Windber, Pa., of influenza-pneumonia on Feb. 11. Mr. Simpson was born in England, Jan. 29, 1878, and was brought to the United States by his parents (in 1879) who became residents of Ohio and later located in Pennsylvania.

When ten years of age, Mr. Simpson started to work as a trapper boy in the mines of the Monongahela Valley. He later became a skillful mechanic but left the mining field temporarily to accept a clerkship with the Pennsylvania R.R. During this time he educated himself for the future through the medium of correspondence schools. He was later connected with the White Rock Coal Co., the Ellsworth Collieries Co. and the Monongahela River Coal & Coke Co. Mr. Simpson left the last named company to accept the superintendency of the Ocean mines of the Berwind-White company, at Herminie, Pa. His achievements here led to his appointment in 1913 as superintendent of the Berwind-White mines with headquarters at Windber, Pa. He succeeded W. R. Calverly, now general manager of the Union Collieries Co. Mr. Simpson was president of the Windber Hospital



MARKET DEPARTMENT

Weekly Review

Traffic Conditions Show No Improvement—Bad Weather Interrupts Car Movement—Operators Complain of Small Profits Under Present Conditions—Serious Situation Exists in Coke Region.

IT IS the belief of some that traffic conditions now existing are possibly the worst ever known, and the railroads are slow in recovering to a normal condition. Although the diversions and confiscations continue, they are not as frequent as they have been in the past. It is worthy of note that because the Seaboard Air Line R.R. confiscated cars intended for use at the power house of the Detroit Edison Co., a discontinuance of electric power service to all non-essential industries in that city has been considered by the officials of the company, unless immediate relief is obtained.

Operators are slowly receiving more of the empty cars that were sent West to alleviate conditions in that territory, but this movement has been interrupted by the recent zero weather such as was prevalent in the Central West. This condition is only temporary, however, and will be remedied with the arrival of milder weather.

Inability of operators to run their mines with reasonable profit under present conditions is responsible for the failure of dealers to lay up a stock of reserve fuel, but demand for bituminous coal remains about the same as last week, and the only real complaint is non-delivery.

With the export ban on coal almost complete with the exception of low-volatile gas-coal releases at Hampton Roads, Eastern mines are finding it difficult to run, the car supply being about one-third of normal. Had the export business continued in part, the mines might not have suffered so much as more cars would have been available in that section.

Except in only a few sections, there is heard little or no word of a lack of hard coal, and anthracite dealers are satisfied with the demand for their product. In the coke region, due to car shortage, a serious situation exists insofar as it relates to the future of beehive-coke production.

WEEKLY PRODUCTION

From the weekly report of the U. S. Geological Survey dated Feb. 21, the output for the week ended Feb. 14 was as follows: Bituminous—10,284,000; anthracite—1,773,000 and beehive coke—440,000 tons.

For the calendar year ending Feb. 14, 1920 the output was as follows: Bituminous—68,996,000, anthracite—79,443,000 and beehive coke 2,849,000 tons.

Atlantic Seaboard

BOSTON

Worst traffic conditions for years. Railroads recovering very slowly. Embargo not likely to be raised this week. Confiscations still general. Practically nothing received via New York and Philadelphia piers. Hampton Roads situation improves. But one "emergency cargo" thus far received. Anthracite quiet, but shipments far in arrears. Only moderate inquiry for steam sizes.

Bituminous—Railroad men are agreed [illegible] storm caused the worst [illegible]. Two thirds of New England's supply comes all-rail, and until the congestion is cleared up on the roads [illegible] are needed to release the thousands of cars that are [illegible] at Worcester, Providence, and Boston there are long lines of cars ice-bound to the hubs, and the result is almost a total cessation of West-bound movement. A week ago there were days when not a single car was taken by the New York [illegible] and at this writing very few of the cars started [illegible] There are [illegible] the [illegible] most part effectually blocked.

Anthracite—Except in a few [illegible] communities there is heard little or nothing of any distress for hard coal. This is the more remarkable when it is realized that not only does the blanket embargo apply to anthracite as well but that the latter has been embargoed from points on the New Haven R.R. since Jan. 16. The water movement has slowed up materially since the storm, the movement of barges having been attended with a great deal of difficulty. There are many cases of serious ice damage that have called for extensive repairs.

One important sidelight on the general New England situation is the very narrow and restricted market for steam sizes. Of course they are now embargoed with the rest, but right up to the date of the embargo there was only an apathetic interest on the part of steam users who usually rely upon bituminous. The trade feels there cannot be a great deal of apprehension, outside of the railroads, so long as this remains a characteristic of the market.

PHILADELPHIA

Anthracite demand shows little sign of easing off. Winter weather still prevails. Receipts of needed sizes fall off. Big call for nut. Stove and egg strong. Pea unsatisfactory. Delivery conditions somewhat better. April reduction likely to be passed again. Buckwheat active; other steam sizes quiet. Bituminous shortage grows. Consumers plead for coal. Plants down. Object to diversions.

Anthracite—Without a doubt more coal has been burned thus far this season than in the entire winter last year, and as a consequence the trade is experiencing the strongest kind of demand for more coal. With a couple of months of coal-burning weather still before them the consumers are not slow in appreciating the fact that there must be coal in the cellar to replace the tonnage which has been burned. Of course it is altogether likely that we have gone through the most severe weather, but the experience has always been that from the first of March right up to the end of April a good tonnage of coal is needed to care for this market.

Bituminous—The industries of this territory are in serious straits for fuel and the reports of plants closing down are becoming common. In many respects present conditions are worse than during the strike last November.

NEW YORK

Coal continues scarce as demand for all sizes of anthracite increases. Transportation difficulties and frozen conditions at piers principal reasons for shortage. Dealers handicapped in making deliveries through bad traffic conditions. Yards running short of coal. Public utilities in no immediate danger.

Anthracite—There continues still to be a shortage felt of the domestic sizes. This shortage is being aggravated by conditions in the regions which to a certain extent are slowing up production. Winter conditions at the piers prevents dumpings of normal capacity. The thawing process which must still be resorted to, as practically all cars are frozen solid through, takes time and dealers are securing not more than one half of their normal supply.

Current quotations for company coals, per gross ton at the mines and f.o.b. tidewater at the lower ports are as follows:

	Mine	F.o.b. Tidewater
Broken	$5.95	$7.80
Egg	6.35	8.20
Stove	6.60	8.45
Chestnut	6.70	8.55
Pea	5.30	7.05
Buckwheat	3.40	5.15
Rice	2.75	4.50
Boiler	2.50	4.25
Barley	2.25	4.00

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates. Independent shippers are securing 75c. over the above prices on egg, stove and chestnut. About 20c on pea.

Bituminous—The placing of various embargoes on coal coming to tidewater and the congestion at the piers is a very disturbing factor in the soft-coal market. For a while, but few consumers on the Pennsylvania road, the Jersey Central and Erie east of Trenton were permitted to receive consignments.

BALTIMORE

Export ban now claimed to be the hub of present domestic shortage in East. Central Coal Committee fails to give relief. Car supply at mines very bad. Anthracite conditions improving.

Bituminous—With the export ban on coal almost completely effective as far as New York, Philadelphia and Baltimore are concerned, and complete with the exception of some low-volatile gas-coal releases at Hampton Roads some leading coal men are advancing the idea that this very condition is causing the present critical domestic shortage in the East through failure to provide sufficient cars for Eastern mines while the production of other districts is reported to be the largest in years.

The price situation is somewhat complex. A very little government price coal is in the market, but the majority of coal is on contract or sold undoubtedly above the government price. Some producers are saying openly that they will quote up to $3.50 and $4 because they can not produce at a profit at $2.75 or $2.95 and that the Lever Act assures producers of a "fair profit."

Anthracite—Conditions in the anthracite trade here are improving. The supply has run easier at a time when the shut down on bituminous came. And some dealers are short of particular sizes, but despite the increased call for late coal by consumers who burned more than they had anticipated, the distribution has been pretty good.

Eastern-Inland

PITTSBURGH

As far as Pittsburgh is concerned, the industry seems to be well taken care of in regard to coal supplies, although the car shortage is felt here. River transportation is very heavy, and a great deal of coal is coming down from the pools and quickly snapped up by the mills and industrial plants in this district.

The mines are working full time, but it is evident that a great improvement must necessarily take place in the return of empty cars from the seaboard before long if the miners are to be kept at work. Further West from here there is a change in the coal situation, and there are several things that enter into the problem of the Central West operators.

Lack of railroad cars and motive power, together with the inability of the operators to run their mines with a reasonable profit under present conditions, is responsible for the failure of the mines to lay up a stock of reserve fuel, or for the mills to depend on any more than will run them from day to day. R. W. Gardiner, of Pittsburgh, commissioner of the Coal Producers Association, is of the opinion that bad business conditions will be upon us unless the miners are placated with better wages and more convenient working conditions.

COLUMBUS

Still further reductions in car supply at all Ohio mines has curtailed production. Scarcity of stocks in many sections is reported and some suffering results. Good mand for both steam and domestic sizes is reported.

With the influenza epidemic disabling train crews, cold weather in many sections and the wide distribution of cars during the suspension, the car supply in Ohio is still further reduced. In previous weeks the average supply in Ohio was estimated at between 45 and 50 per cent of normal, but during the past week the supply has been reduced to about 30 to 35 per cent. This is causing a good deal of trouble both to producers and consumers and the end is not yet in sight. Those in a position to know say that there is no immediate hope for an improvement in the car supply and not much increase in production can be expected soon.

Steam users are now about as clamorous as retailers for coal. Many of the larger users have no reserves and are being operated from hand to mouth, as it were. This is true of public utilities and public institutions. Railroads are taking about 50 per cent of the available tonnage for steam purposes, which reduced the coal delivered to plant to a very low point. Rubber factories had rather large stocks and still have some reserve stocks.

CINCINNATI

The market in this territory is in a very tight situation for fuel for domestic as well as for industrial uses. Business here was never as demoralized as it is at present. The car shortage is growing worse daily and reports from the non-union fields of West Virginia which did more than their share during the strike have received only five-days car supply during the past twenty-one days.

The number of buyers on the market are increasing daily, and some leave this territory with about as much satisfaction as they entered. Operations in the West Virginia and Kentucky fields have worked but about two and one-half days in the past three weeks. The domestic situation here is not so bad as in other places, as daily arrivals are taking care of current demand.

Reports show that more coal is being burned here than in any winter previous despite the fact that we have experienced only a week or two of extreme cold weather. As regards the retail trade demand is in excess of supply principally as a result of labor shortage. Retailers state that they could cope with the supply if they were able to obtain sufficient help.

There is little free coal to offer. There is no set price other than that ordered by the government, but that is a myth. Reports from the various districts of which this city is the gateway show that coal is still being confiscated for railway use. The river is helping to take care of the situation and during the past week heavy tows arriving helped to ease the local situation. Many box cars which were loaded with coal at the mines to help relieve the situation are being unloaded here at a loss of time. There seems to be no relief in sight and no prospect of obtaining an improvement in the car supply before next month.

A fair demand exists for steam coal on account of the fact that the industries in this locality are all working at approximately maximum production. Dealers are beginning to build larger bin capacity to store more coal for the fall and winter months of next year. No one knows what way to turn and there are plenty of firms still trying to get the money that is due them for coal that was confiscated and delivered two or three months ago.

Southern

LOUISVILLE

Cold weather resulting in heavier demand on retailers, whose stocks are exhausted. Deliveries very light, but milder weather relieving demand somewhat. Steam grades in excellent demand. Production continuing light due to car shortage.

Retailers faced a heavy demand for coal for a few days starting Feb. 14, when there was a sharp spell of weather. Yards are practically empty, as deliveries have been poor for the past ten days. Milder weather is relieving the pressure somewhat, but back orders are taking care of deliveries of domestic sizes as fast as they can be had. There is a steady demand for all grades of steam coal, resulting in the market being well cleaned up, with no spot coal being offered to speak of.

Production at the mines continues at the rate of two or three days full work weekly, as the car shortage is not showing much improvement, and deliveries are very uncertain. Nothing new has come up in connection with the threatened suits of operators on the Louisville & Nashville lines against the U. S. Railroad Administration for losses caused by discrimination in the matter of car supply, although action is likely at any time.

BIRMINGHAM

Shortage of cars delaying movement of coal and also cutting production materially. Trade active with indications of a stronger demand developing. Labor shortage results from sickness in many camps.

Brokers and distributing agencies report a very active demand for all grades of coal, and, due to operating conditions, under which production is being vary much restricted, predict a stronger market will soon develop. The mines are all behind on deliveries against contracts and the filling of spot orders is also suffering delay on account of the lack of cars for loading.

The spot inquiry is good and there is also a substantial amount of contract business being offered, some of which is being booked subject to the regulations of Government price control and with a clause inserted allowing a 14 per cent increase over Fuel Administration prices in case restrictions are removed during the life of the contracts.

Export inquiry is being made but there is no coal available for the foreign trade at this time and none of this business is being taken on. Additional towboats provided on the Warrior River increased shipments of coal to Mobile and New Orleans from mines in the Warrior field.

Lake Region

BUFFALO

Again the multiplied blizzards. Much risk of a bituminous famine, but no report of it yet. Some cars moving now. Anthracite shut off temporarily.

Bituminous—Two zero periods in one week, the first with much snow and wind, ought to be about the final effort of the weather this winter to do its worst. We call the shipping tie-ups worse this winter than they were two years ago, even if they stop now. February opened mild and for two weeks it promised to let up for the season. Then suddenly on the night of the fourteenth it shut down again and the car situation has been a matter of stand-still mostly since, for one blizzard was over but a single day before the next one followed.

Still the shippers and the roads have worked together better than they did last month and they have kept the coal moving to the most needy consumers, so that the complaint has not been as great as was expected. If the worst is now over, as it seems to be, the public will have great reason for joy, for the risk has been great of a general famine. In the deep snow the trains could move only on the expenditure of a great amount of work and it often happened that cars or locomotives got off the track in the drifts and made matters still worse. We do not usually like to see the snow go, but a shower of rain would be welcome now.

Anthracite—For some days after the fourteenth the supply was almost entirely cut off. The Lackawanna R.R., which brings in most of it, had much difficulty with snow, and, besides, some snow-plow wrecks to contend with, so that for a day or so nothing passed over the line. Other roads were not much better, and if it had not been for the fact that the consumers were pretty well supplied there would have been many a house without fires for days. As it was the shortage was somehow tided over, just how it was done nobody but those who did it being informed.

Buffalo is so near to Scranton that it has always been felt that an anthracite famine was about out of the question, but the margin has been so small in late years that no safety was enjoyed and it is now the general idea that there will be none till there is a large amount of coal stored permanently, either in the large cities or at junction points where it can be obtained quickly, either by means of local trains or trucks. The consumer will have to pay, but he is getting used to that.

TORONTO

Anthracite in active demand—Shipments delayed by snow blockade, but conditions improving—Great shortage of bituminous—Prices increased owing to exchange.

Continued cold weather, during which the stocks laid in by many consumers were exhausted, has caused an active demand for anthracite. Shipments from the mines have been considerably delayed by the snow blockade at the Niagara frontier, and the shortage became serious.

The situation has lately been relieved and a fair amount of hard coal is now coming forward. Hardly any soft coal is being received owing to the confiscation of shipments for railroad use, and great scarcity prevails. Prices have advanced on account of the high rate of American exchange.

CLEVELAND

Although stringency still prevails, the local coal market is much easier. Headway toward returning empties is reflected in increased operations at southern and eastern Ohio mines, and in turn by larger receipts here.

Bituminous Another week of near-zero weather has further strained the local coal trade, but as has been the case all along, minimum requirements have been met. Diversions to meet the needs of the leading public utility have ceased, and the position of dealers is thereby better. It is estimated that receipts in the past week have been from 35 to 45 per cent of normal. In some cases small reserves—from two days to a week's supply—have been built up.

That the situation in Cleveland is easier than that in nearby districts is seen from the fact that steam-coal users, even from Pittsburgh, are seeking supplies from Cleveland operators. The present scarcity is more market in slack than in mine-run. Hope that Government price maximums would be lifted March 1 has all but been abandoned, with supplies so low. In most cases operators are rationing their output among regular customers, and "shoppers" are now getting short shrift.

Domestic bituminous demand is increasing every week. Stocks laid in last fall, on the average, would have sufficed for a normal winter, but the drain has been so heavy domestic consumers have been forced into the market again. In meeting this demand, coal dealers are more handicapped by a shortage of labor than by a shortage of coal. Here too available coal is being rationed, and domestic consumers limited from a one to one and a half. Dealers' supplies are streaky—one day they will have nothing but Masillon lump and the next nothing but No. 8 Pittsburgh—and domestic consumers must take what dealers can give them. Prices on all grades of steam coal remain unchanged.

The past few days have seen the railroads making more headway returning empty cars to the mines. This improvement has been interrupted by the recent zero wave, but this is expected to be only temporary and operators hope the peak of the shortage has been passed. Cars from Buffalo and Eastern points are slow in returning, but from the West better service is being rendered to eastern and southern Ohio mines.

Pocahontas and Anthracite—Pocahontas continues to come through in good shape, but last week's storm appears to have set anthracite movement back seriously. Dealers are getting about half of the Pocahontas they could sell, but not more than a quarter of the anthracite they seek. On about half the days of the week dealers can supply either grade; on the remaining days they substitute coke or bituminous. Domestic demand for Pocahontas and anthracite is heavy, buying last fall having proved inadequate to meet the needs of the severe winter. Owing to the influenza epidemic, dealers' delivery forces are about one third short.

Lake Trade—An inkling of what may be expected to happen to Lake Superior and Lake Michigan coal rates in the coming season may be gained from the fact that Canadian tonnage of 250,000 tons of bituminous coal to Montreal this season has been contracted for at $2.50 a ton. This is an increase of 50 c. per ton over the 1919 rates, when ocean-going steamers built on the Grate Lakes for the Emergency Fleet Corporation loaded coal for Montreal on their way to the ocean and competed with the Lake lines. The Canadian coal will be loaded at Cleveland and Lake Erie ports to the East. It is not expected Lake Michigan and Superior coal rates will be fixed before the middle of March.

Retail prices of coal per net ton delivered in Cleveland are:

Anthracite—Egg, $12.20@12.40; chestnut, 12.50@12.70; grate, 12.20@12.40; and stove, 12.40@12.60.

Pocahontas—Shoveled lump, $9.00@9.25, and mine-run, 8.00@8.25.

Domestic bituminous — West Virginia splint, $8.30; No. 8 Pittsburgh, 6.85@7.00; Massillon lump, 7.40@7.65; Cannal lump, 11.00; and Coshocton lump, 7.35.

Steam coal—No. 6 slack, $5.75@6.00; No. 8 slack, 5.80@6.00; Youghiogheny slack, 5.25@6.10; No. 8¾-inch, 6.35@6.60; No. 6 [illegible] and No. 8 mine-run, [illegible].

DETROIT

Detroit faces curtailment of Detroit Edison service due to diversion of the company's coal supply to railroads.

Bituminous — Discontinuance of electric [illegible] ing to representatives of the Detroit Edison Co. [illegible] of [illegible] after their arrival in Detroit and while awaiting switching to the company's yards, and the [illegible] West Virginia mine that has a contract to supply the [illegible] must turn over its output to the Seaboard Air Line R.R.

It is [illegible] of the Detroit Edison Co. [illegible] a contract to supply [illegible] to the railroad but [illegible] get sufficient cars to meet [illegible]. Its contracts has been making a pro rata delivery. The Railroad Administration's order requires the mine to turn over 5,000 tons a month to the railroad and forbids loading coal for any other customer until it has made good all deficits on earlier deliveries to the railroad.

J. W. Brennan, purchasing agent of the Detroit Edison Co., says that 2,100 cars of the company's coal were confiscated by the Railroad Administration during the recent miners' strike and that approximately 50,000 tons have been lost from the company's reserves within the last 30 days. It is now necessary, he says, to secure sufficient coal to meet the company's daily requirements and to replenish its depleted reserves.

Various other Detroit industrial and manufacturing plants are facing a similar shortage in supply. Even assuming that the mines are again loading coal for Detroit and Michigan, jobbers feel there is little assurance that coal will be sent through in sufficient quantity to afford relief. Lack of railroad motive power and car shortage are likely to prevent much coal getting into Detroit, they say.

Anthracite—Because of the extremely cold weather early in the week, there has been considerable increase in demand for anthracite, with the result that stocks in retail yards are greatly reduced. Shipments are not coming in very freely, while the transportation situation has been disarranged by storms in the East.

Middle West

MIDWEST REVIEW

Cold weather, and the car shortage have both contributed in some degree in keeping the market very strong and steady. A number of our best known operators and wholesalers are refusing to take business calling for shipment at any specified time, as the congested condition of their order books does not warrant it.

It will take full running time for a number of weeks for the operators to catch up on old and delayed orders. Some firms are not taking additional business, while some are taking business with the understanding that the coal will be shipped as soon as they can get around to it, and not before, which means that shipments will probably move forward some time in the middle, or latter part of March.

There has been no noticeable improvement in the car supply. In fact, the supply this week has probably been even worse than last week, although it is a little early to obtain any accurate figures. To give a comprehensive idea of the situation we will take, for example, a company with a number of mines in the Franklin County field, has a daily output of but 25,000 tons. Mines of this company are served by the Illinois Central, the Chicago, Burlington & Quincy, the Chicago & Eastern Illinois and the Missouri Pacific.

CHICAGO

Anthracite shipments are not coming into this market as rapidly as could be desired, and while there is not an actual shortage, a number of people who heretofore burned hard coal, are now burning soft coal.

Eastern coals are increasingly hard to get, and are in great demand. If the Government restrictions were removed, Eastern coal from West Virginia and Kentucky would be selling at a decided premium. The retail trade are nowhere near as independent today as they were a week or so ago. They are looking for coal, and looking for coal to be shipped promptly, and they are having some difficulty in finding what they are after.

ST. LOUIS

The greatest car shortage in history prevails in the Middle West. Incompetent management of railroads responsible for this lack of motive power and disregard of property rights.

The local condition, while it is not satisfactory, is good, everything considered. St. Louis is short of domestic sizes of coal and also short of steam, but it is nothing compared with outlying districts. A few embargoes still prevail on some of the Western lines and this forces a market in St. Louis.

In the Standard field the working time has gone down to about two days per week and some mines do not work that much. The two days car supply may be distributed over a period of four days, a few hours each day.

If it were not for Government prices coal in this field would be going at as high as $5 or $6. The miners are dissatisfied and say they cannot live under these working conditions. In the Mt. Olive district conditions are a little better, but in a general way similar to those in the Standard field.

MILWAUKEE

Shortage of coal and inadequate supplies by rail promise to precipitate an advance in prices all around. Popular grades of anthracite not to be had.

A pressing demand for coal, with exhausted stocks and an uncertain supply, makes the coal situation at Milwaukee very unsatisfactory. Prices remain unchanged, but dealers contemplate an advance as soon as they can offer sufficient reason for so doing.

They say that reason exists now, but the public will have to be convinced before the step will be taken. Bad weather and interrupted rail traffic will precipitate an advance. The only hard coal obtainable at present is egg and buckwheat. Mine run is the only grade of Pocahontas to be had.

Coke dealers defend the advance in this class of fuel by pointing to increased freight cost as they are now receiving coal by rail. The expense of production held is also continually increasing.

Coke

CONNELLSVILLE

Production of Connellsville coke seems to be all going out on contract, and the market retains very little for purchasing purposes, so that there seems to be no immediate prospect of a broadening in the market, as far as there being any increase in supplies offered.

It is presumed that where buyer and seller were negotiating a contract and had not reached final terms, when the Government control came, they simply decided to consider that they had a contract between them with the Government price as the invoice figure, a regular contract to be negotiated upon the removal of the Government control.

The coke market is not active, but at least it is well defined, at the Government limits, $6 for furnace and $7 for foundry. Several weeks ago one or two coke operators were disposed to suggest to prospective buyers that some coke would be available if means were devised for making it net the seller more than the Government price, but all such efforts at evasion of Government regulations seem now to have disappeared.

There has been a division between operators in the matter of billing coke when the contract stands at above the Government limit, and there are still the two parties—comprising those who have made the concession to customers and those who have not. Making the concession simply means that the law has been lived up to.

The furnaces are being well supplied with coke, that is, much better than in previous months, and yet they could do with a good deal more. It requires a daily watching on the part of the furnaces to insure a sufficient supply. The cold snap at the beginning of the week, and another coming Thursday morning, made matters doubly hard for the railroads, and in consequence the car shortage has become aggrevated, so that reports next week are expected to be very pessimistic as regards production of coke—two or three days this week no coal cars were furnished in the coke region at all, while cars for coke shipment dropped to 30 per cent.

BUFFALO

The situation is affected by the storm, some of the furnaces being very short of any supply. Such times occur so seldom that often not much effort it made to lay down much stock, on account of the extra cost. Furnaces are running as strong as conditions will permit.

Much improvement should be made next week. It is hoped that when the railroads return to private ownership ofter March 1 that a btter distribution of cars will be made.

The ore season ought to open early, for the full amount under contract was not delivered last fall, but the hitch over rates is still on, with vessel owners standing for an advance. Coke prices are quoted on the basis of $9.60 for 72-hr. Connellsville foundry, $8.60 for 48-hr. furnace and $7 for off grades, per net ton f.o.b. here.

COAL AGE

Volume 17 New York, March 4, 1920 Number 10

House-Cleaning Time

By Rufus T. Strohm

THERE comes a time in early spring
When housewives get extremely busy,
And set their mops and brooms a-swing
Until they drive the household dizzy;
They scrub the floors and beat the rugs,
Wash all the woodwork, dust the ceilings,
Eject the spiders, moths and bugs,
With no regard for insect feelings.

THEY gather rubbish by the ton
From closet, cellar, hall and attic,
And keep the ashman on the run
Until his breathing grows asthmatic;
But when the house is clean and free
Of trash and litter evil-smelling,
It then becomes what it should be—
A mansion fit for human dwelling.

THE miners' union ought to take
A lesson from the housewife's duties,
And seize an opportunity to shake
Its garments free from nasty cooties;
For Bolshevistic bugs and fleas,
Within its shack have snugly nested,
And anarchistic ants and bees
Its inner chambers have infested.

THEY'VE stung it with their poisoned darts,
And bit it in and out of season,
Till, driven frantic by the smarts,
It's lost its balanced sense of reason;
And that's why common people choose
To note its actions with suspicion,
Nor will they modify their views
Till it regains a sane condition.

* * *

IT'S got to bounce the rampant Reds,
Expel the troublous Bolsheviki,
And maybe dent the wooden heads
Of radicals who've grown too cheeky;
Then, having purged its council hall
Of law and order's worst maligners,
It may at length be fit for all
The country's honest, decent miners.

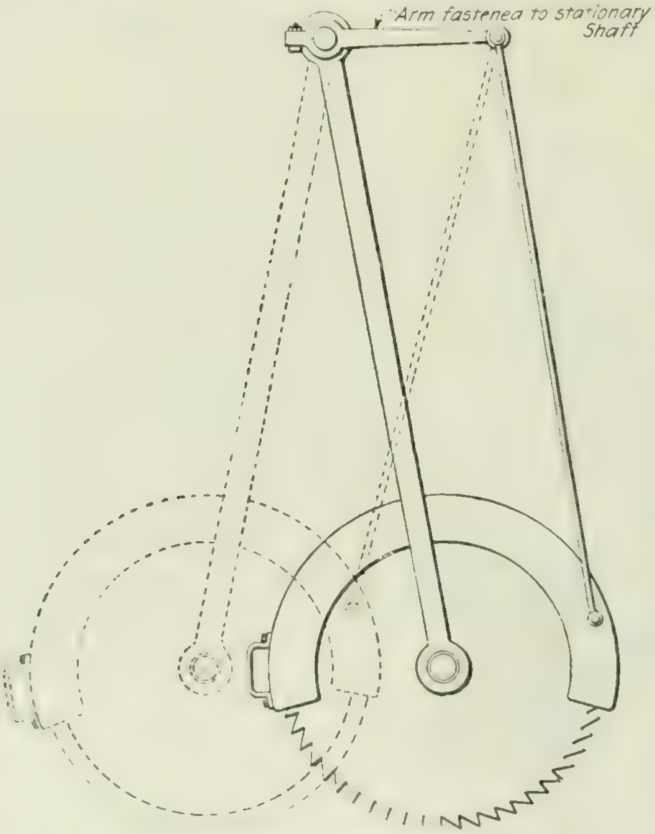
IDEAS AND SUGGESTIONS

PRACTICAL SCHEMES THAT MAKE THE DAY'S WORK EASIER

Safety Device for a Cutoff Saw

DEVER C. ASHMEAD
Tarrytown, N. Y.

An interesting safety device has been devised by the master mechanic of the Burnside Colliery of the Philadelphia & Reading Coal & Iron Co., near Shamokin, Pa. This device works automatically and throws a shield between the man operating the cutoff saw and the saw itself. When the saw is pulled forward by means of a lever a semicircular shield is thrown between the operator and the saw, just allowing sufficient space for the timber to pass between the saw and the shield. The accompanying diagramatic illustration shows how this device operates.



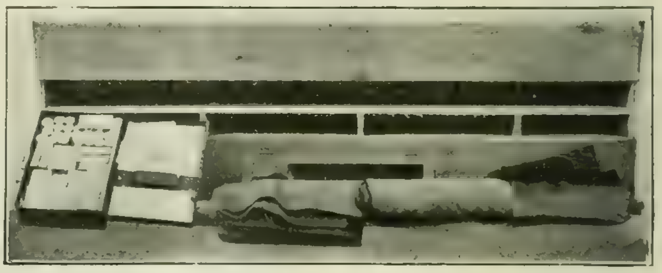
SAW GUARD IN PLACE

Storing First-Aid Supplies in the Mines

Nearly every coal mine plant has some particular building or portion of a building that is utilized for the storage of first-aid supplies. Taking the supplies into the mine and there storing them has always been a problem as it is always difficult to maintain the proper temperature and humidity. Materials such as bandages not in A-1 condition are even more dangerous sometimes than no materials at all.

A simple and inexpensive box divided into three main longitudinal compartments can be readily constructed at the carpenter-shop, and can be made to serve an excellent purpose. Little explanation is needed as the accompanying illustration is practically self-explanatory.

The upper compartment is used to accommodate two stretchers. The middle compartment is divided so as to hold a first-aid cabinet, two woolen and one rubber blanket. The lower compartment is equipped with two 60-watt, Mazda lamps employed to generate heat for keeping the supplies dry. Holes may be bored in the rear of the box to allow adequate ventilation. Any suitable dimensions can be used in constructing such a box.



UNDERGROUND FIRST-AID SUPPLY BOX

At the mines of the Stonega Coke & Coal Co. in Wise Co., Va., one of these boxes is kept within 2,000 ft. of every man underground. Each miner knows the location of the box nearest his working place. Five or ten minutes delay in giving treatment in case of a serious accident may be the dividing line between life and death.

Safe Guards for Trolley Wire

BY G. E. DAUGHERTY
Pikeville, Ky.

How to build the most reliable and safest trolley guard is a question that has been discussed from many different viewpoints. The perfection of any system depends largely on the taste of the workman doing the job or his consideration for the adage, "Anything worth doing at all is worth doing well." There is considerable room for improvement on the present method of safeguarding trolleys in mines. This is a detail for the inventive mind upon which to do something really worth while and win fame and fortune.

Poor workmanship in hanging wire is the first cause of difficulty in keeping it guarded. A trolley frog in the wrong place, too few insulators to hold the wire level or maintain uniform curvature are matters to be first considered if guards are to stay up and haulag carried on. This does not take into consideration the time and money saved from broken trolley poles and consequent delays.

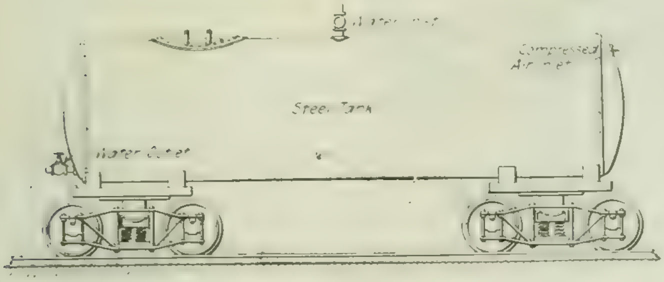
An adequate and reliable guard is the next requisite. This should extend from the trolley frog to 2 ft. beyond the opposite pillar so as to comply with the mining law asking for guards at all places where men regularly pass under the wire, when less than 6½ ft. above the rail. The usual failure under this condition is to guard the space only where the motor passes under. Other places neglected entirely are side tracks, sand boxes, pumps, manway crossings, room necks, trap doors, etc. Every care should be given to safeguarding the trolley on haulageways that are also used for traveling.

The rubber guard is meeting with much favor among east Kentucky operators, being effective and easily installed. Old fire hose is the usual source of supply, but new hose is being used in many places. Guards of this kind have been in use for two years without much attention in the mines of the Pond Creek Coal Co. of Stone, Ky.

The following precaution is necessary in order to secure the best results. Insulators should be hung every 4 ft. on curves, and somewhat farther apart on straight wire. Split one side of the hose and hang it under the insulators and over the trolley clamp. Round off the end where the trolley wheel enters; in some cases a stiff wire is used to spread the mouth of the hose apart. Care should be given to the trolley wheel bolt, keeping it smooth so that it will not tear the guard.

Water Supply for Drills

The Philadelphia & Reading Coal & Iron Co. at the Burnside Colliery has a large water tank with a capacity of about 2,000 gal. mounted on trucks for carrying water into the mine to supply the drills used in driving the headings.



AIR PRESSURE WATER CAR

This tank is made of steel and is so arranged that the water can be forced out under pressure by attaching a compressed air pipe to the proper inlet in the tank. The accompanying illustration shows the arrangement of the connections.

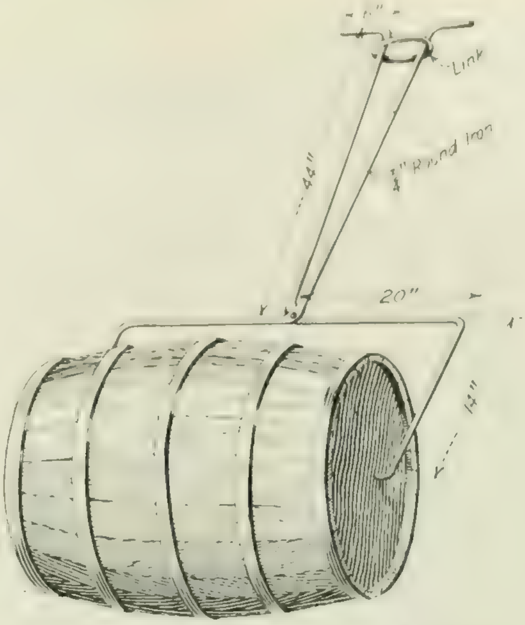
Homemade Device for Handling Oil Barrels

By Jack L. Ball

Amsterdam, Ohio

There is no task around a coal mine that meets with more disfavor than handling leaky oil barrels. This is a disagreeable job, especially in cold weather.

The simple device shown in the accompanying illustration is used to handle barrels at a certain mine with highly agreeable results. It is not necessary to touch the barrel with the hands, and it is easy for one man to move a full barrel over almost any kind of a rough surface.

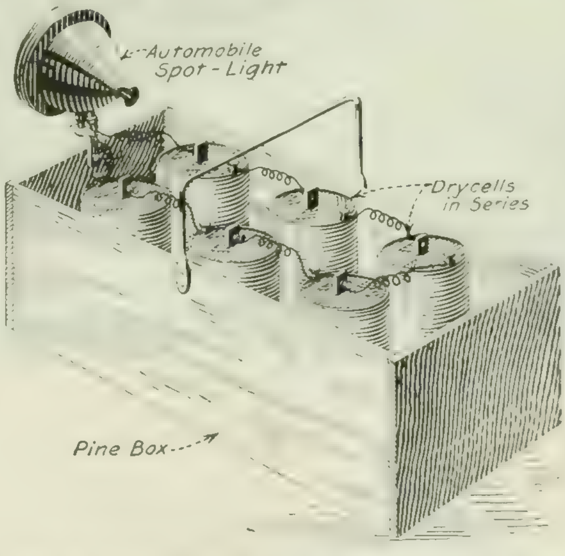


HOW THE BARREL TONGS ARE USED

The measurements shown are for a standard barrel. The points can be shaped so that the injury done to the heads of a barrel is of no consequence.

Safe, Homemade, Mine-Rescue Searchlight

In mine rescue work the rescue party is in many instances handicapped through having insufficient light. Usually, conditions in the mine are of such a nature that open lights cannot be used with safety. Ordinary safety lamps or the small electric flash lights are or may be inadequate for the purpose intended. In all cases it is advisable to have a portable searchlight as part of the mine rescue equipment. The accompanying illustration shows a portable light of high power that may be safely used in a gassy or dust-filled atmosphere.



SAFE SEARCHLIGHT FOR UNDERGROUND USE

Colliery Boiler Plant Satisfactorily Burns No. 2 Tank Barley

Small-Size Anthracite Is Burned on Automatic Stokers and Satisfactory Results Are Obtained Building Is Kept Cool Even in Summer By Draft Fans

By D. C. Ashmead
Tarrytown, N. Y

NEAR Wilkes-Barre, Pa., the Pennsylvania Coal Co. has just completed a boiler plant at its No. 14 Colliery. Its construction was a case of rebuilding while in operation. This did not, however, involve intricate or delicate problems in construction work, so I shall not lay stress on this phase of the situation.

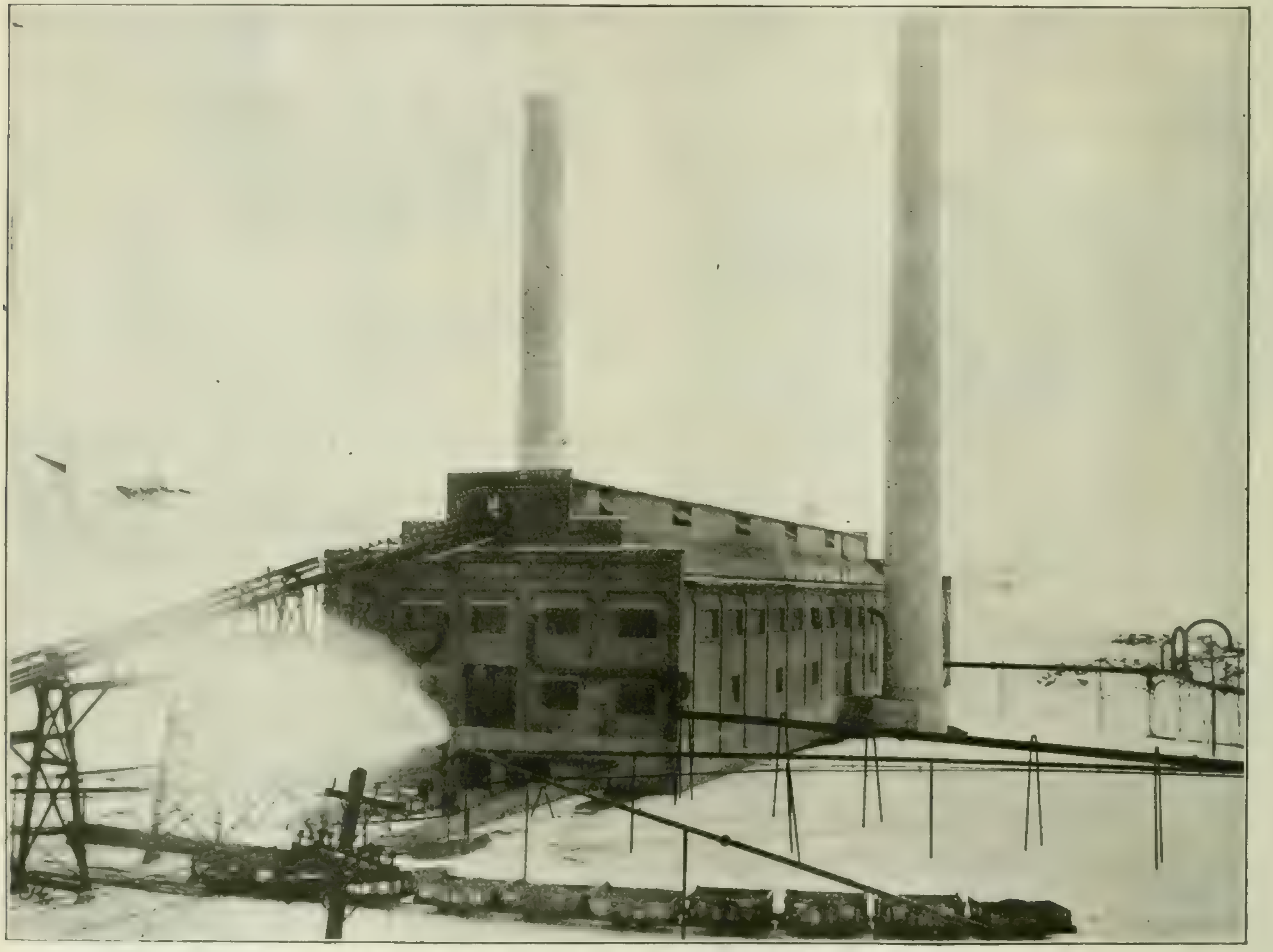


FIG 1. EXTERIOR VIEW OF THE NO. 14 COLLIERY BOILER PLANT
Concrete brick, steel and glass have been used exclusively in the construction of this building

The new boiler house is of brick and concrete construction of the latest design and is architecturally attractive. The foundations and floors are of concrete and reinforced concrete, while the walls and stacks are built of brick.

At the present time the full boiler horse power of the plant has not been developed. There are now in continual service twelve 150-hp. Babcock & Wilcox water tube boilers and five 283-hp. Stirling boilers making a total of 3,215 b.hp. At present there is sufficient space for the installation of four more Babcock & Wilcox boilers and three more 283-hp. Stirling boilers. This will increase the boiler capacity of the plant to 4,664 hp. The foundations for the additional boilers are in place and the company expects to install at least one if not two of the Stirlings some time during the spring. The boiler working pressure in 135 lb. gage.

The coal used in generating steam is No. 2 tank barley and is fired on Coxe stokers. These stokers all have a width of grate of 5 ft. and a length of grate 10 ft. 4 in. with the exception of two which have a grate

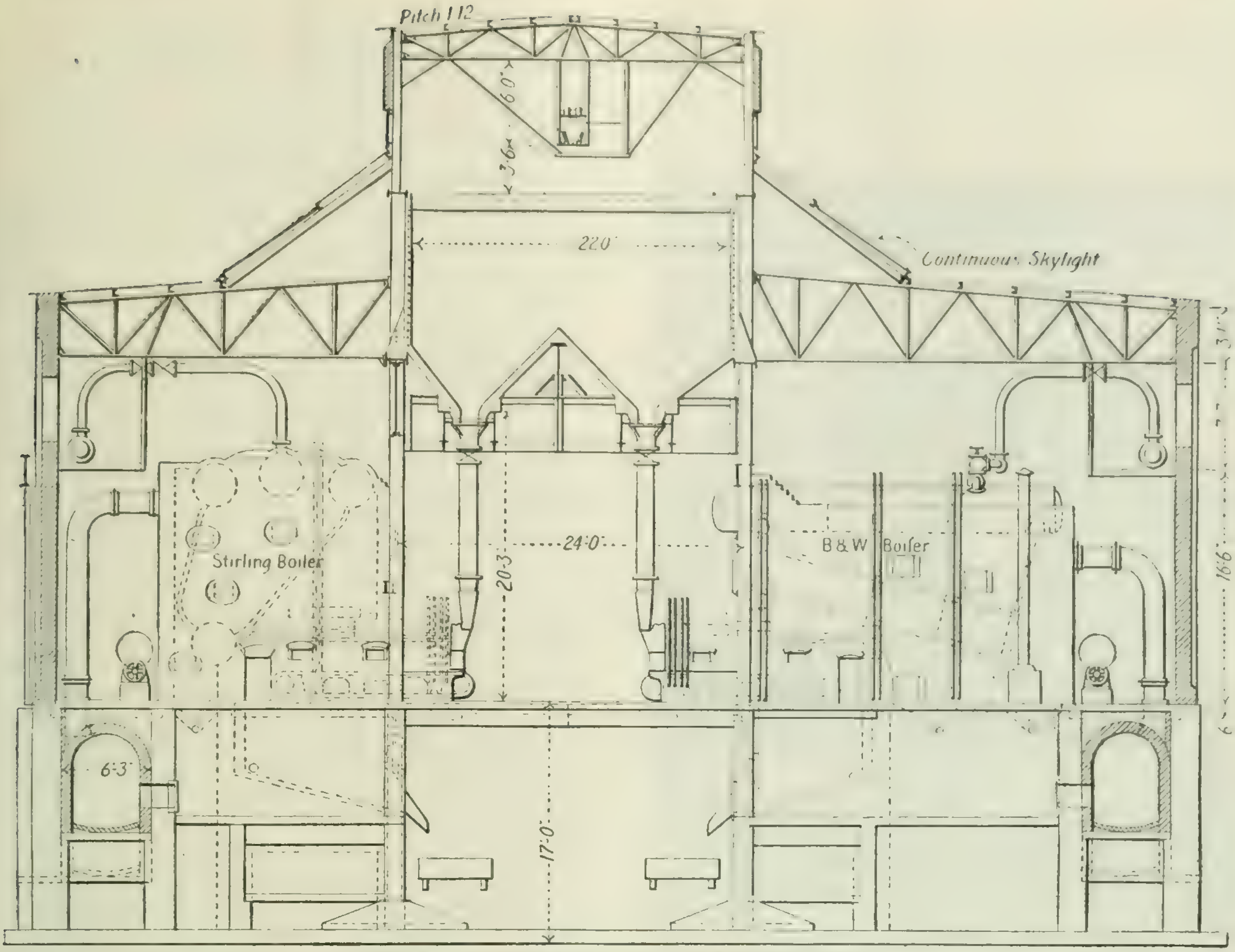


FIG. 2. CROSS-SECTION OF THE BOILER PLANT

The convenience of the arrangement of conveyor, bunkers, downcomers, stokers, boilers, breechings, flues and ash tunnel are immediately apparent.

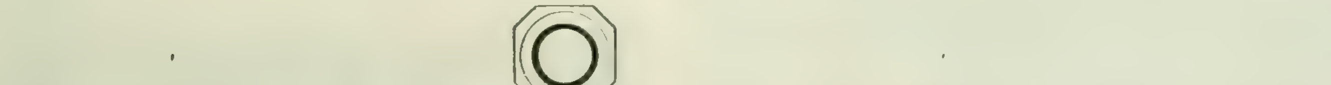


FIG. 3. GROUND PLAN OF BOILER PLANT AND FAN ROOM

Features of design that immediately appeal to the experienced plant operator are the spacious firing alley and the adequate interval between the boiler settings width one foot greater. The length of these grates is, however, the same as that of the rest. The stokers have a speed of travel of 2 to 8 ft. per hour depending on the load. They are driven by a 5-hp. direct-current 250-volt motor built by the General Electric Co. The coal is fed to the stokers, as is shown in Figs. 4 and 5, through steel pipes 14 in. in diameter and the amount of fuel fed to the grates is regulated either by hand or automatically. Intake valves are placed near the top of the pipes and directly below the bunker. These are operated by chains from the boiler-room floor.

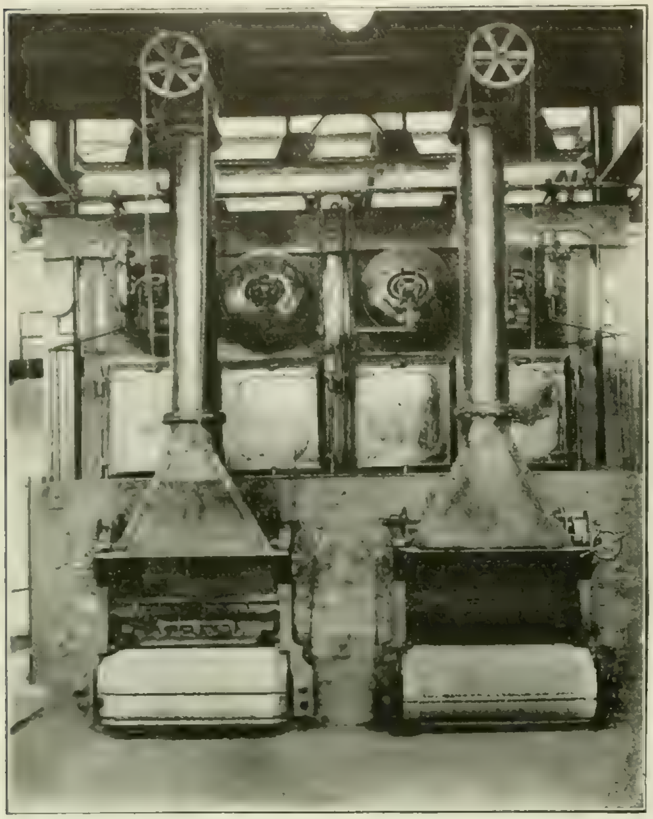


FIG. 4. FRONT VIEW OF THE STOKERS

The coal valve wheels, chains and gate wheels are plainly visible

Williams water columns are used and the feed water is regulated by means of Williams and Copes feed-water regulators. High- and low-water signals are also employed. A central pressure gage is in view from all parts of the boiler room.

The ashes from the stokers are dumped into an ash pit directly under the boilers and from here they are washed and run by gravity into cars which travel under the chutes from the ash pit. The ash tunnel is double tracked and has a drain down the center which carries away all the water used for washing out the boilers and the ash pits, as well as that necessary for cleaning the ash tunnel. The air is kept cool and pure in this tunnel, as it is continually sucked out by the forced-draft fans. The ash cars are pushed out by hand.

The flue gases pass from the boilers through steel breechings to the main flues which are built of brick and concrete and run the full length of the boiler room. At the central point of each of these flues a stack is placed. These are 10 ft. in diameter and have a height of 190 ft. The arrangement of flue and stack is the same on each side of the power house, and each side is independent of the other.

At one end of the boiler room is a small engine room (Fig. 3) in which all the auxiliary machinery for operating the boiler plant is placed. There are two forced draft fans of the multivane type 12 ft. in diameter and built by the B. F. Sturtevant Co. Each has a capacity of 175,000 cu.ft. of air per minute against a pressure of 2½ in. of water. These fans are driven by 14 x 16 in. engines direct-connected. The engines are of the side-crank, single-valve, inclosed, self-oiling type and were built by the Ridgway Dynamo & Engine Co. They operate under automatic control.

The fans draw air from the top of the boiler house and also from the ash tunnel through specially built air conduits. When they were first installed they took air from the engine room only, but it was found impossible to keep the windows in the engine room, when closed, from breaking. Other arrangements consequently had to be provided. The change in source of supply was made and as a result the ash tunnel and the top of the boiler house are not now excessively hot even in the summer. The air from the fans is forced through a tunnel that passes under the front part of the boilers and is admitted to the firebox by a valve that regulates the supply of air in accordance with the needs of combustion.

At the present time the feed-water pumps are of the direct-acting type, but these are to be replaced shortly by centrifugal machines. The feed water is recorded by a Venturi meter on the 6-in. pump-discharge line. A Webster open feed water heater of 6,000 hp. capacity is used for heating the feed water and raises its temperature to 200 deg. F. before it is sent to the boilers.

Besides the feed pumps, the fans, and the feed water heater in the engine room, a small substation is here located, furnishing power to the mine. This substation contains two duplicate motor-generator sets. The generator half is 250-volt direct current, while the motor is 2,300-volt, 3-phase, 60-cycle, alternating current. A 10-panel General Electric switchboard for handling the current is also installed. The current is at present furnished from another of the Pennsylvania Coal Co's plants.

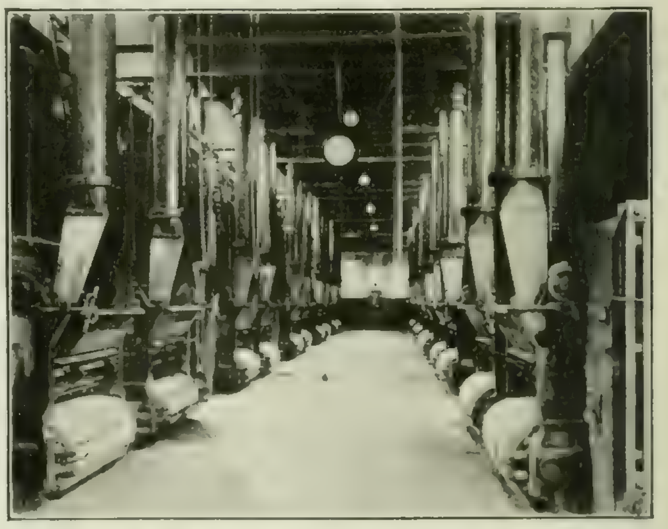


FIG. 5. INTERIOR OF THE BOILER ROOM

Note the vertical down-comers and the big steam gage, visible from all points of the room.

The coal bunkers, or rather bunker, extends the entire length of the boiler room. Its top is 34 ft. 4 in. above the

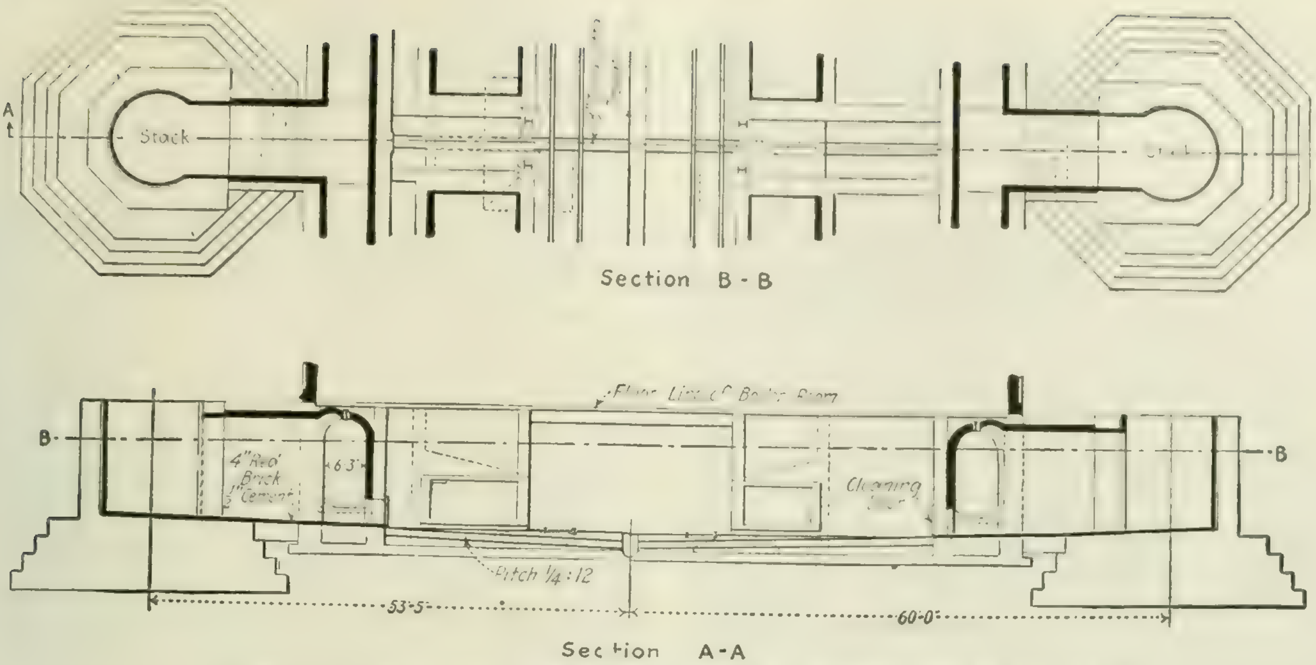


FIG. 6 PARTIAL PLAN AND CROSS-SECTION AT CENTER LINE OF STACKS

The relative positions of the stacks, flues, draft ducts and ash tunnel are here apparent.

boiler room floor. It is 16 ft. deep and can be filled to a height of 5 ft. above its top. The total width is 22 ft. in the clear and there is one coal outlet on each side directly in front of each stoker. The bunker is 200 ft. 10 in. in total length and has a capacity of 1,927 tons of coal, when filled up to the bottom of the distributing conveyor. This bunker is built of concrete and rests in a steel frame. The sides are of reinforced concrete.

The coal is brought from the tank barley pocket in the breaker and carried to the top of the boiler house above the bunker by means of a drag-line scraper. This conveyor traverses the full length of the bunker and the coal drops through slots in the bottom of the drag-line trough and into the coal bunker. These slots are of course so arranged that they may be closed. A coal meter is placed in this conveyor line, recording the amount of coal delivered to the bunker. The scraper line is operated through a belt by a 36 h.p. General Electric alternating-current, 60-cycle, 110-volt motor.

A fire wall has been placed between the engine room and the boiler room. The roof is supported by steel trusses and a long ventilator or skylight extends almost the full length of the building. This admits light and air and helps to keep the building cool in the summer. A steel walkway or balcony is hung in the rear and slightly above the tops of the boiler, giving ready access to any part of the piping, or the outside of the boilers themselves. This balcony runs around all four sides of the building, while iron ladders reach from it to the floor of the boiler room. From this balcony steel stairs extend to the top of the coal bunker and a steel gallery runs the full length of the scraper line.

The steam piping throughout the engine and boiler rooms is protected with 85 per cent magnesia covering. The main steam header is 14 in. in diameter and the individual steam pipes from each boiler are 6 in. in diameter. The feed water line is 6 in. cast-iron pipe. Some of the results obtained in this plant are as follows: Rated boiler capacity, 3,215 hp.; watergage air pressure, 2½ in.; temperature of feed water, 200 deg. F.; evaporation actual, 5.6 lb. of water per pound of fuel; fuel, tank barley; steam pressure, 135 lb. gage; load on boilers, average, 150 per cent.; peak loads, 200 per cent.

The Pennsylvania Coal Co. is considering constructing a large generating station in connection with this power house during the coming spring and increasing the capacity of the boiler plant to the full amount or possibly enlarging it. The additional power thus generated will furnish electricity not only for this plant, but for a number of other operations belonging to the same company.

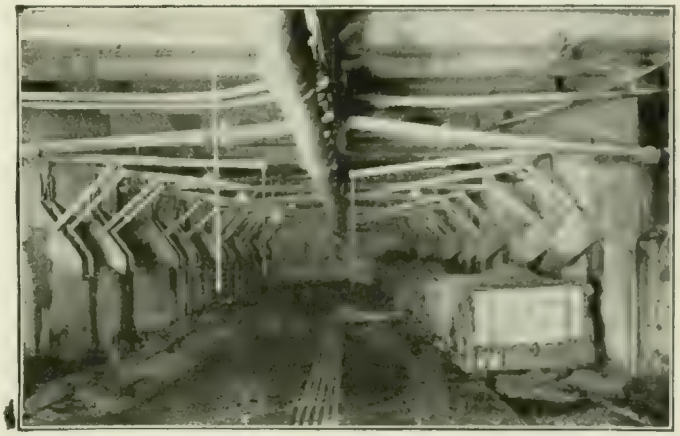


FIG. 7. VIEW IN THE ASH TUNNEL

Draft air is drawn from this passage, keeping its atmosphere clean, cool and free from dust at all times.

Diversion of Coal to Cease

Chairman Spencer, of the Central Coal Committee, issued instructions to cease the diversion of coal, and to buy the coal at whatever price is necessary. The Pennsylvania R. R. is now offering wholesalers to take over their contracts with collieries for 30 days at whatever price the wholesalers have the coal bought from the collieries.

It will pay the wholesaler 15c. per ton profit and will agree to pay cash, ten days after receipt of invoices.

Open Cut or Strip Mining and Its Development

Under Certain Conditions Coal Stripping gives Excellent Results and Low Unit Costs but Many Circumstances Should be Carefully Investigated Before Work is Started

By H. B. Miller
Pittsburgh, Pa.

CERTAIN coal areas exist in Pennsylvania, Ohio, West Virginia and other states, where the cover is so shallow and the roof "so rotten" that it will not endure extraction of the coal by underground mining methods. Consequently the coal can not be taken out by such means. Where this condition exists the open cut or stripping method should be employed, as it is the only profitable manner in which beds lying horizontal or nearly so having an overburden of alluvium, shales, or soft stratified sand rock can be mined. In the anthracite field where the beds are thick, heavy sand rock may be profitably moved. In the development of stripping territory, the method of operation selected depends on the shape and size of the tract, the average depth of overburden, local topography and the output required. In the preliminary examination, the source of water supply and its purity should be taken into consideration, as the average plant will require about 35,000 gal. of water per day of 9 hr., if the shovels are to be operated by steam. This amount will also depend upon the number and size of the units employed.

In selecting a method of strip-pit operation the shape and size of the area worked, the thickness of overburden, local topography, required output, source and quality of water supply, position of state and county roads, buildings and wooded areas above the crop line, railroad approach and rights of way must all be considered.

State and county roads crossing the property must also be taken into consideration, since obtaining permission for a change of their location is sometimes quite difficult, and if not granted a problem is immediately presented in the way of economical operation which may affect the success of the undertaking, as well as the plant layout. Buildings and wooded areas above the crop line, as well as railroad approach, rights of way, and the per cent of grade are also to be considered. If the plant is to be operated by electricity, the proximity to a source of power supply must be considered.

Crop Coal is Usually Unmarketable

In calculating the amount of tonnage available in a stripping area where there is a crop line, it is not wise to estimate from the actual crop, but from a line 5 or 10 ft. away from the crop line, as the coal from this point to the actual crop will probably be so disintegrated as to be unmarketable. It therefore should not be included in the tonnage estimate, which should be figured conservatively.

Output and method of operation should be adjusted to the amount of tonnage available, in order to secure minimum cost of production, including interest and amortization on the capital invested for equipment and that expended in actual stripping operations. Steam-shovel methods involve large capital outlay for equipment and preliminary stripping; hence they should be limited to work where there is sufficient tonnage available to guarantee a suitable return on this investment plus interest during the life of the operation. When properly installed and operated, stripping plants yield enormous outputs at low unit costs.

The general features of steam-shovel mining appear simple; but good management, close attention to details and systematic work are essential to success. The shape and position of the territory to be stripped should be predetermined so as to permit intelligent planning of approaches and track lay-outs, the minimizing of delays and the handling of the maximum amount of tonnage. Maintenance and repair of tracks and equipment are also important. Since the unit cost, with a given equipment, varies inversely with the output, there should be no preventable delays when the plan is once put into operation.

Quite an area may be stripped before actual mining of coal begins, or mining and stripping may proceed simultaneously, when a sufficient area has been uncovered to avoid interference between the two operations. The latter plan is the more advisable, as it reduces the initial investment required before production begins. The direction of the box cuts or excavations will be governed by the topography and average depth of overburden, and the disposition of the excavated materials on the spoil bank. Their arrangement must be such as not to interfere with or embarass subsequent mining.

Operating costs are lowest when there is no expense for transporting stripped material to the waste dump, and the shovel output is increased by eliminating delays incident to loading into cars. The maximum daily output is a function of shovel capacity, depth of stripping and thickness of coal.

The large type of shovel, with long boom and big bucket, much used in coal stripping, moves on tracks laid on the coal bed. The overburden removed is dumped to one side, thus creating the mounds of excavated material termed "spoil banks." The first through cut is termed the "initial box cut," and in subsequent cuts the materials removed are deposited in the previous excavation, thus creating another spoil bank. The large revolving shovel, has its most common application in stripping bituminous-coal deposits, on account of its operating range and capacity for sustained output.

The uncovered coal is generally blasted and loaded with a light shovel into cars. This shovel should be of the caterpillar traction type, since this variety can readily change its direction for operation, has a greater bearing area, and provides more stability, as well as being able to move and work over much softer bottom than the ordinary wheeled shovel.

On a stripping area of appreciable size, a large type of shovel having an 85 to 90 ft. boom, with a 5 to 8-yd. dipper should be used. As an example, we will assume that it is desired to strip an area having about 25 ft. of overburden, and using a shovel with an 85 ft. boom, 60 ft. handle, and a 5 cu.yd. dipper. This will make an initial box cut, overcasting the excavated materials or spoil to one side. When the shovel is in operation it revolves about a central axis or line termed the center line of rotation. Taking the pitch of the boom at 45 deg. the following results are obtained: The distance from center of track to base of box cut bank is 31 ft., or the width of the box cut at bottom is 62 ft. The width at the top would be 73.6 ft., the slope of the box cut being about 1 to 5.

The spoil bank is figured on a 20 per cent swell of materials. The distance across the base of the spoil bank would be about 109 ft., and across the top, 16 ft. From the original ground line to the top of the pile would be 37 ft., and from the top of rail on which the stripping shovel stands to the top of the spoil bank will be 65 ft. The slope of the spoil bank will be 1 to 1¼. The dumping radius from center line of rotation to far side of pile, will be 100.5 feet.

Sometimes instead of casting materials to one side only, conditions warrant the overcasting of spoil to both sides. In this case the box cut width remains the same as formerly, but each spoil area since there are two instead of one is reduced. Then again, as in starting on a hill-side crop, it is desirable to make the initial cut as a side cut. Later on box cuts would be made thus developing spoil areas on one side only.

ONE SHOVEL MAY MOVE 5000 CU. YD.

Working under favorable conditions, such a shovel as assumed above could remove, say 5,000 cu.yd. of material in a day of 9 hr. It would be safer, however, to estimate its capacity at, say 4,500 cu.yd. per day. At times it may be necessary to run the large machine night and day, in order to keep ahead of the small loading shovel. For this reason, the large shovel should be equipped with a 1-kw. 30-volt, steam-turbine generator set. The necessary lights and dynamo should be on the shovel before it leaves the shop.

For loading the coal, a small revolving type of shovel should be employed. This should have, say, a 30 ft. boom, and a 19 ft. dipper stick. Also a special flat-front coal-loading dipper of about 1½ cu.yd. struck measure. If the shovel is mounted on caterpillar trucks, it can be moved about more readily, as this method of support eliminates the use of platforms or tracks and consequently the extra pit labor required. This form of support enables the machine to make a wide cut necessitated by the great range of the coal-stripping shovel that has preceded it.

It also secures the higher lift necessary, in order to load coal into gondolas or other types of coal cars, say, on top of a 6-ft. bed of coal. A shovel of this type can load three 50-ton standard railroad gondolas in one hour, handling run-of-mine coal direct from pit into car. Either of the above shovels can be operated by steam or by electricity.

BALANCING SHOVEL CAPACITIES

In order to illustrate the amount of work that can be performed by the above types of shovels, the following table is prepared, assuming that 1 cu.yd. of coal in the bed weighs approximately 1 ton, and making no allowances for intrusions such as horsebacks and the like. The output (place measure), in cubic yards, divided by the depth of overburden in yards, gives the number of square yards of surface which the shovel uncovers, on top of the coal. Spoil area is figured on 20 per cent swell for loose material. Assuming that the bed is 4 ft. thick, giving 1⅓ tons of coal under each square yard of surface uncovered, we have the following figures for stripping:

Depth of Stripping, Ft.	Width of Cut, Ft	Length of Cut, Ft.	Approximate No. of Cu Yd of Overburden	Sq.Yd. Uncovered	Approximate No. Tons Coal Uncovered
49	60	56	6,094	373	497
35	82	48	5,102	437	583
30	89	50	4,950	494	658
25	95	56	4,928	591	788
20	101	65	4,875	729	972
15	115	76	4,855	971	1,295
10	118	110	4,800	1,442	1,922

One acre of 4 ft. coal will yield about 6,560 tons of coal, or one foot acre, will yield 1,640 tons, more or less, dependent upon the specific gravity of the coal. However, in stripping, 10 per cent loss should be allowed for mining and loading. It will be noted by reference to the above table, that when the depth of stripping is 25 ft. the big shovel will only uncover approximately 788 tons of coal in a day of 9 hr. The capacity of the small loading shovel, on the other hand, is 1,350 tons per day. Consequently, the stripping shovel would have to work double shift in order to keep ahead of the loading shovel, provided the car supply was good and no loss in loading was encountered.

Aside from the shovel tracks, if standard railroad gondolas are run direct into the pit, it is advisable to use 70 lb. rails, of course laid to standard gage. One or two locomotives for shifting would also be required as well as one flat car.

Should it be decided to haul the coal to a tipple and prepare it, instead of loading run-of-mine direct into gondolas, a different type of equipment would be used in the pit as well as lighter rails, and a narrower track gage. In addition to the pit equipment and tipple, there will in any case be railroad sidings to be provided. In some cases also there must be houses and shops, a pump house and pipe line. The use of 2½-in. to 3-in. pipe about a stripping plant will generally provide the amount of water required.

The following is a brief summary of the labor employed about a stripping plant of large capacity, where the coal is prepared and put through a tipple. The scale of wages is omitted.

Stripping Shovel:—One shovel engineer, one fireman, one oiler, one craneman, four men in the pit, one coaler.

Coal Shovel:—One shovel engineer, one fireman, two men at dipper, one man cleaning up spillage, one driller and blaster, three men cleaning off slate and dirt.

Haulage:—Two locomotive engineers, two trip riders.

Tipple Help:—One tipple boss, one tipple boss helper, one boss trimmer, two assistants, one car dropper and one laborer.

General:—One blacksmith, one general repairman, one day boss, one time-keeper and clerk, one watchman, one superintendent.

The total pay-roll therefore amounts to 35 men for operating the plant. From the above force, because of delays from various causes, men can be provided for track maintenance about the tipple and plant. The daily cost for supplies and materials cannot be estimated accurately, but will include the following items:

Coal for boilers and engines, about 20 tons per day; oil, waste and packing; repairs and upkeep; depreciation of equipment and incidentals.

SUMMATION OF EXPENSES

The total of wages and salaries paid on the above labor account, plus the supply account, plus a suitable margin for interest, depreciation, insurance, taxes and expense of administration, will give the daily cost of operation. This divided by the number of tons of output per day, say 1,000, will give the cost per ton of production, f.o.b. cars. To this must, however, be added a certain amount per ton for extinguishment or a reduction of the initial investment in the project. Subtracting this total from the market price leaves the net profit per ton.

Development of any appreciable strip-pit area requires a big investment in shovels, railroad track, tipple and other equipment. Making such an operation profitable depends much upon the ability of the management and the efficiency of the shovel operator. The best talent available is here almost cheap at any price.

An installation to develop an appreciable area of stripping territory, using a large type of stripping shovel and a small loading shovel, figuring on a mile switch to the property, side hill cuts and fills, and including rail and other track materials, tipple construction, engines, sidings, cars, houses and shops, pump, pump-house and pipe line, and providing a surplus to start operation, would cost approximately $325,000 at the present time.

When less than 10 ft. of cover exists over a coal, it is generally discolored and soft. Sometimes even though the overburden is much more than the depth named, and even up to 30 ft., the coal is discolored, but is not as a rule as soft as when under only 10 ft. or less of cover. Such coal is stripped at small expense, but is not the equal of coal found under heavier cover.

When cover heavier than about 10 ft. is encountered it is not generally so discolored or soft as to compel its being placed on the market at a lower price than coal produced by underground mining methods.

COAL SURFACE SHOULD BE THOROUGHLY CLEANED

When the overburden has been removed, the top of the coal bed should be thoroughly cleaned in advance of the loading shovel. The dirt can be swept off with a wire broom, and by thus exercising care, the overburden does not mix with the coal. Equal precaution should be taken to prevent any of the bottom becoming mixed with the product.

As the product of the strip pit is generally sold in competition with coal produced by underground mining and which has gone over picking tables and been screened and sized, equal precaution should be taken with stripped coal. The inferior material, occurring under lightest cover, can generally be disposed of locally for domestic use, at a price below the regular market. The prejudice of the trade against rusty coal is often not well founded, but notwithstanding that it may be practically as good as the unstained variety, the market is not willing to grant this as a fact.

In some districts stripping companies run their coal through the tipple, where it goes over a picking table and is screened and sized. Such plants uphold their reputation, but pits where "everything is loaded" only have a tendency to destroy the reputation of stripped coal.

NO BUG DUST IS FORMED

Stripped coal should have an advantage over that produced underground, inasmuch as there is no "bug dust" to be disposed of, since no undercut is made. Stripping is sometimes termed "daylight mining," and therefore the light should favor a closer inspection of the product so that impurities such as slate, binders, etc., may be cast out. With proper care in mining and treatment stripped coal will generally have an exceptionally good appearance when it reaches the market.

Before the installation and operation of a stripping plant is undertaken by inexperienced parties, a careful study should be made of the subject. It is important that plenty of drilling should be done in order to determine the character of overburden and thickness of coal, an accurate map should also be made of the territory showing the crop-line, buildings and roads, property lines, and the location of drill holes. At times it is desirable to have a good working map, and in this event the surface contours as well as those of the coal should be shown thereon. A map of this nature will enable one to make a layout of the necessary box cuts, and afford some idea as to the drainage problems encountered in the pit. However, a map of this sort is not always necessary as the solution of the drainage and other problems is often self evident.

In addition to the above, careful consideration should be given to the quality of the coal, and the location of any binders in the bed, the continuity of the bed, the hardness of the stratum forming the floor of the seam, as well as questions of transportation and marketing of the product, water supply, labor conditions, etc. It should also be borne in mind, that sufficient stripping territory must be available, so as to keep the equipment busy during its life, either upon the tract it is proposed to work or upon additional areas.

It is not ordinarily desirable to strip over an area that has been worked by underground mining, with the idea of recovering pillar coal. This should be considered as a separate proposition. For this reason, at times, it is not desirable to strip the outcrop coal about an old mine.

The success of stripping operations will depend largely on the shovel engineer and the ability of the superintendent, the genral management, close attention to details and systematic work. The very best men obtainable should be employed for the above positions.

Items in Coal-Mining Cost[*]

INVESTMENT:

Cost of land
Cost of equipment, buildings, machinery, live stock etc.
Cost of railroad spurs and loading tracks
Cost of development to reach coal
Cost of management

LABOR:

Outside

Blacksmiths
Blacksmith helper
Boiler washers
Cagers—top
Camp inspector
Carpenters
Carpenter helpers
Car couplers
Car droppers
Car oilers—men
Car oilers—boys
Car repairers
Car trimmers—men
Car trimmers—boys
Dumpers
Dumper helpers
Electrician
Electrician helpers
Engineers — box-car loaders
Engineers — power house
Engineers—hoist
Firemen — power house
Firemen—helpers
First aid men
Inspectors—coal
Laborers—boiler house
Laborers—general work
Lampmen—electric
Lampmen—helpers
Machine boss
Machinists
Machinist helpers

Masons
Mason helpers
Mine clerk
Mine clerk, assistant
Motormen
Nippers
Painters
Pumpmen
Pushers
Sandmen
Sanitary inspectors
Slate pickers—men
Slate pickers—boys
Stable boss
Stable boss helper
Spraggers
Sub-station men
Superintendent
Supply man
Teamsters
Tipple bosses
Tipple men
Tipple boys
Tool dressers
Trackmen
Trackmen helpers
Water tenders
Water haulers
Watchmen—day
Watchmen—night
Weighman—pit cars
Weighman—R. R. cars

Underground

Bratticemen
Bratticemen helpers
Cagers—bottom
Cagers—bottom helpers
Car couplers—men
Car couplers—boys
Car droppers
Car haulers—men
Car haulers—boys
Car oilers
Cleaners—roads
Concrete men
Concrete helpers
Drill runners
Driver bosses
Drivers
Drum runners
Engineers—electric hoist
Engineers—steam hoist
Engineers—surveyors
Fire bosses
Gobbers—rock
Linemen
Linemen helpers
Loaders—after machines
Machine runners
Machine runner helpers
Masons
Mason helpers

Miners
Motormen
Night bosses
Nippers
Parting tenders—men
Parting tenders—boys
Pipemen—drainage
Pit bosses
Pumpmen
Rockmen
Rockmen helpers
Rollermen
Rope riders
Rustlers
Shot-firers
Shot-firer helpers
Shot inspectors
Sprinklers
Spraggers
Sub-station men
Timber bosses
Timbermen
Timbermen helpers
Track bonders
Trackmen
Trackmen helpers
Trappers
Trip riders
Water bailers

MATERIAL AND SUPPLIES:

Black oil
Blacksmith supplies
Brattice cloth
Car-door boards
Cement
Coal for boilers
Electrical supplies
Electricity
First-aid apparatus
Harness, etc.
Hay and grain for mules
Lubricating oil
Lumber
Nails
Pit car repairs

Props
Rail (heavy)
Rail (light)
Repairs for machinery
Rescue apparatus
Rollers
Sand
Sprags
Telephones
Ties
Track spikes
Track bolts
Waste
Wire rope,
Etc., etc., etc., etc.,

GENERAL EXPENSE:

Officers' salaries and expenses
Other office salaries
Rent and miscellaneous office expense
Legal expense
Doctor and hospital expense for employes

SELLING EXPENSE:

Sales-officers' salaries and expenses
Road-salesmen's salaries and expenses
Other office salaries
Rent and other office expense
Advertising—commissions—miscellaneous

OTHER OPERATING CHARGES:

Royalty
Depletion reserve
Depreciation reserve

Floods
Mine squeezes
Mine fires

INSURANCE

Fire, boiler, etc., workmen's compensation and mine explosions.

TAXES—Federal, State and County

STRIKES

The cost of production is made up of these 200 or more items which the Operator has to pay to put the ton of coal on railroad cars ready for shipment. The wage of the Miner is just one item out of the many.

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[*] Prepared by Oakdale Coal Co., Denver, Colo.

Stonega and Clinchfield Operations

By A. G. Lucas and F. E. Marcey

Mine Inspectors, Richmond, Va.

Owing to the shortage of orders the Stonega Coal & Coke Co. did not operate regularly last year. Yet, in spite of this handicap, it mined more coal than any other concern in the state. During the period of car shortage it continued to operate the major part of its mines by dumping the coal on stock yards prepared for this purpose. While this method is, of course, expensive since it necessitates reloading the coal into railroad cars, yet the company used this means of operating in order to keep the mines running, thereby keeping its working organization intact. It has had as much as 150,000 tons on the yards at one time.

This company has made many improvements this year, building two new camps and making many changes in the old ones. It has built three new tipples and started one new operation; a modern hospital has been constructed and a first-aid team equipped. The new operation is known as the Dunbar mine located on the Interstate R. R. in Wise County and promises to be one of the company's largest operations. With a few exceptions the mines of this company are equipped with electric-cutting machines and electric locomotives with about a dozen storage-battery locomotives. The mines are ventilated by up-to-date electric and steam fans housed in brick and cement buildings.

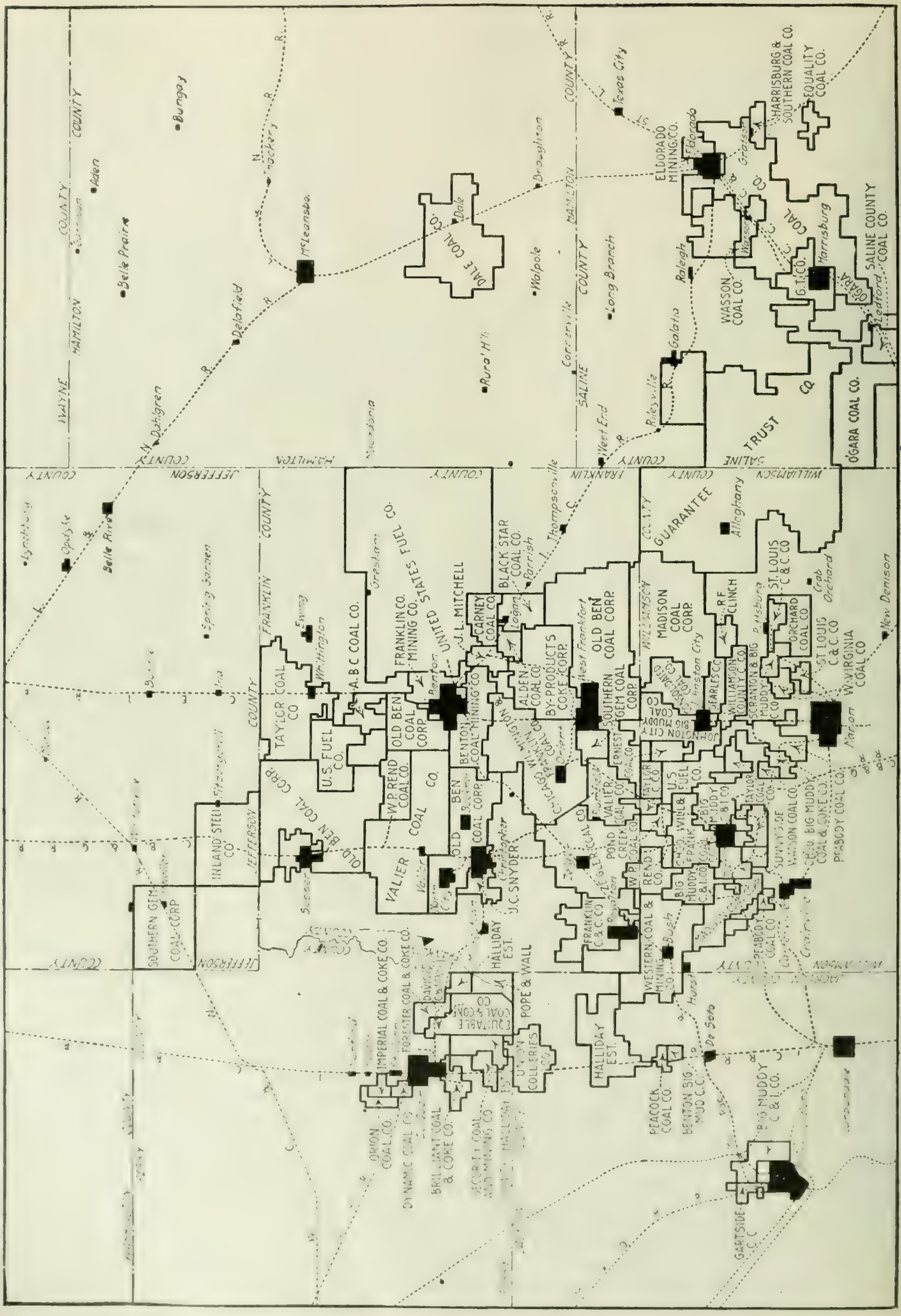
The efforts put forth by the company in respect to safety have done much to reduce accidents in and around the mines. It employs two mine inspectors regularly and its printed safety rules are rigid. Ralph Taggert, Big Stone Gap, Va., is general manager.

The mines of the Clinchfield Coal Corporation, the next largest producer in the state, are located in Russell, Dickinson, and Wise Counties, on the Clinchfield Ry. The mines are both drifts and slopes. The coal is cut by electric machines and hauled by electric locomotives. All the coal is brought to the railroad by conveyors. This company's camps are in good condition and many improvements have been made this year. The mines are ventilated by electric fans, incased in brick and cement buildings. An up-to-date hospital is located at Dante, Va. A mine inspector is employed and the efforts put forth by the company have no doubt reduced the number of accidents at its mines. Lee Long, of Dante, Va., is general manager.

Franklin and Williamson Field Properties

Only a few years ago Franklin and Williamson Counties were a waste of barnless farms and indigent citizens. The land was said to be a land of Egypt and by that was meant, not the land of Goshen in the Nile delta, but the Egypt as it was in the long seven-year famine. Even today there companies bearing the name "Egyptian"—the Egyptian Iron Works, the Egyptian Power Co. and others. But Egypt is now closely inhabited by prosperous citizens, as the map on the opposite page well shows.

The crops of the coal in Williamson County were divided up into small holdings, as the bottom of that map testifies, but the deeper coal in Franklin County involved the introduction of shaft mines and the holdings are large and the equipment as modern as in any part of the country. A somewhat poor streak cuts the field almost in two on an east and west line.



SOUTHERN ILLINOIS COAL FIELD, INCLUDING FRANKLIN, WILLIAMSON AND ADJACENT COUNTIES

Transportation as a Factor in Irregularity of Coal Mine Operation*

Heavy Expenditures by the Railroads Will Be Necessary if They Are to Meet the Needs of the Country—Much of the Necessary Financing May Have To Be Done by the Industries Served

By S. L. Yerkes
Birmingham, Ala.

An adequate supply of fuel and its proper distribution is the foundation of not only our prosperity, but that of the civilized world, and regardless of all other steps in the production of fuel, all will be of no avail without adequate transportation. I will not attempt to discuss any form of transportation except that by rail and the general principles underlying it as they affect the coal industry. At this particular time car shortage looms large and stands out predominently above all other troubles of the coal industry. For many weeks past a number of the large producing districts have not averaged above 50 per cent running time on account of car shortage. Car shortage is not new, but never in the history of the industry has a surplus of approximately 250,000 open-top cars available for coal loading been wiped out and changed to a shortage of approximately 75,000 cars in the short period of eight months, yet such are the facts today. On April 1, 1919, there was an approximate surplus of 250,000 open-top cars, while today a fair estimate of the shortage is 75,000 cars.

A marked deficiency in the available number of open-top cars, an insufficiency of power, the poor condition of existing rolling stock, a lack of main-line tracks, side tracks and passing tracks, and terminals as well as the absence of whole-hearted support and co-operation from employees are some of the present ills of American railways.

There is an additional shortage of open-top cars needed by industry for the transportation of structural iron and steel, gravel, stone, sand, concrete blocks, and other commodities and raw materials. This shortage is estimated at 100,000 cars today. Thus the present shortage of open-top cars is approximately 175,000.

This condition is extremely alarming and shows the necessity of prompt and strong action along many lines, if proper transportation is to be made available, not only for the coal industry but for all business of the country, and the prosperity of all, in final analysis, is dependent upon a proper and adequate supply of fuel.

The available coal-car supply of the country as taken from records of the Interstate Commerce Commission for the 16 years, 1904 to 1919, inclusive, for five-year periods, is as follows:

	1904	1909	1914	*1919
Number coal or open-top cars	622,568	792,291	893,314	975,000
Average capacity in tons	33	40	45	49
Total capacity in tons....	20,760,045	31,748,304	40,583,490	47,775,000

*Estimated.

Increase in total capacity 1919 over 1904, 131 per cent

The production of coal, anthracite and bituminous, for the same period was:

	1904	1909	1914	*1919
Anthracite	73,156,000	81,070,000	90,821,507	86,200,000
Bituminous	278,660,000	379,744,000	422,704,000	458,063,000
Total	351,816,000	460,814,000	513,525,000	544,263,000

*Increase 1919 over 1904, 55 per cent

The five weeks' production of bituminous coal lost because of the October-November strike would have made bituminous production in round figures 500,000,000 tons for 1919, on which basis, the increase of 1919 over 1904 would have been 70 per cent.

The industrial slackness of the first six months of 1919 should be borne in mind as a large factor in the light output during the first half of the year. If the increase over 1904 is figured on the basis of the 1918 total production of 678,211,000 tons, the percentage of increase is 93 per cent.

During the same period that coal production increased as above shown, the output of other lines of industry requiring open-top cars increased at an equal or greater rate. From this it is evident that the need of the country for open-top cars in 1919 as compared with 1904 has not been met by an increase of 131 per cent in total open-top car capacity during the 16-year period named.

Transportation deficiencies existing today are not by any means confined to the shortage in the number of cars owned. Other factors, of railroad transportation such as insufficiency of power, the poor condition of locomotives and cars, lack of adequate main tracks, passing tracks, terminals, absence of whole-hearted support of employees, due in great measure to former Director General McAdoo's labor-union policy, are large contributing elements.

The failure of the railroads during the last few years of private control, and of the government during federal control, to increase the facilities as the business needs of the country demanded, needs no discussion here, as the failures of the past are behind us. What we have to deal with today is the future.

We may or may not be satisfied with the forthcoming railroad legislation as provided by Congress, but certainly the revolving fund of $250,000,000, as proposed in the Esch bill, is totally inadequate to provide even in a small way for the immediate necessities of the railroads, and the outlook is not encouraging for securing capital through the ordinary methods of financial co-operation.

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*Paper presented before the February meeting of the American Institute of Mining and Metallurgical Engineers

Conservative estimates by reliable authorities, place the equipment needs of the country today at 20,000 locomotives and 600,000 freight cars, delivery to be made over a period of three to four years. The above requirements are necessary to meet the business growth of the country and to replace retirements of obsolete and worn out equipment. The estimated cost of locomotives today is approximately $65,000, and of cars, approximately $3,000. Total cost of this equipment on the above basis is $3,100,000,000, in addition to which necessary capital for additions and betterments for tracks, terminals, shops, etc., must be provided.

I am advised by good authority that a bond issue by the government for the purpose of providing capital for railroad expenditures cannot and will not be considered, and as there is little hope of the railroads securing adequate capital from banking sources sufficient for their needs, the business interests of this country, in order to protect themselves, must, of necessity, assist in providing a large portion of the funds needed, particularly that portion essential to the purchase of equipment.

Of all business none is more vitally affected by car shortage than the coal industry, as of necessity, transportation must be available when coal is produced, storage at the mines being entirely impracticable except in a small measure and in isolated cases. Therefore, all business, and particularly the coal operator, should purchase, in such quantity as the resources of the various companies or individuals permit, equipment trust obligations of an individual railroad or group of railroads.

A Safe 6 Per Cent Investment

Railroad equipment trust obligations are considered an unusually safe and sound investment. A banking syndicate could be organized to finance the purchase of equipment for the various railroads, having first secured the pledge of the various lines of business interested, to purchase in such quantity as they decide they can properly absorb, equipment trust certificates when offered by the syndicate. In order to provide capital at a reasonable interest rate, such certificates should not carry a higher rate than 6 per cent, and while this capital might be employed in its own business at a larger profit, investment in equipment trust certificates for the purpose of providing additional facilities and thereby increased operating time for industry, could be well justified, and I urge consideration of this idea by the business and trade associations of the country.

Experts may differ with me as to the number of cars and locomotives needed, or concerning the additional facilities such as tracks, terminals, shops, etc., required, and can properly say that increased efficiency, and particularly the more intensive use of cars, the storage of coal and other things, to prevent cars from being used for warehousing purposes, even for as short a period as 48 hours, would solve the problem. Shippers, and the public alike, will agree in principle that a more intensive use of cars is reasonable, but at the same time will set up what are to them insurmountable difficulties as to why faster loading and unloading cannot be had. Today's situation is sufficient to justify community action against those in a locality who fail to do their part in the prompt loading and unloading of cars.

But I repeat, if the railroads themselves are unable through their own resources and credit to finance the purchase of necessary equipment, which need is now paramount to all others, the business interests involved, for self-preservation, must assist, and in my opinion this must be done, along the plan above outlined.

Just Distribution Has Been a Bone of Contention

A fair and just distribution of available coal-car equipment has been a big question of dispute throughout the years past. In the old days of favoritism the assignment of cars to favored producers was the outstanding evil in the distribution of available equipment, and in the purchase of railroad fuel, assigned cars played the leading role. All the tricks of the carriers in the old days used in the purchase of railroad fuel, and particularly in the preferential assignment of cars, were consolidated under one head, shortly after the beginning of government control in January, 1918, that head being the well known John Skelton Williams, director of purchases, U. S. Railroad Administration.

It is not necessary to review the evils resulting from using cars preferentially in the procurement of fuel. It suffices to say that the evils multiplied, as practice made perfect, and culminated finally in the fall of 1917, and through the winter of 1917-18, in the Fuel Administration requiring, because of war necessity, the railroads to assign cars for the loading of fuel required by certain industries producing the more needed munitions of war. By December, 1917, with federal control in sight, so many cars were being assigned for, particularly, railroad fuel and war munition plant loading, that the cars available for ordinary commercial distribution on many railroads were practically nil. Needless to say, this brought on industrial chaos.

Following the establishment of the Railroad Administration, the question of assigned cars became so serious, because of the great disturbance to business generally, to labor employed at those mines receiving no assigned cars, and particularly because of the announcement by the Railroad Administration, through its Director of Purchases, John Skelton Williams, that it proposed to use assigned cars for the purpose of securing a lower price for railroad fuel than the fixed government maximum, that representatives of the coal industry began a determined fight to abolish the assigned car evil.

Assignment of Cars Was Finally Abolished

This campaign was conducted by the National Coal Association whose position in the matter was espoused by the former U. S. Fuel Administrator, Dr. H. A. Garfield, who, broadly, intelligently, and courageously, recognized the rights of the public, the necessities of mine labor, and the needs of the coal operators. In final analysis the controversy was settled by President Wilson, who abolished assigned cars and at the same time ordered a reduction of 10c. per ton in the fixed government price for coal, both effective as of May 25, 1918.

Following the President's order abolishing assigned cars, conferences between the Railroad Administration and coal operators resulted in the establishment of uniform mine rating and car distribution rules. These rules, with slight modifications, have been in effect since

October, 1918, and have, in the main, tended greatly to stabilize the industry from the standpoint alike of the public, labor and the operators. The resultant good from equal car distribution for the benefit of the three parties at interest, the public, labor and the operators, is so apparent that there should be no return to assigned cars after March 1 next, but when this suggestion is made, immediately there arises the question of how the railroads will secure fuel in time of car shortage.

There has been much discussion on this subject and never more than during the year 1919. In October last, prior to the coal strike, the Railroad Administration, through its Director of Purchases, H. B. Spencer, asked a committee of operators to meet with him and discuss ways and means of providing railroad fuel, as he was having difficulty in securing his requirements. The underlying causes for the difficulty need not be discussed here, as it suffices to say the railroads were in need of coal and we all recognized the necessity of their having fuel. The committee of operators suggested to Mr. Spencer that in those districts from which he was unable to secure sufficient fuel for the needs of both originating and non-originating roads, if he would indicate the tonnage needed, the respective operators' associations would undertake to secure the necessary fuel for him and at reasonable market prices. It is interesting to note here that no demand, either before or since the strike, has ever been made to those assigned to carry out the understanding reached with Mr. Spencer.

The Interstate Commerce Commission under the new railroad bill should continue the mine rating and car distribution rules developed under Government control. Return of the roads to private ownership will probably mean improvement of conditions in the less-congested portions of the country, while in congested districts some of the Government practices should be continued.

With further reference to the matter of protecting railroads with coal in time of car shortage, my personal view, based on the assumption that the railroads will fairly and honestly contract for their fuel supply, is, that when delivery cannot be made of the contractual amounts because of car shortage, the deficit should be pro rated fairly to non-contract mines and shipped without question by the non-contract operators, except to such extent as it is necessary to exempt specialty coals, such as gas, byproduct, bunker, etc., with protection guaranteed by the railroad to the operator against damage for failure to ship on commercial contracts in hand carrying priority of shipment.

This action will supply the needs of the coal-originating roads and will avoid all the evils of promiscuous confiscation which will, of necessity, be resorted to by the railroads when their fuel supply runs short. For the non-originating coal roads, I feel, in case of failure to secure requirements through general purchase in the open market, appeal by such railroads to operators' associations located in the districts from which they normally draw their supply, will result in the securing of sufficient coal to protect the needs of such roads.

If co-operation from the operators along these lines is not given, with such modifications as local conditions demand, we may expect the vicious practice of indiscriminate confiscation with all of its resultant evils to the public and the industry to be continued. I therefore urge action at this time along these lines by the individual carriers and operators, and in so doing endeavor to forestall future controversies and resultant bad feeling on the part of the public, the railroads, and the coal producers, which inevitably arises from confiscation as usually practiced.

The plan suggested for the coal-originating roads is not of itself new, as a similar plan was used by the Fuel Administration in co-operation with the Railroad Administration during the winter of 1917-18 in order to provide the controlled lines with fuel. The plans above offered are suggested to meet the situation as it will arise under private operation after March 1 next.

A given railroad may feel that it can and should in times of shortage assign cars to its contract mines for coal in order to secure a lower price for its fuel. But when this is done such action must inevitably be followed by assigning its cars for loading fuel coal of connections, not in a position to protect contract loading with their own cars. Such practice eventually will cost the coal-originating line heavily, as sooner or later the entire car supply and transportation ability will be so used as to cut off largely, if not entirely, the supply of industrial fuel and result in closing many industries, which are large revenue producers to such carrier. This has happened on some roads and can happen again.

I see no objections in all fairness, to the placement of cars delivered for loading connecting-line fuel, at mines as billed, but connecting lines should not bunch their contracts so as to bring about full running time at such contract mines in time of car shortage with resultant disturbance to mine labor at other operations receiving a less car supply under the general distribution.

It is to be hoped that the Interstate Commerce Commission under the broadened powers given it in the new railroad bill, will continue in effect along the same general lines, the mine rating and car distribution rules developed during the period of government control, as these uniform rules are of great benefit to all interested.

Upon the return of the carriers to private ownership and direction we may expect, in my opinion, improvement over government control in many parts of the country, particularly in the less-congested portions. In the congested section undoubtedly some of the practices of unified operation under government direction should be continued, otherwise, I fear service under private control will not be as good as that under government control. In making this statement I wish to say that I am an ardent advocate of private ownership and operation.

In the return to private operation we must give consideration to the question of open-top car pools, about the wisdom of which there is wide divergence of opinion, not only among coal men, but among the carriers themselves. The big question of arbitrarily allotting cars of a strong well-managed road to a weak and poorly operated line as is frequently the case in car pool operation, is one worthy of discussion. It should be considered from the standpoint of the public, mine labor, and the industry and not from an individual, a selfish or sectional viewpoint.

Personally, I am an advocate of a national car pool operating through regional pools, with original regional allotment on ownership basis, and fair maintenance of interchange balances between the regional pools, allowing for fluctuations arising from extraordinary conditions and movement.

Finally, I feel that the coal industry should approach the railroad's return to private operation with an open mind, forgetting the evils of the past, hopeful that the carriers have profited by the lessons learned, and that they will honestly and faithfully play the game with each other and with the public. We have our part to perform and should do it in the same fair manner, and if all parties will acquit themselves like men our transportation troubles are on the way to a lasting solution.

To Conserve Coal for Future Generations*

True Conservation of Fuel Means 100 Per Cent Extraction, Complete Utilization and Maximum Efficiency in Consumption—Electrification Will Greatly Aid in This Problem

By Edwin Ludlow†
New York City

Any discussion of the conservation of coal can be divided into three headings: (1) The conservation of the coal resources of the country through more complete extraction and better methods of mining; (2) the utilization of the entire output of the mine; (3) the obtaining of the maximum efficiency in the use of the fuel produced. 1. Mining methods in the United States have been, as we all know, extremely wasteful and are only beginning, in certain localities, to show any improvement. The great abundance and the low selling price of coal with the small margin of profit, if any, to the operating company made the task of keeping the company solvent the most important question, and to do so it was usually necessary to mine the cheapest coal at the least cost without much thought for the future. The increased demand and the higher prices that have recently come have made it possible now to work beds at a profit that formerly could not be mined except at a loss and it is now possible, in most fields, to work the veins in a property in the proper sequence, or from the top down, rather than according to the former method of working the big measures first and trusting that the roof would not cave and prevent the mining of the smaller veins lying above.

Owing to the abundance of coal and the low prices hitherto paid for it many impediments have been placed in the way of proper mining. The higher prices at present enjoyed make scientific operation at least possible.

The differences in the methods of mining and what we can learn from Europe in that regard possibly may be exemplified best by giving my own experience in northern France some years before the war. I visited a mine that was just being opened by a large French company. The machinery and equipment were of the very best that I had ever seen. Everything was not only absolutely fireproof but was built with a permanency and architectural finish that is noticeably absent from American mines. I noticed also, in looking over the plain where this mine was located, that other tipples were in comparatively close proximity on practically every side so I asked the chief engineer how it was possible to bring out at a profit the initial expenditure represented by the plant when the area to be worked was evidently rather limited in view of the proximity of the other shafts and tipples. He told me that the first vein that they would encounter would be at a depth of 1,200 ft. and that from there downward they would have a series of veins all the way to 2,500 ft. They would open up the bed at the 1,200-ft. level and by mining it longwall would make a complete extraction. They would not start the next vein below until the workings on the upper measure had advanced sufficiently to bring on a settlement of the roof, making it absolutely safe to open up the lower veins without any danger of affecting the workings above. These workings would all keep one behind the other and the output of that mine would be probably a continuous one for at least 100 years. It was, therefore, necessary to build not only permanently but as much in advance, in the way of machinery and equipment, as possible so that the plant would not become too far out of date and obsolete before the coal was extracted.

The work of conservation of coal in the ground by proper methods of mining is being much assisted now by the engineers employed by the large estates who lease ground to operating companies on a royalty basis. The leases are usually drawn so that the laying out of the work is in the hands of the landowner's engineer and strict rules are given in the lease as to the mining and the percentage of extraction. Great improvements have been made in mining methods but there is still room for much improvement in nearly all fields. To accomplish the complete extraction under the economic law that a mine must pay its expenses, or close, makes conservation methods difficult of enforcement where the competition is as keen as it has been in the past.

In what was formerly Indian territory, now Oklahoma, the coal mines were taken over by the United States government, in 1895, as trustee for the Indian tribes and this coal was leased to operating companies on a royalty basis, the royalty being credited to the Indian nation owning the land. However, conservation methods have not been practiced and the methods of mining used have been as wasteful, if not more so, in that field than in almost any other. Large areas were closed by squeezes, due to insufficient pillars left in the first mining, and the cheaper coal along the outcrop was extracted and the mine abandoned when it reached a depth requiring additional machinery. A large proportion of the field now consists of outcrop slopes standing full of water. No methods of mining were specified in the lease and no supervision was given to that feature.

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*[illegible] meeting of the American [illegible] New York City. [illegible]

†[illegible] of the A. I. M. E.

An example of the difficulty of operating a coal mine under an act of Congress was exemplified here where a mine, at McAlester, Okla., having coke ovens and more slack than the coke ovens could use devised the scheme of making an intermediate size of nut and pea for which a market was found. In order to maintain that market, it was necessary to jig the nut and pea as otherwise it was too high in slate for the steam purposes for which it was well adapted. The slack coal was taken to a washery and the nut and pea cleaned in jigs and the fines taken to the coke ovens. The royalty was paid to the government on the shipments. This, however, was met with an immediate protest by the government, stating that the law required that the royalty should be paid on the coal extracted from the mine and that it would, therefore, be necessary to pay royalty on the slack before it was cleaned. The result was the abandoning of the washery and the shipment of the slack "as is," as the royalty charged on the slate taken out wiped out all possible profit.

NEARLY ALL ANTHRACITE CAN BE UTILIZED

2. For the anthracite region, improvements have been made in grate bars and artificial draft that have enabled the utilization of the smaller grades until now the barley coal, which is being shipped, is made over a $\frac{1}{16}$-in. mesh. At many mines a still finer size is being made which passes through a $\frac{1}{16}$-in. and over a $\frac{1}{32}$-in. mesh. But in spite of these refinements a million or more tons a year of fine coal are being thrown away for which there are now being developed three methods of utilization.

a. Briquetting, which is gradually becoming more successful with various experiments, until now several briquetting plants are in operation and others are in contemplation.

b. Grinding this dust so that it will pass through a 400-mesh screen and burning it as pulverized fuel. Plants of this kind have been built at the mines and a plant is being erected in the cement region. Pulverized fuel has been used for some time with bituminous coal but it is only recently that developments have been made that make it practicable to burn anthracite in this form.

c. Utilization of this waste in the form of coke, which can be crushed down to stove-coal size and used for domestic purposes the same as the prepared sizes of anthracite. This process was invented by Donald Markle, who found that by adding pitch to the fine anthracite a good coke could be made in byproduct ovens. The process is now being developed by the Delaware & Hudson Co. under his direction.

In the soft-coal field, a waste product is the bone encountered in Westmoreland and other districts, where a large bench of this material is encountered in the vein and is thrown away as being too high in ash. It is capable of being used in a gas producer and a plant located at the mines could utilize this waste product in the generation of electricity, increasing the power supply of that section of the country.

CENTRAL STATIONS ACCOMPLISH MUCH

One of the greatest methods for stabilizing the coal industry and permitting the operation of the mines to their maximum capacity is by the installation of central electrical power plants. This can only be economically accomplished by the electrification of the railroads. The results, as given by W. S. Murray, who had charge of the electrification of the New York, New Haven & Hartford, have shown that passenger engines use twice as much fuel when coal fired as when operated electrically, and that for freight and switching engines the quantity is from three to four times as much. He also states that the repairs on electric locomotives are only one-half as much as on steam machines and they are capable of more continuous service and have better tractive effort.

The question of economy in the use of electric motive power on the railroads is no longer one of theory and the only obstacle to be overcome is the large initial expenditure required to make the change. The railroads now burn 28 per cent of the total output of the bituminous mines; with electrification this would be reduced to 10 or 12 per cent. Freight congestion and car supply troubles also would be solved, as the central power plants in the coal-producing states could be located at a group of mines, requiring only a minimum of switching service. Coal too high in sulphur for safe storage could then be burned as produced and the mines kept in continuous operation. For railroads not passing through coal fields, the power plants would require storage facilities to permit an accumulation of coal in the summer months.

Another extremely wasteful method of using coal is in the old-fashioned beehive coke ovens, that are gradually disappearing here; in Europe they were found too uneconomical to use 30 years ago. It has been estimated that enough gas goes to waste from this type of oven along the Pennsylvania R.R. to furnish the electric power needed for that railroad between Pittsburgh and Altoona.

BRIQUETTES AND COKE AUGMENT SUPPLY

In the anthracite field, the output of the mines in the Pennsylvania region has practically reached its maximum; and while the increase in population, especially in the seaboard states, is causing a constantly increasing demand for anthracite of domestic sizes, it will be impossible to increase that supply except by the use of briquets and crushed anthracite coke. The conservation that will have to be adopted by householders is to use the smaller sizes—such as pea and buckwheat for their heaters in place of the egg, stove, and nut—which they have formerly insisted upon buying. This is entirely possible by installing heaters adapted to the use of these small sizes, similar to the Spencer heater made in Scranton. The results have shown that the same efficiency per ton can be obtained from buckwheat as from nut or stove. The firing is much more simple and the heater requires less attention as it is self-feeding; by a thermostat attachment it can be made self-regulating, thus requiring attendance only once a day to remove the ashes and replenish the feed hopper.

3. In the use of bituminous coal, there is the greatest extravagance in nearly all parts of the country and little attention has been paid to obtaining the full heating value of the fuel received. At a large plant I recently visited, the president pointed with pride to the fact that he always purchased the highest-grade coal and insisted that it should have at least 15,000 B.t.u.'s. I called his attention to the fact that his steam results showed that he was only obtaining 11,000 B.t.u. and by improving his boiler and closing up the leaks he could obtain the same amount of steam with an inferior coal or use a much less quantity of the higher grade. During the functioning of the Conservation Committee of the Engineering Council, this question was thoroughly discussed and if the coal shortage had continued it had been determined that there should be a complete survey made of the steam-using plants and that they would be rated by inspectors as A, B, and C. In class A would be the essential industries obtaining a maximum efficiency from their coal; these would be entitiled to preference in obtaining fuel. In class B would be the essential industries that were not burning the coal efficiently, their attention would be called to that fact. In class C would be the other industries which were either non-essential or were not burning coal to obtain the best results. Preference in shipments would be given in the order of A, B, and C. It was felt that there would be a great improvement throughout the country if the attention of the owners was called to the fact that they were liable to be refused coal unless they improved their boiler practice. We had gone to the extent of negotiating with the boiler insurance companies for the use of their inspectors to make these surveys.

Railroad electrification means large economy in the use of fuel. A linking up of big power plants through a high-tension large-capacity trunk transmission line would obviously accomplish still further savings in coal utilization.

STEAM LOCOMOTIVES ARE FUEL EATERS

Another highly wasteful form of burning coal is in the steam locomotive. This subject was taken up by Eugene McAuliffe, who had charge of this matter for the U. S. Fuel Administration, and the reports of fuel conservation for the first nine months of 1919 are now available. They show that, in straight freight and passenger service the roads reporting consumed 76,285,955 tons of coal, as compared with 88,727,045 tons in the corresponding period in 1918. The average cost of coal in 1919 approximated $3.45 per ton, and in 1918 $3.25—an increase for 1919 of less than 6 per cent. The most significant figures, of course, are not those relating to total consumption, which would be affected by the volume of traffic moved, but those bearing on unit performances.

These show that in 1919 there were 186.1 lb. of coal consumed per 1,000 gross freight ton-miles, as compared with 201.2 lb. in 1918. Consumption per passenger-train car-mile, in 1919, was 17.9 lb., while for the same nine months in 1918 it was 19.3 lb. In other words, the increased efficiency obtained per unit of service made the fuel cost per 1,000 gross ton-miles and per passenger-train car-mile less with the higher priced coal of 1919 than was true in 1918 when coal costs per ton were lower. When the difficulties in policing railroad efficiency systems in coal consumption, because of the nature of transportation service, are contrasted with the ease with which the similar regulation can be enforced in a stationary plant, the advantages that will accrue to the managers of the latter type from an intensive study of the question of how much service can be developed from a ton of coal are readily apparent. It has been shown how great an economy in coal consumption can be accomplished by electrification of the railroads; still greater fuel economy can be obtained by the use of electricity in manufactories. The estimated saving is nearly three-tenths since the losses in steam consumption of a plant running 8 hr. and maintaining its boiler plant for 24 hr. would be entirely obviated by the purchase of electric power and the payment for only such energy as was actually consumed.

Attention has been called to this subject by Secretary of the Interior Lane and it has been suggested that an appropriation be made for the study of a high-power trunk line between Boston and Washington, into which would be fed the power generated, as far as possible, first, hydro-electrically; second, from power plants at the coal mines, where they are within reasonable distance of this trunk line; and third by the construction of large power plants at tidewater, where coal could be brought in by both boat and rail. Here in the City of New York such a power plant is needed almost more urgently than anywhere else. Every strike of longshoremen or tugboat captains or a tieup from bad storms brings out big headlines that the coal situation in Manhattan Island is bad and that probably after a few days the subways and elevated roads will have to close down for want of fuel.

It is manifest that no large storage can be maintained on Manhattan Island with its limited area and high cost of land. The Newark meadows, however, can easily be reached by all the coal-carrying roads coming into the neighborhood of New York, and also can be reached by boats from Norfolk or Baltimore. A central power plant erected there could have an unlimited storage, under water, if desired, for the soft coal that is in danger of spontaneous combustion, and coal could be brought in at a minimum of expense, unloaded on these storage piles, and a sufficient reserve to tide over any possible storm or tieup could always be maintained.

High-power trunk lines connecting this power plant to the present generating plants of the Edison, Interborough, and Brooklyn Rapid Transit and other large electric consumers would change those plants to substations for the high-tension power coming in from the central plant and the present boiler plants could be used in emergencies. Such a central power plant could be expanded to sell electric power to the railroads entering New York and all the advantages of an enormous concentration with the highest technical advice and the greatest efficiency could be well afforded at a plant of that kind, which would be a model for the country.

New York's troubles in heat and light, to a large extent, would be eliminated by having a power plant of sufficient capacity to take care of all of its needs and with storage piles to enable it to operate every day in the year irrespective of any local troubles affecting harbor transportation, which now is such an important factor in the fuel supply of New York City. With the successful operaton of this power plant, others could be built at Baltimore, Philadelphia, Boston and Providence and by connecting them with a main trunk line, intermediate industries would receive their electric power at a minimum cost.

While the initial expenditure for such plants would be high, the saving of $100,000,000 a year, which has been estimated as the amount that such a trunk line could save to the industries along the Atlantic coast, would well repay the interest on the investment required.

Pennsylvania Will Provide More Electrical Safeguards

Manufacturers Will Supply, and Operators Will Pay For, New Appliances To Make Storage-Battery Locomotives Safe in Gaseous Mines—New Laws Are Needed

By Frank Hall*
Harrisburg, Pa.

AT THE Capitol in Harrisburg a conference was held Jan. 27, to discuss electrical equipment in coal mines from the standpoint of safety to the employees which was continued at the same place Feb. 10. Most of the state and Federal officials, coal operators and manufacturers of electrical equipment who were present at the first session also attended the second.

The chief of the Department of Mines in opening the meeting said that at the previous session there was not a single dissenting opinion to the statement made by the department that storage-battery locomotives as now constructed are not safe for use in gaseous mines. Copies of the report of the commission of mine inspectors appointed by the chief of the Department of Mines to investigate this matter, were furnished those who attended the first session, together with copies of schedule 15, containing specifications of the U. S. Bureau of Mines as to what would constitute a safe storage-battery locomotive such as could be approved by the Federal bureau.

The manufacturers of storage-battery locomotives were asked to state what they could and would do to improve and perfect the machines in accordance with the requirements of the state and Federal authorities, and there was a general agreement on the part of the manufacturers to build the future machines according to specifications. These, however, will not be completed for some time. The question then arose as to what the manufacturers and operators would do in order to make the locomotives safe which are now in use in the mines, of which there are almost 300. It was shown that it would cost probably $400 to $600 to add the necessary safety features to the ordinary storage-battery locomotive, but this the operators expressed a perfect willingness to pay.

Having reached this point in the discussion, the question arose as to the attitude of the State Department of Mines regarding the equipment of this kind now in use, and the chief of the department assured the operators that it was not the intention of the department to be arbitrary in the matter, or to place hardships or undue restrictions upon them during the period in which the locomotives are to be improved to meet the requirements of the law. He stated that they, of course, realized the obligation that rested upon the department to safeguard the great army of workers employed in the mines, but he thought that proper consideration would be given this side of the question without placing too great a burden upon the operators or manufacturers. The unfortunate feature of this matter and the one that is causing trouble today is the deficiency in the mine laws of the state regulating electrical equipment.

In the anthracite region the act of 1891 is still operative, and it contains no mention of electricity. The bituminous mine code, passed in 1911, was prepared with much care and effort, and at the time was sufficiently comprehensive to meet the demands. Electricity, however, progressed so rapidly and its application has become so generally used with machinery and equipment that was formerly operated by steam power, that the bituminous code is also now far behind the requirements. This being the case, certain rules must be adopted to tide over the interim between the present time and a time when a new electrical code can be enacted.

Electricity in the mines is now applied to storage-battery locomotives, trolley locomotives, mining machines, pumps, chain hauls, drilling machines and fans. In fact in some of the best equipped mines, steam as a power has been entirely supplanted by electricity.

In carrying out the rules of the Department of Mines, the questions that arise in individual cases will be left to the district inspectors to solve and settle as fairly and justly as possible, keeping in view, of course, the main idea of safety to the employees in the mines.

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Exit the Coal Pool?

A Composite Interview Reporting the Comments and Ideas of a Number of Prominent People Who Are Thinking and Talking about the Pooling of Coal and the Future Prospects of This System in Handling Our Tidewater Coal Shipments

By A Staff Contributor

WITH the end of the Federal control of the railways in sight there are many questions before us as to what is going to happen to the various activities in which our National Government has been engaged while directing these transportation systems. One such point of great interest to every coal man is the question of what will become of the system organized for pooling coal at Tidewater, which has received such a large measure of support by the consolidated railroad activities. Just now, therefore, it seems particularly timely to stop and consider the various interests which have been affected by this pooling and just what their desires seem to be at the present time. Of course, within any one of these groups of interest, there are many shades of opinion, but *Coal Age* has undertaken to analyze the situation briefly and summarize just how each group in general feels about this important matter. The first effort made to effect the pooling of coal shipped to Tidewater was a purely voluntary one made for the purpose of handling bunker coal and foreign shipments with co-operation and efficiency. This first effort of the war period was later put into more general effect because of the interest of the Fuel Administration in these matters and particularly by reason of the large increase in the rates for coal-car demurrage established during the war when the car shortage was most acute. About a year ago the war-time form of this activity was modified somewhat, and membership became voluntary, but the railroads still continue to take the larger part in the support and operations of the Tidewater Coal Exchange.

Altogether, five distinct groups of interests have concerned themselves with pooling problems. The large producers of coal together with such of the smaller producers as maintain their own sales organizations can be considered a group separate from those smaller operators who handle most of their shipments through jobbers. A third group is made up of jobbers and wholesalers. Their trade is largely based upon purchases from the smaller producers or from those who do not attempt to maintain sales organizations.

All the railroads handling the Tidewater coal are, of course, actively concerned and they form the fourth major interest affected. The fifth group consists of the purchasers and users of Tidewater coal; this group includes the shipping interests doing coastwise and export business, users of coal in New England and other territory supplied by coastwise trade, and foreign purchasers of United States fuel.

In this classification the Tidewater Coal Exchange itself has not been considered, for it represents merely an agency by which these various interests have coöperated and it is not in itself distinct from them.

In general it can be said that everyone, at least in theory, favors some system of pooling: but with this agreement as to the theoretical advantage, any harmony in ideas as to what should be done ceases and we find many diversified and conflicting opinions. The small producers, the wholesalers, and the railroads in general, favor the pooling of coal. As a rule, however, the large producers and many of the users do not seem to be in favor of it. It is worth while to analyze carefully the reasons given on both sides of this argument.

For Pooling—Why the Railroads Favor It

1. **Less car switching.**
2. **Less car delay at pools.**
3. **More working time and larger earnings per car.**
4. **Larger coal-handling capacity with present trackage, docks, and motive power at tidewater.**

What the Wholesaler Gains

1. **Reduced car demurrage.**
2. **Reduced boat demurrage.**
3. **Greater opportunity to enter export trade.**
4. **Increased chance to speculate in tidewater coal without large risk for investment.**

The railroads handling large quantities of coal to Tidewater have, in a number of instances, strongly favored pooling. It accomplishes many savings to them by reducing the amount of switching at Tidewater, by reducing the car delay at the pool, and by enabling them to handle larger coal shipments with a given amount of track, dock and motive power.

It is obvious that if a railroad has a dozen shippers supplying altogether twenty or thirty kinds of coal it must sort out this coal not only to separate the different sizes and grades, but also to divide it according to ownership. A much larger amount of work is thus required in switching at Tidewater, than if all the coal of any one size and quality could be put together without regard to rights of possession.

With pooling all who have credits in a given kind of coal could draw upon the stock regardless of whether it is their own shipment or that of someone else. This advantage is the same as that exercised by the banker who enters deposits to the credit of the individual who makes them, but, of course, makes no effort to retain the particular coin or currency deposited by that individual for the payment of his checks when presented.

The fact that all shippers of any particular class of coal draw upon the common stock of this class for loading a vessel which they contract to supply gives large flexibility in operation and greatly reduces the car delays at the Tidewater yards, thus the railroad is relieved of much of the burden of demurrage and delay and thus has its cars available for useful transportation work. The income per car in any given length of time is, of course, thereby correspondingly increased.

Attendant upon the lesser switching and reduced complication at the seaboard coal yards is, of course, the great advantage to the railroad that the given trackage, dock, and motive-power capacity can be used much more efficiently. Thus the income-producing power of this investment also is greatly augmented.

In view of these important advantages it is not strange that a number of the railroads have strongly favored the pooling system and can be expected to urge its continuance in some suitable form for the future. However, certain of the roads whose coal patronage lies principally among the larger producers are reputed not to favor this policy simply because their patrons do not favor it. In fact, it offers no particular advantage to them since the coal operators on their lines are each alone able to accomplish most of the advantages of pooling without certain complications which any such co-operative effort involves. Although, of course, in any group one would not expect to find opinion entirely unanimous, the sentiment among the wholesalers seems strongly in favor of some form of coal pooling at the seaboard. With pools in operation, the wholesaler finds several large advantages. 1. He can store coal through his credits in the pool without incurring large charges for car demurrage. 2. He can by careful planning escape boat demurrages that would otherwise be incurred while assembling a sufficient quantity of coal to make up his cargo. 3. He can use the pool as a means for entering export trade, from which he might otherwise be cut off entirely because of the larger risk and frequently higher cost, when demurrage on cars and boats enters as a large factor. And lastly, a point which is of especial interest to the small jobber, he can enter in this export coal trade in a speculative manner without requiring any large investment.

Against Pooling—Difficulties Suggested by Large Producers and Users

1. Quality of the better coals suffer.
2. No reliable system of classification is available.
3. Adequate control of quality is impracticable.
4. A coal loses its identity in the pool.
5. Valuable trade name and reputation is lost.
6. Wholesalers and small producers are too active in export trade, to the detriment of all interests.
7. Pool makes export trade too largely speculative.
8. Permanence of export trade is endangered.
9. Pool is entering wedge for Federal activity and control of the coal business.

This opportunity to enter the speculative export trade as it may be termed, is one that has particularly attracted a certain class of jobbers, who are characterized by some as "maintaining their office under their own hat." Such a one can arrange to ship coal to the pool without danger of incurring charges for car delay and can hold it there from periods favorable to purchase to later periods particularly advantageous for sale, with the added opportunity of slightly overdrawing his coal account in the pool, or perhaps more frequently making quick purchases through the pool, in case he finds a particularly attractive market. Such a one naturally favors this co-operative scheme. On the other hand, these very advantages to a certain class of jobber afford the basis of complaint which is mentioned below.

SMALL OPERATORS' PROBLEM

As a group the small operators do not hold a single opinion. Some favor the pool, others oppose it. Those who would like to see it continued, favor it because of the same factors as influence the wholesaler or jobber in his approval. It affords, especially, to the small operator, an opportunity to enter the export trade and sell at prices which at present compare very favorably with those prevailing in domestic business. He is able to do this through the jobber or even working directly through the pool, whereas he could not possibly "go it alone" in this field.

To this type of operator there is the great advantage of stabilized prices which he can get for dock deliveries and the assurance that he cannot be squeezed by the wholesaler at a time of little demand for coal at this point. This latter fact is particularly true as it affects the car-demurrage charges, which he would otherwise incur if he held his shipments until the time when he could secure a more favorable price. He could not afford to do this if working absolutely alone, but through the pool he is often able to avoid the necessity of disposing of his shipments at the unduly low prices caused by temporary lack of demand.

Just at the present time, with almost famine conditions in the coal trade abroad, practically any means for handling coal overseas is accepted without much question as to the quality of the product which will be made available. However, this condition will not continue and the discriminating purchaser is expected to dominate the market again.

When this time comes, the benefit of the good name of men who have operated conservatively will be of large advantage in the market of export and bunker fuel. The small producer realizing this is anxious to have his coal associated by classification with the product from the mines of good name and large reputation. This is a laudable ambition, of course, but at once it is seen that there are two sides to the question. And right here is where the difference of opinion between large and small producers enters.

So far I have discussed the favorable aspects of pooling as they are seen by many of the small operators. But, there are certain members of this group that find apparently good ground for opposition to any system of classification and co-operation such as has been worked through the coal exchange. Certain cases of complaint have arisen on the ground of discrimination in the allocation of the coal to various pools. Especially this has been a matter of complaint where the coal has been assigned to pools commanding a lower price than others in which the producer thought or claimed his coal belonged.

If by any reason the output of a certain mine be in pool X, which for sake of argument let us assume commands 25c. per ton less than pool Y, then the producer of this coal is at once confronted by the fact that his output everywhere in the market is likely to be regarded as at least 25c. less valuable than the coals which are classed in the other pool. For certain uses this differential of 25c. may be entirely fair, but with other equipment or for other uses it may be that the coal of pool X is substantially if not quite as valuable as that in Y. However, it is extremely difficult for the producer of the coal assigned to the pool of lower price to convince a purchaser of this fact.

Of course, it is not essential to assume for the future any more than in the past that a particular price differential need be maintained between the several pools, as for example X and Y above assumed. But the very fact that there is some classification setting a distinction between the product of different mines is a point that troubles many of the small operators and incidentally perhaps some of the larger ones, too. In any event, this appears to be a ground for decided opposition on the part of many coal producers. In general the large producer does not desire a continuance of the pooling system. In such a program his coal loses its identity; in other words, he cannot sell effectively under his own trade name. This represents a genuine loss to him, for the "good-will" involved in his trade name is worth much to him. In fact, it actually represents a large financial investment which he made while he was building up his reputation and record for quality.

IF BANKING WERE DONE THUS WHERE WOULD MORGAN BE?

The "advantage" of coal pooling "is the same as that exercised by the banker who enters deposits to the credit of the individual who makes them, but, of course, makes no effort to return the particular coin or currency deposited by that individual for the payment of his checks when presented."

In the second place, the producer of high-quality coal is likely to suffer for the sins of others when his coal enters a pool to which other producers are also admitted. The basis of the assignment to this pool is, theoretically, that all are of the same quality; but there is no definite standard for judgment nor accurate system of control. Hence, inevitably producers of better-quality material have lost somewhat.

This loss in reputation and the actual depreciation in quality are two factors which strike fear into the heart of any operator who looks forward to permanency of foreign coal trade. The reputation of American coals can be made and maintained on the highest plane, but unless the quality is carefully guarded (and under pooling this seems to be an almost impossible task), the large producer justifiably fears that our reputation will become even worse than it now is in certain quarters.

The large operator by his very bigness is at an advantage in export operations, but when a pooling system is established he is at that moment confronted with a large number of jobbers and small operators who through the pool can enter actively and more or less effectively into competition with him for this foreign trade. Moreover, with these interests in the field, the speculative element and the uncertainty of operations increases quite to the disadvantage of the larger interests.

Then, too, the very fact that any such co-operative effort as this involves national effort or perhaps Federal co-operation is a ground for fear in the mind of some persons. Anything which savors of Federal activity is unwelcome; in fact, it is almost terrifying just now. Federal ownership and Federal control are in the minds of many only the extreme forms of this sort of activity and anything which seems like federalized effort is, therefore, taboo.

INTERESTS OF PURCHASERS ARE DIVIDED

The purchasers are divided in their interest. As a means of getting prompt delivery and to some extent of eliminating variable prices as a factor in seaboard-coal deliveries, pooling of coal is favored. On the other hand, the discriminating purchasers who realize the great advantage of certainty in quality and characteristics do not wish to deal with any system from which they cannot get sufficient guarantees as to the quality of the coal which they are purchasing! Where a man has been dealing with a large producer and has obtained good results from the coal and a square deal as to prices and deliveries, he certainly does not wish this satisfactory arrangement to be interrupted by any scheme which places him at the mercy of a dozen or more producers with whom he is not acquainted and whose responsibility he, to say the least, questions. On the other hand, there is the speculative element among the purchasers which favors the pooling system for the same reason that speculative jobbers desire it. This group, however, seems to be in the minority.

So long as visual inspection is the only system of coal-quality control, it is doubtful whether it is really practicable to classify coal deliveries at seaboard accurately enough to fully eliminate the serious consequences brought out above. Up to the present time, the means by which the product of certain mines was assigned to certain pools has not been all that everyone could wish.

All sorts of charges of favoritism and discrimination have been made; but without entering into this question at all, it is evident that a system based on such limited knowledge of coal quality as is generally available will not be adequate to care for the problem when hundreds of shippers are all desirous of securing the best possible assignment for their output.

There is no question that there has been some justification for the charges that the quality of coal delivered has not been what it ought to have been. On the other hand, certain gross exaggerations of "poor quality" have been made. Those who argue that this system of pooling can be made entirely successful find support for their argument in the system whereby our naval authorities select "navy" coal.

However, it should be recognized that no such care has been exercised, in fact no time was available for the exercise of such care in the assigning coal to the pools whereas there has always been due care used in selecting coal for the navy. If the same skill and care had been shown, there probably would have been little ground for the objection made on the score of the variability in quality, which thus far has been, at least to some extent, justified.

In any consideration of the quality of coal which is delivered through a pool, one should not forget that there is something of like character in any event, that is the borrowing of coal in order to make up cargoes and fill contracts. However, this practice affects only a small percentage of the coal handled and practically concerns only the man or men who practice this borrowing; hence a purchaser has a direct "come-back" on the man who, because of this practice, delivers a different quality from that he has contracted to supply. Thus borrowing affects quality much less than pooling and the practice of borrowing poor coal to fill a cargo is much easier to control. How to classify coal is much too large a problem to discuss here. It is only neessary to point out that no single characteristic is at all adequate as a basis of classification.

PLAN OF THE WHOLESALERS

A large number of wholesale and jobbing interests are considering a reorganization of the coal exchange in the near future and it is their hope that they will be able to continue this work and realize for their department of the coal business the large advantages which have been pointed out above.

It is possible that a pool continued in this way may be of considerable profit to this group of interests and if they are successful in planning their system of classification the opportunity for a limited success may be considerable. It is doubtful, however, whether support will be given by the larger producing interests and under these circumstances it is sure that no pool of all embracing magnitude is to be expected.

WHAT SHALL WE DO?

There is no doubt, as stated at the outset, that the theoretical arguments in favor of pooling are great; and moreover, there are certain large practical advantages to many interests. However, the principle of sound merchandising recognizes that quality and service must go with the right price to make up satisfactory permanent trade relations.

At the present time, the practical difficulties of securing assured good quality and of controlling this quality at all times for all deliveries seem unsurmountable. It does not seem, therefore, to be a prophecy but rather a bare statement of existing fact, that we cannot expect coal pooling to continue to be a success with the present means adopted for the classification and the control of quality, except perhaps in the service of small parts of the coal trade operating as the jobbing interests propose to do.

Conference Seeks To Cure All Mine Ills—II

McAuliffe Advocates That the Seasonal Differential Be 30 Per Cent—Rice Presents Advantages of a Coal Syndicate—Saint Declares That Export Business, If Not Conducted with Caution, May Be Forbidden

BY R. DAWSON HALL

IN THE animated discussion that followed his paper on "Stabilizing the Market" read before the American Institute of Mining and Metallurgical Engineers on Wednesday, Feb. 18, Eugene McAuliffe, general manager of the Kathleen Colliery, declared that he had proposed an increase in the winter freight rate of 15 per cent and a reduction in the summer freight rate of 15 per cent, the period of the lower rate being from March 1 to Aug. 31. In comment it might be permissible to say that a variation of any given percentage would put certain sections out of certain markets in the winter and into certain markets in the summer. A reduction of 15 per cent in the summer would make it advantageous in some sections to buy West Virginia as against Illinois coals, whereas an increase of 15 per cent in the winter would give Illinois coals the advantage. In certain parts of the country this would not occur, but in some a flat difference in rates would be fairer than a percentage. The rates being uniform over six months would tend to lump buying at the end of the summer period. The anthracite rule of monthly variations seems preferable to that which Mr. McAuliffe has proposed.

The article by Edwin Ludlow, on "Conservation," followed, and it created much interest. In reference to what Mr. Ludlow said relative to the waste of coal, especially in Indian territory on leases under control of the United States Government, where the property was owned by the Indian tribes, George S. Rice declared that the Bureau of Mines had nothing to do with the writing of these leases, and, therefore, could not be blamed for what coal was wasted, the leasing being done before the Bureau was established. In justice to Mr. Ludlow it may be said that he did not charge the matter to the Bureau and the statement of Mr. Rice was solely to correct a possible misapprehension.

In the Alaska bill, which is now under consideration, the engineering provisions by which it is hoped to conserve the fuel of Alaska from wasteful exploitation had not been seriously objected to by those capitalists who are disposed to put their money into the development of the coal lands of that territory. The objections which have been made by would-be leasers have reference to matters not related to engineering.

Mr. Rice declared himself unfavorable to Government ownership, and said that in the Saar region of Germany, where 17,000,000 tons of coal are produced per year, 12,000,000 tons are produced by the state. He noted twelve shafts in a certain section of the Saar region which had been put down by the Prussian government and which produced an aggregate tonnage of 1,400 tons a day. The output of coal in these mines averaged 0.4

tons per man per shift. There seemed to be a delight in these mines to create elaborate engineering feats, regardless of whether the investment of capital was profitable or not.

WOULD IMITATE GERMANY'S SYNDICATE SYSTEM

Mr. Rich advocated that as there were too many mines, a body like the Interstate Commerce Commission should be given the power to regulate the opening of new mines so as to prevent a development in excess of needs. In fact, Mr. Rice believes that it would be well if the United States imitated the syndicate system of Germany, the prices of coal being regulated by a commission so as to keep them within reason. He made the statement that the coal companies made money under the Fuel Administration, and that it was quite likely that a commission by the government for the continuous regulation of prices would be disposed to deal fairly with the coal operators.

Hugh Archbald spoke a few words relative to the matter of efficiency in the mines and urged that no success would be attained in this direction until mine foremen were given more assistance, for as it is now it was impossible for them to keep proper watch of the operation of the daymen and so regulate matters that a steady flow of cars would be afforded the miner. With the uncertain delivery of mine cars it was impossible for a miner to put out a maximum tonnage.

Mention has been made already of the remarks of Charles S. Allen relative to the honorable character and importance of the jobbing fraternity, in which statement he was amply justified, though he unfortunately overlooked the existence of a number of people who were coal jobbers only for a time and preyed on other industries when the coal business was less brisk and profits less promising. No one is more troubled by these temporary interlopers than is the all-the-year-round jobber. He said that a discussion had been taken up with the various chambers of commerce relative to differential freights between summer and winter and had found that these chambers had been favorable to such a variation.

NEW YORK WHOLESALERS ASK FOR DIFFERENTIAL

He said that the New York Wholesale Coal Trade Association had directed him to bring a formal complaint before the Interstate Commerce Commission against the coal-carrying roads in the Eastern section of the country. Later it may be well to add other roads to those against whom complaint is being made. There was a general disposition to take up this matter with the roads on a voluntary basis, because there was no feeling of hostility toward them, and there was every desire to exhibit to them that the action was merely one of co-operation. However, it was thought that any action which had to be obtained voluntarily might take several years, and the Wholesale Coal Association wishing immediate action took these means to secure it.

H. Y. Saint, of the Shipping Board, then remarked that it would be necessary to fit our export trade into the domestic. The conservationists in America were quite strongly opposed in many cases to the export of coal, desiring it to be used entirely by the nation for its own development. There is a prospect that the export of coal may be forbidden, and it is likely, at least, that it will be regulated by Government enactment.

Consequently, it will be necessary for those who are engaged in the export business to go cautiously about their work for fear that they do not in their zeal and anxiety to increase their operations, embarrass the home market. At present the export trade is being done mostly in two or three fields, and that being the case, the large demand from abroad would make it impossible to secure that class of fuel for our domestic trade unless the consumers in this country are willing to pay the high prices which are often charged in the foreign trade.

Should the domestic corporations find they could not get coal from the fields where they had been buying it, or could obtain it only at unreasonable cost, as it might seem to them, they would be apt to call upon the public to put an end to the foreign trade which created their embarrassment. A very little buying will disturb the balance of a trade and cause prices to soar beyond all reason. This is particularly the case when purchases have been confined to a certain field and not spread over a sufficiently large coal-producing area.

MORE SHIPS NOT NEEDED SO MUCH AS NEW PORTS

In order to prevent our foreign trade from having this disastrous effect it will be necessary to increase the port facilities, both as to their size and location. It will be necessary also to rearrange railroad freight schedules so as to make a shift possible to some ports which are not now being used. In this way it may be hoped that large enough areas of the country may be developed for export trade so that it will not interfere with the regular conduct of the nation's business.

When Mr. Saint was asked how much coal could be dumped for off-shore business per month, he stated that some declared that 1½ million tons was the limit, and others even estimated that 2 million tons could be dumped. Asked whether this off-shore business included that of New England, he said he only referred to foreign trade. He thought that one million tons could assuredly be taken care of, but he questioned somewhat whether the estimates he had just quoted were within the mark. Under the "Permit System" 500,000 tons were shipped in January.

There are many people who are talking about the United States shipping from 30 to 40 million tons a year. Such an output is impossible with the present facilities. Mr. Saint said that one item in stabilization had been overlooked, and that was, that the provisions for bunkering foreign vessels furnished a storage capacity which assisted in keeping mines continuously in operation.

Mr. Ludlow, before adjournment, proposed that a committee be appointed by H. C. Hoover to investigate the present coal situation; that committee to consist of the Coal and Coke Committee of the Institute wih 15 other members, including coal operators, mine workers, the Government and the public. With the passage of this resolution the meeting adjourned.

The freight rates to northern European ports, he said, now ran at $22.50 a ton, whereas the freight rate to Mediterranean ports was $26.50. There is practically no return cargo, and that is what is making the shipment of coal so expensive. He said that the rates for the first ten days in January from Baltimore and Hampton Roads were within $1 of the Shipping Board rates. These rates were not excessive because it was necessary under present conditions to use boats that were not really suited to the work.

New Tidewater Pooling Associaton Formed

Tidewater Transshippers Association will Replace Tidewater Coal Exchange —Tonnage of New Association Already 5,000,000 and Will Probably Reach Twice That Figure

A MEETING was held at the Whitehall Club, Tuesday, Feb. 17, at 3 p. m. at which was formed the Tidewater Transshippers Association. C. Andrade, Jr., Esq., president of The Wholesale Coal Trade Association of New York, Inc., in the absence of Charles A. Owen, chairman of the Organization Committee, presided at the meeting.

The chairman stated that the purpose of the meeting was to adopt the plan for the formation of the Tidewater Transshippers Association and to approve the proposed by-laws and rules to govern the conduct of the same. Upon a request from the Chair for criticism of, or suggestions for changes in, the plans and rules proposed, Major Coyle, of Weston, Dodson & Co., suggested certain changes. Mr. Baker, the counsel for the association, explained the legal reasons for not adopting one of the suggestions made and as the remainder were matters having to do with the administrative functions of the Board of Directors, they were referred to that body for consideration.

Realizing that pooling of coal makes for economy, the Tidewater Transshippers' Association is formed. It will make a new classification of mines for pooling purposes. Steam coals will be classified under volatile matter, ash and sulphur, and gas coal under these headings, and on the gas yield and the illuminating power of the gas formed. Analysis of coal in the seam will not be made.

Large Number of Responsible Firms Present

The following members of the trade were present and represented:

Alden Coal Mining Co., Austen Coal and Coke Co., Bertha Coal Co., Big Bend Coal Mining Co., W. H. Bradford & Co., Clark Brothers Coal Mining Co., Coale & Co., Emerson & Morgan Coal Mining Corporation, Emmons Coal Mining Co., Eyre Fuel Co., Ft. Dearborn Coal & Export Co., Garfield & Proctor Coal Co., Gorman-Leonard Coal Co., Gauley Coal Mining Co., Hall Bros. & Co., Imperial Coal Corporation, Industrial Coal & Coke Corporation, Johnstown Coal and Coke Co., The Arch. McNeil & Sons Co., W. A. Marshall & Co., Matlack Coal & Iron Corporation, B. Nicoll & Co., E. Russell Norton, Pan Handle Coal Co., Punxsutawney Coal Mining Co., Pilling & Crane, Producers Fuel Co., Quemahoning Creek Coal Co., Thorne, Neale & Co., E. A. Ward & Co., J. S. Wentz & Co., Weston Dodson & Co., Shawnee Fuel Co., Wm. Cory-Mann George Corporation, Borden & Lovell, Williams Run Coal Co., Clearfield County Coal Co., Virginia Smokeless Coal Co., Wright-Gibson Co.

Mr. Thompson, of the Imperial Coal Corporation, raised the question of the desirability of continuing the name "The Tidewater Coal Exchange." The reason for adopting the new name was explained; first that it was more descriptive of the actual functions of the association, and second, that there would unquestionably be an overlapping of arrival of shipments at tidewater after the date of the official discontinuance of the old organization and the beginning of the new and if the old name were retained, would result in great confusion in the handling of the business of the new organization and might result in so handicapping it at the outset as to reflect seriously upon its future usefulness.

Mr. Thompson also proposed a form of boat bill of lading which should contain information of the pool numbers, etc., for the cargo. This was referred to the Board of Directors with a recommendation from the meeting for favorable consideration.

Mr. Marshall, of W. A. Marshall & Co., then presented a tentative set of principles for the classification of coal and basis for inspection, as follows:

First. The basis of classification shall be that set forth in Rule 6 of the rules of the Association:

Classification 6. All bituminous coal for transshipment at tidewater ports shall be graded and classified in designated pools by a Classified Committee appointed by and under the direction of the Executive Committee.

"The principles of classification shall be just, uniform and nondiscriminatory and it is to be the purpose to improve the classification of coals at all times, and matters of dissatisfaction with classification may be appealed, as provided for in the resolution of the Board of Directors appointing the Executive Committee, dated February*, 1920."

Second. Protection as to quality shall be that provided for in Rules 7 and 8 of the rules of the association:

"*Inspection*—7. The Commissioner and Deputy Commissioners shall at all times protect the quality of coal shipped to the association, through a system of inspection, and analysis, if necessary in their opinion, and they may at any time suspend shipments into any pool when, in their judgment, the quality or preparation of such coal is below the proper standard. Appeal from such action shall take the same course as in the matter of classification."

"*Rejections*—8. Cars containing coal which are, by the inspectors of the Association, rejected from any particular pool, shall be designated as "unclassified" and, upon notice mailed to the registered address of the member, shall be eliminated from the records of the Association. Responsibility for disposition of such coal shall revert, with all charges, from the day following date notice is so mailed, to the member for whose account the cars were shipped."

Third. Classification shall be made upon the basis of analysis for volatile, ash and sulphur, as to steam coals; volatile, ash and sulphur, yield of gas per pound and illuminating power, for gas coals, with such variations as shall be determined by the executive committee upon recommendations to it by the Classification Committee, such variations to be governed by such change in conditions as may arise from time to time making a change important or necessary.

Fourth. A preliminary classification shall be given a mine by the Classification Committee, following application, as provided in Rule 12 of the rules of the Association, based upon such general knowledge as

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Meeting not held before going to press

may be had or can be made available on short notice. As soon thereafter as possible there shall be taken at least three samples of the coal, as commercially shipped from said mine, by a duly accredited inspector of the association, same to be taken in accordance with the principle set forth in "Bulletin 4" by E. G. Baily of Boston, Mass., entitled "How To Sample Coal and Coke."

"*Application for Classification*—12. The shipper of any coal not so classified may make application on forms Nos. 24 and 25, when prompt investigation will be made and the mine added to the classification by supplement and orders issued to allow the coal to go forward."

Fifth. The sample so taken shall be analyzed by a duly acceptable chemist to the association, in accordance with the principles of analysis set forth in Technical Paper 76 of the Bureau of Mines, entitled "Notes on the Sampling and Analysis of Coal."

MINE SHALL BE RATED FROM THREE ANALYSES

Sixth. The average analysis of the said three samples shall establish the basis for an adjustment in the classification of the said mine, and the preliminary classification shall, if necessary, be changed in accordance with the said finding.

Seventh. Further samples from said mine may be taken and analyzed, from time to time, either at the request of the operator or at the option of the Association, in the manner provided for above and the average of all analyses of the coal from said mine, taken officially by the Association, as heretofore provided, shall be used as the basis for correction, from time to time, of the classification, except that in the event that the coal shall show a marked change in quality from its previous standard special consideration will be given to such a mine by the classification committee and, after a thorough investigation, the Classification Committee shall have the right to immediately correct the classification of such coal.

SEAM ANALYSES ARE TO BE BANNED HEREAFTER

Eighth. Samples shall only be taken for the purpose of classification by an inspector who has been duly authorized by the Classification Committee and who shall have shown ability to sample satisfactorily in accordance with the principles set forth in Bulletin 4, by E. G. Baily, entitled, "How to Sample Coal and Coke." Sampling shall be restricted to the following: (a) Coal from any storage. (b) Coal fom cargo. (c) Coal from railroad cars. (d) Coal from mine cars. (e) From chute of tipple or from conveyors at any point. Seam sections will not be used for the basis of ultimate classification.

Ninth. Samples shall only be analyzed for the purpose of classification by chemists having the authority of the Classification Committee and who shall have shown ability to check within — per cent † in this work with a board of acceptable chemists, selected by the Classification Committee, who shall adopt rules conforming to the foregoing, to be followed for the purpose of creating uniform practice in order to gain uniform results in accordance with the aforementioned Technical Paper 76 of the Bureau of Mines, entitled "Notes on the Sampling and Analysis of Coal."

Upon motion, duly seconded, the foregoing tentative principles were adopted, only one vote in the negative being recorded.

Thereupon the Chair asked for an expression on the proposition of whether those present would become members of the Tidewater Transshippers Association, in accordance with the plans and rules submitted, and the following indicated their intention to become members and authorized the statement of tonnage to be annually shipped through the Association as set opposite their names:

PARTICIPANTS AND THEIR SHIPPING CAPACITY

Shipper	Thousands of Tons Shipped
Dexter & Carpenter	1,000
Coale & Co	750
C. W. Hendley & Co	750
Chawnee Fuel Co	400
Bertha Coal Co	300
William Cory-Mann George Corporation	300
Matlack Coal & Iron Corporation	300
Weston Dodson & Co	300
W. A. Marshall & Co	250
Alden Coal Mining Co	200
A. W. Hillebrand Co	200
Anita Coal Mining Co. Punxsutawney Coal Mining Co. Williams Run Coal Co	150
Gauley Coal Mining Co	100
Clearfield County Coal Co	100
Emerson & Morgan Coal Mining Co.	100
Hall Bros. & Co.	90
Imperial Coal Corporation	50
	5,340

This does not cover all who were present because some who attended were not prepared to pledge their companies.

The following indicated the intention to become members but were not able to give tonnage figures:

Borden & Lovell, Wentz Co., Lewis Fuel Co., Inland Coal Co., Keystone Coal & Coke Co., Latrobe-Connellsville Coal & Coke Co., Mountain Coal Co., Argyle Coal Co., E. Russell Norton, Gorman-Leonard Coal Co., Garfield & Proctor Coal Co.

The total tonnage indicated at the meeting was 2,200,000 tons, and upon this basis, with the statement from Mr. Kirchner, of Hall Bros. & Co., of Baltimore, that many of the Baltimore transshippers would become members, and also upon the assurance of Mr. James, of the Pan Handle Coal Co., of Norfolk, Va., that the shippers at that port would probably desire to join the plan, upon motion, duly seconded, the Organization Committee was authorized to proceed with the plan and to perfect the organization and make it ready for business at the earliest possible moment. There being no further business before the meeting, it was adjourned, subject to the call of the Chair.

DEPOSIT OF $300 OR OVER FROM EACH MEMBER

Members will be required to pay on demand the actual cost of conducting the affairs of the association at each port on the basis of the tonnage shipped, that figure to be determined monthly and to be assessed by the Executive Committee, the dues including, however, a sufficient sum to meet the general overhead expenses of the association computed in like manner.

An initial deposit must be made pending the assessment and collection of dues, as above provided. It will not be regarded as dues but as working capital, the deposit being 1½c. per net ton on all tonnage handled by the member at Tidewater ports during 1919. The deposit shall not be less than $300, and shall be subject to revision Jan. 1 and July 1 of each year based on the member's shipments in the preceeding 12 months or at more frequent intervals as the Executive Committee shall provide.

The deposit will be returned on withdrawal from the association. Members must file a satisfactory bond or undertaking with the association to guarantee the credits extended from time to time and conditioned also on the handling of the coal by the member in conformity with rules and regulations of the administration.

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†Percentage not yet determined.

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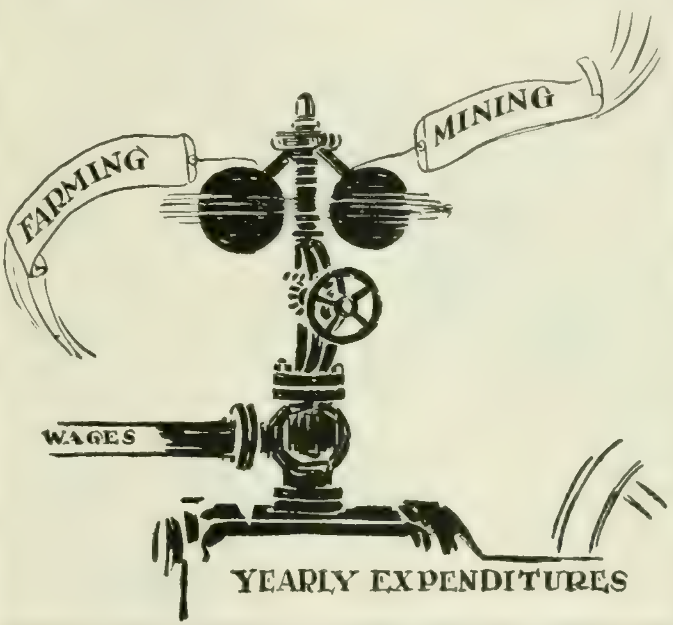
Mining Fatality Roll

DOUBTLESS the fatality roll in the mines is long enough and sad enough to fill us with self-searching regrets, but after all the United States reports of mortality from all causes make us realize why mine workers take the deaths from mine accidents with a large degree of resignation.

In 1918 the number of deaths per thousand in the United States as just published was 18.0, while the number of fatal accidents in the mines was 3.39 per thousand. Thus the general mortality is 5.31 times as great as the fatality risk in the mines. As there are probably five persons to every mine worker in every mining town the loss per inhabitant is only one-fifth as large, and there are probably twenty-five funerals due to natural causes to one due to a mine accident, even in towns that have absolutely no business but that of mining. In 1918, 1.523 persons died from organic diseases of the heart per thousand of population and 1.491 from tuberculosis. Hence the number per thousand of population who die from heart diseases and tuberculosis combined is about the same as the number per thousand of the mine workers who die from accident. No one wishes to do anything to hamper the steady development of the safety movement and certainly no one would regard with indifference the passing of such legislation as will make mines safer, but it is a mistake to regard the mining hazard which the mine worker alone faces as far overshadowing the health hazards to which everyone is exposed.

One Seasonal Occupation Assists the Other



MINING AND FARMING IN MANY SECTIONS OPEN THE VALVE FOR THE FLOW OF MONEY TO THE MINE WORKER'S PURSE

What Other Earnings Do Miners Make?

MUCH HAS been made by the miners appearing before the Federal Coal Commission of the fact that the mine workers were not able last year to secure employment more than 150, 200 or 225 days per year, the number of days varying in different districts. Naturally one does not expect the earnings of a man who is employed only 150 days a year to be as great as one who works 300 days. But it seems that those appearing before the Commission have altogether neglected to take into account the additional amount which these workers can secure from other employment and duties, when not engaged in the mine.

Providence certainly must have considered the welfare of the miner when it arranged that those fields where mining is practically the only occupation available to a man would be those from which the coal is mined during a large proportion of the total working year. On the other hand in the Middle West where certain coals are of a nature to prevent mining and storage during slack seasons, because of the likelihood of spontaneous combustion or of other deterioration of the coal, the miner, in agricultural districts, finds in slack mining seasons, opportunity all about him for employment at seeding and cultivating the arable land and harvesting therefrom the annual crop. *Coal Age* does not understand why these points appear to have been altogether ignored by the operators in their arguments before the Commission. *Coal Age* does not hesitate to declare its policy that every honest worker who is willing to labor diligently when opportunity is afforded him can and therefore should be given a generous wage. The product of the country will afford more than a bare existence and hence "the bread of carefulness" is not enough. However, in determining what this wage shall be, the employer should take into account the total earning power of the man throughout an entire year and cannot be expected to provide for 12 months living on six months working, when the other half of the time can well be employed in other work readily available to the miner if he will accept it. We must insist, therefore, that it is the total earning capacity of the mine workers that should be taken into account in determining whether working conditions and wage afford a reasonable opportunity to the men employed in the bituminous coal mines.

Co-operative Service

THIS IS a day of co-operation—big things that cannot be done by one man or one company alone can be accomplished through united effort. Moreover, it is a day of service. More and more we are coming to a realization that for permanent success the sale of commodities must be made on the basis of genuine service to the purchaser. All of which leads us to ask why not combine these two ideas into one—co-operative service?

A splendid opportunity to accomplish this is just now available to the coal men of the country. Definite means are also at hand. The way to put this thought into operation at once is by placing a service engineer on the staff of one of the larger coal dealers' associations. Such a man would be made available to the member companies, and he could assist them in solving their own and their customers' problems.

The American Gas Association has followed such a plan as this most successfully. Its scheme provides for an engineer of large experience and ability who, on request, goes about the country to aid the various local gas companies in handling the large or particularly difficult special problems that are involved in the utilization of gas. This engineer also makes general surveys of local conditions in order to develop industrial gas-fuel prospects. The gas company desiring the services of this engineer pays the association for his time and expenses, and the engineer is paid by the association on a straight salary basis. Thus the cost is distributed among those companies which get the benefits and no one is taxed beyond his own desires. Best of all this plan makes available a higher-grade man than any of the separate companies alone could afford to hire, and, at the same time, when he is not engaged in outside work the engineer can give the association valuable assistance in solving its problems at an annual cost that is almost nominal.

A Good Motto for the Miner

BUT PUT THE OTHER MOTTO IN THE HOME OF EVERY COAL CONSUMER

In the coal trade today the idea is becoming more and more prevalent that the coal dealer, whether the sales department of a mining company or a jobber or a wholesaler, must assist the user of the coal in the adoption of efficient methods. This policy will form a basis for secure and happy business relationships with the large users of coal; and the policy of co-operating in such a plan certainly gives great promise of success.

To teach a user of coal how to make two tons do the work of three, or even four, may seem a shortsighted sales policy, as it will reduce the tonnage which can be delivered to that fuel purchaser. However, if the user is not thus assisted by the dealer, someone else will supply the help or he himself will provide it; and even looking at the matter from a purely selfish point of view one should recognize that the man who does the teaching is the one who is going to get that user's future business.

The large service to the public involved in the teaching of fuel efficiency should not be overlooked. Anything which develops more economical utilization of our fuel supplies contributes to the general good of the country. Everyone gets the benefit of this. But those will profit first who are most intimately associated with that part of the industry which does the good work.

Coal Age proposes and would urge this plan. It is an innovation in the coal business, but has been proved to be a policy of great advantage in other fields. Coal is a public necessity and one ever being more regarded as a public utility, and for this reason the coal industry must endeavor to advance in public service.

Storm Prices for Retailed Coal

Too often is it customary for the retailer to put five horses on a wagon or have his motor truck stalled for several hours in a snowdrift or in a street jam and pocket the loss that such conditions make necessary, hoping that he will be able to make good that deficit by charging more than a fair price to the customer who buys early and so gives him less trouble.

That customer who provides storage facilities at much cost is well worthy of more kindly consideration. Great is the need to make the man whose motto is always "Better late than never" change it to "Better never late." Coddling the indifferent makes the careless survive in place of the fittest. So often have we taken care of the laggard that he tends to remain doless and self-indulgent. He believes that civilization should be organized to take care of him.

The retailers have made up their minds to require henceforth that the high cost of storms be paid by those who will not provide for coal delivery before the wind begins to whistle and the snow to drift. The cost of this year's snow to the retail coal merchants of Manhattan and the Bronx is said to have been no less than a quarter of a million dollars. On their stationery will hereafter appear a statement that the customer will have to pay more for coal delivered during a snow storm, a storm signal that the buying public will do well to heed.

Recent experience has shown that it is rarely safe to relieve the public of the consequences of its acts or failures to act. If what is wanted can be obtained without provision, why provide? If errors committed can be escaped, why avoid errors? If follies are forgotten and forgiven, why be wise? If prudent foresight does not bring a reward, why be prudent? If an expenditure for the public is money out of pocket, why not keep the money? We have not arrived at such a degree of social excellence that we can henceforth avoid the necessity of providing rewards to the good and of allowing well-merited misfortunes to fall on the indifferent.

DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

Shifting the Worker

Letter No. 1—I have been reading with much interest the experience described in the inquiry of "A. H." entitled "Shifting the Worker," *Coal Age*, Feb. 12, p. 327, and it strikes me that there may be two sides to this question. In the first place, the fact that the electrician offered our friend a change from the substation to the bonding gang would indicate that the mine was not under one head; or, if it was, the superintendent was not IT.

From the tone of the letter, it would seem to me that the superintendent had charge of the substation and its attendant, while the electrician was in charge of the bonding gang. If that was the case perhaps it was not the first time the superintendent had been up against this same proposition. If it was not the case, I think the electrician was very much out of order in offering the man at the substation a change without first consulting the superintendent. Either way we look at it, however, the superintendent if naturally quick-tempered, can be excused for going up in the air when approached in the manner mentioned.

It does not seem to me possible that if the superintendent was, as he should be, the head of the company's operations, the electrician would have had the nerve to go over his head. This may be the real reason that our friend received such a warm reception from his superior officer. In my experience I have seen just such cases as this. In one instance, a mechanic was sent out by the city office, and presumed a great deal on that fact, asserting his authority and taking every occasion to show the superintendent that he did not consider him as his superior. Take it from me, I can think of nothing that will make more dissension and hard feeling than this.

KIND TREATMENT AND SHIFTING EFFICIENT WORKERS BRING BIG RETURNS

It is not my meaning that I approve of the way the superintendent handled this case, for I do not. I have filled the position of superintendent of mines for twelve years and I know it is the wrong way to meet a man who is seeking to better his condition. It costs nothing to be polite and often brings big returns. My experience is that it pays to treat all your men more as if you were their guardian and was looking after them, rather than as a boss who was there to get work out of them.

As for changing men, I have often found it most beneficial, all around, to change a man from one place to another. I would do almost anything to keep a man if he was of any account. I figure that a man you know is an asset, while a man you do not know is a liability. I have, at times, taken a man from one assistant and persuaded another to give him a trial and, by so doing have made a good man out of a former troublemaker and kicker. It proved that the first assistant let his personal feelings govern him.

On other occasions, I have taken a man from one mine where he could not get along with the boss and put him at another mine and found him a first-class man; and have reversed the operation with the same two bosses and got the same results. When a man comes to me in a respectful way and asks for a change and I can accommodate him without lowering the efficiency of the plant or creating friction, I make the change. Should that, for any reason, not be advisable I tell him so, stating the reason.

My policy has always been to treat the men who are under me as I would like to be treated if our positions were reversed. I make no promises that I may not be able to keep. It is often possible to keep one's men in a good humor and get better results, by talking to them and explaining to them just how certain changes would effect them and yourself, rather than to refuse a request and give no explanation. No man expects you to injure yourself in order to help him. It is my earnest hope that we will all understand each other better some day, and the boss and his men will co-operate more fully.

Burgettstown, Pa. SUPERINTENDENT.

Roller Bearings for Mine Cars

Letter No. 6—Referring to the letter of W. H. Noone, *Coal Age*, Jan. 15, p. 148, it is pleasing to note that everyone is not of the same opinion regarding mine-car equipment, and some are to be found to argue the merits of plain bearings in comparison with roller bearings. Difference of opinion invites a discussion that cannot fail to benefit all connected with the coal industry.

Personally, I take an entirely different view of the relative merits of plain and roller bearings as applied to mine-car equipment, than the opinion expressed by Mr. Noone, and I will try to answer some of the questions suggested by his remarks.

Mr. Noone assumes that the large majority of coal mines still have cars equipped with plain bearings. This is probably true; but they are mostly all changing over to roller bearings as fast as they can. In Illinois and Indiana, where the largest mines in the world are located, only the smaller mines, putting out somewhere around 100,000 tons of coal a year, are equipped with plain-bearing mine cars, and many of these smaller mines are changing over to roller-bearing equipment, where the life of the mine is long enough to warrant the investment.

I believe there are few large operators who have made a study of mining equipment and are not convinced that roller-bearing trucks are more efficient, viewed from any angle, than are plain-bearing trucks. This statement is borne out by the fact that the majority of the large producing operations are using roller-bearings.

At the recent meeting of the American Mining Congress, held at St. Louis, Mo., a large roller-bearing manufacturer had a sign on his exhibit, showing that they had done more business in their mine-car department, in 4½ months of 1919, than they had done during the fiscal years of 1914 and 1915. This is a good indication of the popularity of roller-bearing mine cars.

Saves Power and Cost of Lubricating Cars

Speaking of the saving of power, we all know that a wagon with its wheels free to revolve will run far more easily than the same wagon with its wheels chained to the wagon bed or spragged. If this is not the case, why does the driver of a wagon chain his wheels before going downhill? The fact of his doing this proves that rolling friction is less than sliding friction, and it makes no difference whether the friction is in the wheel hub or the wheel tread.

Again, the saving effected in the cost of lubrication is, to my mind, one of the greatest arguments in favor of roller-bearing equipment. When it is necessary to pay greasers $5 a day for squirting grease at the car wheels, as the cars come out of the mine, it is clear that whatever can be done to eliminate this wasteful practice should receive careful attention. To prove that there is a saving in the use of roller bearings on mine cars, in place of plain bearings, allow me to make a comparative estimate of these two styles of equipment.

Comparative Costs Plain and Roller Bearings

A plain-bearing truck requires the application of a lubricant at least four times a week when the mine is running. A mine using 700 plain-bearing cars will require the services of two greasers at $5 a day, making the labor cost for lubricating the cars $10 a day. Allowing that the mine runs but 200 days in the year, this item amounts to $2,000 in that time. Then, estimating the lubricant used at the low figure of 10c. a gallon, we will assume a quart is used on each car, each time it is greased, or one gallon, per car, per week. We have assumed that the mine runs 200 ÷ 6 = say 34 weeks, which makes the cost for lubricant, 34(700 x 0.10) = $2,380 expended for lubricant each year. Adding to this the cost of labor for greasing gives a total of $4,380 a year for lubricating 700 mine cars equipped with plain bearings.

Now, on the other hand, flexible roller-bearing mine cars should be lubricated every three or four months, depending on conditions in the mine and the use made of the cars. Estimating a car as lubricated, say four times a year, and allowing 4 lb. of grease, per car, each time the lubricant is applied, or 16 lb., per car, per year, gives the total cost for lubricant, in that time 700(16 x 0.10) = $1,120.

Now, the cost of labor for greasing cars, as taken from our records at the mine, is 40c., per car, per year. On this basis, the cost of greasing 700 cars four times a year would be 700 × 0.40 = $280, which, added to the cost of the lubricant, makes the total cost of lubricating 700 roller-bearing cars, $1,400 a year. This estimate shows a saving, in favor of roller-bearing cars, of 4,380 − 1,400 = $2,980, which is no insignificant item on the yearly cost-sheet of a mine. It will be observed that our estimate is based on minimum figures for plain-bearing and maximum figures for roller-bearing cars.

Lubrication is not the only item of saving, however. In the use of flexible roller bearings, we have eliminated the wearing out of the car wheels in the hub, so common with plain-bearing wheels. In our experience, the only wheels bought are those required for new cars, or to replace broken wheels, the latter being seldom required. Mr. Noone claims that the greatest disadvantage of roller bearings is in the bearings themselves, owing to their intricate mechanism, which he says makes it expensive to replace a broken wheel. When we break a wheel, the roller bearing is taken out of the hub of that wheel and inserted at once, with no trouble, in a new wheel secured from the stockroom, but this necessity seldom occurs.

Wrecks will happen in mines, at times; but this is no argument in favor of plain bearings. New wheels must be bought to replace the broken ones; and the roller bearings are then removed from the broken wheels and placed in the new ones with little trouble. There must be some types of roller-bearing wheels where this cannot be done, but we have not had this trouble. In my opinion, less than 5 per cent of the wheels broken in mines are the result of wrecks, the large majority being due to worn-out wheel hubs and axles, which a roller bearing reduces to a minimum.

Tests Demonstrating the Saving of Power

Referring to Mr. Noone's claim that the saving of power, in the use of roller-bearings, would have to reach 50 per cent to offset the increased cost of maintenance and admitting, for the sake of argument, that there is some increase, I want to refer him to the test conducted by P. B. Lieberman, at the Greensberg Coal Company's mine. At that test, the H. C. Frick Coke Co. was represented by the chief mechanical engineer, C. E. Huttelmaier.

The Greensberg test showed a saving, in favor of roller-bearing cars, of 47.25 per cent, by the reading of the dynamometer. At another test made at Carbondale, Pa., the average drawbar pull for plain-bearing cars was 32 lb., per ton, as compared with 13 lb., per ton for cars equipped with flexible roller bearings. This test also developed the interesting fact that it takes twice as much power to start plain-bearing cars as is required for those mounted on roller bearings.

The reference made in the last paragraph of Mr. Noone's letter, regarding the fact that roller bearings are not used on surface railroads, has little application to their use on mine cars. It is well known that roller bearings, like other machinery, have load limits. The fact that they are not used by railroads is due to the enormous tonnage carried on those cars. It is clear that the bearing would have to be very large to stand up under that service, and this fact bars their use on railroads. Moreover, speed is another point to be considered.

Richard W. Harris.

St. Louis, Mo.

Entering Mine with Open Light

Letter No. 2—It is with much surprise that I read the recent account of two deaths from blackdamp, and the comments thereon by a Pittsburgh writer. It is the old story of men who, through reckless daring or ignorance, rush into an abandoned place that has been standing idle and without ventilation, for a considerable time.

The account to which I refer states that three men entered an old slope, carrying nothing but a small flashlight to dispel the darkness. The result was that two of the men were overcome by an atmosphere deficient in oxygen and probably containing deadly gases, and died before they could be rescued. The third man following the other two and seeing them fall managed to escape to the surface and give the alarm.

This accident occurred in No. 5 manway, of the Piney Run mine, which is located three quarters of a mile north of Blaine City, in Clearfield County, Pa. The comments of the writer at the close of the article, which show clearly that he had little practical mining experience in mines generating explosive or poisonous gases, should not be allowed to pass without correction.

STRANGE ADVICE FOR A MINING MAN TO GIVE

After taking the precaution to remark that "certain primary considerations should govern the investigation or entry of working places that have not been subjected to ventilation for any considerable time," he adds, "The following, well known but often forgotten, will serve as a basis: In entering an abandoned slope or shaft, an open lamp should be held in advance and at a level lower than the head. In entering an old working place, a mine safety lamp should comprise part of the equipment for the detection of any gas that may be present."

The strangeness of these remarks is that anyone, conscious of the need of "primary considerations" being necessary in respect to the entry of working places that are unventilated, should advise the use of both an open light and a mine safety lamp. Such advice is unthinkable as coming from a man of any practical mining experience in poisonous and explosive gases.

The most limited knowledge of these gases would have led this writer to have stated that the investigation of old abandoned and probably unventilated workings is a hazardous undertaking and should be done by competent, qualified men in an approved manner and with proper equipment. The carrying of an open light with a safety lamp into such a place is simply a call for the U. S. Bureau of Mines rescue car and the services of an undertaker. **W. G. DUNCAN.**

Connellsville, Pa.

Seasons in Coal Mining

Letter No. 1—A recent editorial that appeared in *Coal Age*, Nov. 6, p. 754, drew attention to the seasonable character of different industries, including that of coal mining, and the effect produced on the employment of labor, because of the unsteady work afforded, in the dull season, by reason of the inclemency of the weather or other conditions that lessen the demand for the article produced.

There is no doubt but that the change of the seasons is responsible for the irregular employment of labor in many branches of industry. This is particularly true in farming, carpentering, bricklaying and other outdoor employments. The gathering of ice can only be done in the ice season, just as the harvesting of the fields can only be performed as the crops mature.

As far as the mining of coal is concerned, the work can be performed with equal advantage in every season of the year. Considered in this light, coal mining is not a seasonable industry, though it cannot be denied that the operation of coal mines is determined and controlled by the demand for coal, which is always greater in the winter season than in the summertime. The coal industry is subject, therefore, to the law of supply and demand. In summer, the limited demand for coal quickly overstocks the market; and, for a time after the demand has increased, the supply of coal held in storage is sufficient to meet all requirements, and the mines continue idle for an indefinite time, owing to this oversupply.

In seeking a remedy for these conditions, the operator cannot be expected to lower the selling price of coal, in order to stimulate its movement in the market, any more than the miner can be expected to work for less wages during that season. The success of the industry demands a uniform price for coal and a uniform demand to insure uniform production.

The disintegrating nature of coal, especially soft coal, the lack of storage facilities and the additional cost of reloading the coal for shipment, make it impracticable or impossible to look to this source for remedy. Neither can the railroads be asked to establish a system of freight differentials, in order to stimulate the purchase of coal supplies during the dull summer season. This would throw the burden on the railroads, which have their own operating expenses to meet.

The coal industry is face to face with the problem of a maximum demand in the winter season, and a minimum demand in the summer time. What is to be done to equalize this demand throughout the year and make it possible to keep the mines running uniformly and regularly? In my opinion, the answer to this question is to inaugurate an energetic campaign that will urge the public to lay in their winter supply of domestic coal during the summer months, instead of waiting till cold weather sets in when everybody wants their coal delivered at once.

CAMPAIGN FOR UNIFORM MARKET CONDITIONS

We must patiently hammer away at this problem to create a uniform market and demand for coal. Large dealers of coal, having ample storage facilities, should be urged to fill their bins during the summer, in readiness for the fall demand. This would have a good effect by helping to create a more uniform demand, for every month of the year. The consumer, however, should place himself in a receptive mood that will enable him to understand the need of his co-operation in this regard, which will go far toward solving the problem.

In the past, the public has not taken seriously the warning, "buy your coal in the summer," and the result has been an unavoidable shortage of coal during the last three winters. Coal consumers are not awake to their responsibilities in this matter. The handling and transportation of coal from the mine to the consumer is subject to less difficulties in summer than in winter, and this fact is worthy of careful consideration.

Before closing, let me suggest that the United Mine Workers of America might profitably take off their coats and jump right into the ring on this campaign. As mine workers, they are in a position to take an earnest stand for the purchase of coal, by the domestic consumer and by dealers in the summer months. The organization has able speakers, thinkers, writers and workers; they are live wires and it is to their interests, particularly, that good results should be accomplished in securing a uniform demand that will insure a uniform production of coal throughout the year.

Thomas, W. Va. LOYAL MINE WORKER.

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Miscellaneous Questions

(Answered by Request)

Ques.—A main entry is driven due north 1,925 ft. from the shaft bottom. A pair of cross-entries is started 350 ft. south of the face of the main entry and driven due east, a distance of 2,322 ft. All the entries are 8.25 ft. wide and 5.55 ft. high. The velocity of the air current is 492 ft. per min. and the air has a temperature of 56 deg. F. A door is placed on the main entry between the two cross-entries. The size of the door is 4.5 x 6.5 ft. Find the pressure per square foot on the door, also the total pressure.

Ans.—The pressure acting to close the door is the difference of pressure between the intake and return sides of the door. This difference of pressure, expressed in pounds per square foot, is equal to the unit of resistance for the pair of cross-entries, or the unit pressure due to the circulation in the cross-entries only. The total length of the cross-entry and air-course is 2 × 2,322 = 4,644 ft. The perimeter of the airway is 2(5.55 + 8.25) = 27.6 ft., and the sectional area 5.55 × 8.25 = 45.79 sq.ft. For a velocity of 492 ft. per min., the unit pressure producing the circulation in the cross-entries is, therefore,

$$p = \frac{klov^2}{a} = \frac{0.00000001 \times 4644 \times 27.6 \times 492^2}{45.79}$$
$$= 6.776 + \textit{lb. per sq.ft.}$$

The area of the door being 4.5 × 6.5 = 29.25 sq.ft., the pressure acting to close the door is 29.25 × 6.776 = 198.2, say 200 *lb.*

Ques.—The barometer at the top of a shaft is 30.2 in. and the temperature of the air, 64 deg. F. The depth of the shaft is 1,100 ft. and the thermometer at the shaft bottom reads 75 deg. F. Calculate the difference of pressure on the air between the top and bottom of the shaft, and the difference in the readings of the barometer at these two points.

Ans.—This is a question that cannot be answered with any degree of accuracy, except by the use of a logarithmic equation, and, for that reason, it should not be asked at a mine examination. It is evident that the difference of pressure between the top and the bottom of a shaft is due to the weight of the air column in the shaft. But, since the density of the air increases with the depth of the shaft, it is necessary to know the average density, or weight per cubic foot, of this air, before the weight of the shaft column can be found. Some will assume that the average density of the air is equal to half the sum of the densities at the top and bottom of the shaft, which is not even approximately true. That assumption would increase the pressure from 30.2 × 0.49 = 14.8 lb. per sq.in., at the top of the shaft, to 18.2 lb. per sq.in. at the bottom; and give a barometric reading, at that point, of 18.2 ÷ 0.49 = 37.1 in., making the increase of barometer 37.1 — 30.2 = 6.9 *in.*

As a matter of fact, however, the pressure is increased from 14.8 lb. per sq.in., at the top of the shaft, to 16.2 lb. per sq.in. at the bottom, making the barometric reading at the shaft bottom, 16.2 ÷ 0.49 = 33.0 in., which shows an increase of barometer of 33.0 — 30.2 = 2.8 *in.*

It is well to remember, in this connection, that the approximate rule of allowing 1-in. change in barometer to every 900 ft. of depth of shaft is based on the assumption of the density of the air being 0.0766 lb. per cu.ft. and takes no account of change in density due to changes in the pressure and temperature of the air.

Ques.—What would be the weight of 100 cu.ft. of carbon dioxide (CO_2), when the barometer reading is 28 in. and the temperature 60 deg. F.?

Ans.—The weight of 1 cu.ft. of air at the given barometric pressure and temperature is

$$w = \frac{1.3273 \times 28}{460 + 60} = 0.07147 \textit{ lb.}$$

Since the specific gravity of carbon dioxide is 1.529, the weight of 100 cu.ft. of this gas, at the given temperature and pressure, is 100 × 1.529 × 0.07147 = 10.7 *lb.*

Ques.—What pressure will be required to force 20,000 cu.ft. of air per minute through an airway 14 ft. wide, 6 ft. high and 3,000 ft. long?

Ans.—The perimeter of this airway is 2(6 + 14) = 40 ft., and its area 6 × 14 = 84 sq.ft. For a circulation of 20,000 cu.ft. per min., the velocity of the air current is 20,000 ÷ 84 = say 238 ft. per min. The rubbing surface of this airway is 3,000 × 40 = 120,000 sq.ft. The unit pressure required is, therefore,

$$p = \frac{ksv^2}{a} = \frac{0.00000001 \times 120,000 \times 238^2}{84}$$
$$= 0.8 \textit{ lb. per sq.ft.}$$

Ques.—If 10,000 cu.ft. of air pass each minute through an entry having a sectional area of 49 sq.ft., how much air will pass per minute through an airway having an area of 12 sq.ft., the length of the airways and the power being the same in each case?

Ans.—For the same length of airway, the quantity of air circulated by the same power will vary directly as the sectional area and inversely as the cube root of the perimeter. Without knowing the shape or the dimensions of these airways, it is not possible to determine their perimeters, which must be known before the question can be solved.

Assuming that the airways are square, however, the quantity of air circulated by the same power will vary as the cube root of the fifth power of a side of such airway. In this case, the side of a square airway whose area is 49 sq.ft. is $\sqrt{49} = 7$ ft.; and that of a square airway having an area of 12 sq.ft. is $\sqrt{12} = 3.464$ ft. Then, the quantity ratio being equal to the cube root of the fifth power of the ratio of the sides and calling the required quantity x, we have,

$$\frac{x}{10,000} = \sqrt[3]{\left(\frac{3.464}{7}\right)^5} = \sqrt[3]{0.4948^5} = 0.3096$$
$$x = 10,000 \times 0.3096 = \text{say } 3,100 \textit{ cu.ft. per min.}$$

Retail Coal Dealers Review Timely Problems

Coal Dealers Discuss Insurance—Assert That Railroad Administration Made Unnecessary Confiscations—Bonus System Urged

AT THE Pennsylvania Hotel in New York City on Thursday, Feb. 26, the second annual regional meeting of the New York State Retail Coal Merchants Association, was held. The meeting brought out a very large attendance of coal men from what is termed the Metropolitan district, which includes dealers from Long Island, Staten Island, Westchester County, and Greater New York. Richard J. Wulff, second vice president of the association, presided at the morning and afternoon sessions.

G. W. F. Woodside spoke at the forenoon session on industrial insurance, and told of the great success that has attended the Coal Dealers' Mutual Insurance Association, organized several years ago to provide a reasonable form of insurance for the coal dealers of New York State, as required by the compensation act. While the rates are the same as provided by the old line companies, or the State Insurance Fund, Mr. Woodside stated that the Coal Dealers Association had been able to remit to the insurers annual dividends in good amount and, in addition, had created a very formidable surplus after reserves.

Open discussion followed, in which a number of dealers testified as to their experience with the coal dealers' insurance, and the amounts saved, as compared with old line companies. "Cost and Cost Accounting" was a subject that was discussed by Paul K. Randall of Scarsdale Supply Co., and Roderick Stephens of Stephens Fuel Co.

GOVERNMENT ONLY MUDDLES DISTRIBUTION

About the most interesting paper read during the sessions was that of Ellery B. Gordon, now secretary and manager of the National Retail Coal Merchants Association. His subject was "Coal Service and the Government." The gist of his paper was that relief could only come to the coal trade when the task of distribution is taken from incompetent Government appointees and returned to practical coal men. The Railroad Administration, he held, was incompetent to handle the coal industry, and that there had been unnecessary confiscation and diversion of coal which had resulted in heavy losses to retailers and higher costs to consumers.

"The legitimate relation of Government to industry does not mean the infliction of intolerable conditions to perpetuate the jobs of certain bureaucrats in Washington," he said. "It does not mean paternalism for the benefit of politicians with socialistic tendencies, nor does it mean subsidizing the entire industry for the benefit of a minority, even though that minority be a labor organization with thousands of votes, nor does it involve authority to completely upset the established machinery by bungling efforts and inexcusable interference with production, transportation and marketing."

At the afternoon session three papers were read on "profit-sharing and bonus systems." Frederick Ruby of the Middle Lehigh Coal Co. of Brooklyn, told how his company gets good results from its employees due to its bonus system. Hugh McDonald of the Scarsdale Supply Co., stated that his company uses the profit-sharing basis in order to get the fullest measure of co-operation from its employees.

Harold B. Weaver, vice president of the Chicago Motor Bus Co., told of the experiences of various corporations with which he has been associated, and was a warm advocate of the profit-sharing plan. His description of the plan followed by the Yellow Taxi-Cab Co. of Chicago, which he stated had been most successful, was listened to with interest on the part of the dealers.

"Here, said Mr. Weaver, the taxi-cab company with about the worst type of labor, had been able to secure the most hearty co-operation of its employees, and while pursuing an open-shop policy in defiance to the American Federation of Labor, had built up a paying service which was second to none in the United States."

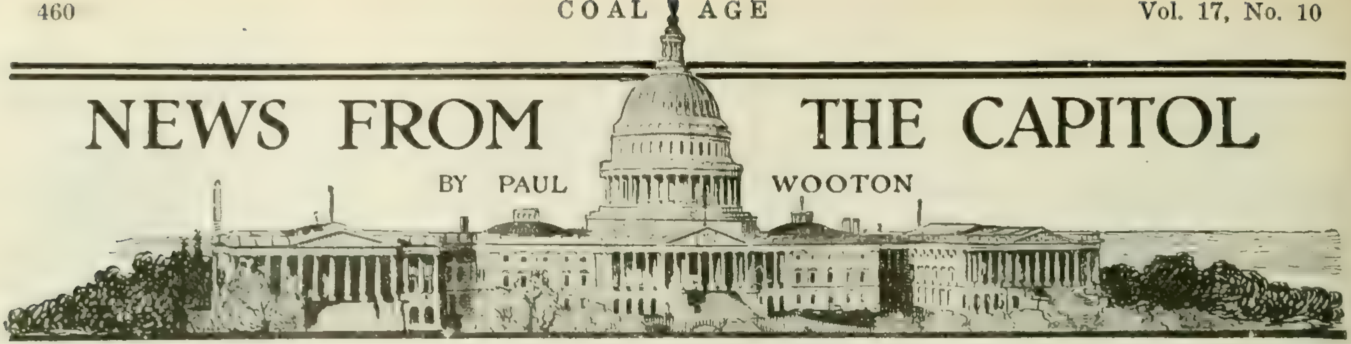
Lambie, New Head of West Virginia's Mining Department

R. M. Lambie, whose likeness appears herewith, was, on Feb. 14, commissioned as the new chief of the West Virginia Department of Mines, succeeding W. J. Heatherman, who had most acceptably filled that post for a period of two years, the retiring chief becoming general manager of the mines of the Cleveland Cliffs Iron Co. in Ethel, Logan County, W. Va.

R. M. LAMBIE

Mr. Lambie is from Mount Hope, W. Va. Since he came to this country from Scotland in 1904, he has worked in all the positions around the mines, both as a miner and as an executive, most of his career having been with the New River Co. and the McKell Coal & Coke Co., both in Fayette County. Until within a short time before his appointment he had been a district inspector, having been appointed to that position Jan. 15, 1918. He resigned during the latter part of 1919 to become assistant to the general manager of the New River Co., but soon thereafter was tendered the appointment as head of the West Virginia Department of Mines.

Thus will it be seen that not only by virtue of his varied mining experience but also through his duties as a district inspector he is in possession of a thorough knowledge of the mines of the state and in a position to fill the duties of the department with efficiency.



NEWS FROM THE CAPITOL

BY PAUL WOOTON

Hines Seeks to Excuse His Confiscatory Policies

ON Feb. 26 the Director General of Railroads submitted to the Senate the following report, in response to a recent resolution by Senator Frelinghuysen, N. J., as to the authority of the Administration over the distribution and export of coal:

The authority, powers and duties with respect to shipment, distribution, apportionment and storage of coal and coke, delegated to the Director General of Railroads by the Fuel Administrator, are contained in Executive Order of Oct. 30, 1919.

In anticipation of the strike of bituminous coal miners, expected to commence Nov. 1, 1919, the President on Oct. 30, 1919, issued an executive order revoking orders of the Fuel Administrator dated Jan. 31, 1919, and Feb. 20, 1919, to the extent necessary to restore all of the rules, regulations, orders and proclamations therein suspended concerning fixing prices of lignite and bituminous coal at the mines; fixing or regulating commissions of persons and angencies performing the functions of middlemen dealing in bituminous and lignite coal; fixing or regulating gross margins of profits of wholesale and retail dealers in bituminous and lignite coal.

Delegates Powers to Hines

Thereafter the Fuel Administrator designated by order dated Oct. 31, 1919, the Director General of Railroads and his representatives to carry into effect the restored order of the Fuel Administrator of Jan. 14, 1918, and to make such diversions of coal in the possession as common carriers, of railroads under his direction as might be necessary in the emergency to provide for the requirements of the country in the order of priority set out in the preference list of the order of the Fuel Administrator dated May 25, 1918, which was as follows:

Railroads; army and navy together with other departments of the government; state and county departments and institutions; public utilities; retail dealers; manufacturing plants on war industries boards preference lists; manufacturing plants not on war industries board's preference lists; jobbers, lake and tidewater.

On Nov. [illegible] the President issued a [illegible] the Fuel Administrator [illegible] to restore [illegible] regulations, orders and [illegible] price or regulating [illegible] shipment, distribution, apportionment, storage or use of all coal or coke as in his judgement might be necessary.

The Director General of Railroads on Oct. 31, 1919 took control of all bituminous coal then on wheels or otherwise held in the possession as common carriers of railroads under Federal control, and also subsequently of all coal loaded in railroad cars during the strike, for the purpose of carrying into effect the powers delegated to him by the Fuel Administrator.

The exercise of these powers by the Director General of Railroads has been in pursuance of the orders above referred to and of the following additional orders subsequently issued by the U. S. Fuel Administrator:

Order of Nov. 12, 1919, providing that the executive order dated Oct. 30, 1919, restoring certain rules, regulations, orders and proclamations relating to the prices of bituminous and lignite coal should not be applicable to bituminous coal shipped on and after Nov. 13, 1919 under a bona fide contract enforceable at will entered into prior to Oct. 30, 1919, and that coal shipped under any such contract and diverted in transit should be paid for by the party receiving same at the price to which the shipper would be entitled to bill same to the original consignee thereof.

Order of Nov. 21, 1920, providing that no anthracite coal produced in the United States should be sold, shipped or distributed except to dealers or consumers and for use and consumption within the United States, its insular possessions and Canada.

Order of Nov. 22, 1919, providing that coal dumped into barges, scows, boats or other vessels on lakes, rivers and other inland waterways should be subject to diversion in like manner and to the same extent as bituminous coal loaded in cars of a common carrier under the orders of the Fuel Administrator in effect Nov. 22, 1919, relating to the diversion of coal in transit; that coal diverted under authority of the order should be paid for by the party receiving the same in accordance with the provision relating to payment for diverted coal contained in the order dated Nov. 12, 1919; and authorizing the Director General of Railroads and his representatives to make such diversions as may from time to time be necessary in the order of the priority set out in the order of the Fuel Administrator dated Oct. 31, 1919.

Order of Nov. 22, 1919, authorizing the Director General and his representatives to make such rules, regulations and orders restricting or prohibiting the use or consumption of bituminous coal for the purpose of producing or manufacturing coke in beehive ovens as may from time to time be necessary.

Order of Nov. 29, 1919, providing that the regulations of the Fuel Administrator permitting a haulage charge to be made in the case of coal from wagon mines when shipped in box cars to be suspended, to include such coal when shipped in open top cars.

Order of Dec. 6, 1919, authorizing the Director-General of Railroads and his representatives to make such diversions of coke in transit as may be necessary in the emergency.

Order of Dec. 8, 1919, authorizing the Director General and his representatives to make and prescribe such local and general regulations restricting the delivery, use and consumption of coal, coke or other fuel or power generated or produced by the use or consumption of coal and other fuel as may from time to time be necessary in the emergency.

The authority delegated to the Director General has, since the original delegation, not been curtailed by the President or the Fuel Administrator, except as it may have been affected by the above mentioned order of Nov. 12, 1919, which provides for the payment for diverted coal by the person receiving same at contract instead of Government price. The authority of the Director General has been enlarged from time to time and to the extent indicated in the orders above described. Response to inquiry as to the extent the delegated powers are now being exercised by the Director General can be better made in the answer to paragraph 4 of the resolution and will be included therein. All papers, documents, etc., referred to in paragraph 3 of the resolution have been above described and copies thereof are attached hereto as requested.

Coal Committees Formed

The existing agency through which the Director General is exercising the powers delegated to him are substantially the same as those issued on Oct. 31, 1919, immediately upon his assumption of the duties imposed by the order of the Fuel Administrator of the same date, with such enlargements as the increasing difficulties of the situation demanded. The organization at first consisted of the Central Coal Committee and Regional Coal Committees. Subsequently various district and local coal committees were formed as occasion demanded and each of such regional, district or coal committees included in its membership a representative appointed by the Fuel Administrator. Such representation was in each case a practical coal man and in almost all instances one formerly connected with the Fuel Administration. The Central Coal Committee exercised general supervision over the other committees, kept fully informed by daily telegraphic reports as to the daily coal supply and needs of the country and directed through the other committees the distribution of coal in conformity with the priority list established by the Fuel Administrator and the needs in the various parts of the country. A full description of these agencies and the work accomplished is contained in the report of the Director General for 1919, a copy of which is hereto attached.

As was expected, bituminous coal production during the period of the strike from Nov. 1 to Dec. 13, 1919, fell off tremendously and for the entire period aggregated but 36.2 per cent of the normal production. Of the coal actually loaded during this period, by far the greater portion, in fact almost

70 per cent, was loaded in the Allegheny and Pocahontas regions in the States of Pennsylvania, Maryland and West Virginia. Practically no coal was produced in the territory west of Pennsylvania to the Rocky Mountains. In addition to this there was independently of the coal strike an extraordinarily large demand for coal by reason of the fact that much less coal than usual had been bought in the early part of the year. In these circumstances consumers' stocks early during the strike began to show signs of depletion and it became necessary to route large quantities of coal over most abnormal and unforeseen routes from producing fields in Pennsylvania, Maryland, Kentucky and West Virginia to the Central West and beyond. This action was indispensable if a coal famine was to be avoided in that consuming territory and by the termination of the strike approximately 40 per cent of the total production in the Allegheny and Pocahontas regions, about 4,000 cars per day, was thus being moved West.

Long Hauls Reduced Car Supply

Simultaneously, in order to avoid loss of market for extraordinary production in the Pocahontas region, which was not readily susceptible to all-rail movement, unusual measures were taken to move such coal by water from Hampton Roads to New England and other North Atlantic destinations.

All of this resulted in an extraordinary disruption of the coal transportation facilities of the country, since it was necessary to divert great numbers of coal cars from their usual routes to distant destinations in the West. This longer haul of course greatly increased the average time of car use per load and therefore correspondingly reduced the coal-car supply. Furthermore the character of coal car used in the East was not well adapted either as to size or construction to the usual requirements of the West, and this caused additional delays in the car movement.

Unfortunately during the strike period and down to the present time there has been a succession of severe storms and cold spells, coupled with depletion of train and yard employees on account of the influenza epidemic, which has further seriously interfered with the handling of coal and all other commodities. Notwithstanding all of these difficulties and the abnormal demand for transportation of every character, the amount of coal produced per week greatly exceeded the weekly production during the winter in the past.

On account of the strike and these extraordinary conditions it has been impossible since the strike to supply coal in sufficiently large quanties to meet the extraordinary demands growing out of the depletion of stocks during the strike. This is true despite the fact that the total bituminous coal produced in January has been considerably above normal for that period.

It has therefore been found necessary up to the present time to continue in slight measure the control over distribution which was exercised by the Fuel Administration during the strike. Every effort has been made to reduce to a minimum this interference with the normal distribution by shippers and the Railroad Administration has constantly followed the policy of caring only for emergency needs and those of essential consumers in the higher priority classes. While the railroads made contracts for enough fuel for their operation, the coal operators have insisted that the policy adopted at their instance by the Railroad Administration not to place cars preferentially for railroad fuel be adhered to. The result is that in times of car shortage the railroads have not been able to get their contracts completely supplied and hence another reason for the continued necessity of diversion has been the need of caring for fuel supply of the railroads to the extent that the railroad contracts were not fulfilled.

I might also point out that upon the earnest insistence of the operators that their contracts made prior to Oct. 30, 1919, be protected, the Fuel Administration order of Nov. 12, 1919, was issued with the result that in many parts of the country operators have shipped only on such contracts, hence people who had not such contracts were unable to buy coal, particularly in the East, where under the Government price program the higher price was permitted for export coal than for coal sold domestically. In other words, a condition was reached where there was practically no spot coal available and in consequence a number of essential consumers have been unable to get coal except as a result of diversion. These factors have contributed materially to the necessity for continuing the exercise of the power of diversion despite the fact that the policy of the Central Coal Committee has been to cut export to a minimum.

Embargo Laid on Exports

At present an embargo on the movement of all coal for shipment overseas is being maintained at all Atlantic Coast ports and no coal is permitted to be exported except on application by shippers, recommended by the Regional Committee having jurisdiction and approved by the Central Coal Committee and representatives of the Shipping Board and State Department who are sitting with it. On account of the present serious shortage of coal in the Northeastern section of the country no export permits are being issued for coal from ports north of Norfolk and only such coal is permitted to be exported through Norfolk as is not required for consumption in this country or cannot be transported to destinations in this country by available boats in the coastwise trade. Export permits for such coal are issued in order that the coal may be promptly unloaded and the cars returned to the mines for further loading. Care is exercised in the issue of export permits to insure an equitable distribution of them among applicants.

Coal Is Now Free To Move

With the exception of the embargo on export coal all restrictions placed on the distribution of coal in the United States and Canada during the strike by the various coal committees have been removed and the normal distribution of coal is interfered with only where emergencies arise which necessitate diverting to railroads, Government and state departments and institutions, public utilities and other essential consumers. In making such diversions the coal committees having jurisdiction select as far as practicable coal moving to consumers of less essential character and occupying a lower position on the Fuel Administration preference list. Such diversions are necessitated by the inability of some essential consumers to secure by purchase the additional coal they require, there being practically no coal available for sale in the Northeastern section of the country at the price fixed by the Fuel Administrator. Such diversions are made only after the committee having jurisdiction is assured by the applicant of his actual necessity as required by the regulations established at the beginning of the strike.

For the purpose of continuing this present control over the distribution of bituminous coal the Central Coal Committee continues to function and with respect to the export situation operates through a subcommittee on which the State Department and the Shipping Board have representatives. In so far as diversion of coal is necessary for the protection of consumers within the United States, the Central Coal Committee relies upon the regional organizations which for this purpose have maintained in part the regional coal committees.

To Advance R. R. Fuel

The Interstate Commerce Commission and the Department of Justice have been advised formally by J. D. A. Morrow, vice-president of the National Coal Association that if the individual railroads return to the practice of assigning cars to mines that there should be an immediate advance in the price of railroad fuel of 10c. a ton. It will be recalled that with the abolition of assigned cars the operators were required to deduct 10c. from the Government price.

An attempt to stop diversions of coal by legal action has been made by the New Haven Utility Corporation of New Haven, Connecticut. An injunction has been sought in the Supreme Court of the District of Columbia alleging that the company is being deprived of its property without due process of law.

President Orders New Fuel Control

Names Board of Four to Take Over Shipping and Export Administration

Coincident with the signing of the Railroad bill tonight, President Wilson issued executive orders providing for continuation of the powers of the Fuel Administration, but dividing them between the Director General of Railroads and a commission of four. Director-General Hines will retain jurisdiction oven domestic distribution, while the commission will handle bunker and export coal matters.

The commission will be composed of A. W. Howe, Rembrandt Peale, F. M. Whittaker and J. F. Fisher. It will function through the Tidewater Coal Exchange, which had been suspended before the resignation of Dr. Garfield as Fuel Administrator.

The order creating the commission is effective until April 30 next. The order said the action was taken "because of the present emergency and in order to insure an adequate supply and equitable distribution, and to facilitate the movement, and to prevent, locally or generally, scarcity of coal."

It directs specifically that the order issued by the U. S. Fuel Administration Nov. 6, 1917, relative to tidewater transshipment of coal at Hampton Roads, Baltimore, Philadelphia and New York, and for the employment of and co-operation with the Tidewater Coal Exchange, as a common agency to facilitate transshipment and to reduce delays in the use of coal cars and coal-carrying vessels," suspended by Dr. Garfield on Feb. 20, 1919, be reinstated.

A second order, investing Mr. Hines with the powers of Fuel Administrator so far as domestic distribution is concerned, said doubt had arisen as to whether he could continue to exercise those powers after the return of the railroads to private control. A new order was therefore issued extending Mr. Hines' authority beyond the date of the return.

Railroads' Coal Confiscation Illegal

National Coal Association Says Victims of Confiscation Can Recover

Rush C. Butler, the general counsel of the National Coal Association, declares that all confiscations and diversions of coal by the Railroad Administration made subsequent to Dec. 13, 1919, the date of Dr. Garfield's resignation as Fuel Administrator, are invalid and unlawful, subjecting not only the Administration itself but the individuals to liability for any damage attendant on such action.

Mr. Butler holds:

1. That the Railroad Administration's authority to divert coal under Dr. Garfield's order of Oct. 31, 1919, expired when Dr. Garfield's resignation was accepted by the President, Dec. 13, 1919. 2. That every carload of coal so diverted by the Railroad Administration since Dec. 13, 1919, was diverted without authority of law. 3. That confiscation of coal by the railroads is "unlawful conversion" and that the owners of the coal are entitled to damages to compensate them for the loss. 4. That where the Railroad Administration has confiscated at less than Government prices, coal moving on contracts, the owners of such coal can recover the difference between the contract price and the Government price. 5. That not only are the carriers involved responsible for losses in the foregoing, but that the officials of the Railroad Administration concerned are personally liable for the amount of damages and may be sued therefor.

Coal and Oil-Land Leasing Bill Becomes Law

President Signs the Measure Which Will Throw Open Over 6,700,000 Acres

At Washington on Feb. 25 President Wilson signed the oil-land leasing bill. The total area of oil lands thus thrown open for lease is estimated at more than 6,700,000 acres, while proved coal lands under Government withdrawal total approximately 30,000,000 acres, with 39,000,000 acres still to be classified. Phosphate lands are estimated at 2,700,000 acres, with sodium and other mineral deposits equally as extensive.

In withdrawn coal lands North Dakota leads the other twelve states with more than 11,000,000 acres, although its deposits are not considered as valuable as those contained in the 2,800,000 acres of Colorado, which are appraised by the Government at an average of $75 an acre, the highest valuation for Government coal lands in any state.

The 7,238,515 acres in Wyoming get the next highest appraisal of $53 an acre, the total valuation of nearly $400,000,000 being the highest for any state. Other states with extensive coal lands are Utah, with 1,069,600 acres; Montana, with 5,782,216 acres, and New Mexico, with 665,565 acres.

IDAHO RANKS FIRST IN PHOSPHATE LAND

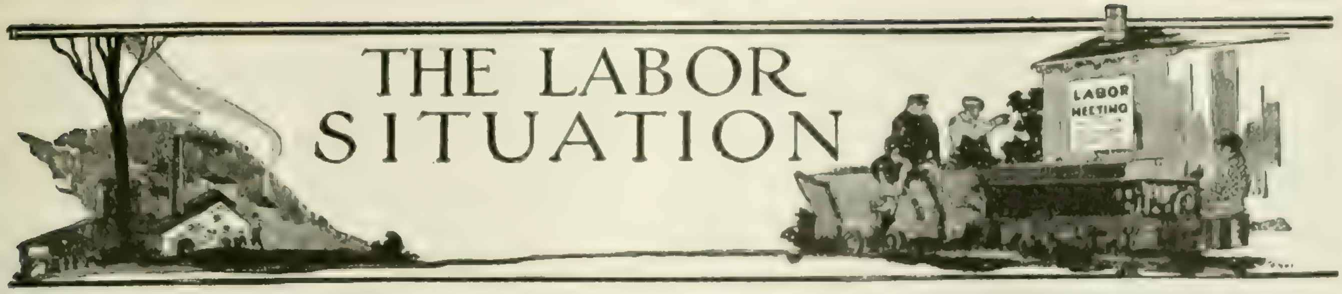
Idaho ranks first in Government phosphate lands, with a little more than 1,000,000 acres, and Wyoming second, with 900,000 acres, these deposits also being considered the richest. The areas in Florida, Montana and Utah range from 100,000 to 300,000 acres.

Authority for the administration of the oil-leasing law is placed with the Secretary of the Interior. On oil lands the leasing rate will be 5 per cent. of the oil produced, and this may be demanded in oil or cash, as the Government may elect. For this year at least the Government is expected to collect its royalties in oil.

John Barton Payne, chairman of the Shipping Board, who soon is to become Secretary of the Interior, recommended recently this course to the Interior Department so the Shipping Board would be assured of an oil supply at fair prices. When he takes over the Interior Department Mr. Payne is expected to carry out his own recommendation in the matter.

A. H. Fay Enters Private Employment

The departure of A. H. Fay from the service of the Bureau of Mines to enter private employment was marked by a bit of ceremony during which J. W. Thompson, the law examiner of the Bureau, made an address in which he set forth the things of value which had been contributed to the Bureau's work by Mr. Fay. Incidentally Mr. Fay will go into private employment with the best brief case that could be bought in Washington.



THE LABOR SITUATION

Public Utility Associations Protest Against Increased Cost of Coal

Representatives of Public Utility Associations appeared before the President's Coal Commission Feb. 17. Vigorous protests were registered against the passing on of the 14 per cent advance by the operators. It is stated that of the 50,000 tons of coal used annually by the public utility companies, 98 per cent of it is contract coal, which is causing the public utility consumers to pay the wage advance which they contend should be paid by the operator regardless of contract provision.

The commission was acquainted with the serious situation confronting the public utilities, making it almost impossible for them to meet the increased coal cost. Representatives of traction lines declared that the point had been reached where it is impossible to add to receipts by increasing fares. Further increases will result in decreased revenues, it was declared.

Objection also was made to the manner in which coal is being confiscated and diverted. While the public utility men testified that they are anxious to have governmental control of coal continued, they prefer some other agency than the Railroad Administration as the distributors.

Chairman Robinson asked one of the witnesses if it were not the duty of large consumers of coal to store as much as practicable of their winter supply during the spring and summer months. This was answered in the affirmative, but the request was made that others who would be benefited by the policy should make reductions in prices so as to offset rehandling and other expenses.

Failure of Adequate Car Supply Affects Price of Coal

Appearing before the Bituminous Coal Commission, T. H. Watkins, president of the Pennsylvania Coal & Coke Co., in the operation of soft coal mines in central Pennsylvania, charged that the Railroad Administration had put into effect a "tyrannical system" of coal-car distribution by which coal operators were deliberately discriminated against.

Under this method, open top cars were arbitrarily offered to operators by the purchasing department of the Railroad Administration under an arrangement by which operators would charge the Railroad Administration a lower price for coal than that offered the consumer. Operators who accepted this arrangement, he said, were able to get three times the car allotment originally apportioned to them by the Railroad Administration, while those who declined to accept it suffered for lack of cars, many of them not having one-third of the supply promised them. Failure of adequate car supply, Mr. Watkins said, was an important factor in the price of coal in the market. Because of their inability to get cars when needed, he pointed out, many operators have been forced to run their mines at huge cost, while not getting coal to the market.

At the end of the day's hearing, Chairman Robinson announced that no further hearings would be held. The commission would consider the evidence submitted, he said, and endeavor to "reach a unanimous agreement as soon as possible." "It is a matter of record," said Mr. Watkins, in appearing before the commission, "that the purchasing department of the Railroad Administration, under charge of John Skelton Williams, not only resorted to the practice of assigned cars, but had the audacity to call some of the leading coal operators of the United States to Washington, while Dr. Garfield was at the head of the Fuel Administration and made to them a definite proposition as to a guaranteed car supply to get cheap fuel.

"The Railroad Administration not only made this offer, but defended it and accused operators who resented and protested against its continuance of a lack of patriotism—operators who were not only trying to protect their customers, and who had vision and experience enough to know the final evil effects in reduced production through strikes and unrest." Mr. Watkins went on to say that this "unfair method of distribution," as he called it, had worked tremendous hardship to various mine operators. He submitted records to show that from March 1 to March 23, 1918, while some mines were able to get cars to carry the product of 160 working hours, others got enough cars to work only 27 hours.

WHY DIDN'T McADOO BECOME AN OPERATOR?

"It is possible under this system for a railroad purchasing agent, if he so desires, to put an operator or a district out of business," said Mr. Watkins. "The miner who has suffered from this, the operator who has suffered from it, may be excused if he uses emphatic and violent language in protesting. And the general public, what have they to say? Unfortunately, the public is not fully aware of the conditions. To the general public mind, the operator is a bandit, a robber, a man without any sympathy or feeling. He is pictured as sitting by gloating over his ill-gotten gain.

"We have an ex-Secretary of the Treasury, Mr. McAdoo, going on record with the most absurd and exaggerated statements of the profits of coal operators, coloring statistics, picking out isolated cases of enormous profits of operators. Dr. Garfield's statement, showing that the average margin of profit was 46c. a ton in 1917, of which the Government took 30c. a ton in the way of excess profit taxes, was ignored. If Mr. McAdoo believed his own statement of 2,000 per cent profits in this industry, one can be pardoned for wondering why, when he resigned from public life to make more money, he did not engage in the coal business, instead of the moving pictures—unless possibly he had in mind that the rap at the coal operators would some day make useful political capital.

"It is hard to chase down a lie, and it is a lie to pick one or two corporations out of the thousands that there are and accuse all the operators in the United States of being profiteers. It was under Mr. McAdoo's administration that the vicious practice of allowing assigned cars to certain operators to secure coal for less than a fair price as fixed by the Fuel Administration was practiced. If there were excessive profits in isolated cases, it was probable that they were due to Mr. McAdoo's own methods.

"And it was not until Dr. Garfield's attention was called to the policies of Mr. McAdoo's administration, as pursued by John Skelton Williams, followed up by Henry Spencer, that there was the slightest check put upon the Railroad Administration, and it then took an appeal to the President of the United States to temporarily check the unfair distribution of handling the coal car equipment of the United States. Contrary to the principles of this order, Mr. Watkins said, railroads now propose to continue the practice when the Lever Law passes out of existence. Unless there is some definite policy adopted by the Government that will prevent preferential car service, I fear it will continue to the point where it of itself will cause a great national strike, without the question of wages or other working conditions entering into it."

Late in the day Mr. A. G. Gutheim, assistant manager of the Car Service Section of the Railroad Administration, defended the practice of preferred car assignment, saying that it was justified by economic and commercial conditions. The commission today heard representatives of the public in the bituminous-coal controversy, going, among other things, into the manner in which the 14 per cent wage advance to the miners had been applied by the operators.

Chairman Robinson announced that Dr. Garfield, the former Fuel Administrator who had recommended the 14 per cent wage advance, this to be absorbed by the operators, had been invited to appear before the commission, but that no reply had come from him. George W. Elliott, representing the National Committee on Gas and Electric Service, which, he explained, represents public utility industries in affairs between themselves and the Federal Government, protested against utility corporations having to meet any increase in wages, through an advance in the price of coal. The utility corporations, he said, had understood that the 14 per cent advance was to be met by the operators entirely, without an increase in price to the consuming public. This, he said, was the inference drawn from statements made by Dr. Garfield, who suggested the 14 per cent advance as a basis of settlement of the coal strike.

PUBLIC UTILITIES HAVE TO PAY 14 PER CENT

The National Committee on Gas and Electric Service, he said, had been informed that the 14 per cent advance had been absorbed by the operators as to contracts which had been made by them prior to the strike of last November. On these contracts, he was informed, he said, that the 14 per cent advance had been passed along. The matter had been taken up with the Attorney General, he explained, Mr. Palmer informing the public utility corporations that under the contracts prior to Nov. 1, the operators were privileged to raise the contract price to meet any increase in the cost of labor.

Ralph Crews, of New York, attorney for the operators, explained that the 14 per cent had been absorbed by the operators in all sales of coal except those under specific contract made before Nov. 1. "I am glad to hear that explanation," said Mr. Elliott. A. W. Brady, president of the National Traction Co., of Indianapolis; Charles L. Edgar, president of the Edison Electric Illuminating Co. of Boston; Paul Thompson, representing the Boston United Gas Improvement Co., of Philadelphia; and M. H. Aylesworth, of the National Electric Light Association of New York, all emphasized the point that if there is to be any increase fixed by the commission it will have to be passed on to the public.

Expected Price Advance Investigated Still Further

How any advance in the price of coal may be applied, as an outcome of the hearings before the Bituminous Coal Commission appointed by the President, has become one of the perplexing phases of the commission's inquiry. While the commission has not indicated that there is to be any advance in wages beyond the 14 per cent given the miners in December, or even that the 14 per cent advance is to remain, the coal operators have insisted that, even if the 14 per cent advance stands, something must be done to enable them to meet it.

Briefs filed with the commission by representatives of public utilities corporations in the Middle West and East emphasize the point that the "general understanding" has been that the 14 per cent advance was to have been entirely absorbed by the operators, so that no rise in the price of coal, due to the increase in miners' wages, would fall upon the public.

George W. Elliott, of Washington, D. C., representing the National Committee on Gas and Electric Service, has stressed the point that if there is any increase in wages, resulting in a higher price in coal to utilities corporations, the public will have to pay for it.

In their arguments before the commission the public utilities representatives from New York, Boston, Philadelphia and Indianapolis have stated that investigation develops that the 14 per cent wage advance has been passed on to the public by the coal operators on contracts entered into before the strike, which began on Nov. 1.

These contracts carried a provision, he explained, that any increase in the cost of labor would be met by an increase in the price of coal. Approximately 85 per cent of the coal output since the 14 per cent advance went into effect, Mr. Elliott said, had been sold under these contracts, the price being increased to cover it. Only on the remaining 15 per cent of the coal consumed, he said, was the 14 per cent absorbed by the operators.

PALMER SAID CONTRACTS WERE INVIOLABLE

Attorney-General Palmer was quoted by Mr. Elliott as justifying the action of the coal operators in applying the 14 per cent advance on coal delivered under contracts entered into prior to Nov. 1. The Attorney General maintained that the matter of putting the 14 per cent advance on the contract price of coal was entirely between the contracting parties.

Chairman Robinson has indicated that the question of how the 14 per cent ought to be applied is seriously engaging the commission, and that it will endeavor to arrive at some adjustment that will be satisfactory. The problem of the inability of coal operators to get an adequate supply of cars by which coal can be run to the markets has become another serious point of inquiry by the commission. Failure of the operators to get enough cars to ship coal has been argued by the operators as being one of the potent factors in the high cost of production of coal. While obliged to run the mines and keep up with the public demand for coal, the operators have pointed out that this necessitates keeping heavy forces at work, and large quantities of coal have been banked up at the mines with no way to get it to the public.

HOW CAR SHORTAGE HAS HELD DOWN OUTPUT

Through figures submitted by operators representing the Central Competitive field, which embraces two-thirds of the bituminous industry, it has been shown that the full time output of the mines has suffered greatly on account of car shortage. The percentage of output of coal that could not be sent to the market because of this car shortage was shown before the commission last week, as follows:

District	Per Cent
Western Pennsylvania	24.7
Ohio, Southern Field	32
Pittsburgh, No. 8	38.2
Illinois	26.8
Indiana	25.7

The average of output lost on account of car shortage since the week of Jan. 17 has greatly increased, the operators have shown, in the different fields. Chairman Robinson has asked for complete figures as to the effect of the car shortage upon the output of the mines and upon the irregularity of employment of the miners. In this connection Mr. Robinson has asked representatives of the public utilities corporations to submit their opinion on a proposal for storing coal during the summer months, so that it may be available during the periods when there is the heaviest demand.

Ohio Mine Workers Complain That Commodity Prices Are Too High

Flagrant profiteering is alleged by the coal miners of Belmont County, Ohio, who meet Prosecuting-Attorney William Dixon during the last week of the month when they will present their claims to him. Miners declare they will appeal their case to Governor Cox of Ohio in case the proscuting attorney fails to act. The Belmont miners state they have been investigating prices for some time and that their investigations show they are being gouged and that advantage is being taken of them because they are unable to buy in the larger markets.

Congress Urged to Enact Legislation Making Labor Contracts Legal

Miners' Contracts Are Mere "Scraps of Paper"—Figures Presented Showing Losses Due to Violation of Wage Agreements

The President's Bituminous Coal Commission was strongly urged on Feb. 28 by the operators of the Central Competitive Field to recommend to Congress the enactment of legislation which will make organizations of employees which enter into contracts of employment with employers legally responsible for the fulfillment of their agreements.

During the hearings before the commission the operators testified that the miners had shown an utter disregard for their contracts, so as to render them mere "scraps of paper." In spite of "strike-proof" contracts the number of strikes foisted upon the coal industry during 1918 and 1919 ranged from 102 to 140 in various states affected.

HIGH COST OF FREQUENT STRIKING

Violations of the so-called Washington wage agreement of 1917, the operators have shown, resulted in losses in the production of coal running up into hundreds of thousands of tons, besides the heavy losses in wages to the men who went out on strike contrary to the contracts made by their official organizations. The loss in wages during the period of the recent strike alone, it is shown, approximated $100,000,000.

In briefs filed before the commission, the operators urge that the "future well-being of the coal industry and its usefulness to the American public" depend primarily upon the observance of contracts by the miners. For this reason, they say, they have formally asked the commission to give the matter consideration in its final adjustment of the controversy.

Amazing figures as to the number of strikes in violation of explicit contract have been put on record before the commission. The disregard of the mine workers' organization for these contracts impelled Philip H. Penna, of the Indiana operators, to tell the commission that, although he had been an advocate of collective bargaining, he would break with the unions and run non-union mines if he were able to do so. Mr. Penna spoke of the operators as having "no redress" against mine unions violating their contracts and urged that the matter was of sufficient gravity for Congress to take up.

A FEW OF THE MINERS' SELF-INFLICTED LOSSES

In the State of Indiana alone, during the year 1918, there were 140 strikes, a brief filed by the Indiana operators shows, resulting in a loss of 248,534 tons of coal which otherwise could have been produced. In 1919, the number of strikes was 105, with a loss in days of 318 and in tonnage of 291,535. These strikes cost the miners in wages over $640,000.

C. E. Maurer, an Ohio operator, has informed the commission that in the district of eastern Ohio there have been 102 strikes since the Washington agreement went into effect, involving 70 mines. This does not include the general strike of last November. The number of days lost by the men in these 102 strikes was 258 and the tonnage lost by these strikes was 329,700. In southern Ohio during the year 1919 the total hours' loss by reason of strikes was 20,088, while the tonnage loss was 109,207. Including the November strike, the loss in coal production for Ohio since April 1, 1917, Mr. Maurer has shown, was 2,687,132 tons.

The extent to which contracts have been violated in Illinois during 1918 and 1919 is shown in a brief filed by Dr. F. C. Honnold. In 1918 thirty-five mines of the Coal Operators' Association, Districts 5 and 9 were affected by strikes for 130 days; two mines of the Central Illinois Association had strikes for 8 days, and forty-four mines of the Illinois Coal Operators' Association encountered strikes for 79 days. The aggregate number of days lost by the men on strike in the three fields was 60,175.

During the first ten months of 1919 seventy-six mines in one district of Illinois, fourteen in another, and twenty-three mines in a third district had to struggle with strikes called contrary to agreements, with a consequent loss in days for all men out of 431,481. The general strike which began in November caused 35 days of idleness in the Illinois mines, stated Dr. Honnold, and was equivalent to 3,150,000 men being idle one day.

While mine workers' representatives before the Coal Commission have urged that what is known as the automatic penalty clause (or the docking clause—for failure of the mine workers to keep their agreements) be abolished, the operators, in their brief, say that it forms the only slight safeguard that now exists. The operators urge that, if anything, it be made even more stringent.

WANTED: AN UNBREAKABLE WAGE CONTRACT

"There is nothing that this commission can do of so much importance to the coal industry, present and future," says Mr. Penna in his argument, "as to make a contract that is a contract, a contract that the willingly disposed will respect and that other people will be compelled to respect."

Ralph Crews, of New York, attorney for the operators, in an argument before the commission, has pointed out that the so-called "check-off" system—which was originated at the instance of the miners' representatives and under which the operators deduct from the miners' pay envelopes an assessment that is sent on to the United Mine Workers of America—has utterly failed of the purpose for which it was intended—to enforce contracts. The operators ask that this system, through which the miners pay an aggregate of approximately $2,000,000 a year into the United Mine Workers of America coffers, out of their weekly wage, be abolished, as one of the acts of the commission.

The operators have seriously urged upon the commission that, if something is not done toward making contracts enforceable, the work of the commission, no matter what its verdict, is likely to come to naught, with nothing accomplished toward stabilizing the bituminous-coal industry. If any new contract that may be made, they point out, is to be broken at the whim of the unions, the operators will be at the "mercy of the miners," with disastrous results to the industry and a consequent disruption of coal supply to the consumer.

New River Miners No Longer Feel They Have A Grievance

The most important action taken by the miners of District 29, United Mine Workers, in their recent second annual convention at Beckley was a revision of the constitution for the district, by which it was hoped that it might be made a more workable instrument. The constitution was almost completely rewritten. The new constitution makes provision for a district-board membership of six instead of seven members, all to be selected through a popular vote. Under the old constitution two board members were elected at conventions and the balance by a popular vote. Hereafter, also, under the new constitution the biennial convention will be held on the second Tuesday in October instead of on the second Tuesday of February.

Though representatives of District 29 appeared before the U. S. Bituminous Coal Commission at Washington during the sessions of the biennial convention of District 29, they had no grievance to present in view of the recent restoration by the operators of the contract of Sept. 1 with its check-off feature. It was stated during the sessions of the convention that the relations between the miners and operators of District 29 are now on a satisfactory basis.

The contract of Sept. 1 now in force in District 29 provides that any increase which shall become effective in the Central Competitive field shall also automatically become effective in District 29. Consequently miners in District 29 are anxiously awaiting a report of the U. S. Coal Commission's findings.

What Miners and Operators Claim Bituminous Coal Commission Should Rule

President Lewis of the United Mine Workers, in summing up his final argument before the Commission, made the following points:

"1. All wage increases which the miner has received during the war period, including the 14 per cent increase fixed in the Indianapolis agreement, do not equal the increase in the cost of living, and the present wage of the miners is even more inadequate than the pre-war wage.

"2. The miners did not receive an adequate wage prior to the war and an increase proportionate to the increased cost of living would not place them on a just economic basis today.

"3. Increases of miners' wages have not kept pace with increases in other industries.

"4. The miners are entitled to a living wage, the principle that was enunciated by the National War Labor Board, proclaimed by President Wilson and affirmed by the laborers' guarantees of the Peace Treaty, a principle that is fundamentally just and that is universally sanctioned, not only by the enlightened opinion of our own country but by the civilized world.

"5. Regularity and continuity of employment constitute an economic right of the miners. A practical application of that principle can be secured by a shortening of the work day.

"6. Punitive overtime wage rates will tend to a more strict observance of the standard work day and the opportunity for more uniform employment.

"7. Increases in the cost of coal to the consumer have not been due to increased labor cost growing out of wage advances allowed to miners, but have been caused by excessive profits demanded and taken by the operators, and by the wholesale and by the retail coal dealers.

"8. Earnings and profits of the operators have been grossly out of proportion to the increased cost of production and the operators have not absorbed the 14 per cent wage increase fixed in the Indianapolis agreement but instead have passed it on to the public.

"9. Earnings of mine workers have been overstated and misrepresented by operators by citing exceptional cases."

LEWIS SAYS COAL HAS BEEN SOLD TOO CHEAP

Mr. Lewis was assisted in his summing up by Secretary Green of the United Mine Workers. One of the points made by Mr. Green was expressed as follows:

"The trouble has been, in the mining of bituminous coal, that everyone, even the operators themselves, have regarded it as a cheap industry. They have felt that they must produce coal at such a ridiculously low figure and sell it at such a ridiculously low figure, so that the mines could be kept in operation. The selling price of coal now runs from $2.35@$2.45. In my judgment the American public and the coal-consuming public must be educated to the fact that this is a very small price for bituminous coal at the mine and that in all probability as the years go by in order to conserve the coal supply the selling price of coal will increase.

"The checkoffs, the installation of time clocks, and other like innovations would disturb the mining industry more than anything else. There are traditions that have grown up with the industry. There are rules and customs. If you attempt to change them you are introducing chaos, a condition which tends to lower production. It would be the same as to attempt to make an Irish Catholic embrace the Hebrew faith."

Mr. Guthrie, for the operators, introduced as a part of the record a statement showing savings and bank deposits in 28 mining towns. The statement, he held, reflects the financial condition of the community in which they are located. In referring to the claims of the miners as to the unhealthful character of their occupation, Mr. Guthrie said: "I heard Secretary Wilson say that he had swung a pick in a coal mine for 23 years. I am surprised that the mine workers do not use him as an illustration of the serious effect which it has on the physical condition of a man. I never have seen a more rugged, intellectual, vigorous man than Secretary Wilson."

A portion of the summing up for the operators was done by P. H. Penna. "I do not stand before this commission as any special pleader for the coal operators. I appear before you as a pleader for the coal industry of this nation, especially that of the Central Competitive Field.

"Regularity of employment is not a guaranteed right, and there can be no reason urged why the concession of such a right to the mine workers could not be advanced as a reason for granting the same to any other class of people in America, which is to claim that we are all entitled to regular employment whether the people require our product or not. We cannot make the mines run steadily, for the American people are going to have their fuel supply and have it when they want it.

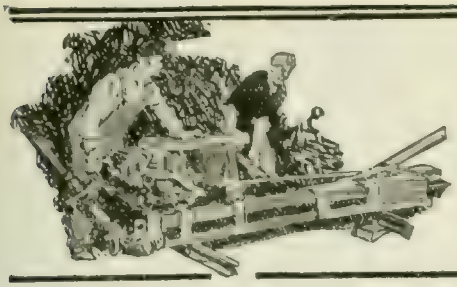
"Reducing the hours of labor is not going to change our occupation from a seasonal one to a regular and persistent one. If that reduction be effected and we continue to meet the wants of the people, it does not mean the elimination of the seasonal feature of our industry. It means more mines, larger investments, more men, and it means nothing else. Hence our output will be produced at a higher cost. The last analysis of the mine workers' demand is more money for less work. During January there were 21 strikes in 85 mines. Think of it, in the face of a contract that is strike-proof. In the part of December that we worked there were 18 strikes with a contract that is strike-proof. The mine workers have become special pleaders for the violation of contracts. I hope that this commission, if it does nothing else, will make contracts enforceable, force the parties to the contract to respect it. If any good has developed from the relationship which is known as 'collective bargaining' it is due to the fact that there was a period when contracts were sacred."

Ralph Crews made the principal summing-up speech on behalf of the operators, the following being the high lights in his discourse:

"Mr. Lewis states that the average earnings of the members of the United Mine Workers of America for a five-year period is some eight hundred odd dollars. This commission, I think, is interested in the average only to the extent that the average fairly and truly typifies the industrious miner. Mr. Lewis' figure is unimportant if that average to a material degree is affected by the presence on the payroll of men who for any reason, other than certain definite ones, do not work whenever the opportunity presents itself.

"The mine workers' organization can justify itself if it will get back to the men at the mines the realization of the fact that because there is work to do today there is no certainty that they will have work next week. If, to the best of their normal ability, they will do today's work utilizing the opportunity for labor as it presents itself, as men do in other industries, as men who succeed have done from the beginning of time, a suitable living can be secured."

S. D. Warriner, of the Anthracite Board of Conciliation, informs us that on March 9 the wage conference between anthracite operators and mine workers will take place at the Hotel Pennsylvania. The conference will decide on a scale to become operative on April 1. It may be recalled that on Aug. 22, 1919, the Tridistrict Convention called for a two-year contract, 60-per cent wage increase, a uniform wage scale, 6-hour day bank to bank, five-day week, time and a half for overtime, double time for Sunday, closed shop, payment for all work incidental to mining, employment while awaiting supplies, elimination of dockage and other concessions.



COAL AND COKE NEWS

What Happened in January

[The bracketed figures in the text refer to the number and the page of the volume in which references to the matter noted may be found and should the reader desire further information he can obtain it in the place indicated.]

Jan. 1—The Tennessee Coal, Iron & R.R. Co. does not renew contract with The Semet-Solvay Byproduct Co., at Ensley, Ala., when contract expires today [XVII, 69]—The G. B. Markle Co., of Jeddo, Pa., discontinues work at Highland No. 5, Jeddo No. 4 and Ebervale mines, while negotiating with Union Improvement Co., of Philadelphia, Pa., for renewal of lease [XVII, 153].

Jan. 3—The State Mining Board of Arkansas upholds Governor C. H. Brough in discharging T. H. Shaw as State Mine Inspector [XVII, 155].

Jan. 5—Thomas Lilley, millionaire coal operator, dies at his home in West Brownsville, Pa., aged 72 years [XVII, 155]—The Fayette County Mining Institute organizes at Mt. Hope, W. Va. Temporary officers are elected [XVII, 203]—E. Fred Wood, vice president International Nickel Co., dies suddenly in New York City [XVII, 292]—The American Expeditionary Force in France passes into history at midnight.

Jan. 6—J. C. Thomas, wealthy coal operator of Bramwell, W. Va., dies at his winter home at Miami, Fla. [XVII, 155]—By vote of 1,639 to 221 the convention of United Mine Workers of America at Columbus, Ohio, endorses the action of the officials of the union in agreeing to President Wilson's settlement of the strike.

Jan. 7—J. H. Wheelwright dies in Paris, France. One-page account of his life is given [XVII, 232]—W. P. Yeatman, coal operator of the Birmingham, Ala., district, dies at his home in Birmingham, Ala. [XVII, 203].

Jan. 12—President Wilson's Coal Commission begins its hearings at its headquarters in Washington, D. C., with Henry M. Robinson, representing the public, as chairman; executive secretary, M. H. Shenton; technical advisor, S. A. Taylor; counsel, A. C. King; director of publicity, K. C. Adams.

Jan. 14—The Federal Trade Commission's report on the cost of producing anthracite coal is made public [XVII, 279].

Jan. 15—J. C. Norwood's resignation is effective today as state mine inspector. He returns to University of Kentucky as head of the Department of Mines and Metallurgy [XVII, 30]—Smokeless Coal Operators' Association of West Virginia holds important meeting at Bellevue-Stratford Hotel in Philadelphia, Pa., regarding car supply [XVII, 203].

Jan. 19—T. W. Guthrie reviews history of miners' lamps before the President's Coal Commission at Washington, D. C. [XVII, 234]—The operators of the Central Competitive field reply to the demands of the miners, before the President's Coal Commission.

Jan. 20—Frank Farrington testifies regarding clean coal before the President's Coal Commission at Washington, D. C. [XVII, 235].

Jan. 23—The U. S. Senate adopts amendment to Kenyon Americanization bill requiring aliens and citizens alike between 16 and 21 years of age who are illiterate to attend classes of instruction 200 hours yearly.

Jan. 24—All miners at mines of the New River Co., in southern West Virginia strike for "check-off" system establishment [XVII, 277].

Jan. 26—Four hundred Kansas miners go on strike because of the passage of the Industrial Court bill [XVII, 236]—Thomas F. Holmes, general superintendent of the Chicago Wilmington & Franklin Coal Co., of Illinois, dies at Springfield, Ill. [XVII, 314].

Jan. 27—Don Rose represents the operators of the Freeport district of Pennsylvania before the President's Coal Commission [XVII, 275]—The President's Coal Commission reaches important part of its deliberations; considers statistical data [XVII, 276].

Jan. 27 and 28—Voluminous statistical material is presented to the President's Coal Commission. Van Bittner makes extended argument in connection with this data [XVII, 277].

Jan. 28—Officials of the United Mine Workers of America announce that conferences with anthracite operators will probably start on Feb. 15 regarding new agreement [XVII, 277].

Jan. 30—John L. Lewis, acting president of the United Mine Workers of America, takes personal charge of the movement to unionize southern West Virginia [XVII, 317].

Indiana, Pa.

New office building at Indiana for Clearfield Bituminous Coal Corporation. To discontinue offices, at Clearfield and Clymer. Details of new building. Prominence of the Clearfield corporation. Properties noted.

On April 1 the Clearfield Bituminous Coal Corporation will move into its new office building at the corner of Eighth and Water Sts., Indiana, Pa., which will contain the general offices of the company. The offices and office employees at Clearfield, Pa., and Clymer, Pa., will be moved to Indiana and the offices at these two places discontinued.

The new office building is a two-story structure of brick and stone and represents an expenditure of $80,000. On the first floor will be the offices of General Manager H. B. Douglass; General Superintendent H. J. Hinterleitner; also offices for the general purchasing agent, the superintendent of materials and supplies, two offices for private secretaries, two rooms to be occupied by the auditing department and a large pay-roll office. On the second floor are the offices of Chief Engineer Fred K. Prosser; also offices of the manager of the real estate department, the manager of the forestry department, as well as a large draughting room, which is lighted from overhead by skylights, and a modern blue-print room.

The architects of this building were Howard & Hatchin, of DuBois, Pa. The building contractors were John W. Cowper & Co., of Buffalo, N. Y. The building is to be heated by a steam plant installed by E. W. Webster & Co., of DuBois, Pa.

The Clearfield Bituminous Coal Corporation is one of the largest producing companies of central Pennsylvania, owning about 200,000 acres of coal land in Indiana, Cambria and Clearfield counties. The company operates large mines at Rossiter, Spangler, Clymer, Dixonville, Peale and Commodore. The Commodore operation is in the course of construction and when completed will be one of the most modern mines in the country.

The company has purchased several houses and lots in Indiana and will make every effort to accommodate all its men in its own properties. The new office building is a valuable addition to the many beautiful buildings in Indiana. It is planned to furnish the basement as a club room for the office employees within the next year.

Charleston, W. Va.

Mines on Chesapeake & Ohio operate less than three days out of six. No early improvement expected. Few cars being returned from western centers. Operators believe cars are held at certain points loaded with coal. Serious operating conditions in New River field. Kanawha coal diverted for use on Pennsylvania R.R. Ban on exports.

Limited production of coal again followed in the wake of a car shortage along the line of the Chesapeake & Ohio R.R. in this part of the state, in the weekly period ended on the twenty-first. The inability of the Chesapeake & Ohio to furnish cars cost mines in this section fully 50 per cent of potential capacity. The daily average in cars available to all mines on the system was only 1,300 cars, which as may be imagined, did not go very far toward keeping mines supplied with enough cars to continue in operation.

Owing to poor transportation facilities most mines were being operated less than three days out of six. No improvement in car supply is counted upon by railroad officials, who claim that weather conditions have not been such as to insure the return of any greater number of cars from western centers. There continues to be a strong belief among operators in this section, that coal cars are being purposely held at certain points loaded with coal. Exports from certain fields in this area are still shut off. It is claimed that if tidewater shipments were larger the short haul would insure a better car supply. Confiscation of coal from this section continues, and what producers are unable to understand, is why such coal should be seized for the Pennsylvania R.R., when that line has sources of supply nearer home. Such a policy has aroused indignation.

New River Operates at a Loss

Insight into the adverse conditions, under which mines of the New River field were laboring, throughout the third week of the month, may be gained when it is stated that during the latter half of the week, the average daily production of all the mines in the New River field on the Chesapeake & Ohio was just a little above 12,000 tons a day. The limited car supply was still holding mines back to about 50 per cent production. Few of the mines in the field were operated so much as half the week.

It is said that the general idleness, resulting from the miserable car supply has been the leading factor in making it hardly possible for most mining companies to meet expenses. In fact it is stated that many of them have been operating at a loss since January first; the strike, Government control, and then a car shortage, all knocking the props out from under production, have deprived operating companies of any chance of realizing any return on their investment in recent months. While New River tonnage for bunkering continues to move in fairly large quantities, the permit system is still restricting export shipments to a great extent from the New River field. The epidemic of influenza in the field is now rapidly abating.

Kanawha Works Half Time

While Kanawha mines found a fairly adequate supply of cars awaiting them, at the beginning of the third week of the month, being able to load 25,000 tons on the sixteenth, cars were decidedly scarce during the remainder of the week, growing less and less in number as the week grew older. Unable to secure cars, mines were forced to shut down, the average working time at most mines being about three days (or even less) out of the six. No factor other than railroad disability was responsible for a production for the field as a whole amounting to about 50 per cent of potential capacity. Even the tonnage which was produced was failing to reach the destination to which it was consigned, because the Railroad Administration was helping itself liberally to the Kanawha product, in order to furnish coal for the Pennsylvania R.R., and the very best grades at that. Kanawha coal is still under the ban as far as export shipments are concerned. Steam and gas coal from this field are at a premium.

Bluefield, W. Va.

Average car supply for the week under 45 per cent in southern West Virginia. Hundreds of idle cars standing empty on side-tracks. West Virginia coal still diverted for Pennsylvania R.R. use. Winding Gulf feels influenza and scarcity of cars. Tug River output reaches low-water mark. Pocahontas production on down grade.

Coal companies in southern West Virginia in the third week of February suffered acutely from the lack of anything like a proper supply of equipment for loading. This period, taking the southern part of the state as a whole, was worse from a production standpoint than any other week in the month, conditions closely resembling those prevailing about the middle of January when loadings sank to such a low level. The average car supply for the week was believed to be under 45 per cent; over that mark in some fields and in others considerable under it. The effect of such a car scarcity was to materially cripple operations. Some railroads in fact were able to furnish only enough cars to keep the mines going for two days out of the week.

Southern West Virginia operators declare, from personal observation, that there are hundreds of empty cars standing idle on side-tracks west of the Ohio River. If such cars had been side-tracked for repairs, little repair work was being done on them. Operators generally strongly condemn the Railroad Administration for permitting such cars to remain idle when there is such a crying need for them.

To add to other troubles, experienced by operators in the southern part of the state, the Railroad Administration still persisted in its course of permitting confiscation and diversion of high-volatile coal for the use of the Pennsylvania R.R. hundreds of miles away. A vigorous protest was made to Washington, it was understood, against the seizure of coal for a road with bituminous coal available on its own line.

Winding Gulf Yard Crews and Miners Being Laid Off

The car supply in the Winding Gulf region, for the week ended the twenty-first, was almost a complete failure. Mines dependent upon the Virginian Ry. for a car supply, were forced into idleness during four days out of the six. In fact cars had become so scarce that yard crews were without work and miners were also being laid off at many plants while several operations had to suspend altogether owing to the prevalence of influenza and the scarcity of cars. Railroad trainmen, commenting on the condition of rolling stock, censure the Railroad Administration for its failure to see that the rolling stock on various railroads was kept up. That transportation conditions on the Chesapeake & Ohio, in the Winding Gulf field, were little better than those on the Virginian, was shown by the fact that mines were able to work only about three days out of the six during the third week of February

Tug River Output on Down Grade

In the Tug River region, for the week ended the twenty-first, mines were able to load only 58,000 tons of coal, production dwindling almost to the low-water mark of Jan. 15. Throughout the week production was on the down grade, only 46 cars in the entire region being available for loading on the last day of the week, the twenty-first.

Report is made by several Tug River operators of a large number of empty cars standing in idleness on sidings west of Columbus. One operator, while going west from Columbus recently on the Pennsylvania R.R., observed several hundred empty coal cars along the side-tracks for [illegible] west of Columbus. [illegible] assumed that most of the empty cars observed were side-tracked for repairs, yet only two repairmen were seen at work. Such a condition of affairs is [illegible] West Virginia operators [illegible] being [illegible] for the present [illegible]. It is taken for granted that what is true as to [illegible] is also true as to [illegible]

Production in the Pocahontas region was decidedly on the down grade during the [illegible] of the month [illegible] about 45 [illegible] sufficient to keep them busy only about three full days. Not only the car shortage but [illegible] on [illegible] Bluefield [illegible] for the Pennsylvania, contributed to the rather gloomy outlook. Incessant rains and snow storms had resulted during the week in high water, which was affecting operations (such as they were) to some extent. While much Pocahontas coal was going to tidewater, the permit system interposed a barrier between the mines and large foreign shipments; although a heavier demand than ever was said by operators to exist both in foreign and domestic markets, for Pocahontas coal.

Huntington, W. Va.

Logan production 40 per cent of capacity. Miners work on holidays with cars available. Influenza does not interfere with output. Tonnage gain on Chesapeake & Ohio lines.

With two hundred cars less in the field during the week ended Feb. 21, production slumped in the Logan field, amounting (it is estimated) to about 162,000 tons, as against 172,000 tons during the previous week. Conversely, there was an increase in the railroad-disability loss which was not far from 250,000 tons. In other words, nearly 60 per cent of the potential production of all the mines in the Guyan field was being lost, merely because of the inability of the mines to secure cars, production being little more than 40 per cent. Neither labor loss, mine-disability loss nor all other losses combined amounted to much more than one per cent. Insufficient motive power, during the third week of the month, interfered to some extent even with such shipments as it was possible to make to tidewater, and it was feared that congestion, as a result of such a power shortage, might result in an embargo.

All the mines in the field had a supply of cars on the twenty-third or at the beginning of the fourth week of the month, and consequently production was speeded up as much as possible on that date, even though it was a holiday, in order to take advantage of the empties furnished. As a matter of fact, Logan miners are paying little heed to holidays now, in their anxiety to earn as much as possible, since a full day's work is seldom possible under present transportation conditions.

There are still a good many cases of influenza among the miners of the district, but the epidemic is not so prevalent as to interfere with production.

While there was a gain in the total tonnage of coal transported by the Chesapeake & Ohio during the week ended Feb. 21, the gain was quite slight, amounting to only 190 cars or to about 9,500 tons In the third week of February, the road handled a total of 10,215 cars of coal or approximately 510,750 tons, as against 10,025 cars or about 501,250 tons handled during the preceding week.

Fairmont, W. Va.

Worst car shortage in the history of northern West Virginia fields. About 25 per cent car supply. Each railroad collecting its own equipment before return to owners. Nearly all northern West Virginia coal going east. Miners insist on further increase in wages.

Never in the history of the Baltimore & Ohio R.R., nor in the history of the Fairmont and other northern West Virginia regions, was there a worse supply of cars than during the week ended Feb. 21. Not even during the severe winter of 1917-18, when there was a transportation breakdown in connection with adverse weather conditions, was the supply of empties so low as it was in northern West Virginia during the third week of the month. There were one or two days during that week, in fact, on some roads when the supply disappeared altogether.

During the greater part of the week there was not over a 25 per cent car supply, and about the middle of the week the supply had dwindled to about 13 per cent. Production was practically paralyzed Most of the mines in the northern part of the state were idle probably about two-thirds of the week, few if any mines being able to work as much as two full days. Mines fortunate enough to secure any cars at all received a supply so far below requirements that such a supply only lasted a few hours.

The third week of February ranked as probably the least productive in the history of the field. As showing how scarce cars were in some parts of northern West Virginia during the week, mines on the Monongahela R.R. on the seventeenth and twentieth were without any cars at all, and no coal trains were operated on those days

As every road is bent upon collecting its own equipment, to the greatest extent possible, before the return of railroads, and as the Baltimore & Ohio road is sending more equipment off its line than it is receiving, therefore officials of the road fear an even larger deficiency in the car supply. Instead of any relief from the car shortage being in sight, there is a prospect of even worse shortages than have been witnessed in recent weeks.

Confiscation is still frequent in northern West Virginia and no class of coal shipment appears to be immune from the long arm of the roads, coal being seized when and where the railroads see fit to take it.

Little or no coal is being shipped to Curtis Bay and on the twenty-first an embargo on shipments both to St. George and to Arlington piers became effective, the embargo covering the period ending on the twenty-fourth While nearly all the tonnage from northern West Virginia is being transported to the East, yet a small proportion was still being consigned to Ohio and Michigan points during the week ending the twenty-first.

Work has become so scarce in northern West Virginia mines, as a result of the car shortage, that miners are more insistent than ever for further increases in pay, to bridge them over such periods of dullness as are now being experienced in the northern part of the state.

Ashland, Ky.

Northeast Kentucky speeds up production. Output 53 per cent of capacity. Chesapeake & Ohio plants operate 3½ days in the week; Louisville & Nashville mines work only 2½ out of six. Car-allotment commission making mine-rating survey. Railroad confiscation of coal works hardship.

With more cars available on the Chesapeake & Ohio and its branch lines in northeast Kentucky, the mines in that field were able to speed up production somewhat during the third week of February; although in the field as a whole, only 53 per cent of potential capacity was realized in the output of coal, potential production for the period in question being (according to railroad figures) 235,000 tons. Even with conditions somewhat improved there was still a heavy production loss—112,545 tons or 47 per cent—all but about 3,000 tons of such loss (or 109,000 tons) being attributable to a shortage of cars.

Still, mines on the Chesapeake & Ohio and its lines were able to work about 3½ days during the week, a marked improvement over previous weeks; it being the third week of the year, in fact, in the northeast Kentucky territory. While Chesapeake & Ohio coal plants had a supply sufficient to keep the mines going fairly well for the period stated, on the other hand mines on the Louisville & Nashville were able to operate only about 2½ days, it being the first time in recent weeks that the Chesapeake & Ohio road has surpassed the Louisville & Nashville as regards car supply

Producers in the northeast field are still bending their energies toward securing an increased rating for mines in this territory; they believe they are entitled to this rating, owing to the extension of plants and the increased working forces available. While at first denied such an increase in rating, the Chesapeake & Ohio car-allotment commission is now making a special survey of conditions at various mines, to determine whether or not mines are entitled to an increased allotment over last year. The practice of deducting from the car supply at a time when cars are scarce for "overage," has been discontinued, it is reported, as a result of vigorous protests filed with the Railroad Administration.

Confiscation of coal produced in the northeast Kentucky territory, for the use of the Chesapeake & Ohio, is being continued at great inconvenience to producer and consignees, preventing an uninterrupted flow of coal to industries greatly in need of coal at this time. Owing to the restricted car supply, northeast Kentucky mines still found it impossible, during the week ended the twenty-first, to supply all the coal for which there was such a stiff demand, all grades being included in the demand.

Norton, Va.

During car shortage, Virginia mines coke or store 30 per cent of output. Influenza beginning to affect production

While production in the southwestern Virginia fields was increased about 2,000 tons during the week ended the twenty-first, as compared with the previous week, yet on the other hand production losses were heavier, reaching 67,000 tons, or 15,000 tons in excess of losses for the week ended the fourteenth. All but about one per cent of the losses were attributable entirely to car shortage.

There would have been a much heavier production loss, in fact, if the mines had depended upon a car supply in order to get out coal. Indeed, it is estimated that if the mines had waited for empties, the production loss would have shot upward to 60 per cent of capacity. Instead of depending upon the car supply, 30 per cent of the product of the various mines was either placed in coke ovens or stored.

Although several months have elapsed since the strike ended, Virginia operators have more than $100,000 outstanding, due them for coal diverted during the strike, and a good deal of trouble is being experienced in reducing the amount still in arrears.

The prevalence of influenza in the Virginia fields was beginning to affect production somewhat during the third week of the month. There were, at the end of that week, 3,000 cases of influenza in the field. The death rate, however, was not over one per cent.

Benton, Ill.

Interest in Hamilton County developments. Prominent coal concern contracts to drill very large territory in near future. To take over big acreage on satisfactory test.

Much interest is being shown in the developments now going on in Hamilton County of this state, where options have recently been taken on quite a large acreage of coal land. No serious effort has ever been made to determine the amount and quality of coal in Hamilton County, although it is almost surrounded by some of the biggest producing counties in the southern Illinois field.

H. M. Rea, a well known capitalist of Franklin County, who has done much toward securing the development of the coal industry in that section, is said to have recently closed a contract in Chicago with one of the largest coal interests in the country, by which the prospective purchaser has contracted to drill out practically the entire southern half of Hamilton County.

Drilling is to begin in this section as quickly as outfits can be placed on the ground, and will continue until a thorough test has been made. The prospective purchaser wants to buy quite a large coal acreage, and therefore intends spending a large sum so as to know positively what thickness and quality of coal underlies this territory. If the quality of the coal and the thickness of the seam are satisfactory, the company is said to have contracted to purchase not less than 25,000 acres, and will probably take over a much larger acreage.

As evidence of good faith and a guarantee that it will drill at once, the operating company has deposited $10,000 in one of the McLeansboro banks. Under the terms [illegible] the contract the company must begin drilling at once, but it has until the first of next year to take up the options.

Victoria, B. C.

Settlers' Rights Act disallowed. Conflicts with terms of Order-in-Council. Controversy of importance to British Columbia coal-mining industry. Cassidy collieries in litigation. Recent Order-in-Council decides public domain taken must be promptly developed.

The Settlers' Rights Act of 1919, passed by the Legislative Assembly early in that year, and which did not receive the signature of the Lieutenant-Governor pending advice from the Ottawa authorities, has been disallowed by the Dominion Government. The position taken by the Federal authorities is that the legislation is in conflict with the terms of the Order-in-Council, under which the Settlers' Rights Act of 1917 was vetoed. It is considered likely that the provincial Government will ask the Legislature to re-enact the measure, its stand being that nothing is proposed under its authority that is not well within provincial administrative rights.

To those interested in the coal-mining industry in British Columbia, the issue of this controversy is of importance. The Act of 1917, which was not disallowed before a number of Provincial Licenses had been issued, is responsible for the opening of the Cassidy collieries of the Granby Consolidated Mining, Smelting & Power Co., Ltd. These licenses, under which the Granby company is operating on Vancouver Island, now are the subject of litigation. The Settlers' Rights Act of 1919 extended the period, in which pioneer settlers within the Esquimalt & Nanaimo Ry. belt, or the descendants or legal heirs of old-time settlers, could obtain title to the coal rights within the area of their realty holdings.

The Government of British Columbia has passed an Order-in-Council reserving for the people all the unalienated coal lands within the province. This means that hereafter staking under the Coal and Petroleum Act is forbidden. Hon. T. D. Pattullo, Minister of Lands, explains that it is the definite policy of the Government to put an end to alienation in respect to coal lands as already there are coal-bearing areas, to which Crown Grants have been issued, which are being held out of production merely for speculation. He adds that it is proposed that use is to be the basis of all British Columbia alienation policies. This is taken to mean, in the case of coal for instance, that no part of the public domain may be taken up by individuals or corporations, unless satisfactory guarantees are forthcoming, that it is their intenion to take immediate steps to make it productive.

PENNSYLVANIA

Anthracite

Scranton—Building operations to reconstruct the Manville breaker of the Hudson Coal Co., at this place, have just been begun. The Manville has been idle about four years and during that time all of the former machinery has been removed and shipped to different points. It was at that time decided to run the coal from the Manville through the Dickson shaft to the Von Storch breaker for preparation, but since the recent sale of the Von Storch to the Acker-Conklin interests, it has been found necessary to make other arrangements. The Manville will now be known as a "concentration plant," in which all coal from the Manville and Dickson collieries will be prepared for market. It will be entirely modern and although the exterior will not be materially altered the interior will be changed considerably to suit the requirements of new machinery. The building is to be strengthened throughout. The company, while utilizing the Von Storch breaker for preparing coal, has found it necessary at times to ship partly prepared coal to Carbondale for final preparation, but the re-opening of the Manville will relieve this necessity and extra cost of shipping. The Manville is the only Hudson company breaker in the Green Ridge section now, the nearest to it being the Marvine says the *Scranton Times.*

Bituminous

Pittsburgh—Work has begun on extensions to the mining laboratories of the Carnegie Institute of Technology, here, which when completed, it is said, will afford the school the most thorough equipment of its kind, in the country. The tentative plans approved include the additions of a laboratory for work and research, elements of mining machinery, electrical applications in mining, coal and ore dressing, mine models and practical demonstrations. Arrangements have been made by Mr. Steidle, professor of mining engineering at the institute, whereby the equipment, in the way of mining machinery, for the new laboratories will be furnished as a loan by some of the manufacturers of this type of machinery.

WEST VIRGINIA

Wheeling—The annual meeting of the stockholders of the Hanover Coal Co. was held at Bellaire recently. A board of directors was elected, which met and elected the former officers. The company has 1500 acres of coal land in Washington County, Pa., where it operates stripping mines. The company has an authorized capital stock of $500,000 and is one of the biggest stripping mine companies in the central field.

Bluefield—Virtually every company in the Pocahontas field was represented at the annual meeting of the Pocahontas Operators' Association held in this city on Feb. 21, the principal business at such meeting being the election of officers. All the officers were re-elected as follows: Isaac T. Mann, president; L. E. Tierney, vice president; Jairus Collins, treasurer; W. E. Koepler, secretary. President Mann was present and presided at the meeting. The president expects to announce the appointment of the various executive committees in a short time. Aside from the election of officers, only the usual routine business was transacted although transportation problems as well as the payment for coal confiscated came in for a share of discussion.

Although at one time an important industry in the Pocahontas field, the production of coke in that region is steadily on the decline, as shown by the figures covering the output for 1919 and the years immediately preceding. Only 493,503 tons of coke were shipped from the Pocahontas district in 1919, the shipments by months being as follows: January 98,858; February 68,803; March 54,160; April 33,368; May 29,902; June 22,238; July 18,876; August 32,061; September 33,29[illegible]; October 35,127; November 36,367; December 35,345. As there was a coke production of 1,272,707 tons in 1918, the 1919 production represented a 60 per cent decrease. Going back to 1917, there was then a production of 1,495,329 and in 1916 the coke shipments aggregated 1,355,646 tons. However, there appears to have been a steady decrease in coke production in the Pocahontas region ever since 1910 when 2,084,023 tons were produced.

Within a few years it is believed that little or no coke at all will be produced in the Pocahontas field, it being unprofitable to manufacture coke in that region because of the fact that the coal itself has become so valuable, although Pocahontas coke is of such a high quality as to command high prices. The bulk of the coke made in the region is produced by the United States Coal & Coke Co. and is used at western plants of the United States Steel Co.

OHIO

Toledo—The congestion at the Toledo gateway which has been holding up coal transportation for months was temporarily relieved recently by the movement of a number of cars into Michigan territory. Producers and shippers in Ohio and West Virginia began to feel better over the situation but soon afterward additional embargoes were announced and the situation is now as bad as ever. Because of influenza among train crews, wide distribution of cars during the suspension and cold weather, there is little hope for immediate improvement in the Toledo situation.

Columbus—Steps are being taken to put into effect the recently enacted law compelling all operators in the state to provide wash houses for their employes after April 1. This law is receiving the support of operators generally, and already many have started to erect such facilities. In many cases the larger operators will provide shower baths for their men in large permanent buildings. Many of the houses will be put into service previous to the first of April.

One of the largest coal deals in central Ohio, which has taken place for some time, was consummated recently when all of the properties, which have been controlled by H. H. Heiner and George H. Barker of the Maynard Coal Co., of Columbus, were merged under that name. The properties consist of three large mines in the Pomeroy district and one in the Jackson district operated by the Maynard Coal Co.; also three large mines in eastern Kentucky operated by the Daniel Boone Coal Co. and the Superior Coal & Dock Co., of Duluth. The authorized capitalization of the company has been increased to $2,300,000. The reason for the merger is to secure more centralization in the management of the various properties.

INDIANA

Terre Haute—Mines in the Terre Haute district are working only three days on an average. In several cases of mines located on the Chicago, Terre Haute and Southeastern R.R., the car shortage has been most acute, many men not working more than one day a week for a number of weeks. The average weekly wage of those who have worked, it is said, is only $18. Eighty-one mines were reported closed one day recently on account of car shortage. The total average daily production of the closed mines is more than 60,000 tons. The shutdown represents a considerable loss to the miners in wages.

The coal mines in Indiana produced 19,327,795 tons of coal during 1919, which was about 10,000,000 tons less than in 1918. These figures have just been compiled by the Indiana Coal Trade Bureau. The miners worked 214,753.11 hours. The miners lost 31,501 hours because of car shortage; 13,206 hours because of labor troubles; 13,525 hours because of mine disability; and 1[illegible] hours because of "no market." The number of mines along the various railroads and the coal tonnage produced by them in 1919, respectively, follows: Big Four, five mines, 641,380 tons; Baltimore & Ohio Southwestern, three mines, 257,992 tons; Chicago & Eastern Illinois, 47 mines, 5,517,481 tons; Chicago, Indianapolis & Western, one mine, 57,510 tons; Central Indiana, three mines, 55,528 tons; Chicago, Terre Haute & Southeastern, 38 mines, 3,632,519 tons; Evansville & Indianapolis, 14 mines, 756,486 tons; Illinois Central, six mines, 447,136 tons; Monon, 21 mines, 1,518,353 tons; Pittsburgh, Cincinnati, Chicago & St. Louis, 42 mines, 5,163,633 tons; Southern, 20 mines, 1,078,628 tons; Evansville & Eastern, two mines, 44,137 tons. The mines reporting to the Coal Trade Bureau represent about 85 per cent of the total tonnage in Indiana.

ILLINOIS

Carlinville—The new tipple at the mine of the Carlinville Mining Co. has been erected and the mine is now able to supply all demands for coal. The mine did a prosperous business in 1919 and a good business is expected for 1920. The mine has been handicapped by poor roads to and from the mine but the owners of the mine hope to arouse enough public interest this year to correct this defect.

Benton—The car shortage continues to be serious in the entire southern Illinois field. However, those in active charge of operations at the mines state that railroad officials are holding out a promise of an early improvement. Mines in this region, since the first of the year, have not been averaging 50 per cent running time. There is still an undercurrent of dissatisfaction among the miners, but should the car supply improve sufficiently to permit of steady work, it would do much to quiet the unrest.

Hillsboro—A deed was filed at this place in Montgomery County, Illinois, recently, the consideration on which was $5,849,740.13. The deed was made by Geo. C. Van Tuyl to the Indiana & Illinois Coal Corporation, and it conveys the coal mines, coal properties, etc., formerly owned in Montgomery and other counties and known as the Peabody mines. At the time the transfer was made the properties were owned by the Chicago & Eastern Illinois R.R. The mines are located at Taylor Springs, Kortkamp, Witt and Nokomis, Illinois. The Illinois & Indiana Coal Corporation owns and operates ten mines and other coal properties will probably be added to the list of holdings, according to well founded rumors.

Springfield—The Illinois State Utilities Commission recently authorized a bond issue of $530,000 to be used in the construction of the Marion & Eastern R.R. from Marion to Harrisburg, or near that city. It will be a coal carrying road, and will open up the vast coal field in the eastern part of Williamson and western Saline counties for development. Some of the richest coal lands in southern Illinois are said to lie in the section which will be reached by this road. The Madison Bonding Co., of Chicago, has agreed to underwrite the bond issue, and representatives of the company were in the territory of the proposed route recently on a tour of inspection. It is not known just when actual building operations will start, but development will be pushed as rapidly as possible.

Duquoin—The Security Coal & Mining Co., of Chicago, operating the Security mine three miles south of here, has started the work of construction on a large rescreening plant. The work of putting in the foundations has been completed and it is expected that by April 1 the new plant will be in operation. All of the plans were made by engineers of the Link-Belt Co., of Chicago and all [illegible] screens and conveyors will be constructed under their supervision. Aside from the regular five sizes which the operation now produces, the new screening plant will add No.'s 1, 2, 3, 4 and 5 nut coal to the output. The total cost of the new plant will be in the neighborhood of from $[illegible] to $35,000.

The car proposition is most serious in [illegible] ply comes from the Illinois Central R.R. and for some reason the company seems [illegible] enough to give the mines even half running time. During the first week in February the Majestic and Security mines, two [illegible] At present [illegible] of the situation improving is held out.

Personals

D. S. Wolfe of Jeanesville, superintendent of the Lehigh Valley Coal Co.'s Lehigh division resigned to go with McTurk & Co., Girardville, Pa. No successor has been appointed.

A. S. Winter, formerly connected as advertising and sales manager for the William Powell Co., has joined the sales force of the Fairbanks Co., of Pittsburgh, Pa., and will represent them in southern Ohio.

T. O. Sloan, who has been with the Peabody Coal Co. for some time at mine No. 19, in Franklin County, Ill., has been made traveling auditor of the company with a territory comprising all of southern Illinois.

Scott Stewart, general manager of the W. J. Rainey company and vice president of the Rainey-Wood Coke Co. has been elected vice president and a member of the board of directors of the Matlack Coal & Iron Corporation.

John Lloyd has resigned from the position of efficiency engineer of the Lehigh Valley Coal Co., Wilkes-Barre, Pa., to accept the position of manager and efficiency engineer with the Perolin Co. of America, with headquarters in Wilkes-Barre.

Leslie W. Sydnor, who was formerly representative of the Eastern Coal & Export Corporation, has been appointed as assistant to E. J. Payne, president of the Lake & Export Corporation, which was recently organized at Huntington, Ill.

A. W. White, for the past several years superintendent of Greensburg No. 1 mine of the Keystone Coal & Coke Co., has been transferred to the Keystone shaft, Madison field, where he becomes superintendent of the Keystone shaft, Madison, Arona and Sewickley mines of that company.

J. F. MacFarland, for a number of years sales manager for the O'Gara coal properties, in the Harrisburg field of southern Illinois, has resigned from that company to accept a position as sales manager of the Indiana Coke & Gas Co., at Terre Haute, Ind. Mr. MacFarland is well known to the gas and coke trade in the Middle West.

J. C. Thompson, a mine inspector for the Consolidation Coal Co., was perhaps fatally injured recently when he fell while attempting to mount the steps of a slowly moving train at Murray to come to Fairmont, W. Va. He slipped and fell, sustaining a concussion of the brain, a broken leg and elbow, and serious injuries to his back. He is in the State hospital at Fairmont.

Robert Medill, formerly with the Peabody Coal Co., at Harrisburg, Ill., has been appointed to fill the vacancy of general superintendent at the large mine of the Union Colliery Co., at Dowell, Ill., known as the Kathleen mine. The vacancy was made late in January when Edward Bottomley resigned and went west to go with another company.

Fred Bateman, who for the past four years has been mine foreman at the Walston No. 3 mine of the Rochester & Pittsburgh Coal & Iron Co., has been transfered to the large Adrian mine of this company located at De Lancey, Pa., where he holds a similar position. The former mine foreman at the Adrian mine has been promoted to the position of superintendent of the Walston No. 3 mine, succeeding John Rudolph resigned.

Frank E. Pomeroy has been employed by the Chicage Coal Shippers' Association as field secretary. Mr. Pomeroy has spent practically all of his life in the coal business. He was born in southern Illinois, and was connected with Franklin County operations; leaving this field he went to Chicago and entered the sales end of the industry. Mr. Pomeroy has had selling experience in Indiana, Michigan, and throughout the Northwest, coming in contact with all of the different kinds of coal produced, and sold, in the Middle West

F. M. Nourse has joined the Charles L. Benjamin organization at Chicago. Mr. Nourse has been an engineer in the advertising department of the Cutler-Hammer Manufacturing Co., at Milwaukee, Wis., for the past two years and prior to that was associated with the Wisconsin Power, Light & Heat Co., at Portage, Wis. He is a University of Illinois graduate in electrical engineering. The Benjamin organization makes a specialty of trade and technical advertising, and Mr. Nourse's new duties will consist of preparing technical advertisements and literature for the company's clients.

G. P. Troutman, for six years assistant to the general manager of the G. B. Markle Co., resigned effective March 15. He goes to the Wentz allied companies as general superintendent.

Robert D. Tonkin, lumber and timber expert and formerly timber estimator for the Rochester & Pittsburgh Coal & Iron Co. and allied interests, has been made manager of the forestry department of the Clearfield Bituminous Coal Corporation, with headquarters at Indiana, Pa. This company owns 25,000 acres of surface lands, several thousand of which are timbered. It is the intention to plant several hundred acres of this land in new timber each year. Mr. Tonkin will have charge of all this work as well as looking after all the mine timber for the mines of this company in Indiana, Cambria, Clearfield and Center counties. He is also a member of the firm of Caldwell, Tonkin & Pealer of Indiana, Pa., mining engineers and valuation experts on mining and timber properties.

A. H. Fay, the mining engineer, who has been in charge of accident and certain other statistics for the Bureau of Mines, since the foundation of the bureau, has resigned to enter private employment. Mr. Fay is the author of numerous technical papers covering accidents in coal mines, metal mines, quarries, metallurgical plants and at coke ovens. For the past seven years he has prepared the material for the monthly bulletin of the Bureau of Mines on coal-mine fatalities.

Obituary

George F. Miller, a prominent coal man of Lewisburg, Pa., dropped dead while bowling in the Lewisburg American Legion club rooms recently. He was a graduate of the engineering school of Bucknell University. During the war he served in the Chemical division of the army. Mr. Miller was recently interested in a large coal deal in western Pennsylvania. He was 27 years of age and is survived by his widow.

Henry A. Porterfield, aged 56 years, after a few days' illness, died recently in the Duquesne Club, Pittsburgh, Pa. After graduating at Lehigh University in 1883 he practiced mining engineering in the coal regions near Wilkes-Barre, Pa. From there he entered the service of the Cambria Iron Co. Later he came with the Carnegie Steel Co., organizing the chemical department of the Edgar Thomson Steel Works. For many years he has been owner and manager of the Dexter Oil Co. He was a member of the Duquesne and Union clubs. Besides his widow, he leaves one brother, Howard H. Porterfield, of Foxburg, Pa., and two married sisters.

Trade Catalogs

Type B Portable Belt Conveyors. Portable Machinery Co., Passaic, N. J. Folder. Pp. 4, 6 x 9 in; illustrated. Describes and illustrates its use.

Crouse-Hinds Imperial Headlights, Arc and Incandescent. The Ohio Brass Co., Mansfield, Ohio. Pp. 15; 6 x 9 in.; not illustrated. Price list 206; applying to catalogues 201, 202, 202A, 203 and 205.

The Rise of Steel Pipe. The National Tube Co., Pittsburgh, Pa. Bulletin 24A. pp. 7; 8½ x 11 in.; illustrated. Statistical data noting comparisons in the production of wrought and steel pipe.

Service Engineering Company. A bulletin published by this company. Pp. 31; 7½ x 10½ in.; illustrated. A brief synopsis of the company's engineering service of interest to manufacturers and works management.

W-S-M Car Dumpers. The Wellman-Seaver-Morgan Co., Cleveland, Ohio. Bulletin 49. Pp. 16; 8½ x 11 in.; illustrated Description of this company's open-top railroad car dumper, showing some installations with working drawings of device.

Direct Current Steel Frame Motors. The Triumph Electric Co., Cincinnati, Ohio. Bulletin 2006 (Superseding Bulletin 491). Pp. 16; 6 x 9 in.; illustrated. A description of the motor and comment on its application to various industrial uses.

Ampere Hour Meters. The Sangamo Electric Co., Springfield, Ill. Bulletin 45. Pp. 31; 8 x 10½; illustrated. Description of the various types of ampere-hour meters made by this company. One of the large applications of these meters is on mining locomotives.

Small Cold Storage Rooms. Armstrong Cork & Insulation Co., Pittsburgh, Pa. Pamphlet. Pp. 36; 5 x 7 in., illustrated. A treatise on "Nonpareil" corkboard insulation and illustrations of its use in cold-storage rooms. Details of construction of storage rooms noted.

Jeffrey 34-B Entry Driver. The Jeffrey Manufacturing Co., Columbus, Ohio. Catalog 269. Pp. 15; 7¾ x 11 in., illustrated. Description of a machine that cuts, breaks down and loads coal at the mine face. Finely illustrated by half-tones from photographs taken of the machine at work in the mine.

C-H Electric Space Heaters—The Cutler-Hammer Manufacturing Co., Milwaukee, Wis. Publication 494. Six-page folder; 3¼ x 6 in.; illustrated. Description and illustration of use. A large broadside has been published, in which are reproduced many current advertisements on this C-H heater, and so on.

Electrical Wires and Cables. The Rome Wire Co., Rome, N. Y. Catalog 19. Pp. 143; 8¼ x 10 in.; illustrated. A description of the various wires and cables made by this company together with price lists and useful information pertaining to bare and insulated wires for electrical purposes. Contains views about the plant showing equipment.

Coming Meetings

American Chemical Society will hold its annual meeting at St. Louis, Mo., April 13, 14, 15 and 16. Secretary, Dr. Charles L. Parsons, 1709 G. St., N. W., Washington, D. C.

New England Coal Dealers' Association will hold its annual meeting March 24 and 25, at Springfield, Mass. President, W. A. Clark, 141 Milk St., Boston, Mass.

National Retail Coal Merchants' Association will hold its annual meeting June 10, 11 and 12 at Detroit, Mich. Secretary-manager, Ellery Gordon, Philadelphia, Pa.

Indiana Retail Coal Merchants' Association will hold its annual meeting April 27, 28 and 29 at the Severin Hotel, Indianapolis, Ind. Secretary, R. R. Yeagley, Indianapolis, Ind.

Industrial News

Toronto, Ont.—It is reported that the Nukol Fuel Co., of 88 Bay St., this place, plans to locate a briquetting plant in Port Arthur or Fort William.

Washington, D. C.—The headquarters of the Executive Committee of the Bituminous Coal Operators' Central Competitive Field, are located in Room 419, Woodward Building, 15th and H Sts., N. W., Telephone Main 9546. John B. Pratt is the secretary.

Washington, Ind.—The Richards Coal Co., of Terre Haute, Ind., has obtained leases on coal land northwest and southwest of Washington and expects to open three new mines soon. This property is in Daviess County in the southern part of the state.

Glen White, W. Va.—The E. E. White Coal Co., at Stotesbury, is preparing to erect a number of dwelling houses and other buildings early in the spring. The Stotesbury mine in 1919 produced more coal than any other mine on the Virginian and it proposes in 1920 not only to maintain that record but to increase it.

Towson Heights, Baltimore, Md.—The Black & Decker Mfg. Co., of this place, announces the establishment of a permanent office and show room at 1436 S. Michigan Ave., Chicago, Ill. This office will be in charge of R. C. Ames, whose territory has been extended to cover the entire Mid-West. F. E. Marrion and J. N. LaBelle will assist Mr. Ames.

Johnstown, Pa.—Cosgrove & Co., coal operators of this place, purchased the holdings of the Sunnyside Coal Co. and the Ideal Coal Co., at a consideration of $500,000. The two mines are fully equipped and include 1,400 acres of unmined coal and the necessary buildings for operation. Production is to be increased from 800 to 2,000 tons daily.

Zanesville, Ohio—The Eastern Hocking Coal Co., chartered in Columbus, with a capital of $100,000, which purchased a tract of 15,650 acres of coal lands just south of Zanesville, has not started development work as yet. According to H. M. Runkle, secretary-treasurer of the company, no immediate plans for developing the tract have been formed. The tract is about three miles wide and 12 miles long.

Somerset, Pa.—One of the largest real estate deals reported in this section for several months was consummated recently when Charles Duppstadt, of Stonycreek Township disposed of his 163-acre farm underlaid with several seams of coal to parties of Weehawken, N. J., for $30,000.

Another deal of importance was that of the John M. Wolfersburger estate to Elizabeth P. Hocking, the consideration being $25,000.

Birmingham, Ala.—A new coal mine with a capacity of 1,000 tons per day will be opened by the Tennessee Coal, Iron, & R. R. Co., near Pratt City, according to the announcement of George Gordon Crawford, president of the company. The new mine will be known as the Hamilton slope. Mr. Crawford announced that it will be located on the Mary Lee seam and will be opened to provide for the loss in production of coal due to the abandonment of worked-out mines.

Columbus, Ohio—The annual stockholders meeting of the Lorain Coal & Dock Co., was held recently when the former board of directors was re-elected. Officers have been elected as follows: Edward Johnson, chairman of the board of directors; F. W. Braggins, president; A. L. R. Wildermuth, vice president and general manager; J. L. Johnson, second vice president and Ray L. Phelps, secretary-treasurer. The company operates mines in eastern Ohio, in Logan County, West Virginia, and in the Pomeroy Bend district.

Birmingham, Ala.—The Sloss-Sheffield Steel & Iron Co. is said to be considering the buiding of a modern washery and screening plant at its Bessie mines in the western part of Jefferson County to replace the equipment now in operation.

The Tennessee Coal Iron & R.R. Co. is clearing a right-of-way preparatory to laying a railroad connection to the site of its new Hamilton slope near Pratt City. This operation will be on the line of the Birmingham Southern, a company-owned railroad with connections to all the principal works of the concern in this district.

Pittsburgh, Pa.—The Blaw-Knox Co., of this place, announces its purchase of the C. D. Pruden Co., of Baltimore, Md., manufacturers of standardized steel buildings for industrial plants. The following appointments are noted: J. Grier Campbell, purchasing agent of the Blaw-Knox Co., has resigned to become assistant treasurer of the C. D. Pruden company. Wm. S. Boyd, formerly assistant purchasing agent of the Crucible Steel Co., and purchasing agent of the Page Steel & Wire Co., has been appointed purchasing agent of the Blaw-Knox Co.

Charleston, W. Va.—Development work will be begun at an early date by the Youghiogheny & Ohio Coal Co. on a tract of 7,000 acres of coal land on Little Coal River. The company expects to be able to secure a production of 4,000 tons a day as soon as plants to be erected are completed. This company is already operating in Pennsylvania and Ohio, its various plants having an aggregate production of 2,000,000 tons per year. On March 1, E. C. Berkeley will assume the duties of general superintendent of the properties of the company, his headquarters being at Madison, Boone County, W. Va.

New York, N. Y.—The Wyngrove Line, Inc., has been incorporated in this State, with F. LeMaistre, as president, and C. B. Wynkoop as secretary and treasurer. Mr. Wynkoop is the president of the Cosgrove & Wynkoop Coal Co. The new concern is associated with Cosgrove & Co., Johnstown operators, and was organized because of the scarcity of boats. It will have its office in the same suite as Cosgrove & Wynkoop, 149 Broadway. The Cosgrove & Wynkoop Coal Co. has announced the appointment of H. H. Schrader, formerly with F. A. Kirk & Co., as head of its export coal department, which has had a steady growth. Arthur Carlson, of Middletown, Conn., will be the New England representative of the company.

Hamilton, Ohio—The Hooven, Owens, Rentschler Co., of this place, has opened two new offices; one in Philadelphia, 2129 Land Title Bldg., with C. M. Decker in charge; another office at Richmond, Va., with E. H. Fairchild as manager. This company has also made the following changes in the personnel of their other offices: E. S. Cooley, formerly with the Fall River Ship Building Co., is now connected with the New York office of the Hooven, Owens, Rentschler Co. Henry E. Balsley, formerly of the American Bridge Co., has been made manager of the Chicago office. R. O. Bolman, formerly with the General Electric Co., is now in charge of all blowing engines for the Hooven, Owens, Rentschler Co. This company makes the well-known Hamilton engines.

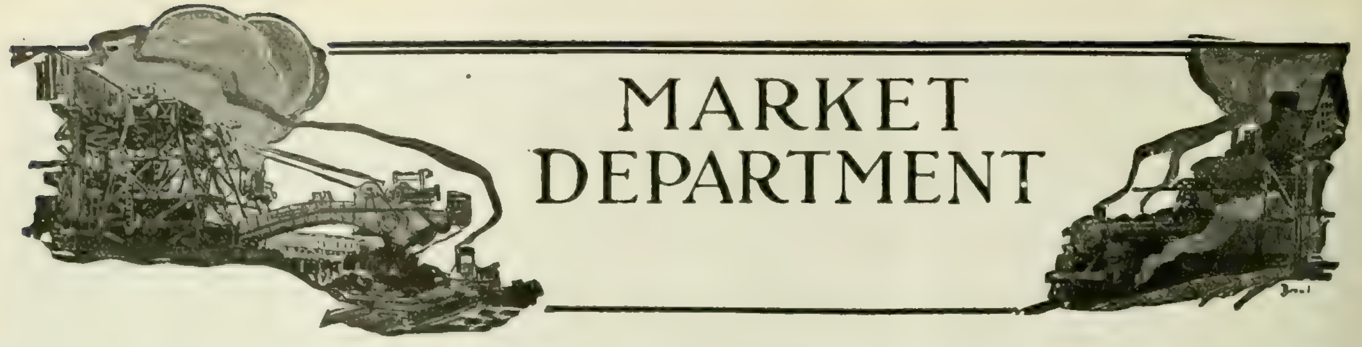
Chicago, Ill.—The Sullivan Machinery Co., of this place announces the following appointments: Louis R. Chadwick, hitherto branch office manager at Spokane, Wash., as manager of the company's branch at 30 Church St., New York City. Robert T. Banks, for several years associated with this company as sales engineer at its El Paso, Tex., office, has been appointed manager at Spokane to succeed Mr. Chadwick. Arthur E. Blackwood, formerly manager of its branch office in New York City, as vice president, in charge of finance and accounting, with headquarters at Chicago. Louis R. Chadwick, for years manager of the company's office at Spokane, has been appointed manager at New York City, succeeding Mr. Blackwood.

Belt, Mont.—George H. Stanton of the G. W. Merkle Coal Co., contemplates an output of 1,000 tons of coal daily from the plant when completed. Those connected with the Merkle company include G. W. Merkle, of Belt; Sam Stephenson and J. R. Hobbins, of Great Falls, and W. R. Wilson, of Lehigh. Machinery has been ordered for cutting and preparing the coal for market. The property to be developed comprises about 2,160 acres of coal land which it is said will give the Merkle company one of the largest coal properties in this section of the state. It is planned to have the machinery in the Merkle mine in place within a couple of months. It is expected that the Wrenn Bros., of Boston, purchasers of the East Butte coal properties a month or more ago, will also have this mine running shortly.

Reading, Pa.—The Reading Iron Co., of this place, announces the recent appointment of W. W. Frazier as assistant superintendent of the company's tube works. Mr. Frazier started his 20 years' experience in the iron and steel business as a draftsman, soon branching out into the engineering and later the operating side. He was successively connected with the National Tube Co., the La Belle Iron Works and the Youngstown Sheet & Tube Co. He was chief engineer of the A. M. Byers Co., left here to become assistant chief engineer of the big Government plant at Neville Island and later served in a similar capacity with the Bethlehem Steel Co., at Sparrows Point. The tube works of the Reading company, with which Mr. Frazier is now connected, is its largest plant, employing about 4,000 men, under the direction of J. H. Mathewson.

New York, N. Y.—The railroads returned to private ownership on March 1 and the Tidewater Coal Exchange went out of business. The latter will no doubt be succeeded by the Tidewater Transshippers' Association, Inc., formed by a committee of New York Coal dealers, affiliated with The Wholesale Coal Trade Association. At a meeting held on Feb. 17 at the Whitehall Club, more than one-third of the tonnage handled by the exchange was represented and it was decided to proceed with the formation of the new association. The secretary-treasurer of the association is to be designated as the commissioner of the association and there is to be a deputy commissioner at Philadelphia and also at Baltimore. The proposed rules also provide that the executive committee of the association may provide for the pooling of anthracite coal, if it is considered advisable. Charles A. Owen is the Chairman of the Organization Committee. It is expected that nearly all of the tonnage now handled by the present exchange will be handled by the new association.

Bluefield, W. Va.—It is understood that a deal was consummated during the third week of February under the terms of which the Pulaski Iron Co. became the owner of the Shawnee Coal & Coke Co., one of the early operations in the Pocahontas field. The mines of the Shawnee company adjoin those of the Pulaski company at Eckman in McDowell County. The controlling interest in the Shawnee company was owned by Lynchburg capitalists; the production for 1919 was in the neighborhood of 100,000 tons. No changes in the executive staffs of either company are contemplated for the present, it is understood. About three years ago the ovens of the Shawnee Coal & Coke Co. were purchased by the Pulaski company. With the acquisition of the Shawnee mines and with another new mine (for which a shaft is now being sunk near Welch) in operation, the Pulaski Iron Co., will soon become one of the large companies of the Pocahontas field. Its annual production will be in the neighborhood of 400,000 tons a year.



MARKET DEPARTMENT

Weekly Review

Railroads Return to Private Ownership—Advance of Freight Rates Discussed—Car Supply Shows Little Improvement—Exports Continue Under "Permit System."

WITH the return of the railroads to private ownership Director-General Hines will retain jurisdiction over domestic distribution while the newly-appointed commission will handle bunker and export coal matters. This order, which became effective on March 1, did not please the operators, for it had been hoped that with the end of Government ownership of the railroads, the Fuel Administration would also be discontinued.

Demand for bituminous continues to be keen with all the sizes moving where available and the retailers willing to take almost anything they can get. For steam grades as well, all available stocks are quickly bought up. Little complaint is heard from local traction companies and public utilities, though their reserves are at a minimum.

Discussion of an advance on the freight rates on coal and general commodities is being heard in parts of the country. A large shipper is quoted as saying: "Even flat general increases would hurt badly, as coal freights are now too high. Increases may tend to force a larger consumption of oil in those districts closer to oil and thus cause a reduced consumption of bituminous coal."

As was the case prior to the restriction on bunkering, a good proportion of coal is going to tide for bunkering purposes and the local consumer is inclined to criticise the shippers for their eagerness in selling to this trade, alleging that the additional price allowed on bunkerage is the cause for the interest shown by these shippers. A fair amount of export business continues under the "permit system." Permits are only granted for business that was contracted before the embargo.

Production for the past week was far from pleasing to the miners because of the car shortage.

WEEKLY PRODUCTION

The weekly report on the production of bituminous coal, anthracite, and beehive coke, compiled by the Geological Survey, Department of the Interior, Feb. 28, 1920, states that the output of soft coal fell off 8.5 per cent during the week ended Feb. 21. Preliminary estimates place the total production (including lignite and coal coked) at 9,580,000 net tons, a decrease of 891,000 tons when compared with the preceding week.

The production of anthracite like that of bituminous coal fell off markedly during the week ended Feb. 21. Loadings by the nine originating carriers were 28,494 cars. This suggests a total output, including mine fuel and sales to local trade, of 1,463,000 net tons. Compared with the preceding week, this was a decrease of 310,000 tons, or 17.5 per cent. The cumulative production for the coal year beginning April 1, 1919, is now 80,906,000 net tons, a decrease of 6.3 per cent when compared with the previous coal year.

A decrease of 2,000 tons in the production of beehive coke was reported during the week ended Feb. 21. Slight increases in output in Alabama, Virginia, and Kentucky largely offset a decrease of 6,000 tons in Pennsylvania and Ohio. Production in the Connellsville region, Pennsylvania, as reported by *The Courier*, of that city, showed a decrease of [illegible] tons.

Atlantic Seaboard

BOSTON

Trade recovers only gradually. Embargoes against bituminous now lifted. Movement increasing. Coal still short at New York and Philadelphia piers. "Emergency" coal arriving. Hampton Roads despatch normal. Anthracite still embargoed all-rail. Barge movement shows signs of improvement.

Bituminous—Railroad operating conditions were distinctly more favorable this week although the recovery [illegible] gradual. Another blizzard [illegible] Feb. 24 interfered with traffic in the northern part of this territory and [illegible] was again suspended except on the [illegible] lines. Several of the large manufacturing corporations have offered men in large numbers to help the railroads clear up freight sidings and it is expected that in another ten days much of the congestion due to cars frozen to the tracks at this end will be relieved. The reports show that the Eastern roads are returning more empties to the intervening lines and should this continue it should in time very much improve car supply in the region.

The tight blanket embargo effective since Feb. 13 was lifted on Feb. 25, so far as it concerned bituminous, but current car supply is altogether too light to permit more than 20 to 25 per cent of normal output in Central Pennsylvania. A quantity of wagon-hauled coal is again offered, but there is little of the standard grades available at the fixed price. It is probable that the great majority of operators have contract orders which will take care of all they can produce in March.

The "emergency" coal arranged for through the Coal Committee at Washington is beginning to arrive here in better volume. There is some apprehension over short car supply at various New England terminals, several ships having been already obliged to wait three to eight days. Heavy demurrage charges are accruing, and this together with the export price carried by much of the diverted coal makes the delivered cost fully as high as coal men were predicting.

Governor Coolidge telegraphed President Wilson on Feb. 28 that the fuel shortage in New England was more critical and that the district would be in a serious condition if Federal control over coal exports was permitted to lapse.

The message said:

"Fuel shortage in Massachusetts and New England is more critical than was stated in the telegram of New England Governors of Feb. 16, due to the inability of the railroads to operate through the snow. Many ships are waiting to take coal at tidewater to bring to New England. It would be a great misfortune if there should be any interval after today when there was no control over the export of bituminous coal. If such control is permitted to lapse New England will be in a most serious condition."

In more cases than one, the regular agencies have been obliged to pay demurrage on chartered ships, only to be loaded with high priced coal, their own coal having been seized for other requirements, either in New England or elsewhere. It is also a fact that the Regional Coal Committee has been put to it to find consignments for the coal which they represented was so urgently needed. We know of cases where cargoes have been consigned to brokers, the ultimate destination to be decided by the broker. This rather has the appearance of having cried "Wolf" too long and too loud. It will be interesting to watch further developments, for it is recognized that the great urgency is on behalf of the railroads, and not because industries are seriously in need of supply.

Hampton Roads despatch is practically normal. Steamers are now loading in one or two days, unless the flow of coal has been tampered with by the coal authorities at Washington. The trade is much interested to know what steps the government will take to enforce present regulations, now that the central railroad authority is passing out. There is a good deal of talk of contracts for the ensuing year, but most coal houses are hesitating over what policy to follow, in view of rules which are assumed to be still in effect and mandatory.

Anthracite—All New England is still embargoed against hard coal all-rail, except for the limited area which can be reached via Harlem River.

In Northern New England there are several communities where the prolonged cold weather is causing anxiety, but it is remarkable that the embargo against New Haven points that has been effective since Jan. 16 has called forth so little comment. In other words, much of New England is reasonably well supplied with domestic sizes.

Barges are moving much better than early in the month. A surprisingly large number has been ordered to repair-yards, largely because of ice-damage, but there are several encouraging signs that shipments during March will materially increase. At Port Richmond piers, 302 cars were dumped March 24 and this was the best day's work for several weeks. There are fewer cases of frozen coal and there are several reasons why loading should be much better the next week or two.

There is inquiry for the steam sizes, but the present embargo shuts off such shipments as well as those of domestic sizes. Should the embargo be raised within a few days it is probable that there would be an active demand for rice and buckwheat.

NEW YORK

Seasonable weather for the past week has helped to consume considerable of current supplies of domestic sizes in consumers hands. As indicating shortage of coal in consumers' hands, buyers have not been sticking for favored sizes, but are taking gladly whatever wholesale and retail dealers have to offer.

Anthracite—With the thermometer just a few degrees above zero, frozen condition of coal at the various piers became more serious, reducing the dumping of cars into boats to a small fraction of normal dumpings. Loaded boats of either domestic or steam sizes are very scarce. Apartment houses were eager buyers of steam coals, taking any of the sizes that the dealers are in position to deliver

Production has also been restricted somewhat by weather conditions and the trade is looking forward to first conferences of operators and mine workers to be held in this city on March 9 to discuss new wage scale Present agreement expires on March 31, and so far, aside from an early presentation on the part of the miners of what they expected in the way of increased wages and reduced hours, nothing has been done. These conferences are expected to last several weeks.

Coal men are generally agreed that consumers may expect to pay higher prices for anthracite from April 1 on. They argue that not only will the operators have to pay higher wages to miners, but that other mining expenses have advanced to a point that they must be taken care of in the next price readjustment. Furthermore, railroad rates are expected to advance in line with the measures of the new railroad legislation that provides the carriers a profit of 5½ per cent. Loaded boats of the steam sizes have been in good demand but these have commanded good premiums over the dock prices.

Current quotations for company coal per gross tons at mine and f.o.b., Tidewater, at the lower ports are as follows:—

	Mine	Tidewater
Broken	5.95	7.80
Egg	6 35	8.20
Stove	6.70	8.55
Chestnut	6.70	8.55
Pea	5.30	7.05
Buck	3.40	5.15
Rice	2.75	4.50
Barley	2.25	4.00
Boiler	2.50	4.25

Bituminous — Bituminous continues in small supply, with many of the public utility companies finding it a difficult matter to secure enough coal to keep them going. New England has been able to pull through only by the wholesale confiscation of coal at Hampton Roads, the Central Coal Committee commandeering upwards of 50,000 tons at the piers there to ship to New England. This has proved a serious blow to exporters who had secured and arranged for steamers accordingly.

Weather conditions have been unfavorable to he movement of coal by rail and water even after it is loaded. Mines have not worked better than fifty per cent in Eastern regions for the past two weeks, owing to small car supply. Embargoes have practically stopped all shipments of rail coal to New England. This is responsible for action of government in commandeering of tidewater supplies.

The trade generally is much chafed at continued government restrictions. Action is being taken from several sources to have all restrictions removed, as it is argued that the coal people themselves are better fitted to distribute coal than the small body of inexperienced men that have had full sway for the past four months.

Due to the uncertainty of wages, railroad freights, etc., after the first of the new coal year, nothing has so far been done in the way of contracting. Usually, at this time, perhaps one-third or one-half of the year's output would be under contract in normal years.

Stocks generally, in every section of the East, are either entirely exhausted, or at the lowest point that they have been in since the memorable winter 1917-18.

Government prices on bituminous coals at the mines, for spot shipment, are as follows:

	Mine-run	Prepared	Slack
Central Pennsylvania	$2.95	2.95	2.95
Western Pennsylvania	2.35	2.60	2.35
Fairmont	2.50	2.75	2.25
Georges Creek	2.75	3.00	2.50

PHILADELPHIA

Anthracite demand very strong. Winter weather continues. Shortage of stove and nut begins to move pea. Consumption of all coal heaviest on record. Size change prospect more favorable. Chance of "slump" gone. Dealers anxious to stock up. Consumers show growing desire to store for next year. Steam sizes strengthen. Buckwheat all taken, and rice moves in big volume. Bituminous shows little change for better. Fewer confiscations. Embargoes help local consumers. Commission decision anxiously awaited.

Anthracite—The winter continues its record of being one of the real old time kind, and while there has been no snow of any moment recently, yet the temperature has hung consistently around the freezing point, and at times during the past week dropped down to 9 deg. F All of this means a big consumption of fuel and the dealers are busy trying to meet the calls on them for coal. It has been one of the busiest winter's on record, even eclipsing the first war winter Consumers' stocks put in last summer are reaching a still lower ebb and consumers are extremely anxious to have more coal.

Of course the demand still is for the larger sizes—stove and nut, and if anything these sizes are scarcer than ever. Dealers are urging the shippers to give them more tonnage and are no longer willing to accept the excuse of the operators that they have filled their orders up to the proportions of previous years. The dealers point out that the consumption this year is the biggest on record and they must have more coal to meet the demand. It is believed that the larger companies are making heavier than usual consignments "down East," as the reports from that region indicate that they are in a bad way for fuel.

Naturally when a scarcity of the larger sizes exists, the consumer, when he actually must have coal, falls back on the size that he can get and this happens to be pea coal. During the past week the movement of this size from the yards has grown very much in volume and the big piles of the dealers are at last beginning to decrease in size. It takes considerable urging on the part of the retailers to induce customers to take this size, as their antipathy to it has not decreased in the least.

Of course this condition is quickly reflected in the shipping offices and more than one dealer of late has actually asked to have pea coal shipped. In addition there is a growing impression that with the probable change in sizes there will be a demand for pea coal next season from that portion of the trade which has been wedded to this size. The more progressive dealers are actually reaching the point where they are willing to store as much of this size as they can find room for. The independents still have difficulty in getting premium prices for this size, and are willing at most times on straight orders for pea to make sales at the company circular of $5.30, although occasionally they are able to get $5.50 for it

Change in Sizes to be Made

Many stories are afloat as to the outcome of the change of size agitation. At this time circumstances seem to be shaping themselves until it cannot almost be said that the shippers are at the point where they are ready to announce that the change will be made. The call for the change from the dealers has been so widespread, coming from the surrounding states, in addition to the almost unanimous call from the Pennsylvania dealers, that as it now stands it looks as if the proposition will be acceded to.

One of the larger companies before committing itself to the proposition finally is understood to be conducting tests of the newly-sized coal in actual burning and upon the result of this experiment hinges their decision. It is believed if the change is made that it will be done with an actual change of screens at the breaker, the plan being simply to mix the coal after it has been screened in the usual way.

With the first of April fast coming on the consuming public, not to mention the dealers, is displaying considerable interest as to what the spring prices will be. Many buyers are reluctantly becoming convinced that there will be no reduction and are ordering their next winter's coal to be put in during March. It certainly looks as if March will be one of the busiest months of the entire season, especially so if the conference between the miners and operators over a new wage scale shows any signs of being prolonged.

At this time all prospects of a so-called "break" in the coal market has vanished, for even should the consumer demand fall off, there is not a dealer in this territory who would not continue during the next four weeks to put aside every pound of prepared coal that he could possibly get hold of It needs no particular foresight to see that any coal bought now will be a bargain later in the season

The steam trade has picked up very nicely, until buckwheat coal of the white ash grade is becoming harder to get than it has been all winter, especially with the big shippers. Some of the special and higher priced buckwheat of the companies are a little bit slow, but are not expected to lag much longer in the face of the bituminous shortage Rice has also increased in demand until the big companies are now moving heavy tonnages of this size from the storage yards, as the current production is not sufficient to meet the demand Barley, however, is still difficult to sell and all companies have a big surplus of it.

The prices for the last month under the present winter schedule per gross ton f.o.b. mines for line delivery and f.o.b. Port Richmond for tide are as follows:

	Line	Tide
Broken	$5 95	$7.80
Egg	6.35	8.20
Stove	6 60	8.45
Nut	6.70	8.55
Pea	5 30	6.90
Buckwheat	3 40	4 45
Rice	2.75	3 65
Boiler	2 50	3.50
Barley	2 25	3.15

Bituminous—The demand for soft coal is far in excess of the amount that is reaching the city. Plants continue to lose time for the lack of fuel, although none has been idle for a long period, although a majority of them are running on close allowance at all times

The fact that the railroads entering New England have been compelled to place embargoes against shipments to their lines on account of traffic being impeded by heavy snows, has helped the local situation. While this help is appreciated it is also realized that as soon as the roads to the Eastern country can handle additional traffic this coal will have to be paid back.

Recently there has been much protest on the part of consumers over having shipments in transit confiscation by the Railroad Administration and used to help out other industries. The method has called forth much criticism until there seems now to be a minimum of tonnage being diverted in this way. As a matter of fact consignees who had been notified that shipments had been confiscated are now actually receiving coal which they were previously told would not come forward.

Much Improvement Expected

Now that the railroads are back under individual control the coal trade is expecting improvement in the situation generally, and one of the first moves was to put into the trade the big number of low capacity wooden cars which had been sidetracked during the war. Quite a few of these cars are now reaching here loaded and this move has materially helped the situation. Traffic conditions have materially improved from the weather standpoint and such tonnage as has been produced has been moving to destination fairly promptly.

The scarcity of coal has once more brought into the market a fair production of coal from the wagon mines. These concerns are allowed an increase of 75c above the fixed price of $2.95 and when sold through brokerage houses, as it usually is, an extra 15c. is added, making the delivered price $3.85 per net ton. The brokers have their buyers in the region and there is quite a bit of competition for this coal. Some of the larger consumers are also endeavoring to get this coal first hand, but most of them have profited by their past experience that this helped the situation very little.

A good proportion of the local tonnage is going to tide for bunkers and the local consumer is inclined somewhat to criticise shippers for their eagerness in selling coal at tide, while the steady line trade is in such desperate need of fuel. However, the additional price allowed on bunkerage has the same attraction as usual, and shippers claim that under the present cost of production they are barely coming out whole at that. There also continues to be a fair export business conducted under the "permit system," as the embargo against such business is still on and the understanding is that permits are only granted for business that was contracted for prior to the embargo.

The trade is anxiously awaiting the report of the Bituminous Coal Commission and the report now is that an early decision can be expected, inasmuch as they have concluded taking testimony. Both shippers and consumers are anxious to start the contract business, but nothing can be done in this direction until they are able to fix a price. Even then the fixing of a con tract price depends entirely upon the finding of the commission, as it is barely possible that the conditions might be such that it would not be advantageous to enter into contracts at all. However, all concerned are hoping that the question of price will be satisfactorily arrived at.

BALTIMORE

Status of the coal trade after railroads are returned to private ownership big feature here as elsewhere. Car supply from bad to worse. Exports die from all points except Newport News. Serious conditions impend.

Bituminous—All last week the coal trade invaded or bombarded Washington to get a little common sense and failed. All wanted to know what was to be the status of business after the railroads are returned to private ownership. With the last of the permits to load, issued before Jan. 9, about cleaned up on export business, the only satisfaction that could be gotten from the Central Coal Committee officials was that it was all up to the President but that they thought it was a good guess that no exports would be allowed from any Eastern port, except Newport News, for many weeks. How this control was to be maintained was a deep dark secret.

On prices there were many guesses as to what would happen, especially as many are now openly selling coal above the government rates ,and it is like the old song "Nobody seems to care." Meanwhile coal men here predict serious conditions. Following the visit of four New England governors to Washington to complain of fuel famine the government diverted large quantities of coal from Curtis Bay and other Eastern points, the Shipping Board allocated ships to carry 100,000 tons from Hampton Roads, and coal was seized on the road for Northern diversion.

Then coal was transshipped from as far south as Clifton Forge, Va., and from Hampton Roads all-rail to New England. The result is a fearful congestion of coal cars at terminals and all along the line that can not be promptly unloaded or moved because of weather conditions. When the weather breaks New England will be flooded with coal-carrying freight charges that consumers will not pay. The story of the strike period, when thousands of cars were sent long distances West and the coal then refused because of cost will be repeated.

Coal is still standing at Western points on this movement of months ago, and there is even talk of sending this coal all the way back to the original consignees in order to get the cars emptied. Just at present the car supply is wretched, largely because cars have been tied up North in this movement and West through shipmen's in cars that had been held for the export trade before the ban was slapped on.

At the outset of the present week the car supply on the Baltimore & Ohio and connections ran between 60 and 70 per cent. It has dwindled until at this writing the supply is only between 25 and 30 per cent and there are days when the total movement is only between 1,000 and 1,200 cars, less than one-third of normal. No wonder many consumers East are crying for coal and everybody—consumer and coal man alike—stands disgusted with the government management.

In passing it may be well to mention that the trade is still in the dark as to the pool prospects for the future, and there are many rumors afloat including [illegible] may be made to give the [illegible] to force all coal through [illegible] and [illegible] business.

Anthracite—The [illegible] run continues fairly good as compared with the bituminous supply. Most of the dealers are getting some coal, although all are not getting the particular sizes desired. [illegible] because [illegible] unusually hard winter.

Eastern-Inland

PITTSBURGH

Coal producers state that the car shortage this week is the worst in this whole period of car shortage. R. W. Gardiner, commissioner of the Pittsburgh Coal Producers' Association, states that on one day this week 35 of the 130 mines represented in the association were closed for lack of cars and that the average car supply in the whole district on that day was only 17 per cent of the Government's rating.

One of the causes named for the fresh increase in the car shortage is the cold snap that began Sunday, Feb. 15, resulting in many carloads of coal being frozen, although if there had been the usual quickness of dispatch the coal could probably have been unloaded without difficulty. The probability seems to be that much of the frozen coal will not be unloaded until warm weather performs the function of thawing it out.

While it has been commonly remarked in Pittsburgh shipping circles in the past few weeks that better transportation could be expected upon the return of the roads to their owners March 1, it is now being asserted in some coal circles that railroad officials are paying so much attention to details attending the transfer of control that they are not giving the usual amount of attention to the furnishing of cars.

The steel industry has not had its production curtailed of late by coal shortage, but an expansion in operations that would otherwise have occurred has been prevented, mills being able to do no more than maintain their January rate of operation, which was about 83 per cent of capacity.

There is some coal to be had in the open market, but not a great deal. The market remains quotable at Government limits: Slack, $2.10; mine-run, $2.35; screened, $2.60, per net ton at mine.

COLUMBUS

Some improvement in car supply is reported in most of the Ohio fields and production is correspondingly increasing. The output is still far below normal figures. Demand for all grades remains strong.

The car supply is now the chief factor in the coal trade in Ohio. Producers in every section are devoting their attention to getting out as large an output as possible and seeing that the cars reach their consignees. But there are many troubles that beset the operator and as a result many are working longer hours than usual. With confiscation of coal by railroads one of the chief disturbing factors, little progress can be made toward getting the trade on a solid basis.

Production in Ohio fields has been increased to a certain extent because of a better car supply. This applies particularly to the Hocking Valley, Pomeroy Bend and Jackson districts. Reports show that the car supply in those districts has been about 45 to 50 per cent and as a result a larger tonnage is being shipped. In the eastern Ohio field the output is still around 33⅓ per cent and little hope for improvement is seen.

Car Supply Only 45 Per Cent

In the Cambridge and Crooksville districts production has been about 45 to 50 per cent. The colder weather which now prevails will probably still further reduce the car supply, because of trouble in moving trains promptly. Influenza has also had its effect among the train crews.

The domestic trade is strong in every particular. Dealers are short of stocks and are clamoring for coal. Consumers have been placing orders briskly as their first stocks are exhausted, due to extra cold temperatures.

Dealers are compelled to reduce the size of orders in order to make available stocks reach to all consumers. Retail prices are firm at the levels which have been established under Federal control. Generally speaking, there has been practically no suffering in central Ohio territory among domestic users, although a marked shortage is reported.

There is a strong demand for all steam grades and all available stocks are quickly bought up. Public utilities are rather short and are operating from hand to mouth. Hospitals are fairly well supplied at present and public institutions are also in the market, and as a result there is a total lack of adequate reserves. Rubber factories have only a small surplus and the same is true of iron and steel concerns.

Retail prices in Columbus per net ton are:

Hocking Lump	$6.50
Hocking Mine-run	5.75—$6.00
West Virginia lump	7.25
West Virginia mine-run	6.75
Pocahontas lump	8.25
Pocahontas mine-run	7.50—7.75
Pomeroy Lump	6.75
Pomeroy mine-run	6.00

CINCINNATI

Railroad confiscation and fuel committee diversions are embarassing coal companies greatly in this vicinity. The market was flooded with buyers of all classes last week seeking spot shipments, but a lot of them went away disappointed.

The car supply has not improved in the slightest degree. Operators claim that everything hinges on the car supply, as they have the labor, and could readily operate full time in clearing all old orders, and taking care of such immediate business as they have been turning down steadily. It is the opinion of operators here that Government restrictions will be removed at an early date and no two dealers seem to be of the same mind as to what will happen to the market. Some say prices will start up at once, due to the shortage of cars. Others feel that prices will continue at the present level or at most, a little higher for the rest of the spring. A delegation of operators left for Washington last week, to put personal pressure to bear in the hope of getting cars.

Demand for steam coal continues keen, but retailers are fairly well stocked and due to the mild weather demand is so light that the retailers are not buying block coal as freely as they were, although there is a ready market for such supplies as can be produced.

Between 8,000 and 9,000 tons of coal would still be bobbing up and down in the barges on the Kanawha River had not the Campbell Creek Coal Co. decided to send it down despite the ice in the river. The barges were loaded but the government officers would not permit the raising of the dams in the river because of the weather conditions. The coal was needed in Cincinnati and the boats were ordered to rush the barges over the dams.

This was a hazardous plan, but the boats and barges rode the flood tide in safety and reached the Ohio river. There ice was encountered and the ice-breaker D. T. Lane ran around the barge fleet or forged ahead, pushing ice out of the way of the boats and its tow as the occasion demanded and the fleet reached Cincinnati without the loss of a pound of coal. The government officers on several occasions in the past have refused to open the dams.

Dealers are urging the public to place orders for smokeless coal, anthracite or coke for next winter, because as soon as the ratification of the Peace Treaty, American coal will be placed in competition with the world and naturally will be sold to the highest bidders.

The position of Cincinnati as the gateway to the coal fields has rendered her safe from fuel famine so far, although nonessential industries and some that are essential have been deprived of fuel. Influenza is not causing much trouble in the mine districts and it is reported that the smallpox epidemic in southwestern Kentucky is less serious.

Southern

LOUISVILLE

Heavy demand for domestic fuel, with car shortage such that retailers are reporting empty yards, and deliveries of only about one fifth what they need. Steam in good demand. Cold weather forcing heavier domestic consumption.

The demand for domestic fuel continues very keen, with all sizes moving, and retailers willing to take most anything they can get just now. Car shortage is showing improvements in spots, but the Kentucky fields as a whole, especially Harlan county, show no material improvement. Mine operators are having trouble in running half time, and report that labor is becoming more dissatisfied.

It is held that the operators are losing large sums daily through not being able to take advantage of a good market, which is resulting in operators in other fields with better car supply being able to divide up the business, which will mean that if production in other fields catches up with demand, operators in the Kentucky fields may get cars after there is no demand to fill.

No New Business Accepted

Kentucky is so steadily short of cars and unable to accept business that it is held by the operators to be injuring the fields. One operator remarked that while the Kentucky operators are reporting inability to secure cars, other districts are having very little trouble, and the Railroad Administration authorities are claiming that there is no serious shortage of cars.

Mines on the Louisville & Nashville lines are still being discriminated against, and while car supply on the Illinois Central lines in western Kentucky is worse than it has been, it is not as bad as on the Louisville & Nashville lines in the same field. Western Kentucky as a whole is somewhat better off than eastern Kentucky. The Hazard fields is doing much better than formerly, but the situation in the Harlan, Straight Creek and Jellico districts is about as bad as it has ever been.

In the Elkhorn and Northeastern districts of the state it is reported that conditions are improving and car supply is better, some sections being fed by lines that are in the car pool, and which are having no decided difficulty in getting cars

Movements to control prices of foodstuffs, etc., sold through commissary mines, resulting in Federal warrants being issued for a few mines recently, will probably slow down somewhat now, for in the Kentucky High Cost Commission, all but two members of the Louisville division have resigned.

Discussion of advanced freight rates on coal and general commodities after the railroads go back to private control are being heard C. D. Boyd, traffic manager for the three leading associations of the state, in discussing this matter said "Even flat general increases would hurt badly, as coal freights are now too high. Increases would force larger consumption of oil in districts closer to oil, and at the same time reduce consumption of bituminous."

One interesting factor in the argument between coal and oil is that oil is rapidly advancing, and even the cheaper fuel oils which do not produce much gasoline are higher. Kentucky crude oil which has been selling at $2.60 a barrel at the well for the past year or more, is now quoted at $3.25 a barrel, with prospects of a mid-summer price of $3.50, which has resulted in increases in all petroleum products. Oil operators are not being governed like coal operators, and are forcing up the price through refusal to turn holdings over to pipe line companies or make shipments unless they get their price. On the last price advance in eastern Kentucky the largest runs of months were shown.

Lake Region

BUFFALO

Bituminous—There is much complaint just now of the selling of coal, especially at the mines, for considerably more than the regulation prices. To this the consumer seems to be contributing, for he finds that the jobbers cannot offer coal in much amount, so he goes to the mining districts and offers a premium. It is reported that coal, which should sell at $2.50 at the mines, is held for $4 and even more. The consumer supposes that he is obliged to pay these prices and so gets around the jobber entirely.

What will come out of this is not to be said now. The Government does not seem to be taking any notice of it and it may not. Buffalo jobbers are not following the practice to any extent and they may come out best in the end, but it is very discouraging to sit by and see others taking advantage of the shortage of coal in a way that one may not feel like following. At the same time the confiscation of coal by the railroads is going on much as formerly, so that when the jobber is through his day he has little to show for the effort he has made to stay in the trade.

There would be complications enough in the trade if these avoidable ones were left out of it. Cars are very scarce and will be at least till the loaded ones that have been held up by snow are unloaded and put back into regular business again. About the only reason for satisfaction is that the supply did not run down till the factories had to shut down. Nobody out of the trade will ever know how much work has been done to keep the supply up. The consumer is accused of having a way of forgetting it all just as soon as he is past the stress, but that may be a mere matter of trade. Everybody gets what he can at a price as low as possible and is ready to repeat the operation.

Everybody wonders when there will be an end of this terrible winter. Buffalo has had its share of cold weather, but the snow is not nearly as deep as it is at other points South and East. There is, though, snow here that has been with us since November and it is high time it was gone. At the same time there are predictions that as soon as the spring thaws are here the demand for coal will drop off seriously. It is a fact that few consumers have much coal ahead and most of them have very little, but they do not intend to stock up any more than they must till the trade settles down to something.

The regulation prices continue as before, no matter if some people are disregarding them. Quotations: $4.70 for Allegheny Valley sizes, $4.50 for Pittsburgh and No. 8 lump and three-quarter, $4.25 for all slack, $4.60 for smithing and $4.70 for smokeless, per net ton, f.o.b. Buffalo.

Anthracite—The supply is not good yet and it may take some time to restore the movement from the mines. The car supply is poor and the entire cutting off of the shipments during the great storm of Feb 14 has had an effect on this market that is anything but good. The consumers were pretty well supplied, better than for several winters, or there would have been great difficulty.

As it is the shippers and distributors are finding it hard to keep up with the needs of this market. Nobody is frightened, but if a state of panic, such as existed in recent winters, the situation would be bad. The long waiting for the severity of winter to pass has no reward yet The month of February is much colder than was expected, in view of the cold weather earlier in the winter. It looks now as if this winter would be decidedly colder as a whole than that of two years ago. Still it cannot last much longer. Everybody sighs to see the cold days return again and again, when it would seem to be time for the stress to be over.

As soon as the sunny days of March do come the situation will change speedily, for it is always the case for the demand to drop off fast in early spring. Reports from the mines are not reassuring, for there are prospects of labor difficulties in the spring and the miner as a rule is much harder to control than he used to be, for he has a notion that he does not need to work steadily, and there is trouble if an effort is made to keep him busy

CLEVELAND

Receipts continue about 35 per cent of normal and with cold weather recurring, the shortage is as acute as any this winter. It is expected a price of $3 will be sanctioned for No. 8 mine-run and slack and $3.25 for prepared sizes, and offers to contract on this basis have been made. Anthracite receipts are good; Pocahontas bad.

Bituminous—Steam-coal users continue to limp along with supplies not much over one-third of normal. Some actual shut downs and curtailed operating schedules as a result of no fuel are reported. Diversion of coal to meet the needs of the largest public utility continue, the utility having only a 48-hour "rubber" in the way of slack. Were one day to pass without any coal being moved into the city a third of the industries would be compelled to close. Receipts at present are on a par with the average of the past two months, but demands because of the extreme cold weather have made the situation as serious as at any period this winter. Every steam-coal user is only about a day's supply ahead.

Some No. 8 district operators with headquarters here are predicting that when the President's Coal Commission reports it will grant miners only a small additional wage increase but will permit the f.o.b. mine price of No. 8 slack and mine-run to be advanced to about $3 and No. 8 prepared sizes to $3.25. This would mean an advance of 65c a ton. At least one operator has been approached by a steam-coal user with a proposition to contract for his needs at $3, provided that is the new price.

With the freight rate from the No. 8 field to Cleveland $1.35, this would make slack and mine-run, delivered Cleveland, $4.35 and prepared sizes $4.60 Retail dealers are allowed $2.08 additional for delivery and profit in sales to manufacturers, $2.65 to churches and apartments and $2.80 to dwellings. The feeling in the local trade is unanimous that prices will be advanced; the only point of speculation is how much. It is believed that new rules for car distribution will be worked out by the commission; on this point operators believe the commission will lay especial emphasis.

Cleveland operators are hopeful that the middle of March will see the car situation much improved; in fact, some are predicting it will be doubled as soon as the railroads have settled down to private operation. Opening of the lake trade in April also will work for improvement, as the additional cars made available for the iron-ore trade are used to carry coal back to Lake Erie ports.

Labor at the mines now is adequate for the car supply, but once near-normal operations are made possible the labor shortage will make itself felt, operators fear. Reports of operating losses are heard on all sides. An operator with a mine on the Pennsylvania was able to operate only 52 hours in the first three weeks of February A mine owned by the same operator on the Wheeling & Lake Erie was operated 61 hours in the same period. Improvement in car supply on the Pennsylvania is expected to be greater than on any other road.

Anthracite and Pocahontas—Receipts of anthracite are reported quite good and dealers are not far behind on their deliveries. Receipts of Pocahontas are practically negligible. Domestic demand for anthracite, Pocahontas and bituminous is heavy. Dealers no longer wheel coal into cellars; dumping at the curb is the rule, with labor so short. Prices are unchanged on anthracite and Pocahontas.

Lake Trade—Lake shippers have changed their minds on the opening of the season, instead of a late opening, provided navigation is possible, they believe it will be fairly early. Upper lake docks, which last spring were congested, will be pretty bare by April 1. Outlook for an improved car supply is better, and it appears that more lake coal will be available late in March and early in April than appeared possible a few weeks ago

While some lake coal has been placed, no prices have yet been named. It is believed whatever price the coal commission names will rule for the lake trade; normally, the lake price is somewhat higher than that named for the lower lake trade. The talked-of price is $3 for mine-run, with the freight from the No. 8 field to Lake Erie ports $1.33.

Prices of coal per net ton delivered by dealers in Cleveland are:

Anthracite—Egg, $12.20@12.40; chestnut, $12.50@12.70; grate, $12.20@12.40; and stove, $12.40@12.60

Pocahontas—Shoveled lump, $9.00@9.25; and mine-run, $8.00@8.25.

Domestic Bituminous — West Virginia splint, $8.30; No 8 Pittsburgh, $6.85@7.00; Massillon lump, $7.40@7.65; Cannel lump, $11.00; and Coshocton lump, $7.35.

Steam Coal—No 6 slack, $5.75@6.00; No. 8 slack, $5.80@6.00; Yougheigheny slack, $5.25@6.10, No. 8¾, $6.35@6.60, No. 6 mine-run, $6.30@6.85; and No. 8 mine-run, $6.30@6.85.

DETROIT

Obstacles attending the transportation of bituminous coal into Detroit, ranging from car shortage to embargoes, were augumented with the coming of a heavy snowfall, Monday. To just what extent the storm will become an impediment is not yet certain.

Bituminous—That continuance of the power supply of many of the manufacturing plants of the city is still a matter of considerable uncertainty is made clear in a statement by J. W. Brennan, purchasing agent of the Detroit Edison Co., who says that for some time past his company's daily receipts of bituminous have averaged about 800 tons a day less than consumption

To make good this deficit in daily supply it has been necessary for the company to use coal liberally from its stock piles, with the result that it now has, Mr. Brennan says, only about four days supply ahead. Under these conditions the delaying of shipments by the storm would be likely to create a crisis forcing suspension of power service to customers other than those that might be classed as essential industries.

Jobbers and wholesalers are still receiving reports from the mines that in many instances they are able to operate only two or three days a week because of insufficient supply of cars for loading or because of the in ability of the railroads to provide locomotives for moving cars.

Complaints are also coming to the jobbers that the Railroad Administration is continuing the confiscation of shipments sent to Detroit and is diverting the coal to provide for railroad requirements.

Anthracite—Though anthracite is not coming into the city very freely, the situation just now seems to be occasioning little anxiety. Jobbers calculate that household consumers are in a comfortable position and that the retailers though not carrying very large stocks will be able to supply their customers.

Lake Trade—Reports coming to vessel owners indicate that coal is being moved rapidly from docks on the upper lakes and that there will be an active demand for vessel capacity to load coal at the opening of navigation, providing the railroads are then able to supply a sufficient number of cars to get the coal from the mines to loading docks. So far no coal has been loaded for shipment up the lakes. At this time last season several cargoes were afloat.

Middle West

MIDWEST REVIEW

Coal is now so scarce in the Middle West that retail dealers and purchasing agents for manufacturers appear to have moved in a body to coal centers like Chicago, Indianapolis, and Peoria, and having once arrived, proceed to besiege the offices of operators and wholesalers in the vain hope of purchasing an additional tonnage of coal.

The car shortage, which has been with us for some time past, is now beginning to make itself felt throughout the middle west. Operators who contracted say 40 per cent of their output are now having great difficulty in supplying their contract customers, let alone their retail and miscellaneous trade. To add to the seriousness of the situation the car supply continues to grow worse, rather than show signs of improvement.

A certain Ohio Congressman was in Chicago a few days ago, and addressed the members of the Union League Club, on the railroad question. This club has a large number of coal operators in its membership, and the address was listened to with great interest. Among other things said was that as soon as the roads were returned to private ownership approximately two hundred and fifty thousand men would be discharged. These men had been placed with the various roads through the Railroad Administration, and are now considered unnecessary help, by the private owners of the roads. This case of overemployment is only one example of the extravagance and mismanagement of the administration.

In spite of repeated promises for better service coal is still moving slowly, and it is not an uncommon thing for a car of coal from West Virginia or southeastern Kentucky to take from four to six weeks to go from the mines to some point in either Illinois or eastern Iowa. This, coupled with the car shortage we have already touched upon, is perhaps the main factor responsible for the present coal shortage.

A number of our most prominent coal men have made predictions as to business conditions during the coming season. Practically all of these opinions are very hopeful and optimistic. It is thought that the car supply will improve, perhaps slowly, but improve some, and a strong demand for coal for a number of months is taken for granted by almost everyone. These predictions for excellent market conditions are based on the fact that there is, at the present time, a coal shortage in this country which will have to be made up.

CHICAGO

Chicago wholesalers, as well as operators, who have mines in Illinois and Indiana, are combing the market very thoroughly in an endeavor to purchase coal. Operators are interested because they are not receiving a sufficient car supply at their mines to take care of their contract customers, let alone miscellaneous orders from retailers and steam plants.

Wholesalers are buying because they are not getting nearly enough coal from their regular source of supply. Chicago retail trade is coming into the market strong, and are now very grateful to receive mine-run, even of the poor grades, whereas a couple of weeks ago they were rather particular if their lump coal was not prepared up to standard.

But little anthracite is being received in Chicago of late, and retailers are pretty generally complaining about the preparation of the anthracite which does arrive. It is claimed that the preparation is very poor and that there is an inordinate amount of slate in practically every shipment. Complaints made to the shippers, on this account, always result in the same thing—namely, labor at the mines is so independent and careless that little can be done in the immediate future towards betterment.

It is believed that within two hours Chicago could hold an impromptu convention of the majority of coal purchasers in the Middle West. Various factories tired of waiting for coal salesmen to call upon them, have sent their purchasing agents here to Chicago, and this, combined with the large number of retail dealers here looking for coal, has resulted in a demand for fuel about three or four times in excess of the present supply.

ST. LOUIS

Market in a critical condition account shortage of coal. Mines averaging less than two days per week. City supplied but country districts without fuel with cold weather and future prospects bad. Miners dissatisfied.

The situation instead of showing improvement has been getting worse. Miners in the Standard and Mt. Olive districts are averaging less than two days work per week on commercial coal. The past week has been worse than any other. On the [illegible] R.R. [illegible] commercial coal has been shipped. Everything [illegible]

There is much dissatisfaction among the [illegible] amount of working time they get, contending they cannot live on the money they are getting if this is to continue. Many of th[illegible] in [illegible] before spring, and then they do not know whether there will be steady work at that time, even if there are plenty of cars.

With the miners in this condition, there is evidently trouble ahead for the operator in the matter of wage scale. Everything produced finds a waiting market and were it not for gevernment prices, there is no telling what coal would be bringing in the St. Louis territory right now.

Locally there is a shortage of fuel, but everything is kept going. However, outside of St. Louis proper many steam plants have been obliged to shut down and many towns have been without domestic fuel for several weeks. The places that are hit hardest are the local stations on the Iron Mountain line south that carry rates only from the Iron Mountain lines in Illinois.

Throughout the Carterville field of Williamson and Franklin County conditions seem to grow worse, although they are not as bad, generally speaking, as in the Standard and Mt. Olive districts. Most of these mines are on two or more roads and they get a pretty fair car supply, whereas in the Standard and Mt. Olive fields nearly all mines are on one road. That gives the mines in the Carterville fields about three days car supply a week, but the railroads draw heavily.

In the Mt. Olive and Standard districts the railroads are taking about half of the coal produced. On the Missouri Pacific R.R. the mines are prohibited from loading any commercial coal because the amount of cars furnished are insufficient to give the Missouri Pacific its tonnage of railroad fuel. An order went out one day this week to confiscate fifty cars of coal. The best they could find on road was thirty eight cars and then they began confiscating coal in the St. Louis terminals that came from other fields.

A check up showed at that time that there was 105 per cent of coal equipment on the Missouri Pacific rail and an investigation developed that this equipment instead of being held for coal carrying is permitted to be loaded with logs to make automobile wheels and spokes and kindred luxuries, and the equipment is shipped to all parts of the country. On account of the shortage of box cars it is used for commodities that until the last year were never shipped in coal cars before. It is not a question of shortage of equipment. It is a question of incompetent railroading.

The weather is cold throughout the Middle West. The movement of everything is slow and the shortage of fuel continues to increase. It is possible that when the railroads pass into private ownership after the first of March that there will be a difference in everything.

The papers in the Middle West accuse the railroads of laying down on the job right now to show up a better contrast under their own supervision after March 1. There is practically no anthracite moving into St. Louis and no smokeless at all. The movement of coke to outside points is good. There is practically no Franklin County coal coming in and all prices are the same as last week.

MILWAUKEE

Coal in brisk demand. Supply depends solely upon rail facilities at present. Prices remain unchanged, but an advance is seemingly in prospect.

The coal market at Milwaukee is maintaining an even balance, despite an unceasing demand upon sources of supply which are about as uncertain as the weather. Everything depends upon the inflow by rail at the present time. This movement is slow enough under normal circumstances, but the least obstruction to traffic pinches the market.

Prices continue unchanged simply because dealers shrink from becoming involved in the popular sleuthing into high costs, which has reached the stage of local committee investigations; but a rise all around seems to be impending unless the situation changes materially. Rail service is poor and the outward movement of stocks held to protect contracts is slow. Milwaukee could handle twice as much coal as it does at present if rail facilities were equal to demands upon them.

Coke

CONNELLSVILLE

The coke situation shows no material change. Car supplies in the Connellsville region were somewhat poorer last week than previously, but there has been a corresponding improvement this week.

Production on the whole has been remarkably steady since the first of the year, but with increasing demands on the part of the blast furnace industry, made up only in part by increased production of byproduct coke, the apparent shortage is as great as ever. Several furnace interests would willingly pay considerably more for prompt coke, if permitted.

It is now generally thought that as long as winter weather obtains the railroads will not be able to increase their car supplies to the Connellsville coke industry, but it is likewise felt that the advent of mild weather, which is unduly postponed, will automatically bring prompt relief. As has often been the case in the Connellsville coke industry the change in the attitude of furnaces as to coke supplies may be spectacular.

Often it has occurred that at one time the furnaces would be bidding higher and higher prices for spot coke and a fortnight later would be instructing shippers to suspend shipments on contracts. A sharp improvement in transportation conditions would bring about three things a reduction in the quantity of coke in transit, resulting in correspondingly heavier receipts at furnaces, an increase in the amount produced and shipped, and the picking up of the considerable tonnages of coke that the old fashioned ovens have stocked in the past few weeks. The modern push-ovens cannot stock coke. There is scarcely any coke obtainable in the open market except off grades, which command the full Government limit. The market is quotable at Government limits: Furnace, $6; foundry, $7; crushed, over $\frac{3}{4}$-in., $7.30, per net ton at ovens.

The *Courier* reports production in the Connellsville and Lower Connellsville region in the week ended Feb. 21 at 235,157 tons, a decrease of 8,829 tons.

BUFFALO

There is report of profiteering in the coke trade as well as in coal, so that the regular price of $9.60 for 72-hr. Connellsville foundry is often up $1 or more, so far as the asking price is concerned.

Furnace is also held for more, though it mostly goes for $8.60 on contract, with off grades $7. Domestic sizes sell well at $7.75 and breeze less actively at $5. The prospect of a heavy smelting year is good. Already there is enough iron ore sold to insure the bringing down of 60,000,000 tons by lake. Buffalo will as usual supply a number of furnaces East of here, some of which have already bought liberally. No vessel chartering has been done yet, but it is expected that the 1918 rate of $1 per ton from Lake Superior will be paid.

Foreign Freight Rates

		Tons Dis-placed
Genoa/Leghorn	$26.50 —	1,000
Spezia/Savona	26.50 —	1,000
Piraeus	28.50 —	1,000
Trieste/Venice	31.00 —	800
Algiers	26.00 —	800
Cadiz/Bilbao	23.50 —	1,000
Barcelona	26.00 —	1,000
Antwerp/Rotterdam	22.50 —	1,000
Lisbon	22.50 —	1,000
Gothenburg	24.00	1,000
Marseilles	26.00 —	1,000
Stockholm	26.00 —	800
Hamburg	25.00 —	1,000
Rouen	23.00 —	1,000
Malmo	25.00 —	800
Pernambuco	16.00 —	500
Bahia	16.00 —	500
Rio	17.00 —	1,000
Santos	18.50 —	600
Rio Grande do Sul	19.50 —	500
Buenos Aires or	16.00 —	1,000
La Plata or		or
Montevideo	17.50 —	750
Para	15.00 —	500
Rosario	19.00 —	750
Bahia Blanca	17.50 —	1,000
To Nitrate Range	12.00 —	1,000
Havana	7.50 —	600
Sagua or Cardenas	9.00 —	300
Cienfuegos	9.00 —	500
Caibarien	9.50 —	300
Guantanamo	9.50 —	300
	9.00 —	400
Manzanillo	9.50 —	300
Bermuda	9.00 —	300
Bermuda p.c. and dis. free		
Kingston	9.50 —	400
St. Lucia	11.00 —	500
Barbados	11.00 —	500
Santiago	8.50 —	500
	9.00 —	400
Port of Spain, Trin	11.00 —	500
Curacao	10.50 —	500
Free p.c. Curacao		
Demerara	13.00 —	400
St. Thomas	10.00 —	500

All above rates gross from charter.

COAL AGE

Volume 17 New York, March 11, 1920 Number 11

Assigned Cars for Railroad Fuel

"THEY never come back." Well-proved words that are rightly applied to many a dethroned champion who tried. Nevertheless, they do try, for it is hard to realize that the old order is gone. Report has it that another of the dethroned will try to stage a come-back. This ex-hero is the notorious assigned car for railroad fuel.

He used to be the champion bruiser for the purchasing agents of the railroads when they went out to buy coal. The coal producer was a jelly when old A. C. finished with him. Prices were wrecked, profits abandoned. Discrimination was the established practice. Some mines ran overtime on unprofitable railroad orders; other mines worked only odd days or parts of days for lack of cars. In consequence the public paid more for its coal; miners were idle; they got in debt; they and their families starved; they were ripe for strikes and revolution against such conditions.

The whole system was viciously unfair and unjust. But it meant cheap railroad fuel and had never been decided illegal. Therefore, the purchasing agent and the railroad president were satisfied and happy. Bankrupt coal operators, idle mine workers, hungry women and babies, festering revolt in the coal fields never troubled their bland serenity. Nor did any unwelcome ideas of fair play and justice ever disturb their case-hardened consciences.

Then came the war and the Railroad Administration. John Skelton Williams, head of the Railroad Administration's purchases, had in his hands the purchase of 150,000,000 tons of coal for railroad fuel. He also had the use of the entire railroad transportation system of the country. He likewise had the full authority of the government. No man in the history of the world ever had such power in any market. And he announced his intention to use all that economic and legal power to the limit in order to buy coal cheap.

He proposed to use the assigned car as his main weapon and to disregard government prices, government plans for the war distribution of coal, the production of ships, munitions, or other war supplies, principles of fair dealing and any other trifling objections that might be urged against his high and mighty purposes. Director General McAdoo found it easy to support him while the fawning satellites under him walked softly in his august presence and made ready to execute his unholy plans in reverent admiration, for what he proposed went far beyond anything that any mere human purchasing agent had ever dreamed of accomplishing.

But the coal men in the Fuel Administration condemned the whole scheme unreservedly. They insisted that the Railroad Administration should buy its coal like any other purchaser and should distribute the cars equally to all mines. They appealed to the Fuel Administrator. Dr. Garfield took one good look at Mr. Williams' scheme, saw its utter iniquity, and when he was unable to persuade McAdoo to kill it, went to the President. The President also got his feet down on the solid ground of right and justice and gave orders that there should be no assigned cars under the United States Railroad Administration but that the distribution of cars should be equal among all mines. The benefit to the public was made instantly apparent in a $50,000,000 reduction in the nation's coal bill.

Now that the roads are returned to private management, it is reported that some of them will again use assigned cars in the purchase of their railroad coal; in other words, pay for the coal partly in money and partly in cars for the loading of coal. Meantime, the new railroad bill says that in times of car shortage every car furnished must be counted against the mine, and the failure to so count every car is penalized. Railroad men may try to twist that language into something else, but evidently Congress has meant to end discriminatory distribution of coal cars.

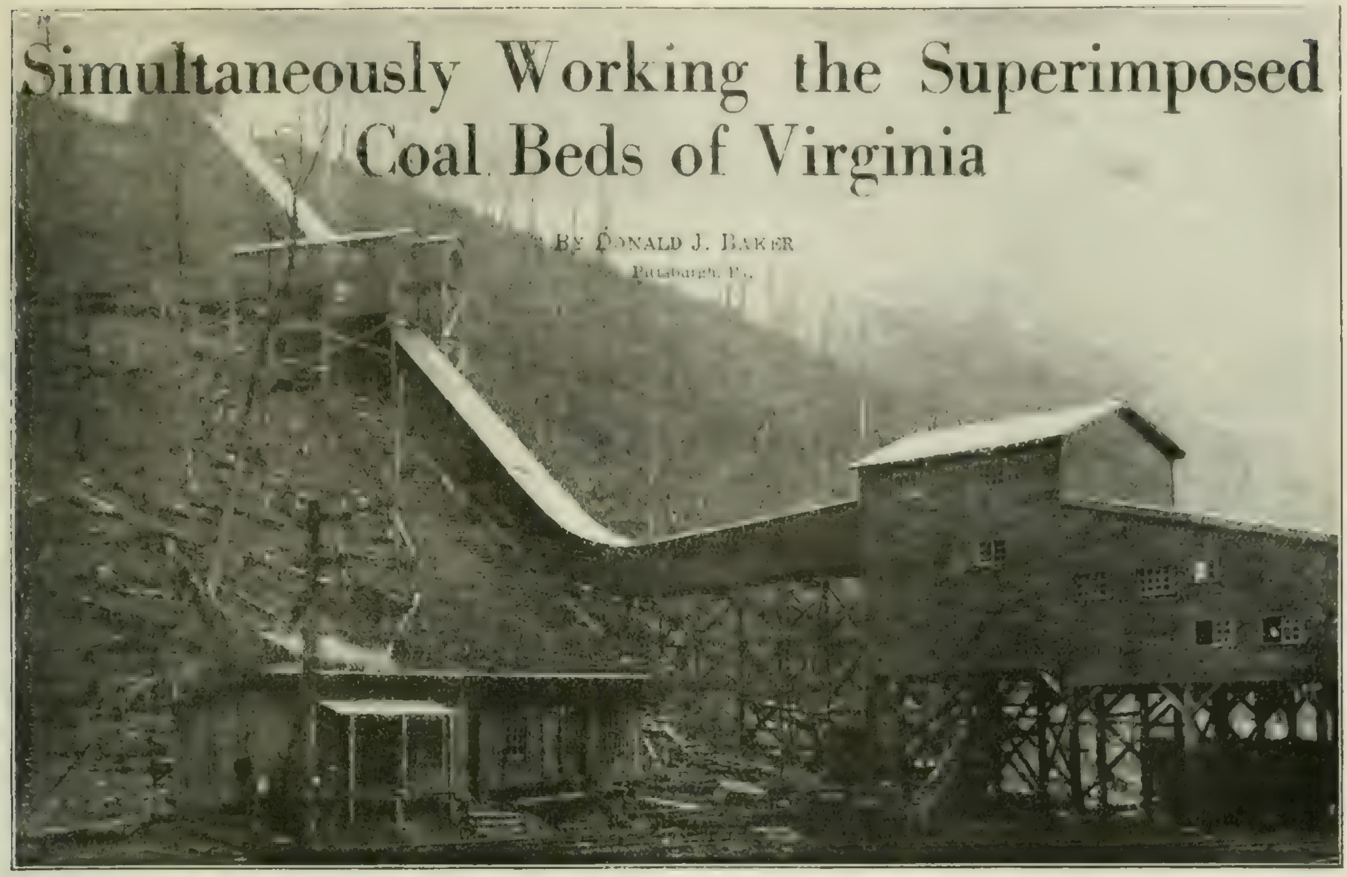
The wise railroad president will heed the plain public condemnation of an old evil and abuse and will not even waste time speculating on whether he can somehow evade the statute and still avoid heavy penalties and damages. The unwise may try it, but the finish of his effort will be certain. In an emergency there may be some ground for the special placing of some cars for fuel loading at available mines for a day or two, but there is neither reason, excuse nor legal warrant any longer for going out and deliberately making discriminatory car supply a consideration in a contract providing for fuel deliveries throughout a whole year.

The coal producer has as much need of taking to heart the lesson of the President's decision as has the railroad man. The coal operator also knows now that the assigned car is a branded convict. The disapproval and condemnation of the industry will rightfully fall upon the producer or jobber who becomes a party to any railroad business carrying assigned cars with it. Moreover, the public will not placidly submit to the added cost of its coal which the re-establishment of the old practice would entail.

In brief, it will be far better for all concerned to recognize the fact that this old abuse is done for. Neither the coal industry nor the public will tolerate its return. They will rub the old truth into avaricious doubters good and hard that "they never come back," if said doubters go ahead with their plans to try turning the moral and economic progress of America backward.

Simultaneously Working the Superimposed Coal Beds of Virginia

By Donald J. Baker
Pittsburgh, Pa.



VIRGINIA as a state has more to boast of than merely being the "Mother of Presidents," producing the largest peanut crop and being second in tobacco growing. In Wise County the Cumberland Mountains attain their greatest height and contain the most valuable and numerous coal deposits found within the state borders. It is little wonder that Wise County has become the scene of numerous coal operations. Mining conditions here exact a greater exercise of engineering skill than is commonly necessary in districts farther north. The compensating feature, however, is that the coal beds are relatively thick. Furthermore, the coal is clean, requires no extensive preparation and is nearly free from gas. The roof is usually a firm sandstone that resists the disintegrating action of the air.

Output from four operations in as many different beds is fed to one conveyor and prepared in one tipple. One of these mines is regularly inspected on horseback.

One of the leading operators of Wise County is the Blackwood Coal & Coke Co., whose main offices are at Blackwood about 5 miles west of Norton. This company was organized in 1903 and operations were started the same year. The mines of the company are located at Blackwood, Pardee and Roaring Fork, all of which are within a radius of 12 miles of each other and located in Big Black Mountain; one of the highest and most impressive elevations of the Cumberland chain. The mountain itself is the dividing line between Virginia and Kentucky and is in truth a fitting monument to separate two states whose picturesque scenery must be seen to be appreciated.

The coal deposit that is receiving the most attention in the development work of the Blackwood Coal & Coke Co. is the Parsons. This is sometimes known as the Pardee or Cornett bed. It is 2,740 ft. above sea level and is perhaps the thickest known bed of hard, i.e., non-friable bituminous coal in the world. A general thickness of 10 ft. 4 in. is averaged throughout the properties of the Blackwood company. The coal is practically free from impurities and contains no binders. An analysis will show the following constituents: moisture, 0.87 per cent; volatile matter, 38.92; fixed carbon, 56.41; ash, 4.67; sulphur, 0.716 per cent. The The heat content is 14,907 and the fusion point of the ash is high averaging approximately 2,710 deg. F.

The mines at Pardee are most picturesque and interesting because they are so entirely different from the ordinary. In the first place, the coal is unusually thick and maintains its height so evenly that the mine is inspected on horseback. The mountain roads are so steep and rocky that they forbid the use of an automobile in gaining access to the drift mouth. Accordingly C. J. Creveling, general superintendent of the Blackwood company, when he would inspect the mine in the Parsons bed, vaults into the saddle and never has occasion to withdraw his feet from the stirrups until he has visited the last room.

The mine is developed on the room-and-pillar system and certain inspectors of, say, the Miller bed mines of Somerset County, Pa., would indeed think they had reached the ultimate—the Utopian coal mines—if they could make their rounds of inspection on horseback. The same methods are employed by the firebosses making their early morning tours. They are indeed "Knights of the Black Diamond" in every sense of the phrase.

This pleasing and alluring feature is, however, partially eclipsed by reason of the mine being in the nearly inaccessible portion of the Cumberland Mountain region.

While a few labor problems have to be met in the Blackwood mines this freedom is largely offset by most difficult transportation problems which make the question of how to handle the coal after it is brought to the surface not easily solvable. This alone keeps the operator's path from being a velvety one. During the recent nation-wide strike of miners, the Blackwood company never lost a day. Wise miners in this mine of Wise County knew when they were well taken care of. Miners to work this thick bed are easy to secure. Getting men to strike who work in a non-gaseous mine where the coal is over 10 ft. high and the roof so sound that posting is seldom needed, is no easier than it sounds.

END VIEW OF THE TIPPLE WHEN LOOKING FROM BELOW

Cars are here as usual dropped through the tipple by gravity.

The tipple at Pardee receives the coal from four separate beds from a retarding conveyor 588 ft. long having a capacity of 300 tons per hr. The output from the Taggart or "C," the Low Splint, the Parsons and the High Splint beds all enter the one conveyor leading to the main tipple. These beds lie above each other in the order given. Two headhouses discharge the coal after it is dumped onto the conveyor. The lower headhouse collects the coal from the High Splint and Parsons beds while the upper headhouse receives the outputs from the "C" and Low Splint beds.

COAL ON THE SHAKING SCREEN

Slotted lump screen is here employed instead of the common perforated plate.

At first thought it might appear that this statement is incorrect, as the Parsons and High Splint beds lie above the other two; however, the two lower beds are worked at practically headhouse height. Furthermore, the drift entrances are so located that the above arrangement was considered the most practical.

The development in the Parsons bed is 700 ft. vertically above the tipple. This fact is unfortunately not brought out in any of the accompanying illustrations. The mine cars, which are of 120-cu.ft. capacity, are dropped down a 1,500-ft. incline in trips of three by means of a 1⅛-in. wire rope. Upon reaching the bottom, the cars are gathered by a 14-ton Jeffrey "armorplate" locomotive and hauled to the lower headhouse. At this point the cars pass over a crossover dump, from which the coal enters a receiving hopper and is finally distributed upon the retarding conveyor by a reciprocating feeder, which insures a uniform supply. This is an advantageous method.

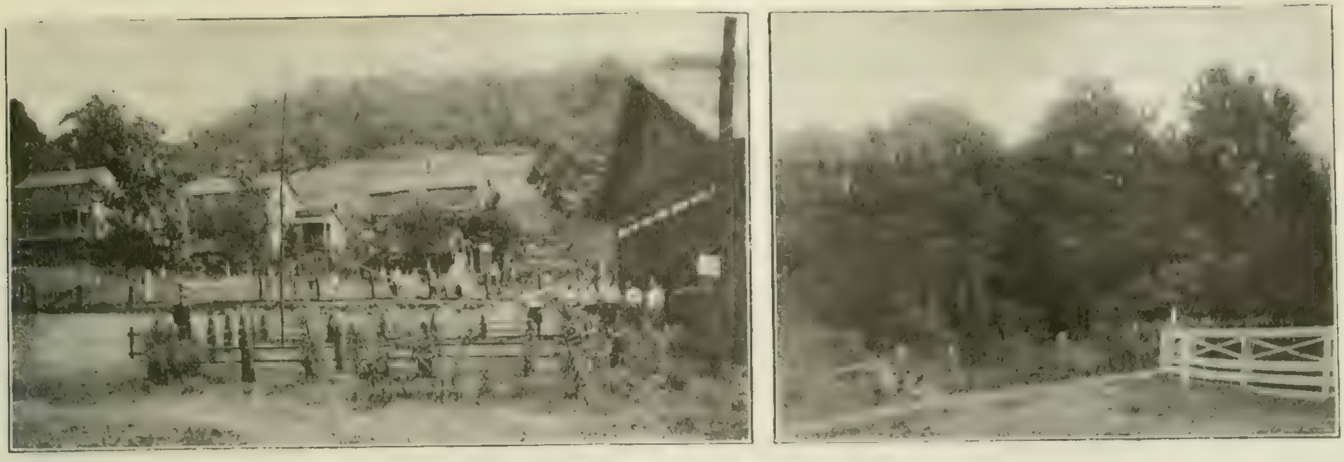
LUMP AND EGG COAL ON CARS

Loading booms are employed for both these sizes

The conveyor is of the chain-and-scraper type and is operated by two motors—a 40-hp. machine at the upper headhouse and a 5-hp. at the lower. The upper headhouse is equipped with a kickback dump, receiving hopper and reciprocating feeder. Both headhouses as well as the tipple are of wooden construction. The tipple and retarding conveyor at Pardee were fully described in the May 1, 1919, issue of *Coal Age*.

The room-and-pillar method of working is employed in the thick bed. Main entries are driven in pairs 1350 ft. apart; each is 12 ft. wide. One is double tracked and used as a haulageway while the other is utilized as an air course. The distance between the two is 72 ft., which gives a 60-ft. pillar. Room entries are turned directly off the mains every 250 ft., this distance being the length of the rooms. The coal is then developed by the panel system with 15 rooms to the panel each located on 60-ft. centers. This allows for a pillar approximately 35 ft. thick between the rooms, which are widened from 20 to 25 ft.

The coal is undercut by 28-A Jeffrey shortwall mining machines and shot down with black powder. A knife-blade parting runs through the Parsons bed and with a conservative use of explosives, the coal will separate at this line and only half will fall. As may be seen in one of the illustrations, the upper undisturbed portion of the bed is allowed to remain in position until the lower bench has been removed for a distance of from 40 to 50 ft. The upper bench may then be brought to the floor by a small quantity of black powder.



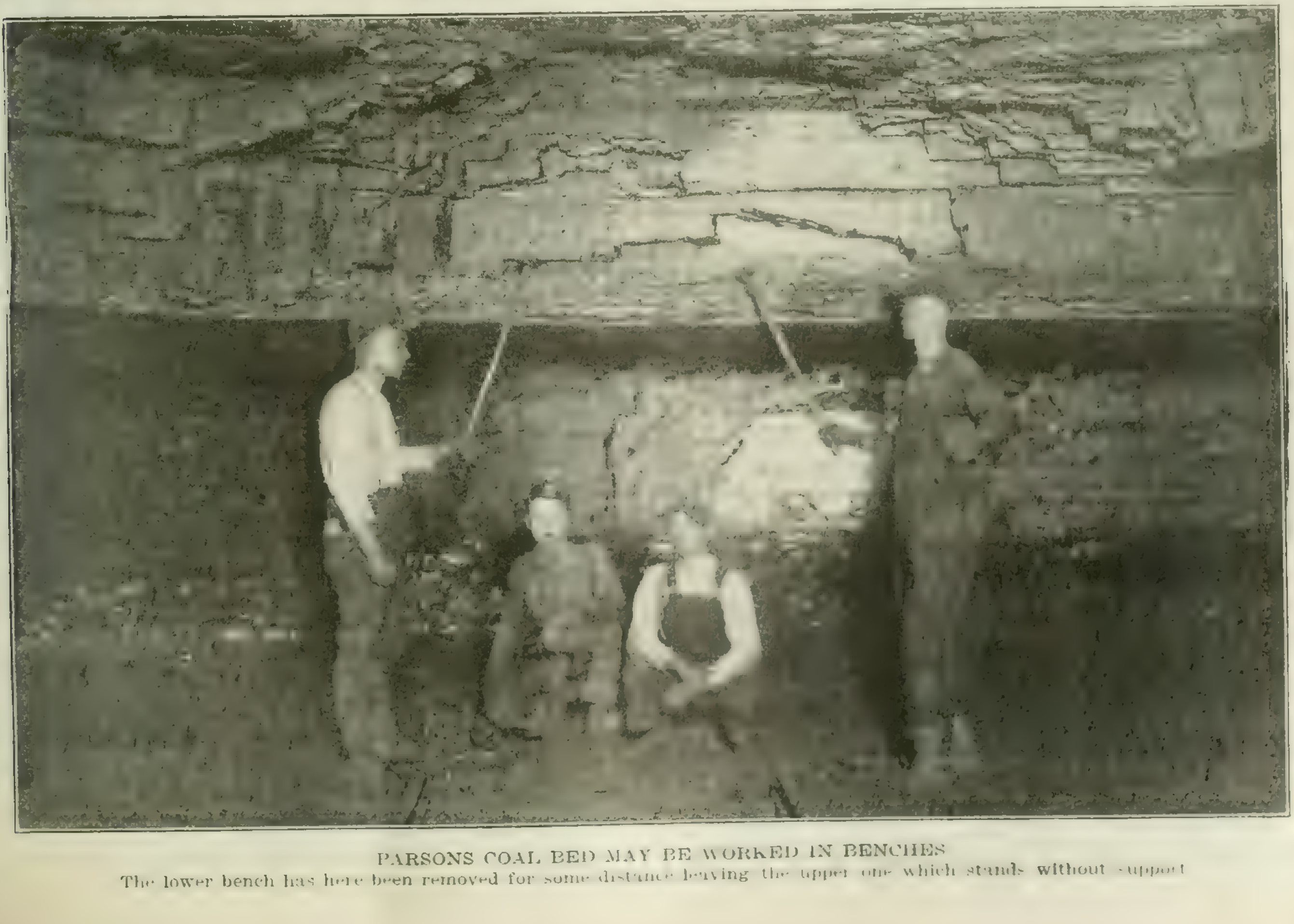
PLAYGROUND AND PART OF THE TOWN
"Growing things," both animal and vegetable, are conspicuous

The coal is harder than ordinary bituminous but is not an anthracite. Posts are seldom employed in driving a room and find only a limited use in holding up the upper portion of the bed while the lower is being removed. The room pillars are split and removed in retreat after all the rooms have been carried to their full length.

Intervals of at least 250 ft. exist between the Parsons, the Low Splint and the "C" beds. Accordingly operations in these measures may be carried on irrespective of each other, as it is considered that there is sufficient cover to protect the overlying workings. However, this does not hold true with respect to the interval between the High Splint and the Parsons beds and these are therefore worked in conjunction with each other, lest in robbing the pillars of the lower bed, operations in the upper should be interfered with and become unsafe.

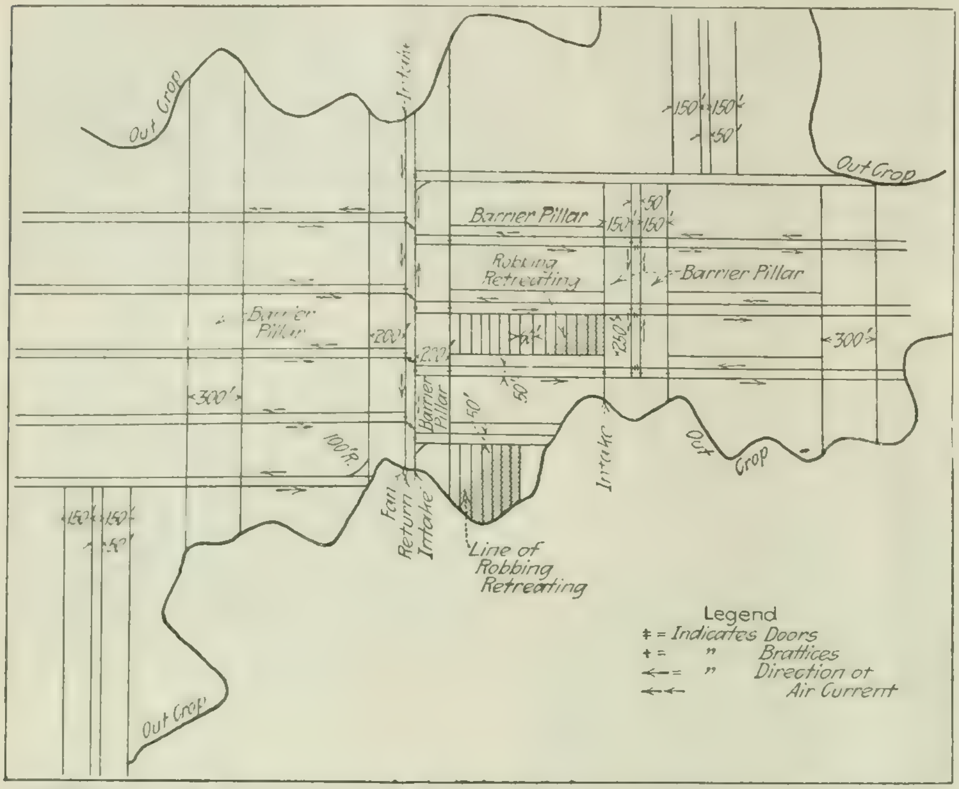
This double development, as it might be called, is carried out without difficulty. The High Splint coal, which averages 5 ft. in thickness, is only found on the highest ridges of Black Mountain. This bed is practically level and approximately 2,990 ft. above sea level. As the highest point on Black Mountain in this region is at an altitude of 3,800 ft., there is no large unbroken tract of this bed as might at first be imagined. Outcrops are numerous and the bed overlies the Parsons only in restricted areas. Accurate surveys have been made of the mines in the two beds and the development work in both is shown on the same map.

As a result, the progress of development in the lower, as regards those sections that underlie the upper, is curtailed until such a time as the room pillars in the upper bed have been removed. It is then safe to pull the pillars in the lower or underlying bed.



PARSONS COAL BED MAY BE WORKED IN BENCHES
The lower bench has here been removed for some distance leaving the upper one which stands without support

This method of working the two beds simultaneously, which is probably the only one that could be used, has one drawback, namely, that water encountered in the upper mine eventually finds its way into the lower. Thus while the drainage problems in the High Splint bed are automatically solved, the Parsons is compelled to bear the brunt of the dewatering for both measures. Fortunately, this bed is practically self-draining as it dips about 3 per cent and development has been made against the dip.



HEIGHT IN THE HILLS, NARROW COAL AREAS AND IRREGULAR OUTCROP ARE CHARACTERISTICS OF THE BLACKWOOD OPERATION

The only places where pumps are required are in those local "swags" that may be encountered in any mine. Taken all in all, therefore, topographical conditions are about as near ideal as could be hoped for when there is not sufficient cover to guarantee one bed being developed independent of any other. Other operations in the same beds may not encounter the same happy combinations that the Blackwood people enjoy.

As will be noticed in the accompanying illustration showing a projection of the mine in the Parsons bed, the outcrop line which corresponds fairly closely to the 2,740-ft. contour line on Black Mountain, limits the field of production. The distance from outcrop to outcrop is highly irregular, although fairly uniform near the location of the present workings. The High Splint field lying above is, of course, even more restricted, while the Imboden bed at the foot of the mountain has the largest unbroken area of any of these several measures. However, this bed, which averages about 6 ft. in thickness, has not been developed to date except at the Roaring Fork mines of the company. These are located 12 miles from Blackwood.

Both the Parsons and the High Splint coals show practically no tendency to weather. This statement is particularly true of coal from the Parsons bed, specimens from which have been exposed to the elements as long as 10 years without showing any visible effects. I was shown a block near the company's office at Blackwood which had been exposed for several years and still appeared to be in the same condition as when mined. This is a big factor in the development of these mines whose crop limits are so closely defined and relatively near each other. The coal is firm right up to the very outcrop. A small quantity of gas is encountered, however, as the outcrops are approached. Black powder is then displaced by permissible explosives when the coal is shot down.

Power for operating all of the company's mines is purchased from the Old Dominion Power Co., whose central station is located at Dorchester, Va. Substations are provided near all the mines.

Much has been accomplished by the Blackwood Coal & Coke Co. in community and welfare work. This section of country, which is naturally bleak and dreary to the eye, lends itself readily to any efforts that are made to relieve the monotonous outlines of the hills. Artificial beautification when applied in the form of transplanted trees and scenic playgrounds, is even more noticeable and gives a more pleasing impression than where the same scheme has been used in a district that lacks the impressive mountainous scenery for a background.

The miners' homes are substantially constructed, but they are of a design that is all too often encountered. However, Blackwood is a relatively old town. It is not the design of the houses that here creates a favorable impression. It is the careful consideration that has been conscientiously applied in the matter of making the most of a mediocre or even bad situation. Each house is neatly fenced and provided with a lawn, while vines drape the porches.

One thing is paramount in the problem of civic beautification. In the older mining towns that were perhaps hastily constructed and where it is now impossible to change the design of the houses, they may be made less bleak in appearance by camouflaging the exterior defects in design. If the men can be interested in their homes, there will soon be built up a friendly competition that needs no further attention, as it is self-sustaining. This has been carried out at Blackwood to a degree and with a result that might well influence other towns farther north to "go and do likewise."

What Happens to Pyrite Under Heat

Carbonization tests of a mixture of coal and pyrite at 1,000 deg. C. showed the formation of some free sulphur, that some sulphur was absorbed by the coal substance and that a larger amount of sulphide than one-half the pyrite sulphur remained, showing a secondary reaction in carbonization. A. R. Powell made the tests for the U. S. Bureau of Mines.

How an Anthracite Breaker Was Remodeled—I

The Old Forge Breaker Was Remodeled During Operation. Concrete Being Largely Substituted for Wood—Rebuilding the Supports Under Load Was a Delicate Process Requiring Great Skill and Care

By Dever C. Ashmead
Tarrytown, N. Y.

ABOUT three years ago the Pennsylvania Coal Co. of Scranton, Pa. decided that it was necessary either to remodel the old structure or build a new breaker at its Old Forge colliery. There were three reasons for this decision; first the cost of preparation was entirely too high as it involved the employment of 156 men; second, the methods of preparation were out of date and therefore the quality of the product was undergrade, and third, the foundations of the breaker were showing signs of decay and the cost of maintenance was high.

It would have been a simple matter to have torn down the breaker and built a new one on the old site or to have built a new breaker on another site but both of these methods were out of the question because of the fact that the country was at war and every pound of coal that could be produced was absolutely necessary for the proper conduct of hostilities. This made it impossible to tear down the old structure in order to build a new one as it was necessary to operate the old breaker continuously. Furthermore, a new breaker could not be built on any other site without negativing the idea of cutting down the cost of production. The expense of operation of the breaker could be reduced but that of handling the output would have been greatly increased. Consequently no material reduction in total cost of production would have resulted.

These conditions made it necessary to come to one of two decisions—either to abandon reconstruction of the breaker or else to remodel it while in operation. After careful consideration of the extra cost of such a method of construction and the results obtainable because of improved output and lessened cost of production, it was decided to go ahead with the work of reconstruction immediately.

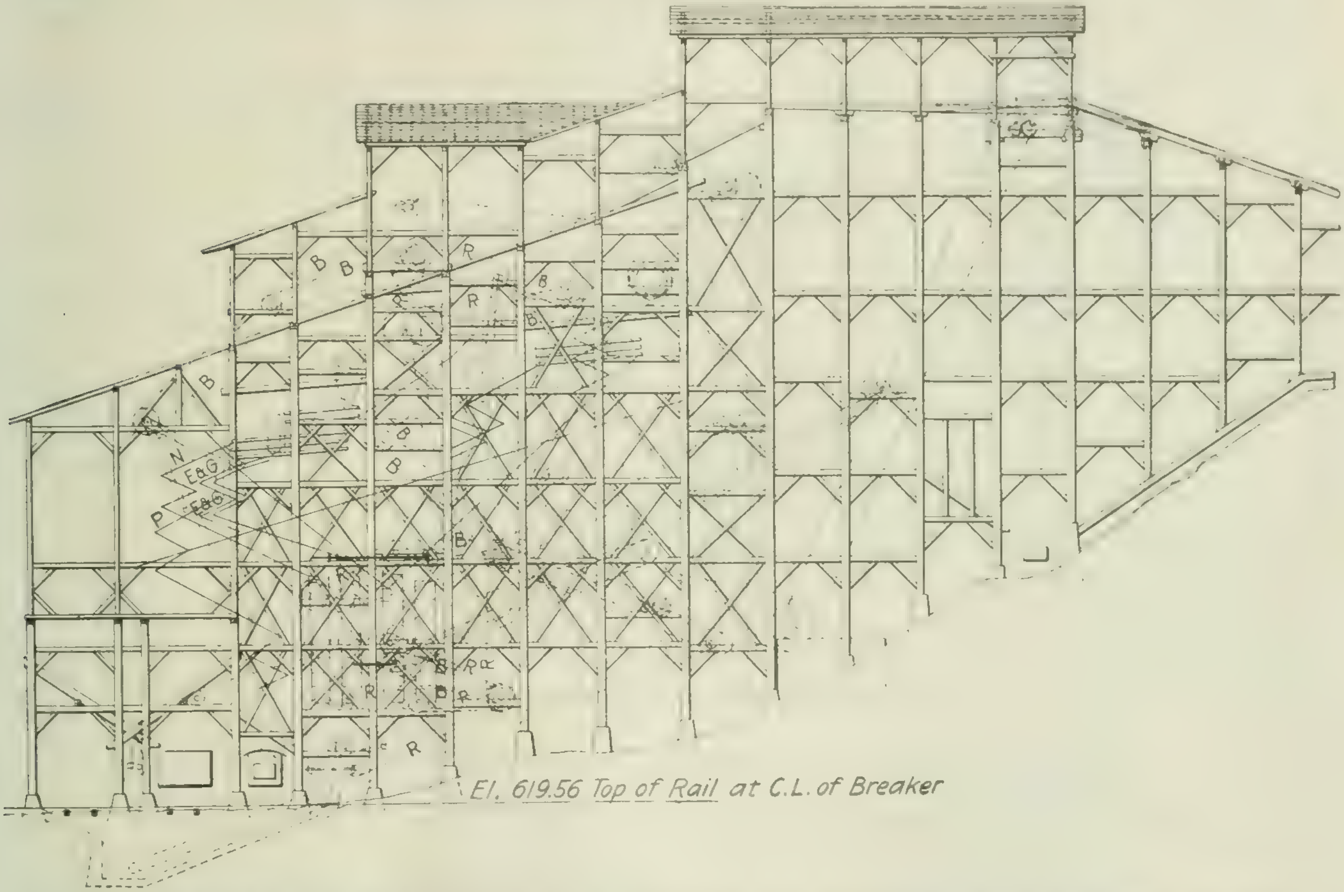


FIG. 1. SIDE PLAN OF THE OLD BREAKER. NOTE INTRICATE AND COMPLICATED MECHANICAL ARRANGEMENT

Having decided to start the work the next step was to decide upon the material to be used. Owing to the great demand for steel it was found impossible to secure this material on anything like advantageous deliveries so that the idea of steel construction, although the most favored, was abandoned. Wood was next traversed but, when the future life and cost of upkeep was considered, given up as costing entirely too much. It was found possible, however, to secure sufficient steel for reinforced concrete and therefore as the cement could be secured with comparative ease it was decided that these materials should be used for the construction. The old breaker consisted of two buildings, one the main dry breaker proper and the other the washery. Both of these buildings were entirely of wood construction. It was planned that the dry breaker should be replaced to a height of 42 ft. above the railroad tracks with reinforced concrete. This included the pockets. The washery upon the completion of the reconstruction work was to be torn down.

Reese D. Isaacs & Son of Wilkes Barre, Pa., received the contract for the construction work and took two years to perform it. With the exception of two months, January and February, 1918, the work was continuous until its completion in the summer of 1919. The original contract called for the construction of the breaker up to a height of 42 ft. above the railroad tracks. The contract was further extended to include the construction of the breaker engine room and a rock pocket in the rear of the engine room; both can be seen in Fig. 3

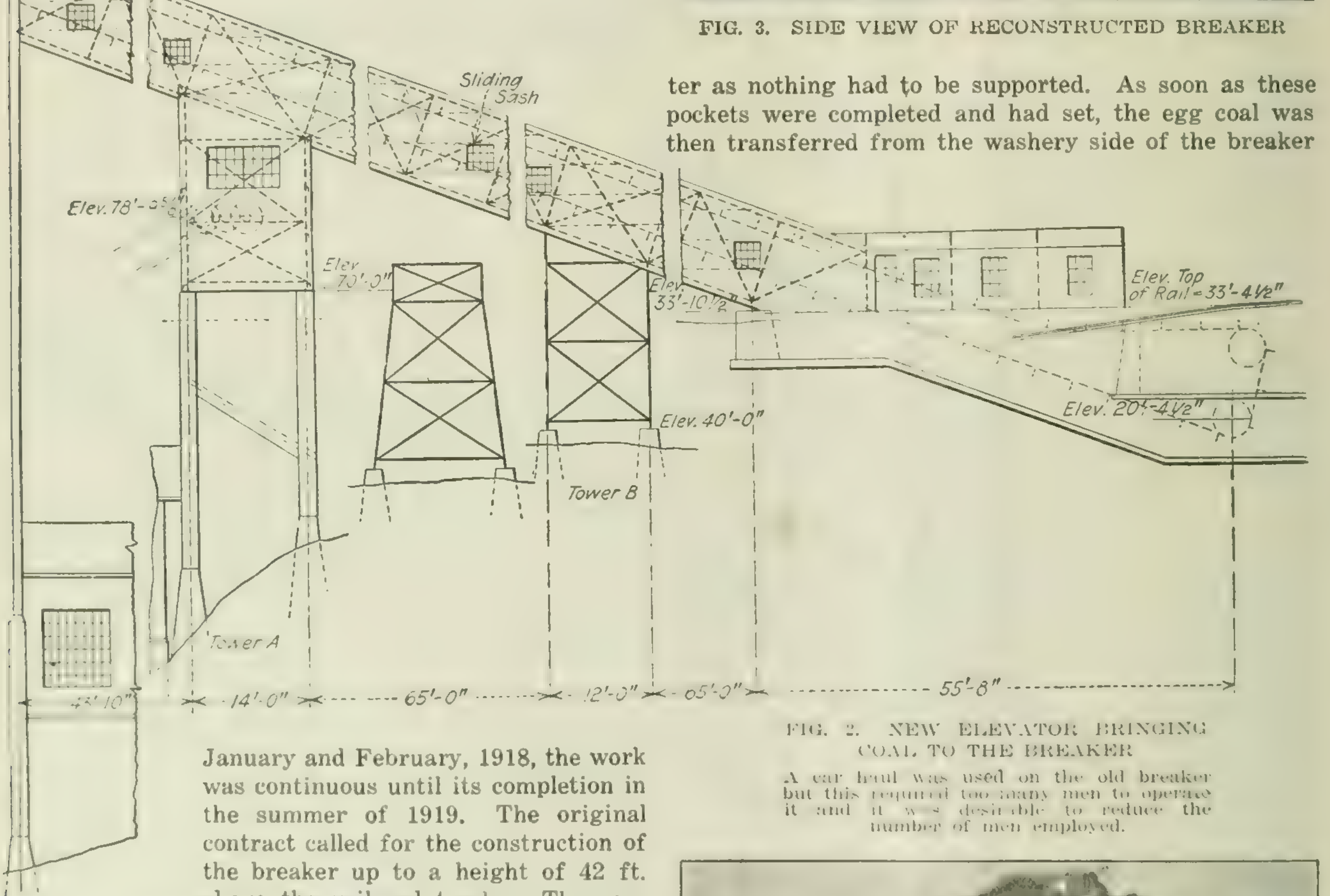


FIG. 2. NEW ELEVATOR BRINGING COAL TO THE BREAKER

A car haul was used on the old breaker but this required too many men to operate it and it was desirable to reduce the number of men employed.

In planning the method of handling the construction work it was necessary to take into consideration the necessity of continuing operation uninterruptedly. Accordingly the first step in the construction work was to transfer from the main breaker all operations on any coal below the size of egg that had to be treated where the construction work was going on. These operations were crowded into the washery. The egg coal was accordingly shunted from the side of the breaker farthest from the washery to the side nearest to it.

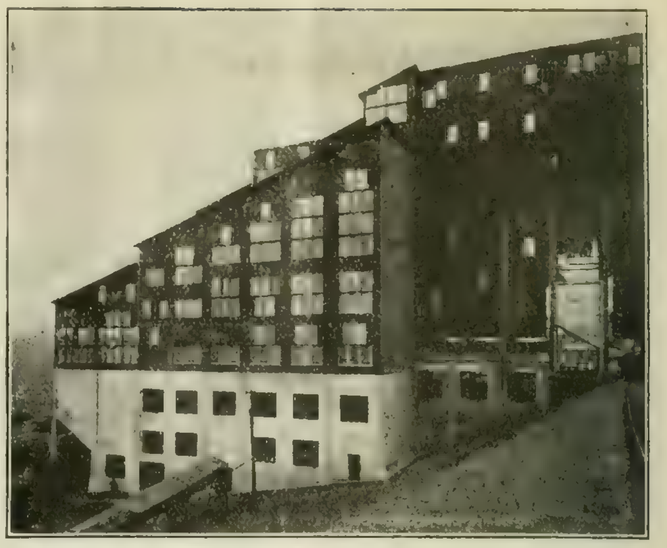


FIG. 3. SIDE VIEW OF RECONSTRUCTED BREAKER

The pockets on this vacant side were then torn out completely as well as all the superstructure directly above them. This made the construction of the pockets on this side of the breaker a comparatively simple matter as nothing had to be supported. As soon as these pockets were completed and had set, the egg coal was then transferred from the washery side of the breaker

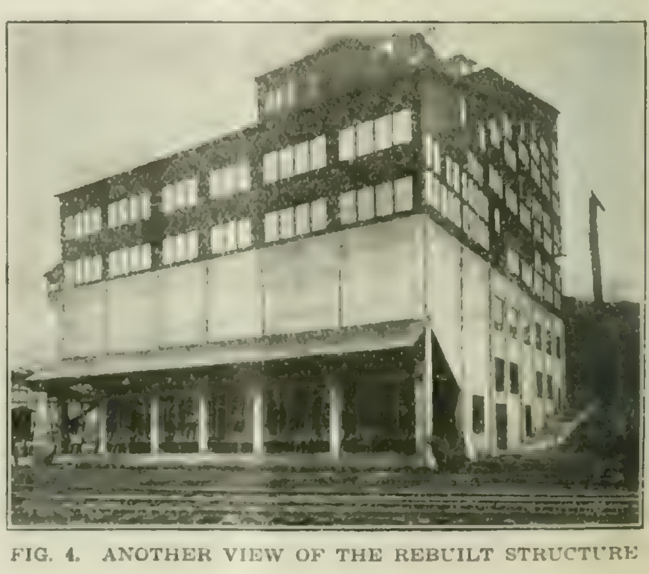


FIG. 4. ANOTHER VIEW OF THE REBUILT STRUCTURE

to the completed pockets. Next the old pockets were removed together with their superstructure and rebuilt. The wood structure above the old pockets had been taken down carefully so that it was possible to reassemble it upon the completion of the concrete pockets with a minimum loss of material.

While the construction work was proceeding, the changes in the preparation process carried on in the upper part of the breaker were being made. These included changing the types of screen and of subsequent treatment. The entire process was altered from dry to wet.

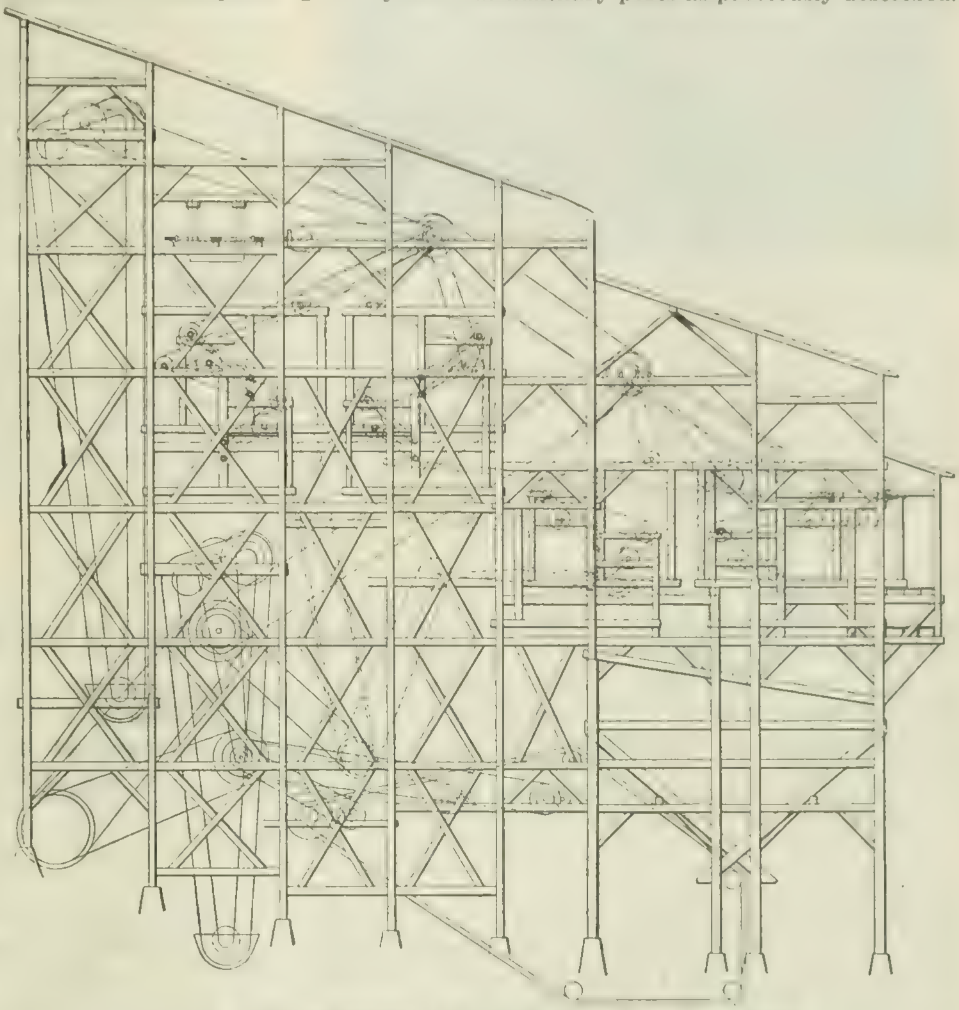


FIG. 5. ARRANGEMENT OF MACHINERY IN OLD WASHER

Washery was abandoned and torn down on completion of the remodeling of the old breaker, the washing being transferred to the new building, all the work being done under one cover. In consequence the handling of coal was much simplified and degradation was reduced

Having completed the pockets in the breaker, all chutes were put in proper place and the coal was then run directly into the pockets in the breaker itself and the washery was abandoned. It then became necessary to replace the foundations and the columns supporting the balance of the breaker. This had to be done carefully so that the building would not be placed in danger. The operation of coal preparation had also to proceed uninterruptedly.

The plan adopted was to replace one or two columns in one locality, then move to another part of the breaker and replace one or two more columns. This would permit plenty of time for the columns to set before placing their loads upon them. When replacing supports in the center of the building, that is in the central three rows of columns, only one at a time was rebuilt as the greatest load in the breaker rests upon these supports. When working on the outer three rows it was possible to replace two of the columns simultaneously. The methods for supporting the superstructure, when replacing either one or two columns, although simple, was strong. The wooden posts that were to be removed were 12 x 12 in. hemlock on the three outer rows of columns on each side of the building while in the central three rows they were 14 x 14 in. white oak.

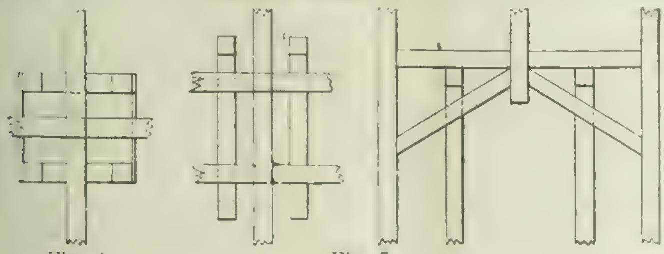


Fig. 6 Fig. 7

METHOD OF SUPPORT EMPLOYED WHEN REMOVING ONE OR TWO COLUMNS WHILE UNDER LOAD

By referring to Figs. 6 and 7 the simple method used will be readily understood. For the replacement of one column at a time, four posts were set about 36 in. from column to be removed, two cap pieces were placed as shown in Fig. 6 and the posts were diagonally braced in both directions. Next the main column whose lower part was to be replaced with concrete was cross braced in four different directions at a point immediately above the cut, thus transferring a part of the weight onto the four adjoining columns besides the support given by the four auxiliary posts as previously described. This made the supported column really stronger after than before its lower part was removed.

For the distribution of the concrete the contractors erected at the corner of the breaker nearest the railroad and farthest from the washery a tower 80 ft. high. This tower was sufficiently high to permit all the work in the main part of the breaker to be accomplished, but was not high enough to accommodate the construction of the engine room and the rock pockets which were added later to the contract. This extra concrete work necessitated the erection of another tower at the rear end of the breaker. The concrete was delivered by the first tower to the foot of the second and from this tower to the job.

The new reinforced concrete work is much heavier in construction than the old building. The main columns are 24 x 24 in. and the outer columns are 20 x 20 in. The concrete floors are 6 in. thick. The bottom of the pockets are of 9 in. concrete as are the walls. Twenty-

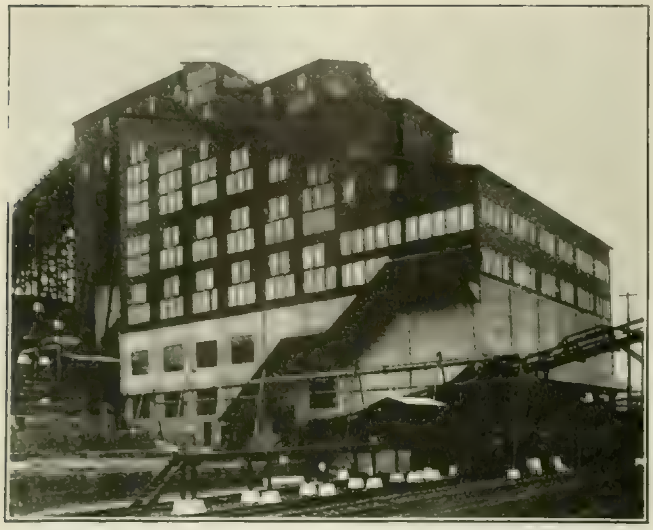


FIG. 8. RECONSTRUCTED BREAKER

The old car-haul trestle may be seen in the rear. Many new windows have been added so that adequate lighting is assured.

inch steel I-beams support the bottom of the pockets. There are two large pockets of 150 tons capacity each and 6 small ones of 75 tons capacity each. The large pockets have 3 gates while the small ones have only one.

There are two loading tracks at the breaker—one for open cars and one for the accommodation of box cars. The company up to the present time has not purchased a box-car loader as the original plans called for.

Upon the completion of the change from dry to wet preparation the old washery was dismantled and torn down. The stone from the foundation of this building and also from that of the breaker itself was removed and used in building a series of retaining walls on the outside of the breaker. These have been filled in and some good soil placed on top of the fill and grass planted thereon. As a result there is a pretty series of terraces at the side of the breaker.

The entire construction work is not as yet finished as the old car haul which carries the loaded cars to the top of the breaker has not as yet been replaced with the new drag-scraper line that is about to be installed When the new scraper line is finished the coal will enter the breaker at a point about 14 ft. lower than the present car dump and the long unsightly trestle that now makes the approach to the breaker will be removed and in its place will be the new steel trestle of the scraper line.

The whole of the breaker above the concrete portion has been covered with new siding and the number of windows has been greatly increased. The breaker is thoroughly heated by exhaust steam making it very comfortable for the men when working in cold weather.

Stabilization of the Bituminous-Coal Industry*

Overdevelopment, Short Working Time, Absenteeism, Seasonal Demand, and Transportation Difficulties, Wages, the Use of Machinery and a Fluctuating Load Curve Are Some of the Problems Confronting the Industry

By Eugene McAuliffe
St. Louis, Mo.

IMPORTANCE of the coal-mining industry has never been realized fully in the United States. Since the last quarter of 1917, however, the problem of the coal supply has thrust itself into every phase of our national life. For 28 months disaster in one form or another has confronted the industry as a whole and famine has actually threatened the workers.

Secretary Lane in speaking of the coal industry said: "It should be treated with profound respect, because we know from Paris that sacred treaties and national boundaries turn on its presence. The world wants our coal, envies us for having it, fears us because of it." Again, as was well said by Secretary Lane, "The public must accept responsibility for the coal industry and pay for carrying it on, the year round. Mine operators and mine workers of whatever mines are necessary to meet the needs of the country must be paid for a year's work." The 105,253,300 people who use coal, who depend on it for life, health and comfort, must sense the problems that confront the industry; it is of too vital importance to be longer let run adrift.

In 1870, five years after the close of the Civil War, our annual coal production of all grades was 0.857 tons per capita, while in 1918, less than half a century later, it had increased to 6.44 tons per capita. To this extent and in this ratio, has coal grown into our national life. Any interference with its production, however occasioned, is reflected immediately in the earnings and activities of the thousand lines of endeavor dependent on the coal industry. When a cessation of production is anticipated the merchant ceases buying, and when the mines close the open store door yields to bars and shutters, and privation frequently begins for the mine worker's wife and children.

Post mortems are frequently only perfunctory ceremonials, but it is customary to try to fix the causes that led up to an accident after it has occurred. The bituminous-coal strike that began on Nov. 1, 1919, led our whole industrial and social system to the brink of disaster. The responsibility for this national calamity—to some extent international in its effects—should properly be laid at the door of the coal consumer.

Early in 1919 a careful survey of the coal requirements of the nation was made by the United Fuel Administration, and it was estimated that the 1919 requirements of bituminous coal would total 500 million tons. The normal monthly requirements of the nation, with the tonnage produced and marketed, together with the excess tonnage produced or the shortage by months as set forth below, presents the conclusive evidence of the nation's responsibility for the strike of Nov. 1.

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*Paper presented before the meeting of the American Institute of Mining and Metallurgical Engineers, New York, February 15, 1920.

MILLIONS OF TONS WHICH WERE AND WHICH SHOULD HAVE BEEN PRODUCED IN 1919

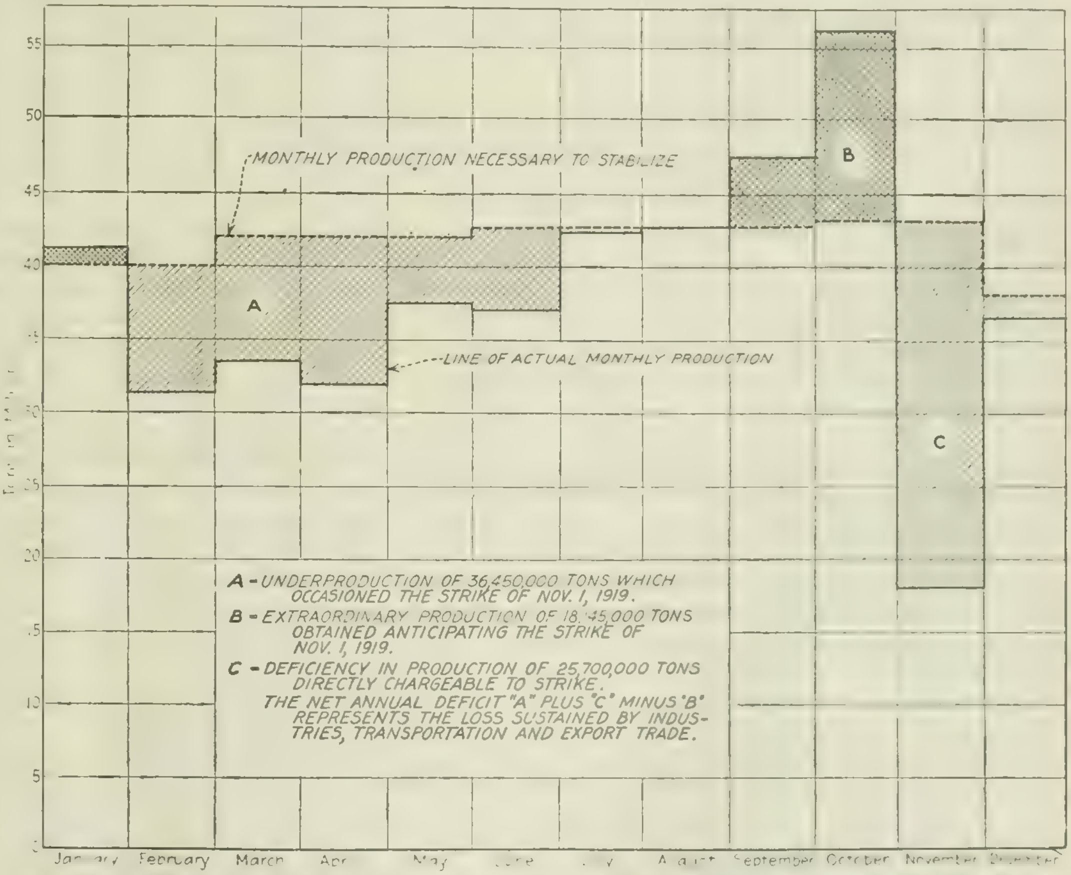
	Normal Monthly Requirement	Month's Production	Production in Excess of Normal Requirement	Production Below Normal Monthly Requirement
January..	40	41 487	1 487	
February...	40	31 566		8 434
March	42	33 719		8 281
April.........	42	32 164		9 836
May	42	37 547		4 453
June	42	37 054		5.446
July	42	42 698	1 98	
August	42	42 883	3 83	
September..	42	47 402	4 902	
October......	43	56.243		
November	43	18 688		24.312
December	38	36 612		1.388
Total	500	458 063		41 937

I have no hesitation in saying that if the 36,450,000 tons of bituminous coal not produced and, therefore, not transported and marketed in the five months February to June conclusive, had been so produced, transported and placed in storage for subsequent consumption, this strike would not have occurred with all the resultant losses occasioned thereby. In my opinion, if the bituminous-coal consumers of the nation had purchased the coal necessary to overcome the underproduction that occurred in the five months above mentioned, the nation's fuel bill would not have been seriously augmented during this five months' period, and, on the other hand, the domestic and foreign demands for fuel would have been sufficient to lift the annual production to the estimated 500 million tons.

During the early part of 1919 the coal transportation facilities made available by the Railroad Administration exceeded the demand. During this period, however, the market for bituminous coal was limited, and in many districts, mines were operated only 24 hr. per week. In certain districts where the quality of the coal, was relatively poor, individual mines work one day per week, one day in two weeks, and in some instances were closed for a period of from three to five months. There is no other industry in the world that would even attempt to live under these conditions, and the price paid by the coal-consuming public on account of this condition represents a sum that is hard to even approximate.

Late in July, 1919, a crisis developed rapidly and since that time there have been periods when the operator, the mine worker, and the consumer either in turn or simultaneously have suffered greatly from the inevitable results of the conditions that controlled the industry earlier in the year. The demand for cars could not be met by the railroads; the miners demanded shorter hours and a rate of pay which they hoped would relieve the situation; and, in the meantime, the 105,000,000 users of coal, after previous experiences of a somewhat similar nature, accept the situation as apparently inevitable, not realizing that a comparatively easy and probably the only practical remedy lies in their own hands if they will but apply it. While we cannot measure the full extent of the losses flowing from the strike begun Nov. 1, 1919, certain compelling conditions are deserving of more than passing notice, for example:

(1) Debts Contracted by Workers. Thousands of mine workers and industrial operatives will struggle for months to come in order to pay off the debts incurred during that period of idleness.



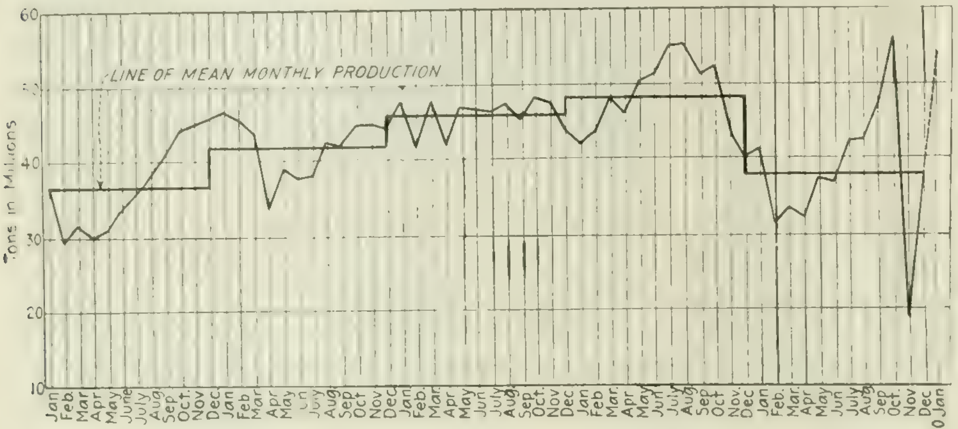
SHOWING WHAT TONNAGE SHOULD BE PRODUCED EACH MONTH IF WORK IS TO BE STEADY AND WHAT TONNAGE WAS ACTUALLY PRODUCED IN 1919

An underproduction of over 36 million tons signalized February to June of last year. In September and October the tonnage produced exceeded the average figures by over 18 million tons. In November the strike was staged, and nearly 26 million tons less than average production was mined, and as a result the year ended with a shortage of nearly 12 million tons.

(2) Losses Sustained by Railroad Administration. The U. S. Railroad Administration, through losses sustained in the form of reduced earnings and increased operating costs, was compelled to pass to the taxpayers a further deficit totalling many millions of dollars.

(3) Interruption of Industry. Because of the interruption to industry during the strike consumers are now paying a premium for basic necessities because of a scarcity of raw and finished material.

(4) Marketing of Inferior Coal. Reputable engineers allege that the product of many permanent mines showed an increase in ash content of 5 per cent above normal during the period of panicky demand felt in 1917. It is difficult to measure the extent of a loss such as a condition of this sort occasions when carried to an ultimate conclusion. Coal of a quality that would ordinarily be rejected in any normal market was absorbed by the Railroad Administration and the public, with the result that the actual cost of coal, as measured by the results returned, frequently equalled or exceeded in the case of single carloads a sum in excess of $25 per ton.



MONTHLY COAL PRODUCTION CONTRASTED WITH AVERAGE ANNUAL PRODUCTION

Showing how the peaks and valleys of production contrast with what would be a steady annual output and how markedly one year's average differs from another

If any man versed in even the elementary side of fuel combustion, will vision anthracite culm placed in the hands of engine men for use in the fireboxes of locomotives drafted for Ohio, Indiana, and Illinois soft coals, and will imagine West Virginia low-volatile coal placed on the tenders of engines drafted for the product of Missouri and Iowa mines, he will understand how this loss, made up of excess mileage, wage and overtime bills, was sustained.

(5) Opening of Inferior Mines. Every period of hysterical demand for coal, such as occurred in the fall of 1919, is the signal for the reopening of thousands of small, incompetent, refuse-producing so-called mines. They call for railroad equipment, sometimes holding it for days, eventually shipping to the suffering and unwary a mixture approaching 50 per cent combustible and 50 per cent ash and water.

It is fair to say that both organized labor and the operators have failed signally in their efforts to improve and stabilize the business. It is true that periods of peace among the operators, mine workers, and the consumers have prevailed for a few months at a time, but the condition at such times has been one of armed neutrality rather than of good understanding.

The welfare of the bituminous-coal industry affects in a vital manner every social, industrial and economic activity of the American people and the experiences suffered in the past two years should be sufficient to warrant the nation in lifting the industry as a whole to a plane upon which commercial stability may be possible. Briefly the essential problems which confront the industry are as follows:

1. Overdevelopment. There is, if properly employed, an overdevelopment of the bituminous-coal mine industry, and too many mine workers are now depending on the industry for a livelihood. At the time the survey of the nation's fuel requirements for 1919 was made, a similar careful survey of the industry developed the fact there is a potential annual producing capacity in excess of 700 million tons, or a surplus stand-by investment equivalent to 40 per cent of the normal amount of capital required.

This, however, is merely the first of the serious losses incurred; for example, the transportation and coal industries of the country have not, except in a few instances, realized the close and vitally dependent relation that exists between them. Where this relation was recognized in the past, unholy alliances were unfortunately frequently created for selfish purposes, the general permanent welfare of the two inter-related industries being substantially ignored.

When I say that 40 per cent of excess capital is invested in coal mines, mining machinery and equipment, it should be remembered that an equivalent excess investment is likewise carried by the transportation companies in the way of railroad tracks, locomotives and cars. A similar excess investment in mine labor, and to a lesser extent in railroad transportation labor, also obtains; and the loss does not stop here, but extends on down through the various individual lines of business that have been developed and which are maintained in the vicinity of the mines.

2. Short Working Time. The miner's year contains too few working days: frequently these days are of short duration, resulting in extraordinary and unwarranted social and economic losses.

3. Absenteeism. The voluntary absenteeism of individual mine workers, who are perforce assigned to a certain definite working place, reduces the production of the mine to the extent that the number of such absentees bears to the total number of primary producers, i.e., machine runners and loaders. Day-shift forces must necessarily be maintained, and the absence of primary producers working on the piece work basis seriously increases the unit cost. It is hard to measure the losses that flow from this extraordinary indifference to continuity of service, inasmuch as its effects extend down throughout the whole mine organization. In this connection can be mentioned disarrangement of haulage forces, the prolongation of the life of individual working places, with consequent increase in timbering and maintenance cost per ton extracted, the increased plant capacity and capital investment required, and the serious interference that is occasioned in the application of necessary safety measures.

The general public will perhaps be astonished to know that few mines suffer an average absenteeism of less than 10 per cent of their working forces, while in many mines voluntary absenteeism averages from 16 to 30 per cent. I have in mind one small property where the primary producers, i.e., machine men and loaders, lost 25.7 per cent of the potential working days available in October, 1919, the month immediately preceding the well-advertised strike of Nov. 1. I have said that this condition is unexplainable. Perhaps, a more dependable measure of continuous service, made possible by more uniform purchase and transportation would have a good effect on those disposed to absenteeism.

4. Seasonal Problem of Coal Sizes. The seasonal variation in the demand for coal of certain established sizes must be eliminated and the demand balanced. During the storage season an increased demand for the larger sizes will occur and it may prove difficult to market the smaller sizes that are less adapted for storage purposes. This difficulty can be overcome in part by large steam and railroad consumers who use mine-run coal, taking for current use during the storage period a compromise grade between screenings and mine run, while if necessary the smaller coals should be sold through a pool at not less than a normal market price, making a corresponding overcharge on the prepared sizes unnecessary and unjustifiable.

5. Seasonal Transportation Difficulties. The irregular seasonal demand made on the transportation resources of the railroads, including the items of railroad labor, cars, locomotives and terminal facilities, and which might be considered as largely assigned to and dependent on the transportation of coal for employment and revenue return, represents a loss which the public has looked upon in the past as the sole concern of railroad managers and stockholders. This charge, rather unfairly disposed of in the past, has now become a direct tax on the American people, and the economic losses suffered by the mining industry bear with double weight on the carriers who suffer through a premium paid on their fuel requirements, plus the revenue losses outlined.

The coal-mining industry is confronted with two distinct transportation problems: (a) its own underground transportation which is conducted under relatively difficult conditions subject to numerous dislocations, all of which must be absorbed by the industry; and, (b) super-imposed on this situation, and wholly beyond the control of the coal industry is an additional surface, steam-railroad transportation requirement, that during recurring periods frequently returns less than 50 per cent of the service required.

I will make the broad statement that no other industry suffers the transportation losses that obtain in the case of the production of bituminous coal. The consuming public must bear in mind that the owners of coal properties must pass these losses along to the customers of the commodity produced. In other words, the consumer again "pays the freight." The direct and inseparable relation that exists between the coal industry and the railroads must not only be fully recognized by both parties thereto, but a sympathetic, helpful attitude must be taken by the general public in undertaking the solution of this part of the problem.

In order that the hopeless inadequacy of the transportation facilities now furnished bituminous mines may be appreciated, I have prepared a tabulation showing hours worked and hours lost through lack of cars—during the 30-day period ending Feb. 10, 1920.

Idleness Due to Railroad Inefficiency

Mines "A" and "B" located in the Central Competitive field, and in two states ranking high as coal producers, represent a capital investment as of Dec. 31, 1919, of $1,567,000. When it is remembered that a coal mine requires the service of a large maintenance force whether working or idle, and that it must be pumped, ventilated and examined continuously throughout the 24-hr. period, the per cent of idle time chargeable to insufficient transportation should stagger those who are responsible for the conditions.

CHART SHOWING THE IRREGULAR OPERATION AT TWO BIG COAL MINES OWING TO CAR SHORTAGE

	MINE "A"		MINE "B"	
1920 January	Hours During Which Mine Worked	Hours Lost for Lack of Cars	Hours During Which Mine Worked	Hours Lost for Lack of Cars
12	8	0	6	2
13	0	8	8	0
14	8	0	7	1
15	0	8	0	8
16	6	2	5	3
17	0	8	8	0
19	8	0	8	0
20	6½	1½	8	0
21	0	8	7	1
22	7	1	0	8
23	0	8	7	1
24	0	8	5	3
26	8	0	4	4
27	7	0 (Note)	0	8
28	0	8	5	3
29	8	0	0	8
30	0	8	4	4
31	7½	½	0	8
February				
2	8	0	5	3
3	0	8	0	8
4	8	0	5	3
5	0	8	0	8
6	0	8	6	2
7	8	0	7	1
9	7½	½	7½	½
10	0	8	0	8
Total hours	105½	101½	112½	95½
Per cent	50.7	49.3	54.1	45.9
Hours per day, 26 days per month		4.06		4.33

Note—1 hour lost on account of mine disability

Is it unreasonable to ask those who operate iron mines, copper mines, automobile manufacturing plants, car and locomotive shops, great mercantile houses or other like lines of industry, how long their establishments would function under a condition such as that set forth above.

6. Fair Wages for Proper Standard of Living. The cost of producing coal must be kept within bounds, and at the same time labor must be paid a wage equal to that earned in like lines of endeavor, and which will guarantee to the worker:

(a) The full American standard of living; (b) a margin, which if conserved, will insure him against privation and want in sickness and old age; (c) the opportunity to secure in addition proper social, educational and recreational privileges for himself and his dependents.

The unfortunate, unstable condition that now surrounds the industry is costing the country not less than $1 per ton produced, or one-half billion dollars annually.

7. Increased Use of Machinery Underground. The proportion of bituminous coal mined by machines reached in 1918, 55.9 per cent of the total, and electric haulage is rapidly supplanting animal haulage. The drilling and loading of coal should, as rapidly as mechanical facilities are perfected, be done by power-driven machinery, thereby reducing the number of operatives required. The ideal mine installation of the future will be one mechanically equipped throughout and the mine force should gradually evolve into one required primarily for operating and maintaining the machinery employed.

Production, employment, wages, transportation, profit and loss all show great variations. The public seems to think that the coal industry, operator and workman, can either produce fuel or lie idle indefinitely without serious detriment to anybody.

8. Uniform Load Curve. A uniform load curve must be established for the bituminous-coal industry. There is no substantial reason why the coal-famine shadow should overhang a nation which holds more than one-half of the known world's supply of this fuel, and which now mines nearly one-half of the coal produced in the entire world. Prior to the advent of existing transportation facilities, the Indian Empire suffered periods of merciless famine in one section, while food products rotted in the fields for want of a market in districts not far remote from the scene of these recurring periods of food scarcity whose toll was millions of lives.

We today have temporarily 40 per cent more mine development and mine labor than is necessary to meet the demands of the nation if such development and labor were properly employed, and the existing transportation machine would fall less short of the work of transporting the fuel requirements of the country if the consuming public, continuously menaced by famine and intereference with industrial production, would do its part.

The production curve, the work-day curve, the worker's wage curve, and the profit and loss curve all show too many peaks and valleys. I have referred to the transportation losses sustained in the present indefensible administration of the coal industry. Coal tonnage now approximates 35 per cent of the freight traffic carried by the railroads, and in addition, thereto, a material collateral tonnage of mining machinery equipment and material is moved by the carriers in a direction opposite to the coal movement.

The 600,000 mine workers and their families contribute materially to passenger transportation revenues. If the bituminous-coal industry load factor is to be improved, the four parties involved in the production, transportation and consumption of fuel must recognize the importance of the industry and collectively work out a solution of the problem. The public, as the consumer, gives little concern to the industry or its troubles until the day of disaster arrives when a condition approaching panic usually appears. The country normally moves on in its self-ordered way, without more than a negligible coal reserve. Somewhere and somehow it is presumed that the mines will produce coal and the railroads will transport it, providing it is wanted. When, however, the demand is reduced and coal is not desired, the same indifferent public feels satisfied that the mines and equipment will be maintained and the mine labor and transportation forces will remain standing at attention awaiting for the word "Forward"!

The American people have in the past invariably worked out a solution of their many recurring problems. What is lacking today is definite knowledge of the coal industry and its difficulties, and an orderly plan of remedial procedure supported by a sufficient motive.

Erroneous Reports Are Circulated

There is too much said about the conditions that surround the mining of coal that is not only erroneous and unreliable, but which is actually vicious. Whenever a sensational publicist or headliner seeks opportunity for notoriety he pays his respect to coal. Too many unsupported statements regarding excessive profits, high wages paid, low wages paid, etc., are being published, all of which tends to confuse the public and cloud the situation.

It is our duty to meet the issues squarely and to consider only such remedies as will make it possible to organize and build in a permanent manner; the day for temporizing has passed. I am unalterably opposed to government operation of railroads, of coal mines, in fact any form of industry. Government operation dwarfs and stifles initiative and individual endeavor. Those who advocate government ownership and operation today seek a preferential creditorship for their class at the expense of the more numerous, but less intimately interested stockholders.

I do, however, advocate the education of all citizenship. A full knowledge of every angle of the coal industry should be gathered by the government for the use of those who operate and work the mines, and most of all, for those who pay to maintain the industry.

There can be no broader conception of governmental responsibility than that which depicts the Government putting into the hands of every citizen the knowledge and the opportunity necessary for the attainment of results, allowing the individual to work out his own prosperity and wellbeing, free from the twin scourges of oppression and paternalism.

After carefully considering the experiences of the coal-mining industry during the last 20 years and particularly during the last 5 years, I am prepared to recommend strongly the following:

1. A General Coal Commission. There should be created at once a permanent general coal commission consisting of seven members, one representing the mine operators, one the mine workers, two competent accredited mining engineers and three representatives of the public, each with equal voting power, with a tenure of office of 7 years, the chairmanship rotating annually.

This body should be bi-partisan, appointed by the President, paid an adequate salary and endowed with a sufficient organization and authority to gather for publication and general distribution information concerning the coal industry, including the cost of production, average monthly and annual realization, profit per ton, per cent return on the actual investment, selling expense, allowances made for depletion and depreciation, compensation paid for death and disability, the hours and days of employment afforded labor, and the per cent of working opportunity accepted by the various classes of mine employees.

It should study the social, recreational and educational privileges afforded mine workers, the progress made by the installation of mechanical labor-saving devices; and, in fact, it should investigate every feature of the mining industry and related transportation problems. The authority of the commission should cease with the promulgation of the information secured, keeping clear of all administrative entanglements.

There should be no record, whether of owners or of labor union, that is not open to this body. The results shown by the commission should be representative of the general condition; extraordinary individual wage earnings or owners' profits whether high or low never indicate the true condition. A complete survey of the industry would, on the other hand, show what the whole public pays and what is received in return.

2. **Price Fixing.** With the safeguards made possible under the complete measure of publicity regarding cost, realization and profit that would be shown by the reports of the general coal commission, the existing anti-trust laws should be so amended as to enable the industry to agree on such minimum prices as would insure not only the payment of a proper return to labor employed, but in addition thereto, provide a sufficient margin to make certain the carrying out of all necessary regulations relative to a proper conservation of the fuel supply of the country, the safety of mine employees and to improve the social, educational and economic condition of the mine worker. Coal should not be produced and sold at a loss and on the same theory extraordinary intermittent tribute should not be levied on the consumer.

Carriers Can Do Much Toward Stabilization

3. **Seasonal Freight Rates.** Stabilization can be effectively carried out by the railroads through the adoption of seasonal coal rates. These can be put into effect without the passage of new or additional legislation by simply writing into the coal tariffs a provision to the effect that during the period, March to August inclusive, the rate shown in the tariff would be reduced 15 per cent; with the further provision that during the months, September to February inclusive, the rates shown in the tariff would be increased 15 per cent, making a net spread between the summer and winter rates of 30 per cent.

This provision need not involve any change in rate relationships or the measure of the freight rate paid by the consumer, providing he distributes his purchase on an approximately even basis throughout the 12 months of the year: on the other hand, the establishment of a more uniform load on the coal-mining industry would eliminate completely all periods of panic and hysteria when coal prices are frequently increased by buyers who frantically bid coal away from each other, paying in addition numerous extraordinarily high commissions to jobbers. It is a well known fact that frequently jobbers, who are without other capital than desk room and telephone service, edge in between the producer and the consumer, only to disappear when the demand lessens and conditions are restored to normal.

I have personal knowledge of four individual commissions totalling $1 per ton paid on coal moved during the pre-war period of 1917. Moreover, it is safe to say that an equalization of the mining load would reduce mining costs throughout the country from 25 to 50 cents per ton, a sum materially exceeding the profits that ordinarily accrue to the industry.

From a railroad-transportation standpoint, it is safe to say that the variation in the rates set forth above would tend to equalize the difference between operating costs that exist during the winter as compared with those that obtain during the summer months. The opportunity to employ a definite amount of coal equipment and track facilities continuously in coal carrying service, together with the privilege of maintaining adequate and trained car maintenance forces, represent transportation economies that cannot be well measured.

The per-cent basis of variation in seasonal coal rates would automatically force the summer movement of storage coal to the more remote points, thereby disposing of the maximum number of ton miles during the period of most favorable operating conditions.

Periods of High and Low Freight Charges Should Be Equal

The completion of the long-haul traffic during the summer months would further admit of a corresponding concentration of transportation effort in short-haul territory during the season of railroad activity, protecting that portion of the consuming public most disinclined to store coal. The period of high and low freight charges should be of equal duration insuring an equitable average rate to certain consumers who now buy in equal monthly installments. The reduction in rate should take effect on March 1, insuring the taking up of all seasonal storage stocks before the period of reduced consumption sets in, otherwise there will be a temptation to carry over stocks which would defeat the end sought.

Transportation rates should be made more nearly commensurate with the measure of service performed, that is to say, communities located in the immediate vicinity of mines should not be prevented from capitalizing their "opportunities of location." On the other hand, transportation companies overzealous to obtain traffic for limited period should not be privileged to make rates to points unduly remote on a basis approximating or below the out-of-pocket cost of the service recouping such traffic losses by charging unduly high rates on relatively short-haul business.

Make winter tariffs 15 per cent higher than a fair figure and summer tariffs 15 per cent lower, making these revisions Sept. 1 and March 1. Require better coal so as to reduce the amount of transportation demanded for escorting a British thermal unit from the tipple to the furnace bed.

In other words, transportation ton miles should neither be given away nor wasted, and the existing measure of cross haul that now obtains in the case of coals of relatively like character, which evil is made possible and fostered by railway traffic managers, should be eliminated.

4. **Better Preparation of Coal.** The cost of producing coal, including the items of labor and mine material together with the transportation charge required to move the fuel from the mines to the place of consumption, has now reached that point that will justify the statement, that coal loaded at mines should be prepared invariably in such thorough manner as will result in the elimination of all removable non-combustible matter. Any excess of non-combustible matter purchased, transported and handled reduces the percentage of efficiency normally possible one and one-half or two times the amount of such removable non-combustible matter placed in the car.

Five per cent of excess ash-making material loaded with clean coal frequently reduces plant efficiency, whether stationary, locomotive or domestic, 10 per cent; and in comparing the price paid for fuel f.o.b. cars at mines, this variation in the proportion of obtainable net efficiency should be considered in determining the actual cost of fuel delivered. Every producer should seek to establish a standard of quality and preparation as high as possible. This, however, cannot and will not be done while the present intermittent demand continues. I have seen the work of months spent in building up the standard of quality go down in a day under such conditions as those occurring in October last. The railroad and industrial field inspection forces will require months to regain the ground lost in the fall of 1919.

A No. 5 shovel will hold 20 lb. of coal or one per cent of one ton; during periods of excessive demand ten times one scoopful or 10 per cent of readily removable non combustible matter is frequently loaded with 1,800 lb. of coal. Double this loss to cover the interference suffered with combustion on the grates and figure the loss sustained on \$4, \$5, \$6, or even higher-priced coal. The cost of producing and transporting fuel is now so high as to warrant educating the public to this serious source of loss. As costs go up the problem steadily becomes a more serious one.

SOME MINES MUST GO TO THE WALL

5. **Temporary Elimination of Inferior Mines.** Numerous mines now producing grossly inferior coal should be eliminated until such time as the growing scarcity of marketable fuel makes possible the investment necessary to clean and make marketable this product.

6. **Central Sales Agencies.** The existing duplication of sales forces and multiplication of marketing costs should be eliminated. Central selling agencies should be established for the disposal of the product of the several mines in each field.

7. **Education of Public as to Storage Problem.** Fear has been expressed that the coal-consuming public cannot be induced to make sufficient summer purchases and to store the volume of fuel necessary to equalize the coal-production load. This is a matter of education, and supported by the information made public by the general coal commission, and aided by seasonal variation in coal freight rates, the producers and retailers of coal can in a short time create on the part of the consuming public the habit of storing reserve stocks of coal. It is to be assumed that the railroads, public utilities and large steam consumers will be willing to bear their share of the burden of purchasing and storing during the six low-demand months their respective shares of the 50 million tons necessary to balance the coal production load.

The characteristic variations in demand as between seasons is well illustrated by the following statement of minimum and maximum production for the 4-year period immediately preceding our entrance into the world war:

MONTHS OF MINIMUM AND MAXIMUM PRODUCTION

	Minimum			Maximum		
Year	Month	Thousands of Tons	Per cent of Year	Month	Thousands of Tons	Per cent of year
1913	April	34,169	7.1	October	46,164	9.7
1914	April	23,609	5.6	March	45,455	10.8
1915	February	29,321	6.6	December	45,814	10.3
1916	April	33,628	6.7	January	46,596	9.3
Average		30,181			46,007	
Ratio		100 Per cent			152 Per cent	

In 1915 the Geological Survey undertook the compilation of monthly statistics covering the production of bituminous coal and lignite. The accompanying diagram shows the extraordinary variation in monthly production for the calendar years 1915 to 1919 inclusive. It is unfortunate that similar statistics are not available for the several coal fields as they would show an even more extraordinary range in monthly production, this condition being due to the fact that certain Eastern fields which are heavy producers of coal enjoy a relatively uniform production made possible by the summer movement of coal to New England and to the docks at the head of the Great Lakes. Progressing westward the seasonal spread widens until in the case of mines located west of the Missouri River, where industrial life is least active, this variation reaches maximum proportions.

Roughly speaking the bituminous-coal requirements of the United States, excluding the amount exported to Canada and foreign countries, but including coal used for bunkerage purposes, will approximate the tonnage shown below. The distribution as between classes of consumers of the additional 50,000,000 tons which should be stored during the low demand period is also set forth in the following table:

ANNUAL CONSUMPTION OF COAL WITH ESTIMATE OF NEEDED STORAGE

			Additional Storage Needed*	
Purpose for which coal is used	Millions of Tons	Per cent of total Production	Thousands of Tons	Per cent of Total Production
Coal gas plants	5	1.0	507	0.10
Steamship bunkering	7	1.4	Not desirable	
Electric utilities	33	6.6	3,346	0.67
By-product coke	34	6.8	3,447	0.69
Beehive coke	52	10.4	5,273	1.05
Domestic consumers.	59	11.8	5,983	1.20
Railroads...........	130	26.0	13,182	2.64
General industries...	180	36.0	18,262	3.65
Total	500	100.0	50,000	10.00

*Additional storage estimated as being necessary during periods of low consumption to accomplish a stabilization of the industry.

If those engaged in the coal-mining industry will unite in presenting the benefits to be secured, there is sufficient intelligence and business force behind the industries of the country to insure each line of business performing its part in the matter of storing coal during the periods of low consumption. Insofar as possible, every consumer, whether railroad, public utility, manufacturing industry or domestic consumer, should undertake storage of sufficient coal to create a balanced monthly demand on the mines, and the domestic fuel required by consumers who are not home owners can readily be stored in the retail distributors' yards.

The capital required for the accumulation of such storage stocks can be taken care of through the medium of acceptances issued by the retail distributor, (a) to the railroads to cover freight charges, and (b) to the producer to cover mine costs. Such acceptances when protected by a proper survey and adequate fire insurance should be taken by the carriers under special authority of the Interstate Commerce Commission, and would, without doubt, in the case of those given to the mine operator, be accepted by the banks as collateral for loans.

Individual sales made to householders who accept delivery, but who seek the privilege of deferred payment could be arranged for under the terms of specially prepared customer's notes payable as of a fixed date. The matter of storage capital requirements has been well covered by Cyrus Garnsey, Jr., late assistant U. S. Fuel Administrator, who recently said: "The retail coal dealer can and will finance summer storage if he has definite assurance that there will be an increase in retail prices as the season advances sufficient to cover the cost of storage." A small modification in summer prices at the mines, together with a lower summer-season freight rate, will guarantee this requirement.

Seasonal Rates Represent a Payment

The publication of seasonal coal rates on the part of the carriers would represent the equivalent of an immediate cash payment made to the consumer at the time storage coal was put down; this initial payment in substance being duplicated in the form of reduced fuel costs at the time the coal placed in storage is taken up for consumption. The statements now made by coal salesmen relative to low summer prices are seldom taken seriously by the consuming public. A railroad tariff, which is in substance a Governmental document, furnishing supporting proof of such reduction, would be accepted as dependable notice of a future and definite increase in the delivered cost of coal.

In considering the problems that confront us in our efforts to make the coal industry a stable one which will keep step with, and cease to harass our general industrial program, individual doubts must not be allowed to creep in. If we cannot develop at once a sufficient business to keep our deserving operations employed, then those that cannot find a market should be closed and means provided to carry the investment until a growing demand requires their reopening. With a foreign demand for coal which we cannot fill, I have no serious fear of the existing overdevelopment lasting long, bearing in mind that mines are worked out and abandoned continually.

Even if we have 100,000 men hanging on the fringe of an over-manned industry, there need be no fear of their suffering lack of work. With an extensive railroad construction and rehabilitation program confronting us, including the construction of thousands of cars and locomotives; with the demand for, not thousands but millions of homes, with our farms rapidly depopulating, the mine worker can take his choice of employment. Certainly no greater loss can occur to a nation than to have a material portion of its man power in partial idleness and bitter discontent.

I have sketched the bituminous-coal industry and the work of stabilizing it from the broad premise that every owner and operator of coal mines, every mine worker and every consumer of bituminous coal will be willing to contribute his part toward curing the evils that surround the industry and which have grown of late to such proportions as not only to menace our whole economic structure and wellbeing, but to actually threaten the foundation of our government.

Suggested Measures Can be Secured

With a general coal commission, such as is suggested above, to secure all of the facts regarding coal production and consumption, and with the active cooperation of the several business associations of the country, including the American RailwayAssociation, the National Chamber of Commerce, the several local chambers of commerce, boards of trade, manufacturers' associations in the various trade centers, the American Bankers' Association, the National Industrial Traffic League, the National Association of Public Utilities, the National Coal Association, the National Associations of Wholesale and Retail Coal Dealers and other business and trade bodies, there should be no difficulty in doing what is necessary to insure the informative, regulatory and remedial measures outlined above.

With the possession of all of the facts, there should be no room for controversy between mine owners and mine workers, and, on the other hand, all differences should be capable of prompt and fair adjudication between the parties at issue without the intervention of a governmental body. When, however, difficulties arise that cannot be amicably and properly adjusted, and which threaten the continuity of production, a separate mediative board should be empowered to determine a finding which should be based on the information made available by the general coal commission.

Working Model of a Welsh Mine

By Mark Meredith

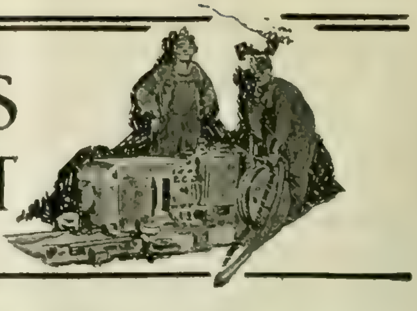
Liverpool, England

Samuel Mead, has now on exhibition in Merthyr (Wales) a working model of one of the big collieries in the Rhondda Valley at which he was employed. He gave all his spare time during a period of seven years to its production, and experts state that his ingenuity and perseverance have resulted in a great achievement.

The model weighs one -ton, and is three yards in length. It affords a full representation of the mine at work as well as engine-house and other necessary structures on the surface. Groups of miniature men, 70 in all, go through all stages of pit work, and to complete the picture an ambulance party attends to a man who has met with an accident.

Coal when cut is placed in conveyors and cars and drawn along rails by a model winding engine to the bottom of a shaft—a deep one—and there hoisted by the surface engine. The lighting of the colliery is by electricity, and the whole of the evolutions constitute an exact replica of the routine of the miner's daily occupation.

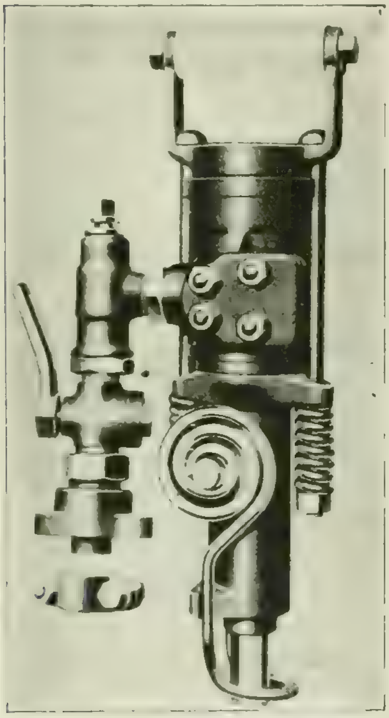
NEW APPARATUS AND EQUIPMENT



A New "Jackhamer"

The Ingersoll-Rand Co. has developed, and is now offering for sale, a new member of the "Jackhamer" group of hand hammer drills. This machine, known as the BAR-33, is smaller and lighter than the other machines of a similar construction. It fulfills a long-existing need for a light self-rotating hammer drill. Its weight, of 21½ lb., should be a welcome feature as it permits the use of a drill in locations and positions not accessible to heavier machines.

The manufacturer recommends this light drill for work in soft limestone quarries; for trimming in metal and coal mines, and for pop-hole work in quarries and open-pit mines. In addition to the above the machine may be conveniently used for drilling holes in concrete and masonry foundations. This type of machine is not recommended for drilling deep holes or for use in hard rock, but for drilling where a machine of extremely light weight is nesessary. The BAR-33 is the fourth type of "Jackhamer" placed on the market. Machines of this type are now available of the following weights: 21½, 35, 41, and 70 lb.



NEW BAR-33 JACKHAMER

Storage-Battery Cell Cover Remover

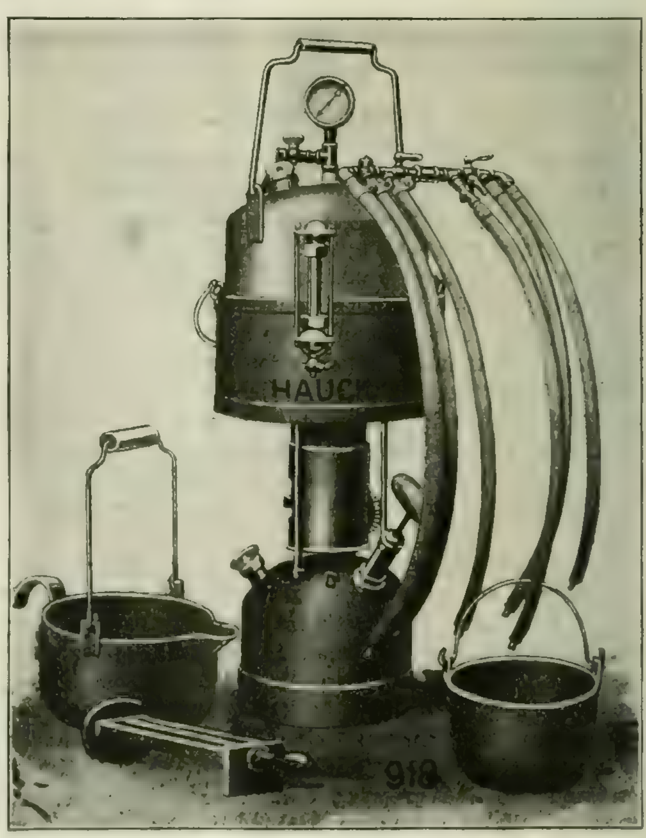
It is frequently necessary to clean storage batteries when they have become excessively dirty. This is best accomplished by means of steam, as all dirt and grease readily yield to it.

To replace broken cells, the top covers can be removed by steaming them open. A new and quicker way than the old time steam box has been introduced by the Hauck Manufacturing Co. of Brooklyn, N. Y. This firm has placed on the market a battery steamer that generates steam in four minutes, and which is now used by many charging stations.

This storage-battery opener is operated either by kerosene or with a gas burner and the steam is conducted to the battery by means of hose. The method of operation is to insert the composition hose tips into the vent hole of the cell. The sealing compound softens almost instantly, and the plate may be lifted out. The average repair man opens a battery and has it dismantled, in from three to six minutes which is decidedly faster than is usually the case.

The steam generator is of 3 gal. capacity, and is equipped with a safety valve which releases pressure at 10 lb., although 3 lb. of steam is sufficient to work with. The steam gage registers 30 lb. pressure. Where desired, a water gage is supplied. The manifold is equipped with six 20-in. lengths of steam hose having composition hose tips not affected by acid. The manifold is further supplied with three steam-control cocks. Any size of battery can be opened without loss of steam and in a short interval of time.

Furthermore, the manufacturer states that it manufactures a lead burner which operates with compressed air and oxygen, or gas and air, to be used for fusing battery-terminal straps or connections, and for similar work. Either or both of these machines find employment at charging stations and elsewhere where storage batteries are cleaned, charged or repaired.



OUTFIT FOR STEAMING OFF BATTERY-CELL COVERS

Steam may be passed through any number of nozzles up to six. This will accommodate any ordinary battery.

Coal Has Technical Session in New York Section of Mining Institute

Coal Preparation Should Follow Ore Dressing Methods., But Not Too Closely. Says Holbrook—Meissner Relates Progress in Coke Making—Ludlow Summarizes Problems of Irregularity in Mine Operation—Ransom Gives Results of New James Fine-Coal Jig—Wendell Describes Progress in Centrifugal Drying

By R. Dawson Hall

AT THE Wednesday, March 3, meeting of the New York Section of the American Institute of Mining and Metallurgical Engineers, E. A. Holbrook, chief engineer of the Pittsburgh station of the U. S. Bureau of Mines, speaking on Coal Versus Ore Concentration, stated that the preparation of coal had suffered from the fact that the subject had not had a sufficient degree of publicity and co-ordination such as the great work of Prof. R. H. Richards on "Ore Dressing" had afforded the metal industry. Much was known about coal preparation, but the information possessed by individuals had not been made available to others. The condition of the subject resembled that which obtained in relation to ore dressing in the earlier days.

Holbrook declares that lack of publicity regarding preparation is leaving the coal-mining industry floundering in uncertainty. He advocates the use of tables on all coal passing through a half-inch screen. Meissner gives details of Steel Corporation's fight to lift the coke industry from its wasteful habits and set it on a high conservational level.

Mr. Holbrook added that the low value of a ton of coal had made it difficult to approach the question of preparation with a readiness to spend money which was exhibited by those who attacked the problem of the successful and economical dressing of ore. With coal selling at $1 per ton, how could any large amount of money be spent in its beneficiation? This was true, even though the problem of shipping the coal made the presence of ash not only undesirable in use but also extravagant of transportation.

Progress Is Anticipated

Prices are now higher, Mr. Holbrook stated, and in consequence progress in preparation methods may well be anticipated. Another reason for expecting progress is that the good coal with a low percentage of sulphur is fast being used up. When we seek a coal for metallurgical processes, we are limited to fuels having less than one per cent sulphur. So, also, in our domestic- and producer-gas installations we need low-sulphur coals, and the reduction in the area of such deposits by continued extraction is making us wonder how we may succeed in beneficiating coals, which in the bed are unduly sulphur-ridden.

Mr. Holbrook declared that we had been unduly governed by European practices. We had naturalized these without having exact counterparts of European conditions. He added that he was of the opinion that, as ore which would pass over a 30- or 40-mesh screen was jigged while all finer than that was passed over a table, he expected that having regard to specific gravities it would be found best to pass the half-inch coal to tables and wash larger coal in jigs.

The need for a difference between the treatment of ore and coal arises from the fact that with coal it was essential only that a degree of beneficiation such as would make the coal pass the required specifications should be attempted. Any further rejection of impurity would result in the lowering of the speed of preparation, always an important matter with raw material of low value, and would cause a loss of fuel which had a distinct and valuable place in the fuel market.

Mr. Holbrook painted a vivid picture of a visit to a washery where he found a workman standing on a table, rake in hand, dragging over the coal on another table. The foreman explained that the table was rated to treat 8 tons per hour, but with the kindly help of the rake it was doing 18 tons every 60 min. When the audience laughed Mr. Holbrook denied that this story was in any way one rightly calling for merriment. He said that the table was cleaning its 18 tons in a manner that enabled it to comply with specifications and that without the rake it would waste excessive amounts of suitable fuel. In the metal industry there is no similar desire to wash to a given limit and no further.

He stated that little had been done in the coal industry to develop a good centrifugal drier till Carl A. Wendell invented his machine. Mr. Holbrook contended, however, that there was still a field in the preparation of sludge coal waiting to be developed and that dry concentration methods may well be successful.

The speaker then introduced the new Trent process of coal purification discovered by a member of that Trent family which invented some years past certain great improvements in the cyaniding process. Mr. Holbrook declared that a coal of 12,000 B.t.u. had been so completely cleaned that it showed 15,000 B.t.u., the ash running about 5 per cent carbon.

Carl A. Meissner, coke expert of the United States Steel Corporation, stated that his company had done much to advance conservation by its experiments and developments in the matter of byproduct coking. The first plant established was at Joliet, and, after its successful operation had been proved, orders were sent out that no more beehive ovens should be built.

The coking of Pocahontas coal with its 18 per cent of volatile matter gave at first an immense amount of trouble. Even in the making of beehive coke it was found necessary, in order to avoid the formation of granular coke, to grind it extremely fine, so fine that 60 per cent would pass through an 80-mesh screen. The trouble with coking of Pocahontas coal in beehive ovens is that it gives only about a 55 per cent yield. When first used in byproduct ovens it was charged without mixing and it swelled so much that it could hardly be removed from the oven.

Edwin Ludlow read a paper which will be printed in a future issue, for it is a remarkable exposition of the conditions in which the coal industry finds itself in face of the problems of 1920. He said that nowadays it was possible to jig everything, down even to the finest dust. No. 3 buckwheat, the smallest size listed, goes over a $\frac{1}{16}$-in. mesh screen, but there are about 1,000,000 tons of dust produced in the anthracite region which will pass through holes of that size; and the problem is, what can be done with them?

Donald Markle, in making experiments for the purpose of writing his graduation thesis mixed extremely fine anthracite with tar and tried to find out what would happen when the mixture thus made was carbonized. He discovered that a useful product could be derived from these operations, and the material obtained is known as anthracoke. Mr. Blauvelt of the Semet-Solvay Co. became interested in this experiment, and the Hudson Coal Co. has made an appropriation of $100,000 for experiments which will determine satisfactorily what is the future of this new development.

When Mr. Ludlow was in Belgium he found that the coke men believed the best byproduct coke was made when the volatile matter in the mixture ran about 22 per cent. In order to produce uniform results they made a practice of mixing coals so that the 22 per cent. figure was invariably reached. When high-volatile coal was used it was their custom to compress the coal before it was put in the ovens and charge it in the oven so that it did not pack on the sides, making it possible for the expansion on coking to take place without crowding the sides of the ovens.

RANSOM SPEAKS ON NEW JAMES JIG

R. S. Ransom, of the James Ore Concentrator Co., was the next speaker introduced, and he said that he and his company believed when they first began to make experiments in the preparation of anthracite coal that the jig was not suited for the preparation of the finer grades of coal, but that the table should be given the preference. Now he is of the opinion that No. 3 buckwheat or barley, which passes over a $\frac{1}{16}$-in. mesh, but passes through a $\frac{3}{16}$-in. mesh can be satisfactorily jigged, if the right equipment is used. He said that in his experiments with the James table excellent results were obtained from the point of view of perfect separation. The table that the company had installed separated the slate from the coal most satisfactorily, but unfortunately the capacity was small, and if such tables were to be used extensively the floor space provided for such preparation would be wholly inadequate. Besides, the tables use considerable water, and the product depends upon a uniformity of feed, such as can rarely be provided in a breaker. It would be necessary to have a feeder to regulate the delivery of coal to the table.

Last December a new James jig was run at a rate of 7½ tons per hour, the coal having 24.312 per cent ash, and the percentage of ash was reduced to 15.6 on leaving the machine. There were nine tons of coal in the bin and 2,056 lb. of slate were removed. It was decided to try to see if the machine could be speeded up with satisfaction, and the nine tons of coal in the bin were passed through in this instance in 38 min., as against 1 hr. and 25 min. in the previous experiment. The rate was 14.3 tons per hour. The raw coal in this case was somewhat better and ran 21 per cent ash, there being 13 per cent ash in the material leaving the machine. A further check showed 14 per cent, while another check placed the figure at 13½ per cent, this being about an average.

The speed was again increased to 19.1 tons per hour, and coal having an ash percentage of 24 left the machine with only 17 per cent of ash. With 13 tons per hour it was found possible to reduce the ash to 13 per cent. It was finally decided to make the speed from 16 to 17 tons per hour, and under those conditions coal with an ash percentage of 28 leaves the machine with 15.6 per cent of ash.

ONLY A FEW PARTS IN JIG

In general, according to Mr. McNally, the maximum capacity at which the machine is run is 16 tons per hour and the coal rarely runs over 15 per cent ash, and on leaving the machine; the average result is more nearly 14 per cent. The jig has the advantage of having only few parts. Another advantage is that in using the jig the question does not arise as to how to take care of the middlings, as is the case with the table. Variable feed both as to quality and quantity obtains at Locust Mountain washery as in other places, but it is taken care of without any adjustment. No change need be made in the adjustments if the percentage of refuse changes. Sometimes the strippings are alone delivering coal, and then the impurity may rise to 40 per cent. At other times all the coal comes from the mines and then runs from 12 to 14 per cent ash. The only matters which must be watched are that the water is kept reasonably level, 3 or 4 in. from the coal bed, and that the machine is properly slushed out.

Carl A. Wendell, the next speaker, stated that in his belief good preparation was just as possible a few years ago as it is today, because the high price of coal is largely illusory, the money that is received for the product going no further in paying for labor and machinery than it did at an earlier date. Mr. Wendell said that $18,000 would buy as much silica brick a few years ago as would $40,000 now.

COKING COAL SHOULD BE DRY

The presence of water in the coal fed into the coke oven caused the silica bricks which lined the oven to crack and spall and, therefore, it was extremely important that the coal should be as dry as it could be made. Mr. Wendell is the engineer who developed the centrifugal drier, which is now being sold by the Link-Belt Co., the experience of Mr. Wendell being obtained with the United States Steel Corporation.

Following Mr. Wendell, John Griffin of the Dorr Co. made some remarks on coal preparation in the anthracite region, which perhaps it would hardly be necessary for us to report here, because he has recently expressed his ideas at length in a paper entitled "Slush, Breaker and Mine-Water Problems," which was published in *Coal Age*, Feb. 19, pp. 349-353. Mr. Edwin Ludlow made some further remarks, and the meeting came to a close.

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Do As You Would Be Done By

A FEW DAYS back the public-service corporations went to Washington and told the Bituminous Coal Commission that the wage-paying operator should bear the cost of the increased wage. Fateful folly! Shall it not be said to them hereafter and with all the justice of retribution that the wage-paying public-service corporation shall also bear the cost of its increased wages and pay all the increase in material prices out of its past earnings?

Is this, in fact, not now being already said? Thus have the helots in the essential service of the public turned on one another saying to their masters, the useless and less useful industries, that they individually will support the masters in their injustices if thereby a little measure of relief may be obtained from an intolerable helotry?

Byproduct Coke Predominates

THE GOVERNMENT returns, as C. J. Ramsburg intimated in our Annual Review and Forecast Number, show that for the first time in the history of the country, the output of the byproduct oven exceeds, and quite notably, the product of the beehive oven. It is clear that one reason for that reversal of conditions in 1919 was that the demand for coke was far lower than the capacity of the ovens, and the beehives suffered the bulk of the contraction.

Whereas the byproduct-oven output fell off 997,000 tons, or 3.8 per cent, the beehive-oven product dropped no less than 10,831,000 tons, or 35.5 per cent. The decline in the output of the beehive oven was about 11 times as great as that of the byproduct oven.

Clearly the waste caused by the beehive ovens of the country may soon come to an end, for the growth in the number of ovens of all kinds makes certain that the beehive-oven industry will not long continue to be one of our nation's leading wastes. E. W. Parker some time ago ascertained that the loss in the operation of the coke ovens of the country would supply twice the amount of coal that would be needed to run all the trains of the Pennsylvania between Pittsburgh and Harrisburg. A few years have corrected that condition materially.

In 1918, when the byproduct ovens in commission ranged between 8,904 on Jan. 1, 1918, and 9,279 on Jan. 1, 1919, or on a rough average 9,091 ovens, the output was 25,997,000 tons, or 2,860 tons per oven. There were 853 ovens in building on Jan. 1, 1920, and 1,100 built in 1919, so these alone should produce, if the demand continues, 5,585,580 tons in 1920, which added to the output of 1918 should be 31,582,580 tons. Assuming that 1920 shows as much aggregate activity in coke making as 1918 and produces 56,478,000 tons as in that year, the tonnage of byproduct coke should be 31,582,580 tons, at least, and of beehive coke 24,895,440 tons, and byproduct coke should constitute 55.9 per cent of the whole output, showing that the gain of the byproduct oven on the beehive will still keep it well ahead of the beehive oven, of which the days are clearly numbered.

Of the byproduct-oven plants completed and put in operation in 1919 four were in coal districts, but two of these, that of the Jones & Laughlin Steel Co., at Pittsburgh, Pa., and of the Carnegie Steel Co., at Clairton, Pa., were located at steel plants, and two others, that of the Citizens' Gas Co., at Indianapolis, Ind., and that of the Indiana Coke and Gas Co., at Terre Haute, Ind., were obviously intended for gas supply.

Of the plants now under construction, two are in Birmingham, Ala., one at the steel works of the Cambria Steel Co., at Johnstown, Pa., and one at the Jones and Laughlin Steel Co.'s plant, at Pittsburgh, Pa. All the plants therefore now being built are either at large municipal centers or at steel works or at both. The coal people have not yet learned to use the gas from byproduct ovens and the general mixing of coals makes it usual to put plants convenient, not so much to one mine, as to two totally different fields.

Curing One Malady By Taking Another

MALADJUSTMENTS, whether of the human body or of the social order, frequently result in other unforeseen maladjustments. The oyster finds a piece of grit in its shell that it cannot remove and it covers it with nacre, which in itself is a body that must cramp the shell, but is more easily endured by the sensitive organism than the uncovered grit.

In like manner the coal operator finds in his industry an annoying interference—the car shortage—which he cannot remove. He tries to find some means by which he can get a car apportionment equal to his needs. He learns that the cars are apportioned according to mine capacity and so he builds up the equipment and personnel of his mine beyond his needs so that the inadequate apportionment will come somewhat near accommodating his necessities.

The railroads have been saving the expenditure of capital by permitting a shortage of cars, and President L. F. Loree of the Delaware & Hudson R.R. recommends that the practice be continued and that every industry "reservoir" its output and pour it gently into the railroad channels as opportunity presents. What then will be the result? A loss due to output being held out of use, a cost for storage and rehandling and above all an unnecessary increase of equipment on the part of the producer such as will give him an apportionment of cars sufficiently large to meet his needs.

As regards President Loree, however, we must keep in mind that the Delaware & Hudson R.R. is well equipped and that therefore the call for larger provision is not addressed to his road and to the other anthracite-carrying roads but to those handling, in the main, bituminous coal or lumber.

As car shortage causes the producer to have additional equipment and excess of men, as it makes storage necessary and the large financial ability that must accompany storage, the idle capital and the idle men in industry are each far greater than the idle capital and labor on the railroads would be if the roads were properly equipped.

C. Andrade, Jr., speaking at the American Institute of Mining and Metallurgical Engineers, said that storage was a heavy charge on finances and should be saved. But someone must stand such a charge in any event—the idle workman or the idle railroad. Someone must provide the excess equipment, mines and houses, and these are a heavy drain on finances. Hence it would be well that we have either more storage room or more railroad equipment. Better it is to lose the interest on property, than property itself. Labor is the property of the workman, he cannot afford to lose that property, and the nation as a whole cannot afford to lose it as well as it can afford to lose the interest on the premature investment.

Perhaps nothing was more illuminating in the whole Stabilization Conference than the remarks of H. M. Chance. He said he was one of the children of reprobation who were opening up more mines and seeking more men when more mines and more men were not needed. He was a consulting engineer, he added, for a public-service corporation that was tired of having its operations hampered and their continuance jeopardized by the coal shortage. They viewed the prospect of the exhaustion of the best deposits of coal as near enough to make investment desirable. So they had bought a tract of good coal and had instructed him to lay out a mine that would give an output of 1,000 tons a day. He had assured them that if they wanted such a tonnage it was necessary to prepare the ground for 2,000 tons, for only with such a capacity could a car apportionment equal to caring for 1,000 tons a day be unqualifiedly promised them.

A Good Motto for the Power User—

For Coal Operators
Wage increases must come from the wage payer not the public
PUBLIC UTILITIES
BANKRUPTCY

TILL IT IS APPLIED TO HIS OWN CASE

Representatives of public-utility associations appeared before the Bituminous Coal Commission, Feb. 17, and made vigorous protests against the passing on to the public and to themselves of the 14 per cent advance in wages that the Government had promised the mine workers.

So long as cars are kept in all difficult times 50 per cent below call, so long will mines tend to be kept 100 per cent above needs. The excess equipment in the mine is a defense against the inadequate equipment on the railroad.

But not only must there be miles of underground road and working places by the score, tipples fitted for large capacity, mine locomotives in number and mine cars by the hundred, but there must be men in plenty, not to fill the cars when delivered, but to satisfy the railroad that the excess capacity is in man power as well as in machine power and development. If the men are in short measure, the capacity becomes regulated to suit.

Consequently, said Mr. Chance, if we want the railroad cars to haul away the tonnage we must have more men than the work will justify, and despite the unsteady work we must hold them and that can only be done by systems of welfare. This much, at least, the workman gains from an evil condition. According to Mr. Chance, much of the interest put into welfare work had its origin in the hope of inducing men to migrate to mines where an equipment for tonnage double their needs had been provided.

All this applies only to the bituminous coal industry and probably to the United States alone. In the anthracite industry, the railroads have cars enough, and the mines can scarcely fill their orders in normal years except as to the small sizes. It does not apply to Great Britain or to France because, in both, output is barely equal in ordinary years to meet the need and just now is hopelessly inadequate to fill orders. It does, however, apply to the bituminous industry of the United States almost wherever bituminous coal is mined, though New Mexico may be a partial exception. It is a deplorable condition to be best met by bringing the railroads more nearly to an adequate standard of equipment or by relieving the railroads by furnishing electricity from power stations at the mines.

A call for the stabilization of the coal industry is not made primarily to remove the losses resulting from the equipment and development, unused and closed mines. Idle machinery and dormant mine workings only involve losses from interest and depreciation, whereas, on the other hand, idle men cause a loss of real capital, for, indeed, the work of the artisan is nothing other than capital. Interest is important and too often forgotten, but the loss that comes from folded arms is one compared with which a loss of interest is negligible. A period of idle time is as disastrous as a fire. A conflagration wipes out something of value, while by reason of an idle spell the thing of real value never reaches the point of creation.

Still it must be remembered that the haltings of industry are, in many cases, highly important operations of economic law and such as cannot be suspended with entire impunity. When a man is idle it is in obedience to some law. Perhaps there has been an excess of production, and economic law is trying to urge him to embrace another industry where he is more greatly needed. When the time of perfect regulation comes, when work is always assured to the artisan, we shall find a lot of product made for which there is no use and at a time of year when other industries are, perhaps, clamoring

McKinney Says Coal Industry Is Robbed of Railroad Cars

Declares That Cars Bought for Coal Delivery Are Kept for Other Uses and Prophesies That Good Roads Movement Will Corral Car Supply

THE "coal" situation is the "car" situation, states W. D. McKinney, secretary of the Southern Ohio Coal Exchange, Columbus, Ohio in a letter addressed to Chairman Freylinghuysen of the Senate Investigating Committee. He goes on to say that the supply of coal is inexhaustible, insofar as this and a few succeeding generations are concerned.

There is enough labor at the mines, working a reasonable time, as in other industries, to produce fifty per cent more coal than we now require. Transportation only is lacking to give the public all the coal that it can consume and at a price fixed by the consumer. This lack of cars and transportation has been brought about largely by the rulings of the Interstate Commission prior to the great war.

It has caused the necessity of a Fuel Administration, and the necessity for the investigations of your committee. It has caused also investigations by the Federal Trade Commission, and the investigation now going on at Washington with the Coal Commission. It will continue to be the cause of investigations and the appointment of tribunals as long as the conditions are permitted to exist.

At one time, in 1916, one hundred and twenty-five cars of Toledo & Ohio Central R.R were loaded with pipe at Zanesville for Oklahoma and were over one year getting back to the initial line. This deprived the railroad and the consumers of not less than fifteen hundred car-loads of coal. This is but one instance for an illustration. These conditions have grown to such an extent that instead of coal receiving the primary use of the equipment purchased for its transportation, it simply gets the residue, a complete reversal of the original intent.

AGENTS TRY TO KEEP CARS FROM MINES

This came about naturally under the Interstate Commerce rulings, for every agent on every railroad of the United States is or should be energetic to get as much business as possible for his line. He is anxious to get the kind of equipment that his customer needs. If there is an empty car on his siding, he wants it and all the persuasive power and influence is used that he and his shippers can bring to bear to obtain that car.

An additional word on this subject as to 1920: the states of New York, Pennsylvania, Ohio, Indiana, Illinois and Michigan have a good-roads program calling for the expenditure of over fifty million dollars during 1920. Practically all of the materials used for these good roads must be hauled in coal cars and not only must the material be hauled in coal cars but every agency, political and otherwise, will be used to see that cars are secured for this good-roads material.

The Governor of each of these states, the representative in Congress, the County Commissioners of every county, Township Trustees and the citizens who use the roads generally will bring every pressure to bear to secure cars for the good-roads movement and, mind you, the shippers of the materials for these good roads are not on a percentage basis. They will get all of the cars they need. This will mean just that many fewer cars for coal, and these cars will run to and from quarries, gravel banks, brick yards, cement plants, etc., and not to and from coal mines.

Retipping the Teeth of Crushing Rolls

D. C. ASHMEAD
Tarrytown, N. Y.

TWO years ago the U. S. Fuel Administration objected to the preparation of the coal made by the Treverton Colliery Co. at the Katherine Colliery, near Shamokin, Pa. This objection was based on excessive degradation arising from the worn-out condition of the teeth of the rolls.

It became necessary therefore to either purchase and install a new set of rolls or in some way to repair the old ones. As these rolls were of the solid and not the sectional type this meant the purchase of an entirely new set of rolls instead of the replacement of a few segments.

The company made inquiries as to the cost and delivery of a new set and found that the best delivery possible was at least six months with probably a longer delay. The cost, including the purchase price, installation expense and time lost was calculated to be about $5,000. This cost as well as the poor delivery made it highly advantageous to devise some method whereby either the expense or delay might be lessened, preferably both, but at least the delay.

MUCH TIME LOST INSTALLING NEW ROLLS

The time lost in installing a new set of rolls it was estimated, would have amounted to nine shifts and this meant that the breakers would be shut down for that period. This in itself was prohibitive because of the demand for fuel.

The surface foreman of the coal mine thought that it might be possible to replace the old teeth with new ones but this was found to be impossible because of the difficulty of access to the machine and the condition of the teeth themselves. This investigation, however, led to good results for it was suggested that the teeth be retipped by welding. This was immediately tried, as the company owned an oxy-acetylene welding outfit, and excellent results were obtained. It was unnecessary to remove any part of the rolls and the welding outfit was used on the spot.

It took one man 12 shifts to make the repairs, but the work was prosecuted at night and did not interfere in any way with the operation of the breaker. The cost of the materials, including the gas, was less than $10, and the cost of labor was $54.28, or at the rate of $4.54 per shift. This made the total cost $64.28 as against $5,000 for a new set of rolls.

ROLLS ARE EXAMINED SEMI-ANNUALLY

The company now has the rolls examined every six months and any teeth that show excessive wear are promptly retipped. The rolls thus repaired, the company now believes, give every bit as good service as a new set would have afforded and they are now kept in perfect condition.

This method of retipping roll teeth can be successfully used on rolls made up of segments. The work in this case, however, can be done in the shops.

Survival of the Fittest—

Only One Escape Remains If Wages to Remain Stationary, Namely, More We Must Pool Our Equipment Infor

MIRACLES of efficiency wrought in trades having peculiar adaptability to the economies of multiple production have led the public to expect that all wage increases shall be met by elimination of waste and the introduction of machinery. Fortunate indeed is the industry that can secure an efficiency of operation such as can be attained in the punching and shaping of plates or in the making of watch parts.

Such developments will probably never come to mining, transportation or farming, yet there are large possibilities that with more and better equipment and more intensive methods a great development may take place though not equal to that which manufacturing processes have secured.

* * *

THE marvel has always been that the small mine without equipment has been able to continue in existence alongside of the big operation with large facilities. The explanation is simple; the small mine for a while has no inside transportation problems, for its work is not extensive; it is not started if there are any large surface difficulties to be met. If the small mine hopes to continue more than a year or so in operation it must lay plans for equipment to haul and cut coal and thus reduce the large expense that accompanies the operation of an extensive underground working.

* * *

REDUCTIONS of 50 per cent or over in the cost of operation may some day be made in the very best of mines and even to-day a 25 per cent reduction in cost is quite possible. The main difficulty in securing such a result is to be found in the attitude of the workman who wants its pay to be based wholly on output rather than on the labor or the time involved in producing the product.

There are many mines, however, that are working with antiquated equipment, using mule power, wasting steam, consuming electricity in useless resistance, using human effort where electrical energy would be less expensive, consuming ventilating power in eddy currents, wasting its output in broken, poorly-gated cars. Friction and flat wheels are consuming energy needlessly and much good coal is being prodigally thrown away at the tipple. In like manner the labor of unloading rock is nearly always excessive.

Progress is being made in removing these difficulties —now in one part of the country, now in another. *Coal Age* with contributors in every coal-mining state and province of North America and many overseas countries is the natural medium of exchange for all these many developments. The coal industry will never advance unless it progresses on the myriad feet of the whole mining public. Now one man or one establishment makes progress and now another, but unless the advance thus made is communicated to the whole body the advantage is lost.

* * *

MANY companies are publishing house-organs to give their employees a sense of the good work they are doing, to "sell the job" to the employee. *Coal Age* is doing that good work for every wide-awake coal company. It gives not only intercompany publicity, but publicity of a national and even of an international character. It kindles the right kind and largest kind of pride in the minds of the biggest as well as the most subordinate of company officials and makes the job worth while to them all. It lifts their daily work from a drudgery in a forgotten "neck of woods" into a proud and prominent endeavor of such merit as to be worthy of publication in a metropolitan weekly, read by all the world and copied

An Equipment Problem

Are to Be Raised and Prices Are Equipment and Greater Efficiency. mation So As to Meet Rising Costs.

broadcast the world over. In these days when "pride of achievement" is the watchword, *Coal Age* stands as the medium by which that pride can be created.

* * *

WEARIED by the dull glare of a tropical sun, drenched by the rains that wetted him to the skin, discouraged by the slides and bottom uplifts of the canal excavation, the man who worked at Panama longed for home but kept proud of his job, happy in its execution, strong in his morale, because every newspaper and every magazine of the country told of the importance of the work and discussed its details. He felt it was worth while even if it cost much. In like manner the man who went "over the top" was thrilled with the immense importance of the work on hand and vibrated in accord with the public sentiment as reflected in the newspapers and magazines.

So in like degree—let us concede at once that it is a lesser degree—the man whose plant, whose work, whose thought has record in a national publication is moved forward by that fact. In it every man who has achieved may read what he has done and many may profit by his thought and act. He has had a part in the World's Work, he has forged a link in the chain-binding nature; he has helped to bridge the chasm between things as they are and as they might be; and his work is known !

Publicity of the mechanical achievements at any plant is good therefore for the industry and for the contributor. His vision is cleared by writing—that alone is worth while—but his enthusiasm is also stimulated. It has been said that laziness in thought is more common than laziness in action and everyone knows it is so who has had to deal with men—and with himself. Many things, in fact, most things, are taken for granted; but given a great enthusiasm, a feeling that this is a period of big things and that one is in the thick of them and how largely will the imagination and the thinking, conceiving, and planning faculty be quickened ?

* * *

THIS is a long and dreary preface, the reader will say, to a request that he will send to *Coal Age* some information on what he is doing or on what is being done at the plant where he is employed. *Coal Age* wants to know something about the savings resulting from improvements installed, how certain difficulties were overcome by the use of improved equipment, how his haulage, ventilating, pumping, coal-cutting or mine-car placing problems were satisfactorily solved.

But equipment is not all underground; there are stokers and boilers, dynamos and engines, turbines and air compressors, lathes and drills, hammers and forges, there are large mines and small, big problems and little ones. All problems call for solution, all mines have their difficulties. We would like to receive information regarding the way in which, any and all, large and small, were solved to the satisfaction of the writer.

* * *

ON May 6 we will publish our annual Equipment Issue to which our readers are invited to contribute. All articles having line illustrations should arrive before April 6 and all others should be received before April 20, so as to leave ample time for the preparation of this important issue. The work of enlightening the coal industry will not be without its compensation; *Coal Age* will see that an adequate check shall reward the effort of every accepted contribution.

DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

Setting Return-Tubular Boilers

Letter No. 1—I have been greatly interested in reading the article of C. R. Weihe, *Coal Age*, Feb. 12, p. 308, in which he describes the resetting of a horizontal, return-tubular boiler and draws attention to many practical points.

In my practice, I have adopted the same methods outlined in that article, with the exception that our boilers are set 4 ft. above the grates. While I agree with Mr. Weihe regarding all the good features of this setting, I wish to state that he has only mentioned some of the good features about a setting of this kind and I will describe a few more obtained in a setting recently installed under our boilers.

First, by setting a horizontal return-tubular boiler, 4 ft. above the grates and with a moderately high bridge, say the top 22 in. below the shell of the boiler, with moderate care, it makes no difference how bad the water may be, there is absolutely no danger of bagging the sheets. Seldom will you see a leaky girth seam, which is often observed in boilers having a low setting.

Large Combustion Chamber Burns Smoke

Another feature, and one to be appreciated, is the good effect of the large combustion chamber in which the smoke is completely burned. The tubes then have clean hot gases passing through them, in place of black smoke, which always deposits soot in the tubes and coats them with an insulating scale that results in a wonderful waste of fuel.

In practice, this condition will cause a continual growl between the dayman and the nightman, on account of the nightman neglecting to clean the tubes; or because he cleans them too early in the night and they are dirty again before morning.

Another feature resulting from setting a boiler high above the grates is that the arrangement admits more air to the furnace and it is possible and economical to use the refuse fine coal that accumulates around the mine. With the old style setting it was necessary to use either lump coal or mine run. The work of firing is now a pleasure instead of a curse. As an illustration of the advantage gained by setting boilers in the above style I will cite an example of such a setting.

Good Service in Steam Power Plant

We have at our plant two horizontal return-tubular boilers, 72 in. x 16 ft., rated at 125 hp., each, making a total of 250 hp. With these two boilers we are running one 168-hp. engine; one 50-hp. engine; two hoisting engines, 16 x 36 in., for hoisting coal out of a shaft 160 ft. deep, weight of car 2,500 lb., coal 4,500 lb.; one pump 14 x 16 in. All of these are running almost continually, and we are firing with slack and refuse from around the mine. I notice that these boilers are popping off more than half the time. In case of the regular fireman laying off we have to pick up anyone who can shovel coal, to fire them; but we always have steam. There is not a swab on the place, and our tubes are never dirty, because we are burning all the soot out of the gases before they enter the tubes, and there is nothing left to be deposited in the tubes.

Protecting the Blowoff Pipe

There is one thing brought out in Mr. Weihe's article regarding which I do not agree with him. I refer to the method he uses in taking care of the blowoff pipe on his boiler. I consider the blowoff pipe one of the most dangerous places about a boiler, and one that can cause a lot of trouble if it is not properly managed. With the method of protection described, it is not possible to inspect this pipe as often as that should be done, and the chances are that it will be neglected and, consequently, give out some day when it is most needed, making it necessary to shut the boiler down.

My method of caring for the blowoff pipe, on the setting I have described, is to simply wrap it with a 1-in. asbestos rope, which gives a very good protection, though not as good as the brick covering mentioned by Mr. Weihe; or a V-shaped brick pier can be used, which is also very good. However, a solid covering around a pipe prevents its inspection and I therefore condemn its use. A V-shaped brick pier built around a pipe makes a very effective covering, under low-set boilers; but, owing to the liability of its tumbling down, under a high set boiler, I would condemn its use. The only effective covering, in my judgment, is the asbestos rope I have mentioned, as it can be removed at different places and allow the pipe to be examined every time the boiler is down. These places can then be patched with a new piece of rope. **E. H. Hart.**

Basket, Henderson County, Ky.

Electric Mine Haulage

Letter No. 7—The discussion in *Coal Age*, regarding the trouble so frequently experienced in electric haulage in mines, has interested me greatly, as it has been my fortune to be troubled in the same manner on different occasions. In one case in particular, it was necessary to abandon the attempt to use the locomotive that had been installed and secure a heavier one if we were to maintain the output of the mine at its regular standard.

It having been decided to install electric haulage in that mine, the question was put up to me by the general manager, who asked what size of locomotive would be required to haul the coal. After some little calculation, I reported that, in order to maintain the present output it would be necessary to haul trips of 20 cars. The grades on the main haulage road were 2 and 3 per cent. for distances of 600 ft. and 1,000 ft., respectively. I stated that this would require a 14-ton General Electric locomotive, on the main haulage road. At the same time, I recommended getting a 10-ton, storage-battery locomotive, for use on the gathering haul in bringing the cars from the working faces to the sidetrack where the trips were made up to be hauled out of the mine.

LOCOMOTIVES TOO LIGHT FOR SERVICE INTENDED

My report was taken under consideration by the general manager, who decided a little later that a 10-ton locomotive would do the work on the main haulage road. He also thought that a 6-ton, storage-battery locomotive would do all that was required on the gathering haul. Accordingly, these locomotives were ordered and shipped to the mine. After the necessary electrical work was completed, the locomotives were taken into the mine and the installation was ready for service.

It was the second day after when, believing that everything should be working satisfactorily, I went into the mine to see if all was going right. I found the 10-ton locomotive hauling a 20-car trip up the 2½ per cent grade. The cars had a capacity of 3 tons each, making the weight of coal hauled, per trip, 60 tons. When I arrived the motorman was having trouble with his motor, and, there being 4 ft. of space between the track and the rib, I decided to follow the trip to observe the action of the locomotive and, if possible, locate the trouble. I soon noticed that the front wheels of the machine were being lifted sufficiently to let them slip.

As the trip reached the 3 per cent grade, the trouble grew worse. Soon the weight of the loaded trip acted to life the front wheels of the locomotive clear of the rails. The motorman at once shut off his power; but a broken bumper on the car next to the locomotive allowed the latter to swing to one side and the front wheels dropped onto the ties. The motorman stated that he had had much the same trouble the day previous, but did not like to mention it, hoping to overcome the difficulty. I ordered him to haul 12 to 14 cars on a trip and, while this overcame the trouble, it reduced the output of the mine.

LIKE TROUBLE ON THE GATHERING HAUL REDUCES DAILY TONNAGE OF MINE

Proceeding into the mine, I found the same difficulty was experienced with the storage-battery locomotive, which was at work gathering the cars and hauling them to the sidetrack. The front wheels of this machine acted in the same manner as I had just observed when watching the larger machine on the main haulage road; and I was obliged to give orders here also to reduce the load and haul only six or eight cars instead of twelve or fourteen, as he had attempted. By thus reducing the number of cars hauled, the trouble was overcome here also.

It was not long, however, before the falling off in the daily tonnage started an investigation by the general manager, who accompanied me into the mine to observe for himself. By his direction, the 10-ton locomotive was hitched to a trip of 20 cars and started on the upgrade out of the mine, with the result previously observed. Likewise, the 6-ton, storage-battery locomotive was made to haul a 10-car trip, with similar results.

The mine electrician was then ordered to make a close examination of each machine and reported that he found everything correct. As a last resort, the general manager had the front end of the 10-ton machine weighted for the purpose of holding the wheels down to the rails. I claimed that the extra weight on the locomotive would cause the overheating of the armatures, which proved to be the case. He then had the machine reversed, but with no better results.

For two months we persevered in our attempts to make these machines perform the required service, and then a 14-ton locomotive was ordered for the main haulage road. The 10-ton locomotive was made to help out the 6-ton gathering machine, by hauling the cars onto the sidetrack. By this means, we were able to reach the required daily tonnage in the mine.

I heartily agree with the statement of W. H. Noone. *Coal Age*, Feb. 5, p. 282, that there are many mines experiencing the same difficulty, which I found to be the case in mines in West Virginia and Pennsylvania.

JOHN J. CLARK,
Mahaffey, Pa. Mine Superintendent.

The Vicious Circle

Letter No. 2—In his interesting letter on the so-called "Vicious Circle," *Coal Age*, Jan. 1, p. 22, Mack Williams appears to suggest two remedies or means of counteracting the present high cost of living. If I understand his meaning, he would have the government fix the price of coal and other important commodities and devise some measures to eliminate strikes. My own thought is somewhat at variance with these suggestions.

Allow me to express the opinion that if the government should adopt the policy of price fixing in order to fight profiteers the cure would be much worse than the ailment. If the price was fixed high enough to let some plants earn a living profit, others more favorably situated would reap profiteer's profits; and if the price were fixed low enough to prevent the better situated plants from making more than a reasonable profit, the low-grade plants would be driven out of business.

An open market where the law of supply and demand has free play is the only equitable and just method of price fixing. In such a market, the supply being regulated by the demand, the market price does not take long to adjust itself to a fair and satisfactory basis.

THE STRIKE PROBLEM A DIFFICULT ONE

The problem of doing away with strikes is a deep and difficult one. To arbitrarily and forcibly repress them is autocratic and un-American, and to overcome the wage earner's desire for striking, by increasing his pay and bettering his living conditions until he is satisfied, is unpractical. The golden mean lies somewhere between, and we must hope and believe that it is obtainable and will be realized eventually.

The uninterrupted industrial production, in the United States during the war, was one of the largest contributing factors to the military success of the Allies. Comparative freedom from strikes was largely due to the patriotism of both wage earners and employers, in conjunction with certain mediating and arbitrating machinery that the government set up and operated, under the direction of ex-president Taft and Frank A. Walsh. If no better and more practicable means for preventing strikes can be discovered and put into operation soon, some scheme based on the experience of the National War Labor Board should be worked out and made effective.

It would scarcely be wise to make strikes unlawful, except in the case of certain public service occupations, as policemen, firemen, etc. Any man or group of men has an inherent right to refuse to do particular work, unless the safety of the government or the public is endangered thereby. When a group of men causes the whole consuming public to suffer through a general strike, intended to force their employers to grant them better wages or more comfortable working and living conditions, it is undertaking a grave responsibility. The people have everything to lose and nothing to gain by such a strike, which encroaches on the rights of the public. The answer of the labor leaders that "Might makes right" has had no standing since the signing of the armistice, Nov. 11, 1918.

RESPONSIBILITY OF LABOR ORGANIZATIONS

Labor organizations should be made more responsible, certainly to the extent of incorporation under charters from the Federal Government. At present, the autocracy of labor is more to be feared than the autocracy of capital. Capital is now fairly amendable to control; but labor is running wild, judging from the number of wild-cat strikes unauthorized by labor leaders and often in full operation before employers are apprised of the reason of their men for striking.

Contrary to the claim of Mr. Williams, labor leaders deny that labor is a commodity; and many men of affairs like Mr. Vanderlip, president of the largest bank in the country, are in accord with this view. At any rate, it is not a commodity like salt or nails, which can be bought and stored until required for use. Labor is human and has human rights, the right to a decent standard of living.

In an industry like coal mining where steady employment is dependent on a steady car supply, steady demand for coal and many other factors beyond the control of the operator, the wage earner is necessarily idle a part of the time. This is because the great mass of the people wait until winter is upon them before ordering their supply of domestic coal. The wage earner registers a kick against the operator because of his enforced idleness for which the operator is not to blame. His plant is just as idle as the wage earner. The loss rests as heavily on the employer as on the men whose daily wages are cut off by the enforced idleness. There are no profits, but expense and loss instead.

PROFITS AND PROFIT SHARING

Profits in business are the surplus remaining after labor is paid a decent standard of living, and capital has had a fair return on its investment. The wage earner, who faces the liability of a period of idleness, cannot in fairness and justice to his employer contend against assuming this risk and, at the same time, demand profit sharing. Unless he shares the losses, he is not entitled to share the profits of the business. The operator risks the failure to receive a due return on his capital, or even the loss of a part or the whole of his investment.

Profit sharing is a comparatively recent idea and will doubtless be worked out satisfactorily to all concerned if the rank and file of labor do not allow themselves to be led into unwise action by visionary and irresponsible agitators. Better and more lasting results can be accomplished by American methods of law and order, through responsible and trustworthy leaders.

One of the best methods of profit sharing, I believe, is for the employee to acquire stock in the company. Some of the more progressive companies are putting out a special stock issue designed for that purpose. Such an issue should be: (1) Safe (preferred stock); (2) paid for by installments if desired; (3) offer a good return on the money invested by the employee; and (4) be non-negotiable and redeemable by the company, to prevent its falling into the hands of outsiders. Such a scheme encourages thrift and builds up a bond of loyalty and sympathy between the company and its employees that will be a tower of strength to both in working out their mutual industrial relations.

By making the wage earner consciously a capitalist, even if only in a small way, he comes to acquire a sympathetic and concrete idea of capital, which has always been to him an abstract thought. After all, capital is merely stored-up earning power; and a wage earner who wishes to provide for his wife and children against the inevitable time when he shall no longer be able to earn a wage, by reason of death, old age or disability, must have recourse to "capital." Thus capital is humanly entitled to a return upon its investment.

PRODUCTION AND THRIFT THE SOLUTION

The first step toward the solution of the so-called "vicious circle" is undoubtedly *production and thrift.* During the present period of restlessness, the employee should work hard; he should lay by instead of laying off. He should take a fair-minded view of the problems of his employer and the rights of the public, as well as his own. The employer should recognize, in everyway proper, the very human desire of the employee to participate in the management of the industry and the determination of his living conditions.

As for governmental machinery for avoiding strikes by mediation and arbitration, that will doubtless come as soon as the industrial and labor leaders and experts can effect it. Its design is indeed a knotty problem and calls for the best informed and fairest minded thought America posseses. WALTER H. DUNLAP.

Kingston, W. Va.

Shifting the Workers

Letter No. 2—The view that I take of the incident narrated by "A. H.," in his letter, *Coal Age*, Feb. 12, p. 327, is that the electrician did wrong, by going to a man employed at other work and offering him another position, requesting him to report on the job a certain morning.

The electrician should have taken the matter up with the superintendent or the mine foreman, to learn if there was a man to take the place of the one at the substation, before trying to get him away from his job.

Again, we must consider that, in taking this man and placing him on the job of rail bonding, it is well to know whether the position of bonding was made vacant by some one leaving, or whether he was being put on as an extra hand and expected to remain. If the work of bonding the rails was an extra job and not necessary the electrician was adding to the daily cost of his department. At the substation, the man had been reeciving $110 per month. He was to receive $30 more in his new place, making $140 per month; at the same time, another man was to attend to the job he left, at the same pay, $110 per month.

In my opinion, any official is doing wrong when he increases cost without first taking the matter up with the superintendent. It is a well known fact that whenever the cost-sheet at a plant is increased it is the superintendent that must give an account of it and be able to explain where and why it was done, when the general manager goes over the cost-sheet.

At each and every mine, no one official knows it all; and, for that reason, it is important that the superintendent, mine foreman, electrician and master mechanic, all have a thorough understanding with each other. In fact, mine officials should never fail to co-operate and work together. Then such actions as that which occurred in the narration of "A. H." would not be so liable to occur.

Frequent consultation between mine officials on general matters concerning the mine, and the giving to each other their candid opinions, will often overcome many difficulties and reduce the cost of operation. Having been both mine foreman and superintendent, my own practical experience leads me to say that the action of this superintendent toward one of his employees shows plainly his lack of experience and ability to handle men employed in and around a coal mine.

Often has the mine electrician reported to me that a certain person would suit him, either for work as a wireman, bondsman or even as his assistant. I could not and never did, reply with such a remark, as "I will not do any such d—— thing." On the contrary, I would help the electrician, knowing that if he had the right helper it would be to my benefit.

Again, I have often had to use young men from off the coal, as extra spraggers, tracklayers' helpers, pumpmen and drivers, and have always been willing and glad to assist any who proved worthy of assistance and were interested in the work or job they desired. As a result, I have been fully recompensed by having satisfactory men on the job.

When a mine superintendent will not assist his workmen to better their conditions, when he knows that they are worthy of such assistance, and will not cooperate with his men or manifest a kindly regard for them, he cannot gain or hold their respect and will surely be the means of his company losing money.

——— Pa. Mine Superintendent.

Supporting Mine Roof

Letter No. 1—The inquiry regarding the supporting of roof in the Pittsburgh seam, which appeared in *Coal Age*, Feb. 12, p. 327, leads me to offer a few suggestions in reference to what is necessary, in the early planning and laying out of a mine, in order to reduce to a minimum the difficulties experienced by bad top.

Although this inquiry had particular reference to the scarcity of timber and the growing need of considering other means of support for the roof, I will not go further than to speak of those points, which if considered in the early development of a mine, will greatly reduce the quantity of timber required. First, let me say that, before we can hope to make a success in the extraction of coal with a minimum amount of timber and a maximum degree of safety, it is necessary to study the conditions existing in the strata overlying the seam and give particular heed to the character of the roof slate or rock immediately above the coal.

Examining the blueprints or mine plans, and observing the area of abandoned workings and the disposition of the working faces in the mine, we do not have to go far or look very close to discover evidence of the fact that little attempt has been made, in the past, to leave ample pillars for the support of the roof. The natural result is that a great supply of timber is necessary to safeguard the lives of the workmen, particularly where they are engaged in the hazardous work of drawing back the pillars.

SUGGESTS THE LONGWALL RETREATING SYSTEM

In the mining of the 6 and 9-ft. seams mentioned in the inquiry, I would suggest that, perhaps, the surest plan would be to work these seams on the longwall-retreating system, driving the main headings in the center of the tract, not exceeding 12 ft. in width and reaching to the boundary. The chances are, if the top bench of coal is arched a little, less timber will be required to secure the roof.

When the main and cross-entries have been driven to their limit, a longwall face is started at the inby end. My preference is to keep the longwall face in a straight line so as to distribute the weight of the roof more evenly over the packwalls, which must be well built and kept within 10 or 12 ft. of the working face. If there is a scarcity of building material, it will be necessary to bring rock from the surface or from other seams. I observed, in South Wales, rock brought from a stone quarry half a mile away and taken into the mine to build packwalls. The chocks in that mine were built in the form of a triangle, with one side parallel to the coal.

It is worthy of note that, in the retreating system, the haulage roads are always driven in solid coal, which reduces the cost of maintenance by avoiding the necessity of brushing roof or lifting bottom to maintain the necessary headroom on the roads. It cannot be denied that the work of development, in the retreating system, is costly, but there is a great saving in the outlay for timber and deadwork.

MINE LABOR THE PROBLEM OF THE FUTURE

Speaking of the future needs in coal mining, the labor problem will demand consideration; and mechanical coal cutters and coal loaders will be required to take the place of strong arms and muscle. If operators would give more attention in this regard, a far greater percentage of coal could be mined and loaded mechanically than is done at present. Generally, however, the majority of operators seem to tackle the problem by way of making the machine conform to the layout of the workings, instead of planning the work to suit the machine.

In my experience I have seen machines installed in mines where they were as much out of place as a butcher in a drug store. Before making changes or installing machines, let us study carefully the conditions and not go it blind. It would seem that it is the natural tendency of some superintendents and foremen to be constantly making changes, which in the end are of little avail for economical operation. In this manner, thousands of dollars are wasted annually.

Let me say, in closing, that it is my belief that there is a great need, in the development of the Pittsburgh seam, to give the same thought and consideration to the mechanical mining and loading of the coal as in reference to the support of the roof without timber.

West Pittston, Pa. RICHARD BOWEN.

INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD

Trolley-Wire Guards

I want to ask the opinion of *Coal Age* readers on the requirement of compensation-insurance regulations making the standard width, between the guard boards of a trolley wire, 5 inches. Taking the wire as ½ in. in diameter leaves but 2¼ in. of clear space between the boards and wire. Would not danger arise when, as frequently happens, the trolley jumps the wire. The axle of the trolley wheel is practically 3 in. in length, and the result would be that the wheel would become wedged in this narrow space and either break the board or possibly pull down the wire when the attempt is made to adjust the trolley pole. I want to ask if it would not be better to require a space of 5½ inches between the guard boards.

Chambersville, Pa. Triprider

We willingly submit this question to the readers of *Coal Age* for an expression of their opinion. Assuming, however, that the trolley wheel and axle requires a clear space of 3 in. it might be safer to make the width of the boards, say 3½ in. and reduce the chance of the trolley jumping the wire.

Kerosene or Steam?

We are about to install a coal puncher of the Pneumelectric Machine Co's type, Syracuse, N. Y., in our mine and will probably want to operate one or two small pumps on the same power line. The coal puncher it is claimed will require a maximum of 7½ horsepower for its operation. Estimating that the pumps will not consume to exceed 1½ horsepower, I am thinking of installing a 10 horsepower engine to drive the generator.

To operate this outfit I am told that a kerosene engine will be much cheaper than a steam plant and will require far less attention. Not having had any previous experience in the operation of this class of machinery, I want to ask if the kerosene engine will give satisfactory service. Also, kindly advise what sort of current should be used. The maximum distance of the power transmission will not exceed 3,000 feet.

Using a kerosene engine to operate the generator, can it be so adjusted as to require little or no attention after it is started? Robert H. Daugherty

Coshocton, R. F. D. No. 6, Ohio.

Replying to this inquiry, we say without hesitation that a kerosene engine can be operated, in this case, with far less expense and attention than would be required by a steam plant. We would recommend, however, installing a larger unit than the one mentioned, as it is always safe to allow a good margin over the horsepower required. For this layout, we would use direct current, at 250 volts, owing to the difficulties involved with alternating current on account of the poor speed regulation obtained with the kerosene engine.

With regard to the transmission of electrical power a maximum distance of 3,000 feet, for the operation of two or more machines in the mines, it would not be advisable to generate alternating current in order to reduce the cost of copper. The increased cost of copper, for direct-current transmission, would be less than the cost of installing step-up and step-down transformers and a rotary converter when using alternating current.

Construction Work

Being in charge of construction work as foreman at our mine, I desire to ask two questions, as follows:

1. Should a furnace be built larger at the bottom and smaller at the top, in order to make it draw better?

2. When building an overcast in a mine, if the walls are not sloped down on each side of the main road will there be any increase in friction caused by the air current striking against the vertical sides of the main road, which has been bratticed off to deflect the current so that it will pass over the air bridge?

————, Ky. L. E. R.

In answer to the first question asked, we would say that it is common practice, in furnace construction, to make the area at the top of the furnace smaller than the area at the firebed. These areas, however, have nothing to do with increasing or decreasing the draft, assuming that the furnace is properly built so that the draft is not choked.

The draft of a furnace is determined by the effective air column in the stack, which depends on the height of the stack and the relative temperatures of the gases passing up the stack and the outside atmosphere. The contraction of the area of the furnace above the grate makes suitable allowance for the contraction of the ascending gases, as they cool in rising from the fire.

Replying to the second question, it is always better, in constructing an overcast in a mine, to start the work by blowing down the top over the main road where the crossing is to be made. An uprise is then started a short distance back in the cross-entry and driven upward on an angle of about 45 deg., and connection made with the opening already formed above the roadway. In like manner, a similar uprise is started in the parallel main heading or air-course and driven to connect with the same opening over the road.

In this arrangement, the air current will be deflected easily up the slope and over the air bridge, and there will be less frictional resistance than when the air current is made to strike against the vertical wall dividing the main road from the cross-entry. There is also the advantage that there is less chance for leakage or air when the approach to the air bridge is sloped upward in the solid coal.

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Indiana Mine Boss Examination, Indianapolis, Indiana

(Selected Questions)

Ques.—Discuss the subject of mine ventilation, setting forth the purposes; mechanical devices and their uses; quality of air required and how determined; quantity of air and how determined; humidity and temperature and how determined; mine gases, how detected; their danger and how prevented; and give the law respecting mine ventilation.

Ans.—The purpose of ventilation in mines is to supply a sufficient quantity of pure air to make the mine workings healthy and safe. The mechanical devices employed are, a ventilating fan to create the air current; and doors, stoppings, air bridges and brattices to conduct the air through the mine and make it sweep the working faces. The quality of the air must be such that it is pure, free from dust and contains the normal percentage of oxygen, as determined by actual test. The quantity of air circulated must comply with the requirements of the law and be sufficient to create the necessary velocity to sweep the gases from their lurking places in the mine. The velocity of the air, as measured by the anemometer, multiplied by the sectional area of the airway determines the quantity of air passing. The humidity of the air is ascertained by the wet-and-dry bulb thermometer, which also gives the temperature.

The important mine gases are methane, which is detected by observing the height of flame cap formed in the safety lamp when this gas is present; carbon dioxide, detected by the dim burning of the lamps or their extinction; carbon monoxide, detected by observing its effect on small animals, as birds and mice; hydrogen sulphide, detected by its smell. Methane, carbon monoxide and hydrogen sulphide are inflammable and form explosive mixtures with air, the last two gases named being also poisonous. Carbon dioxide produces a toxic effect on the human system, causing headache, nausea, suffocation and death. These dangers must be prevented by an adequate supply of air and its proper distribution in the mine. The Indiana mine law requires the circulation of 100 cu.ft. of air per minute for each man and 300 cu.ft. for each mule employed in the mine, and as much more as conditions may require. The air current must be conducted through the entries and made to sweep the working faces clear of standing gas.

Ques.—Discuss haulage tracks in mines, with respect to bed, gage, weight of rail, ties, fishplates, curves, grades, switches, ballast, drainage and the law respecting wide entry and refuge holes.

Ans.—Mine tracks must be laid on a solid roadbed. The gage commonly varies from 30 to 42 in., depending on the size and weight of mine cars in use. Likewise the weight of rail, ties, fishplates, etc., will depend on the tonnage hauled and the kind of power employed. The weight of rail varies from 8 and 10 lb. per yd., in mule haulage with light cars having a capacity of 800 to 1,000 lb., to 30 and 40 lb. per yd., in rope and motor haulage. The size of ties varies from 4 to 8 in. in width and 3 to 6 in. in depth, depending on the same conditions. Mine curves and grades should be as light as conditions will permit and are limited by the kind of haulage employed. Mine switches commonly use a No. 3 or No. 4 frog. All tracks should be rock ballasted and thoroughly drained. The Indiana mine law requires a clearance space of two feet on one or both sides of the haulage road and this must be kept free from timber, slate or other obstructing material.

Ques.—Give five safety precautions that a miner should observe on going to his working place at the face.

Ans.—1. Observe the fireboss' mark and date at the face of the coal. 2. Examine carefully roof and coal to detect any dangerous top or loose coal that is liable to fall. 3. Set what timber is needed to secure the roof, before proceeding to load coal or do other work. 4. Take down any loose rock or coal. 5. Test the place for gas before proceeding to work.

Ques.—What is the best and safest way to detect the condition of the roof?

Ans.—The common practice of sounding the roof with a pick or hammer is not sufficient to insure its safe condition. Mine roof must be carefully examined at frequent intervals, in order to detect any loose top, slips or faults in the measures, boulders, "pot-bottoms" or other dangerous conditions that may develop in the extraction of the coal.

Ques.—Give five causes of accidents that occur on haulageways and the methods to prevent them.

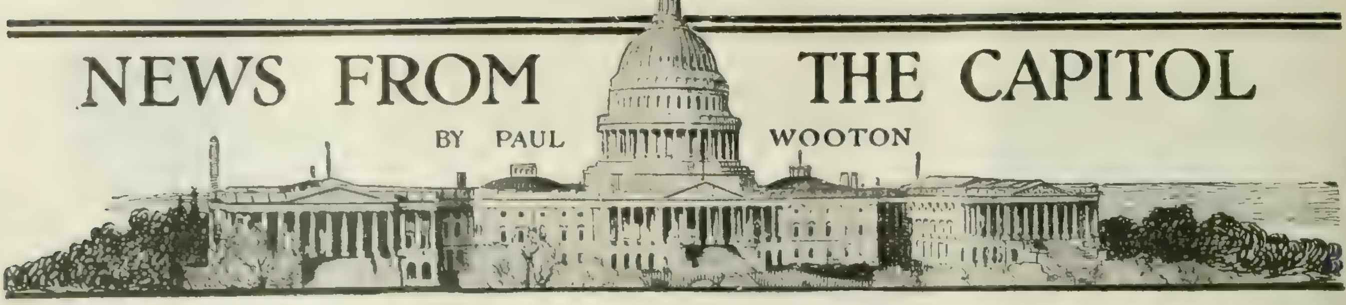
Ans.—1. The practice of using haulage roads as travelingways; prevented by providing separate roads for the men to travel to and from their work. 2. Doors on haulage roads; prevented by building air bridges, as early as the development will permit. 3. Derailment of cars; prevented by providing well ballasted tracks, which must be kept in good condition and inspected regularly. 4. Roof falls on haulage roads; prevented by good timbering and frequent inspection and the replacing of old or broken timbers. 5. Cars standing on switches at the mouths of rooms or left on sidetracks, without protection; prevented by strict regulations regarding the handling and movement of cars.

Ques.—In what way would you provide for the protection of the men from falling roof?

Ans.—Adopt a systematic method of timbering the working places and insist on the frequent and careful inspection of each place, to see that these regulations are obeyed. Frequent inspection at regular intervals and strict discipline are the chief requirements in preventing accidents from falling roof. This applies alike on all roads and all working places in the mine.

NEWS FROM THE CAPITOL

BY PAUL WOOTON



Tidewater Coal Exchange Is To Be Continued For Sixty Days

Shipments To Exchange Ordered Compulsory—Order Remains In Force Till May 1, 1920—Fuel Administration To Exercise All Powers of Former Order of Nov. 6, 1917

The executive order signed by the President on Feb. 28, continuing the Tidewater Coal Exchange and making shipments to the same compulsory, is as follows:

By virtue of the power conferred upon me under the Act of Congress approved Aug. 10, 1917, entitled "An Act, etc.," and because of the present emergency, and in order to assure an adequate supply and equitable distribution and to facilitate the movement and to prevent locally or generally, scarcity of coal, I, Woodrow Wilson, President of the United States, do hereby order and direct that the order issued by the U. S. Fuel Administrator, dated Nov. 6, 1917, and entitled "Order, etc.," which was suspended by order of the U. S. Fuel Administrator dated Feb. 20, 1919, be and the same is hereby reinstated from and after this date.

OFFICIALS OF COAL EXCHANGE

It is further ordered that J. W. Howe, at present commissioner of said Tidewater Coal Exchange, Rembrandt Peale, F. M. Whitaker, and J. F. Fisher, are hereby designated and appointed as my representatives to carry out the provisions of this order, they may exercise the powers reserved to the U. S. Fuel Administrator by said order of Nov. 6, 1917, and they are further from and after 12:01 o'clock A.M., on March 1, 1920, vested with the authority now vested in the Director General of Railroads, relative to the export of coal from the United States.

This order shall remain in force and effect until midnight of the thirtieth day of April, 1920, at which time, unless otherwise ordered, it shall cease to be operative. The order was signed by the President.

The order of Nov. 6, 1917, is quoted as follows: "Order relative to tidewater transshipment of coal at Hampton Roads, Baltimore, Philadelphia, and New York, and for the employment of and co-operation with the Tidewater Coal Exchange, so called, as a common agency to facilitate such transshipment and to reduce delays in the use of coal cars and coal-carrying vessels."

It appears to the U. S. Fuel Administrator that the production of coal intended for transshipment at the Tidewater ports of Hampton Roads, Baltimore, Philadelphia and New York and ports near or usually considered as tributary to said ports is being restricted, and that the loading of coal-carrying vessels and the unloading of coal cars at such ports and the movement, arrival and return of such vessels and cars at and from such ports are congested and delayed, and that the shipment of coal from such ports is reduced in quantity, and that the distribution of coal to consumers in the territory tributary to the ports to which such coal is destined is less efficient, prompt, and reasonable than is necessary for the efficient prosecution of the war, and that delay is occasioned in the delivery of coal for vessels of the navy and transports of the army, by reason of the continuance of individual shipments of coal by various producers upon the lines of coal-carrying roads having terminal at the ports aforesaid, and of individual and distinct transshipments of such coal at such ports only to coal-carrying vessels specially chartered or designated for the transshipment thereat of such individual shipments. The objectionable conditions aforesaid can be largely eliminated and the production, shipment, and distribution of coal from said ports both for the army and navy and for consumers in the territories aforesaid can be hastened and improved by the employment of and co-operation with a common agency at each transshipment port in the manner and with the powers hereinafter provided, and that such employment of and co-operation with a common agency is essential to the national security and defense, for the successful prosecution of the war, and for the support and maintenance of the army and navy, and to assure an adequate supply and equitable distribution, and to facilitate the movement, and to prevent locally or generally scarcity of coal.

The U. S. Fuel Administrator, acting under authority of an Executive Order of the President of the United States, dated Aug. 23, 1917, appointing said Administrator, and in furtherance of the purpose of said order and of the Act of Congress therein referred to and approved Aug. 10, 1917, hereby orders and directs that, until further or other order of the U. S. Fuel Administrator and subject to modification hereafter by him at any time and from time to time, the following rules are established for the regulation, to the extent hereinafter provided, of the method of production, sale, shipment, distribution, apportionment, and storage of bituminous coal for transshipment at the ports aforesaid.

TRANSSHIP COAL MUST GO TO EXCHANGE

(1) Every shipper of bituminous coal for transshipment at any one of the ports at Hampton Roads, Baltimore, Philadelphia, and New York and ports near or usually considered as tributary to said ports, shall on and after Nov. 11, 1917, consign all such shipments of coal to the Tidewater Coal Exchange, so called, of which Rembrandt Peale is the commissioner. Such shipments and consignments shall be made by each such shipper in accordance with and subject to the provisions of the existing Tidewater Coal Exchange rules in the same way to the same extent and with the same rights and liabilities respecting such shipments and the transshipment and delivery of the coal included therein, as under the terms of said rules apply to members of said Tidewater Coal Exchange but no such shipper subject to this order shall be required by reason of anything herein to become a member of said Tidewater Coal Exchange.

A copy of said rules is annexed to this order and hereby referred to. Wherever said rules refer or mention a "member" or "members" of said Tidewater Coal Exchange, said terms shall with respect to this order and shippers subject hereto be deemed to mean a shipper or shippers of coal who are subject to this order; and wherever the "effective date" of the Exchange or of said rules is referred to therein, such reference shall be deemed, with respect hereto and to the shippers subject hereto, to refer to the effective date of this order.

(2) Bituminous coal consigned under the provisions of this order shall be graded and classified in accordance with '"Exhibit B" Consigning Pool Numbers,' referred to in said rules of the Tidewater Coal Exchange, as modified, cancelled or superseded by the pro-

visions of Classification C, dated July 15, 1917, Classification D, dated July 17, 1917, Classification E, dated July 19, 1917, and Classification F, dated July 27, 1917, and in accordance with the provisions of said Classifications C to F inclusive, wherever applicable, copies of which and of said "Exhibit B" are on file with this order in the office of the U. S. Fuel Administrator for inspection by any shipper subject hereto.

Changes May Be Made

Changes in said classifications shall not be made against the objection of any shipper subject hereto except after approval of such changes by the U. S. Fuel Administrator. Upon application from any shipper subject hereto, the representative of the U. S. Fuel Administrator appointed under the provisions of paragraph (3) of this order is directed to furnish copies of said "Exhibit B" and said Classifications C to F to such shipper.

(3) Said Rembrandt Peale, commissioner of said Tidewater Exchange, is hereby designated and appointed as the representative of the Fuel Administrator to carry out the provisions of this order with power to appoint deputies representing him as such representative of the U. S. Fuel Administrator at any one or all of the ports aforesaid; and in case of any disagreement or controversy between any shipper subject to the provisions hereof and said commissioner with respect to any shipment or transshipment of coal or other matter arising under this order, or if any decision under rule 15 of the said Tidewater Coal Exchange Rules hereto annexed, which would be final as to any member of said Exchange, is unsatisfactory to any shipper subject to the provisions hereof, such shipper may appeal to the U. S. Fuel Administrator.

(5) No change shall be made in the membership of the Executive Committee of said Tidewater Exchange except with the approval of the U. S. Fuel Administrator so long as this order is in effect.

May Apply for Suspension of Order

(6) Any shipper subject to the provisions of this order may at any time apply to the U. S. Fuel Administrator for suspension or termination of this order upon the ground that its continuance is no longer essential to the national security and defense and for the successful prosecution of the war in which the United States is at present engaged.

(7) A copy hereof shall be served upon each of the railroad or railway companies and upon each of the producers of bituminous coal named in the list marked "Exhibit 1 to the Tidewater Coal Exchange Transshipment Order of the U. S. Fuel Administrator, dated Nov. 6, 1917."

The order was signed by H. A. Garfield, who was then U. S. Fuel Administrator.

Hines Outlines New Distribution Policy

Coal To Be Diverted Only When Urgent—New Regional Committees Appointed—New England Receives Immediate Attention

COAL is to be diverted in the future only in cases of the most absolute necessity. New committees have been appointed by the Director General of Railroads to look after the diversions in the different regions. The Central Coal Committee at Washington is simply to continue its supervision over the general control of fuel movements through the regional committees.

Director General Hines outlined the new policy in a statement issued March 5. It is as follows: I am advised that in the Eastern section of the country and in New England particularly the severe weather conditions continue to interfere to a large extent with railroad operations, which is materially affecting the movement of coal from the producing sections to the consumers. The coal strike in November and December resulted in a shortage of approximately 50 million tons of bituminous coal. Although during the week ended Feb. 28, 1920, 10,250,000 tons of bituminous coal was produced and transported and although the production and movement of bituminous coal so far in 1920 has considerably exceeded the production and movement in the same period in the three preceding years, it is a fact that demand it still considerably in excess of the supply.

To Give New England Attention

As a result the Director General has received representations from a number of Public Utilities, schools, domestic consumers and industries that they are unable to purchase coal to meet their urgent needs, and that they will have to cease operations unless they promptly secure coal. To assist the New England situation and because weather conditions have made it impossible to move much coal to New England by rail, a large amount of coal has been diverted to New England by water. This movement will be continued.

In Executive Orders dated Feb. 28 and March 5 the President, in order to meet this situation, has continued in the Director General of Railroads authority to direct the distribution of coal to the extent necessary to meet the urgent needs of public utilities, railroads and other domestic consumers. Acting on the authority thus continued, the Director General has today sent out instructions to Regional Coal Committees under his authority in the Eastern section of the country for the purpose of effecting the absolutely necessary diversions of coal.

These committees have been instructed that diversions of coal under this authority be kept at an absolute minimum and cease entirely as soon as possible. All applicants for coal should exhaust all possible means for securing coal through the normal channels since the power to divert will only be exercised to meet emergencies. The instructions of the Director General places authority in the hands of the designated committees to make the necessary diversions. While the Regional Committees will continue to work under the general directions of the Central Coal Committee, Railroad Administration, Washington, D. C., applications for diversions of coal will not be forwarded to the Central Coal Committee but will be dealt with directly by the Regional Coal Committees.

New Regional Committees

The territory over which the regional committees will have jurisdiction and the chairmen of the different committees are as follows: Eastern Regional Coal Committee with headquarters in New York, with jurisdiction on the lines of the railroads which comprised the Eastern Region of the U. S. Railroad Administration, G. N. Snider, chairman.

New England District Coal Committee, with headquarters in Boston, Mass., with jurisdiction on the lines of the railroads which comprised the New England District of the Eastern Region of the U. S. Railroad Administration, W. T. Lamoure, chairman, and James J. Storrow, vice-chairman.

Ohio and Indiana District Coal Committee, with headquarters at Cincinnati, Ohio, with jurisdiction on the lines of the railroads which comprised the Ohio and Indiana District of the Eastern Region of the U. S. Railroad Administration, H. A. Worcester, chairman.

Detroit Committee, with headquarters at Detroit, Michigan, with jurisdiction over Detroit and Toledo Terminals and in the state of Michigan, P. G. Findlay, chairman.

Cleveland Committee, with headquarters at Cleveland, Ohio, with jurisdiction over Cleveland and Terminals, E. R. Bissell, chairman.

Allegheny Regional Coal Committee, with headquarters at Philadelphia, Pa., with jurisdiction on the railroads which comprised the Allegheny Region of the U. S. Railroad Administration, Samuel Porcher, chairman.

Pocahontas Regional Coal Committee, with headquarters at Roanoke, Virginia, with jurisdiction on the railroads which comprised the Pocahontas Region of the U. S. Railroad Administration, D. E. Spengler, chairman.

H. B. Spencer, who was Director of the Division of Purchases of the Railroad Administration, has accepted a position as head of the Washington office of a private concern which is operating a refrigerator-car line.

Wholesalers Seek Injunction Against Railroad Administration

Cushing Criticizes Government Control — Fuel Control Redelegated Too Many Times— Unintelligent Diversions Made

AN injunction is being sought by the American Wholesale Coal Association against the Director General of Railroads in the matter of diversion of coal. The case is brought in the name of Swayne & Co., Noah H. Swayne 2d, of Philadelphia, who trades as Swayne & Co. He is the president of the American Wholesale Coal Association.

George H. Cushing, the managing director of the American Wholesale Coal Association, in analyzing the case, states that one allegation in the bill is that the President's control over coal, as granted by the Lever law, has been delegated and redelegated too many times and that the coal industry is no longer regulated by the Government in the public interest.

Instead, anyone who uses coal and wants to confiscate what he wants, can get and use the President's powers under the Lever law. Specifically, it is and will be shown the President delegated his authority to Dr. H. A. Garfield; Dr. Garfield redelegated it to the Director General of Railroads; the Director General of Railroads gave it to the Central Coal Committee; the Central Coal Committee passed it on to Regional Committees. The Regional Committees transferred it to Federal Managers, the Federal Managers allotted it to their fuel agents; and the fuel agents used this authority to get coal for some of their friends along the railroad. The bill questions the legality of such frequent delegations of the President's power.

DIVERTEE PAID ONLY PRODUCTION COST

A second allegation is that those who thus regulated coal in their own interest assumed still in their own interest to divest the owners of coal of their title to it. The owner of the coal who had paid cash for it had his property taken away and the title went back to the person who produced it. This eliminated, contrary to the constitution, the title and right of the retailer and wholesaler. It left the divertee—mainly the Railroad Administration—to pay only the production cost of that coal.

The allegation in the bill is that such divestment of title is unconstitutional since the courts have held frequently that when a man's property is taken, he must, under law, be put in the same position as though his property had not been taken.

The third allegation is that an organization—the Central Coal Committee—consisting of three men and two clerks, has tried to distribute about two million tons of coal per day. They had no force adequate to investigate either the truthfulness of statements of coal users or to determine whether the man, whose coal was taken, needed it as badly as the man to whom it was being given. In practice, this unintelligent interference set up a system of robbing Peter to favor Paul. When that had been done it was necessary to rob John to save Peter, and to rob Samuel to reinstate John in his rights. One unintelligent diversion gave rise in time and necessarily to ten unintelligent diversions and the result has been to create the impression of a coal famine, when production daily, weekly and monthly was, and is adequate.

The fourth allegation is that, under this system, men who have spent their money to finance the coal mines during the recent strike had to sit by while their funds were tied up by the Railroad Administration which worked under rules that made it impossible for them to recover what they actually had spent for coal, to say nothing of collecting enough additional to pay their cost of doing business.

At the end of the petition, the plaintiff requests that the court establish a commission to settle claims between the owners of the coal and the divertees. They also ask that the Director General of Railroads be ordered to show cause why an order should not be issued restraining him from further illegal interference with their business.

While this suit is filed in the name of Swayne & Co., it is specified in the bill that it is in behalf of the 600 members of the American Wholesale Coal Association. It requests the Supreme Court of the District of Columbia to consider this as a test case and to allow the wholesalers to intervene as individuals to establish their rights.

The real purpose of the suit is to compel the Director General of Railroads and his agents to allow those who buy coal to actually get the coal they have bought and paid for. As the matter now stands, it is impossible for any coal man to make a sale to a retail dealer, a public utility company or to a factory and guarantee that that coal will be delivered.

Another purpose of the suit is to stop practices such as the following:

ENDLESS CHAINS DEVELOPED

(1) Some time ago the Central Coal Committee was asked to divert 75,000 tons of coal to the New York Edison Co. and the Interboro Rapid Transit Co. of New York. The request was granted without an investigation. It developed later that 60,000 tons of this coal was moving, when seized, to the Boston Edison Co.

To allow the Boston Edison Co. to get its coal, the Central Coal Committee then seized 60,000 tons from other wholesalers. It later developed that this 60,000 tons of coal was moving to other utilities companies located up and down the Atlantic Coast, and it became necessary to divert to these concerns 60,000 tons of coal moving to other wholesalers—an unending chain.

(2) The Fuel Administrator for Canada petitioned for 50,000 tons of coal. That quantity was seized while standing in the railroad yards of Buffalo, N. Y. After it had been shipped into Canada, it was found that it was all a high grade of gas coal moving to the gas plant at Buffalo. To satisfy the Buffalo Gas Plant, it was necessary to seize and divert 50,000 tons of other coal, but the coal actually seized was not fit for gas making.

(3) The Newberry Plant of the American Steel & Wire Co. at Cleveland, Ohio, petitioned for coal and got it, but it was found that after this coal was diverted it was taken away from the Wickwire Steel Co. of Buffalo, N. Y., the immediate competitor of the American Steel & Wire Co. of Cleveland.

(4) Within the last two weeks, coal that was moving to retail dealers in northern Ohio and Michigan, to satisfy household demands, was diverted to the McKinney Steel Co. at Cleveland.

(5) As showing the business difficulty confronting the petitioners, documentary evidence will be submitted to the court showing that the Chicago, Rock Island & Pacific R.R. received and used 3,630 cars of coal. Three months later it was still unable to find who produced or owned that coal, and hence who to pay for it. Also, the Illinois Central received and used 3,000 cars of coal under exactly similar conditions. These two railroads found it necessary to print and circulate among the members of the coal trade, lists of these cars asking coal men to come forward and prove ownership of the coal.

There was involved in these two instances alone at least 325,000 tons of coal, valued, at least at one million dollars. Yet, the railroad had burned the coal but did not know three months afterward who should be paid for it. The petitioners believe they are justified in asking the court to relieve them at once from the burden of such unintelligent and illegal interference with their business.

Colorado Operators Mine at a Great Loss Under Present Conditions

FOLLOWING a short hearing for the consideration of the anthracite situation the Frelinghuysen Coal Investigating Committee will make its report to Congress. Senator Frelinghuysen states that he is going to do all within his power to submit the report at the earliest possible date.

E. H. Weitzel, manager of the Fuel Department of the Colorado Fuel and Iron Co., was the last witness to appear before the Frelinghuysen Committee. He submitted extensive data with regard to the situation in Colorado, but placed most of his emphasis on matters relating to the price of coal and to wages. He declared that the operators in Colorado can not sell coal at the present government price without very great loss. He also attempted to demonstrate that coal miners in Colorado are able to live up to American standards without the fourteen per cent increase.

Mr. Weitzel explained that the mines of his company are maintained on open-shop basis and that the industrial representation plan which has been adopted by the company and the employees is operating satisfactorily. To demonstrate that he presented a resolution adopted by the employees of the Colorado Fuel and Iron Co. just prior to the Central Competitive strike, in which they announce their intention to continue with the industrial representation plan and denounce the strike order as being unfair. It was stated that only seven men refused to sign the resolution, and that the employees themselves ejected these seven from their camps.

Mr. Weitzel explained that in addition to supplying Colorado, Nebraska, Kansas, Oklahoma, and Texas are dependent to a considerable extent upon Colorado coal. He called attention to the inability of his company to continue to supply coal at government prices when, with the present wage scale an average loss of 31.7c. per ton is being suffered. In that connection Mr. Weitzel said:

"Our cost of production in the coking and steam mines in 1919 was exactly the government price of $2.70. The profits on domestic mines averaged 9.7c. per ton in 1919. With the increase of 14 per cent in labor costs and selling at the government price for lump, nut, and slack we will have a loss in 1920 of 16.8c. per ton on the domestic coal. Our total labor bill was $5,944,491.45 for 1919. An increase of 14 per cent on that will show what the extra burden is. It means an additional charge on the consumer of at least 40c a ton."

To show that the mine workers in Colorado have a comfortable living wage Mr. Weitzel pointed to the large percentage of them who own automobiles.

Mine Rating and Car-Distribution Rules To Be Continued

UNIFORM mint rating and car distribution rules established by the Railroad Administration are to be continued unless some carrier should do the unexpected thing and challenge the following suggestion which has been promulgated by the Interstate Commerce Commission.

The supply of cars available for the transportation of coal is insufficient to meet the demand. Unusual movements incident upon the strike of coal miners has brought about an abnormal location of cars. It is desirable that the proper relocation of cars shall be brought about as rapidly and with as little confusion as is possible. Critical situations still exist in which fuel for essential industries and purposes must be provided.

To the end that conflicting and contradictory rules on different roads and in different fields may be avoided in the unusual conditions which now exist in the industries and on the roads, the Commission recommends that until experiences and careful study demonstrate that other rules will be more effective and beneficial and especially during the remainder of the early spring the uniform rules as contained in the Railroad Administration's Car Service Circular CS-31 (Revised) be continued in effect.

Fuel-Briquetting Industry Also Affected in 1919

Like the entire coal-mining industry, the manufacture of fuel briquets was adversely affected by the period of readjustment which followed the armistice. The total production of fuel briquets in 1919 was 296,000 net tons, a decrease of 182,000 tons, or 38 per cent, when compared with the preceding year. In fact, the output fell far below even that of 1917, reaching almost exactly the level of the pre-war year, 1916.

The value of the briquets produced in 1919 was $2,301,000. In 1918 the value was $3,213,000, and in 1917, $2,234,000. Twelve plants operated during the year, five in the Eastern States, four in the Central States, and three on the Pacific Coast. The fuels used included 104,000 tons of anthracite culm and fine sizes, 112,000 tons of semianthracite and bituminous coal, and 80,000 tons of lignite and petroleum residues.

Repeal of Lever Act Sought

Sentiment in Congress for the repeal of the fuel provisions of the Lever act has become sufficiently strong that it is probable that serious consideration will be given in the near future to legislation looking to the repeal of the fuel provisions.

Representative Tilson of Connecticut has taken the lead in the matter. He is a member of the Ways and Means Committee and is in a position to exert considerable influence on behalf of his proposal.

FOREIGN MARKETS AND EXPORT NEWS

Coal Concession Granted by China

More details of the concession from the Chinese Government granted to the Chinese Engineering and Mining Co. have been given at the recent stockholders' meeting. Chairman W. F. Turner said in a statement made in *The Sun and New York Herald* of Feb. 11:

"You may have seen in the newspapers a cablegram from China stating that a preliminary agreement has been entered into by the Kailan Mining Administration with the Shansi government for the working of mines in the province of Shansi. The agreement in question refers to the Tatung coal field. It is essentially of a preliminary character, and the effect of it is that, in the first instance, a careful investigation will be made of the character and resources of the field, and everything will depend upon the results of that investigation.

"The position of the field is good; it is situated to the west of Kalgan and close to Peking-Kalgan-Suiyuan Ry., which is approximately several hundred miles to the west of Peking. The coal is said to be of good quality and to exist in large quantities. It is too early to say more on this subject, but there would appear to be large possibilities involved. There are other matters under consideration which are not sufficiently advanced for discussion; I have dealt with those which are of most immediate interest.

"You will have realized that we have entered on a period of great expansion, and that the future of the business controlled by the Kailan Mining Administration is not only of interest to ourselves and our associates, but is becoming a considerable factor in the industrial development of China."

Vast Coal and Iron Resources in New South Wales

New South Wales has large deposits of iron ore (53,000,000 tons awaiting treatment) in close proximity to vast beds of [illegible] coal, states the New South Wales Information Bureau of New York City. Both classes of deposits are being worked more extensively each year. In 1917 the coal mined amounted to 8,292,867 tons, of which 5,000,000 tons were used within the state — almost exclusively for industrial purposes, as the mild climate of Australia requires very little fuel to be employed for the heating of buildings.

The coal beds of New South Wales cover about 16,550 square miles in three districts: Northern, Southern and Western. The main lines of railways pass through the districts where the deposits are most easily worked. Newcastle, famous throughout the world, is a port near Sydney, and at the heart of the Northern coal district, which furnishes sixty-five per cent of the coal that is mined in the state.

Two hundred and forty-four million tons of coal, valued at $480,000,000, have been mined to date in New South Wales.

It is conservatively estimated that there are over 115,300,000,000 tons of coal still available to be mined in New South Wales. This represents an asset to the State of New South Wales of over $175,000,000,000.

Danzig Received Two-Fifths of Its Coal By Sea

Before the war Danzig received about two-fifths of its coal supply by sea and the remainder by rail, states *Commerce Reports*. During the war the sea supply was largely cut off, but there was an increase in incoming rail shipments, as is shown by the following figures for incoming and outgoing shipments in 1913 and 1918

Items	1913 Metric Tons	1918 Metric Tons
Incoming by sea from		
United Kingdom	130,348	.
America	510	
Dutch and Belgian ports	33,536	
German North Sea ports	22,790	52,238
Rhine region	29,284	
Baltic ports	2	
Total by sea	216,470	52,238

Items	1913 Metric Tons	1918 Metric Tons
Incoming by rail (chiefly Silesian coal)	339,678	505,480
Shipped out:		
By river	79,320	113,241
By rail (chiefly to East and West Prussia)	81,344	48,241

The foregoing figures do not include coke or briquets

According to customs returns, incoming shipments of petroleum by the sea route amounted in 1913 to 45,068 metric tons, of which 23,263 tons came from the United States and 15,517 tons from Russia. No petroleum appears as received in 1918.

Ruhr Daily Output Slightly Improved

During the 21¼ working days in December, states the *Colliery Guardian*, the Ruhr coal output amounted to 6,471,130 tons, as compared with 6,172,248 tons in the 23¼ days of the previous month, and 9,075,000 tons in December, 1913, the decrease in comparison with the latter being 28.7 per cent.

The output for the whole year was about 70 million tons, against 95.97 million tons in 1918, and 114.56 million tons in 1913, a decrease of over 44 million tons, or 48.6 per cent, although the number of miners has increased by 50,000. The output per diem is, however, improving slightly, being 257,256 tons in October last, 265,473 tons in November, and 266,850 tons in December.

Distribution was fairly good in the existing state of affairs, and towards the end of the month the wagon shortage had practically disappeared, this, however, being partly due to the fact that many works extended the holidays in consequence of the short supply of coal in hand and thus required fewer wagons for the time being. The favorable state of the river previous to the recent overflow also facilitated coal traffic to South Germany.

The new year has opened badly for the local coal industry, and the combined effects of the floods and the railway strike will long be felt. Still worse will be the result of the six-hour day, which is to come into operation on Feb. 1, and is calculated to give the finishing touch to the economic existence of the nation.

Boring Operations Begun in Brisbane

Boring operations for coal were recently begun on Crown lands between Torbanlea and Colton, in the Howard district, and so satisfactory was the result that a start has been made at sinking a shaft.

It is intended that the State of Queensland have its coal mines in three sections of the state, so that it may become independent of private enterprises.

Would Cancel Norwegian Coal Bids

The shipowners organization of Christiania, Norway, has asked the Norwegian Government to make an effort to cancel the American coal contracts, which call for 35,000 tons monthly.

The cancellation is desired in order to ease the heavy demand upon tonnage.

Tidewater Shipments, By Ports, 1918 and 1919

Through the courtesy of the Tidewater Coal Exchange the Geological Survey is able to publish the following summary of bituminous shipments to the principal North Atlantic ports in 1919. The striking features of the year were the increase in the tonnage of foreign export and bunker, and the decrease in the movement to New England. The total movement to tide declined from 42,908,522 net tons in 1918 to 37,061,817 tons in 1919. Two of the ports, Charleston and Philadelphia, increased their tonnages; at the other three a decline occurred. Hampton Roads remains the greatest coal port of the country, with New York second. Philadelphia passed Baltimore during the year, and is now third in rank.

TIDEWATER SHIPMENTS TO NORTH ATLANTIC PORTS, 1918 AND 1919(a)

(Net Tons)

Harbor	Inside Capes and Bunker	New England	Foreign	Bunker	Other(b)	Total
New York						
1918		3,946,368	28,222	2,573,443	10,542,700	17,090,736
1919		2,510,497	10,348	2,659,030	9,054,362	14,234,237
Philadelphia:						
1918	2,006,025	548,014	90,570	420,057	56,290	3,120,956
1919	2,069,043	492,405	1,140,077	677,498	31,882	4,410,905
Baltimore:						
1918	1,108,532	1,991,184	112,376	387,927	41,446	3,641,464
1919	775,552	129,311	1,771,562	610,335	180,510	3,467,270
Hampton Roads						
1918	1,358,591	8,756,011	3,499,579	2,648,634	2,713,861	18,976,676
1919	584,912	5,233,612	5,183,712	2,837,007	789,889	14,629,132
Charleston:						
1918	2,584	6,552	10,003	32,938	26,613	78,690
1919	8,346	19,557	186,715	90,049	15,605	320,273
Total:						
1918	4,475,732	15,248,129	3,740,750	6,062,999	13,380,910	42,908,522
1919	3,437,853	8,385,382	8,292,414	6,873,919	10,072,248	37,061,817

(a) As reported by the Tidewater Coal Exchange

(b) Consists, for New York, of water shipments to New York and New Jersey points located around New York Harbor plus a small tonnage for Army and Navy; for other ports consists largely of coal for Army and Navy

Belgian Coal Production

Consul General Henry H. Morgan, Brussels, on Dec. 23, 1919, states that coal production in Belgium for October, 1919, increased in all mining districts compared with the month of September. It is to be noted that October included one more day of work than the month of September. For the whole region the increase was 11.8 per cent of the production for September; for the Mons fields it was 11.7 per cent; for the Centre, 13.7 per cent; Charleroi, 12.3 per cent; Namur, 5.9 per cent; Liege, 9.4 per cent; and Campine, 46.5 per cent. In the latter field there was a strike in September. The production in the Campine was 13,540 tons in August and in September 11,870 tons.

The total number of surface and pit miners was 119,842 in October, compared with 144,922 in September, an increase of 4,920, or 3.4 per cent. Stock during October decreased 167,115 tons.

The following table gives the October, 1919, net production of coal (including that consumed in the pits), the stocks at the end of the month, as well as the average number of employees, surface and pit, for each of the coal districts, and for all the coal mines of the country. Production for the kingdom was 1,884,740 tons.

Coal Basins and Fields	Production Net Tons	Stocks at End of October Tons	Average Number of Miners Employed: At Pit	On Surface	Total
Hainaut					
Fields—					
Mons	421,610	104,570	25,066	10,257	35,323
Centre	318,155	50,481	17,650	7,282	[illegible]
Charleroi	640,695	414,704	31,384	16,339	47,773
Namur	50,200	37,100	2,743	1,272	4,015
Liege	436,720	58,300	25,553	10,637	[illegible]
Limbourg	17,360	1,380	1,004	655	1,669
Kingdom	1,884,740	666,535	103,400	46,442	149,842

The following table gives the coal production for the normal year 1913, compared with the 1919 production:

Coal Basins and Fields	Average Monthly Production in 1913 Tons	Production in October, 1919 Net Tons	Production in October, 1919, Compared with the 1913 Monthly Average Per Cent
Hainaut:			
Fields—			
Mons	364,200	421,610	115.0
Centre	303,830	318,155	104.0
Charleroi	679,000	640,695	94.3
Namur	65,420	50,200	76.7
Liege	498,260	436,720	89.6
Limbourg		17,360	
Kingdom	1,910,710	1,884,740	98.6

Lianelly Coal Market Maintains Its Firm Tone

A recent issue of the *Colliery Guardian* states that the local market maintains its firm tone, and collieries are very busy coping with the heavy demand. Pits are working good time on the whole, although in some cases idle days are reported through shortage of wagons. Shipping is very busy, and a good number of vessels are waiting loading turns.

Inland deliveries are also being well maintained, but the demand is heavy. All anthracite coals are well placed, with more orders offering than collieries can accept. Large kinds are very difficult to secure, and the machine-made grades very scarce. Culm and duff are strong, with a good demand ruling.

Steam coals are also very firm, and outputs well stemmed ahead. Large and throughs are scarce, and smalls well enquired for, particularly the better grades.

Swansea Coal Trade Unsatisfactory

The trade of the port during the past week was by no means good, only 42,176 tons of coal and patent fuel being exported, states the *Colliery Guardian*. A good attendance assembled on Change today, and all classes of coal were in very pressing demand, but, as has been the case for the past few weeks, little business seemed to be possible, owing to the already heavy bookings.

The market, generally speaking, is very firm and difficult, owing to the continued falling out of position of tonnage through bad weather, and at the same time there is a heavy list of boats in the port, caused by congestion on the railways, and in consequence very slow at the tips.

No Marked Change in Nottingham

There is no marked change in the condition of the trade in this county, states the *Colliery Guardian*. Despite the fact that the output shows some improvement, the general demand is active. There is every indication that the shortage in the house-coal section so far as local merchants' supplies are concerned, will be abated to some extent shortly, and already supplies are coming to hand rather more freely.

The position in this respect was becoming acute, many householders, being without fuel, having to get permits to obtain small allowances from the fuel overseer. Steams continue in active demand, and collieries readily dispose of all available supplies.

Foreign Freight Rates

From W. W. Battie & Co's coal trade freight report of Feb. 19, 1920, the Shipping Board's rates by steam are as follows:

	Rate	Tons Displaced
Genoa/Leghorn	$26 50	1,000
Spezia/Savona	[illegible]	1,000
Piraeus	28 50	1,000
Trieste Venice	[illegible]	800
Algiers	26 00	800
Cadiz Bilbao	23 50	[illegible]
Barcelona	26 00	1,000
Antwerp Rotterdam	22 50	1,000
Lisbon	22 50	1,000
Gothenburg	24 00	1,000
Marseilles	26 00	1,000
Stockholm	26 00	800
Hamburg	25 00	1,000
Rouen	23 00	1,000
Malmo	25 00	[illegible]
Pernambuco	16 00	500
Bahia	16 00	500
Rio	17 00	1,000
Santos	18 50	600
Rio Grande do Sul	19 50	500
Buenos Aires or	16 00	1,000
La Plata or		
Montevideo	[illegible]	750
Rosario	[illegible]	750
Bahia Blanca	17 50	1,000
To Nitrate Range	12 00	1,000
Havana	7 50	600
Sagua or Cardenas	9 00	300
Cienfuegos	9 00	500
Caibarien	9 50	300
Guantanamo	9 50	300
Guantanamo	9 00	400
Manzanillo	9 50	300
Bermuda	9 00	300
[illegible]		
Kingston	[illegible]	400
St Lucia	11 00	500
Barbados	11 00	500
Santiago	[illegible]	500
	9 00	400
Port of Spain, Trin	11 00	500
Curacao	10 50	500
[illegible] p.c. Curacao		
Demerara	13 00	400
St Thomas	10 00	500

All above rat [illegible]

Coal and Coke Exports During December, 1919

Coal and coke exports for December, 1919, as reported by the Department of Commerce by countries and customs districts are as follows:

Countries	Coal: Anthracite 172 Tons	Coal: Bituminous 173 Tons	Coke 174 Tons
Austria Hungary	5		
Denmark		[illegible]	
France	30	2,918	
Germany	20	3	
Italy	318	11,640	[illegible]
Portugal	25		
Canada	[illegible]	208,691	26,695
Guatemala		5	
Honduras	[illegible]	500	4
Panama		16,300	
Mexico	418	[illegible]	14,826
Newfoundland and Labrador	315	[illegible]	
Trinidad and Tobago		7,318	
Cuba	3,168	57,478	[illegible]
Danish West Indies		[illegible]	2
Dutch West Indies		[illegible]	
Dominican Republic	1,424	[illegible]	[illegible]
Argentina			1
Brazil		[illegible]	20
Chile	50	[illegible]	
Colombia		[illegible]	
Peru			11
Egypt		[illegible]	
Total	345,402	[illegible]	[illegible]

Customs Districts	Coal: Anthracite 172 Tons	Coal: Bituminous 173 Tons	Coke 174 Tons
Maine and New Hampshire	258	39	304
Vermont	1,841	330	
Massachusetts	410	4	
St Lawrence	100,694	43,595	3,175
Rochester	6,003	15,933	[illegible]
Buffalo	223,926	58,722	[illegible]
New York	4,871	3,591	[illegible]
Philadelphia	2,041	2,273	
Maryland		2,231	
Virginia		92,876	
South Carolina	1,458	[illegible]	
Florida		[illegible]	
Mobile			1,259
New Orleans	838	505	[illegible]
Sabine			37
San Antonio	215	403	
El Paso	187	1,705	4,124
Arizona		[illegible]	10,623
Southern California	3	[illegible]	
San Francisco		1	2
Washington	1	71	
Alaska		1	
Dakota	381	2,637	[illegible]
Duluth and Superior	2,225	7,005	[illegible]
Michigan	50	47,765	6,799
Ohio		32,593	[illegible]
Porto Rico		160	2
Total	345,402	[illegible]	43,320

BUNKER COAL

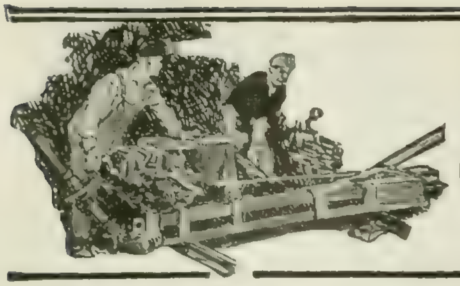
Customs Districts	[illegible]
Maryland	28,338
New York	[illegible]
Philadelphia	32,967
Virginia	90,175

Chesterfield Coal Pits Working Steadily

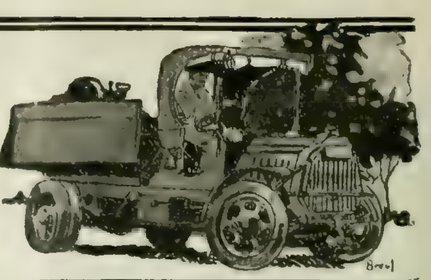
All the pits of the district are working steadily and the output of coal shows an upward tendency which, states the *Colliery Guardian*, is [illegible]. The increase is, however, very slight, and has no appreciable effect upon the quantity available for distribution. The demand continues strong, but supplies continue far below the requirements of the country. The pressure for coal for household purposes is great and orders for this class of fuel are considerably in arrear.

The scarcity of railway wagons is serious and is interfereng very much with colliery operations. There is an active demand for coal for manufacturing purposes, which is difficult to meet, particularly in respect of cobbles and nuts for gas producers. Slack for steam raising is also in great request. The pressure for gas coal and locomotive fuel is very great.

Much attention is being given to the export trade. As soon as the car distribution is in a better condition, operators in this district will find a good market for their entire output.



COAL AND COKE NEWS



What Happened in February

[The bracketed figures in the text refer to the number and page of the volume in which references to the matter noted may be found and should the reader desire further information he can obtain it in the place indicated.]

Feb. 2—Attorney Crews, of New York, submits data to the President's Coal Commission on behalf of the coal operators.

Feb. 3—Representatives of the miners and operators sum up the points in controversy in the investigation by the President's Coal Commission [XVII, 318].

Feb. 4—New River Operators' Association decides to restore the "check-off" system, at a meeting at Charleston, W. Va. When this decision is reached, representatives of miners of district 29 of United Mine Workers of America are called in and a joint meeting is held. An agreement is adopted which ends New River strike [XVII, 358].

Feb. 6—Governor John J. Cornwell, of West Virginia, delivers an address at Bluefield, W. Va., on the subject of past and possible future coal strikes. In connection with an attempt to unionize West Virginia, he said his duty was to see that peace was preserved and the rights of the public respected.

Feb. 6—The International Executive Board of the United Mine Workers of America accepts the resignation of Frank J. Hayes, as president of the union. Acting president John L. Lewis is put in his place [XVII, 316].

Feb. 9—The President's Coal Commission enquires into conditions in the bituminous mountain districts of Colorado, Wyoming, Montana and Washington [XVII, 359].

Feb. 10—President's Coal Commission names committee of five to consider question of price to charge for coal, as follows: John P. Cameron, central Pennsylvania operator, chairman; C. E. Lesher, direcetor statistics, National Coal Association; Percy Tetlow, statistician United Mine Workers; P. M. Reynolds and Paul White.

Feb. 11—James D. Simpson, general superintendent of Berwind-White Coal Co., dies at his residence in Windber, Pa. [XVII, 423].

Feb. 14—R. M. Lambie succeeds W. J. Heatherman as Chief of the Department of Mines of West Virginia [XVII, 459].

Feb. 17—[illegible] H. Manning addresses American Institute of Mining and Metallurgical Engineers, on subject of "Problems of the Coal Industry," at New York meeting [XVII, [illegible] 398]—George Otis Smith delivers address, prepared by him in collaboration with F. W. Tyron, on subject of "Fluctuations in Coal Production—Their Extent and Causes." Delivered before American Institute of Mining and Metallurgical Engineers at the New York meeting. Discussion follows. [XVII, [illegible] inclusive].—A meeting [illegible] is formed [illegible] Association [illegible] the Tidewater Coal Exchange [illegible] is [illegible] [XVII, 451, 452] —[illegible] Association [illegible] the President's Coal Commission [XVII, [illegible]]—The President's Coal Commission begins hearings of the public's side of the coal situation being investigated [XVII, 358].

Feb. 17 and 18—The American Institute of Mining and Metallurgical Engineers holds session at the Engineering Societies Building, New York City. H. C. Hoover is elected president of the institute [XVII, 408 to 411 inclusive].

Feb. 18—American Institute of Mining and Metallurgical Engineers, the New York meeting: Edwin Ludlow reads a paper on "To Conserve Coal for Future Generations." Discussion follows [XVII, 442, 443, 444]—Eugene McAuliffe reads a paper on, "Stabilizing the Market."—Prof. H. H. Stoek reads paper on, "Coal Storage." Discussion follows.

Feb. 21—Pocahontas Operators' Association holds its annual meeting at Bluefield, W. Va. Officers are elected [XVII, 469].

Feb. 25—President Wilson signs coal and oil-land leasing bill, which throws open 6,700,000 acres of oil lands and 30,000,000 acres of coal lands with 39,000,000 acres of coal lands still to be classified [XVII, 462].

Feb. 26—Director General of Railroads submits report to U. S. Senate, in response to recent resolution by Senator Frelinghuysen, as to authority of the Administration over the distribution and export of coal [XVII, 460, 461].

Feb. 28—Operators urge the President's Coal Commission to recommend to Congress enactment of legislation making labor contracts legal [XVII, 465]—President Wilson provides for continuation of power of Fuel Administration as follows: Director General Hines of the Railroad Administration retains jurisdiction over domestic distribution. A commission will handle bunker and export coal matters. Commission includes: A. W. Howe, Rembrandt Peale, F. M. Whittaker and J. F. Fisher; commission will function through the Tidewater Coal Exchange, which is restored for that purpose. The order is effective until April 30, 1920. Mr. Hines' authority is extended beyond the date of the return of the railroads—Cummins-Esch railroad bill becomes law on the signing of the act by President Wilson.

Scranton, Pa.

Persistent effort being made to solve the mine-cave problem. Brief sketch of action taken during the last six months. One committee conferring with the operators. Another to bring about legislative action if necessary. Scranton citizens aroused. Results attained. Authority on constitutional law drafts bill to regulate future mining. Authority of Mayor to deal with mine-cave questions is outlined.

The mine-cave question has been an active one for years in this section, and while the agreement entered into between the corporations mining coal here and a body representing the citizens of Scranton met some of the requirements of an adjustment of the matter, it was not considered to be an entirely satisfactory solution of the mine-cave problem. Within a year after the signing of this agreement, the situation reached an acute stage when the Warburton boy was killed in a mine cave at Scranton last August. This matter was commented upon in the Aug. 21, 1919, issue of *Coal Age* in the "News" department. Action was demanded of local and state authorities. A grand jury returned an indictment to court charging involuntary manslaughter against certain coal-company officials. It is said that this is the first time that criminal action, commenced as the result of a death caused by alleged reckless mining, has resulted in an indictment.

A brief review of further action taken by Scranton citizens will give a clearer idea of the latest developments in the mine-cave controversy, from which tangible results are confidently expected. Following the demand for action, civic associations took up the matter with more deliberation, and at a meeting of representative men of this section in the Board of Trade rooms, an organization was formed uniting all civic bodies in a fight for elimination of the mine-cave menace. It was recognized that the agreement in effect between the Board of Trade and the coal companies did not solve the mine-cave problem entirely; while it was a step in the right direction, it must be broadened; failing in this, remedial legislation must be sought.

Committees were appointed at the Board of Trade conference of representatives of the various interests of the city and section. These committees are a part of the permanent organization effected to move in the mine-cave matter. A plea was made for united action and unanimity of purpose. An earnest effort was made to decide just what was wanted by the people, and to work out the details of a plan which would bring a practical solution. Among the committees formed was first a citizens' general committee; this body appointed two other committees as follows: A conference committee to carry on negotiations with the operators; and another committee to prepare bills for presentation at Harrisburg, should the expected conference with the operators prove fruitless.

In furtherance of better relations, last October an agreement was made with the officials of Scranton by the Delaware, Lackawanna & Western company in regard to damage done to property through mining operations. It provided for three men, appointed by the city and paid by the mining company, to act as guards in areas where disturbances are expected. Tenants of houses, which may be damaged by cave-ins, are to be notified of their danger, moved at the company's expense, their rent paid and their houses rebuilt for them in case they are destroyed as a result of mining operations.

In the last few months the conference committee appointed by the citizens' general committee, met the heads of the big anthracite mining corporations in New York City, at which time the whole situation was gone over thoroughly. As a result of these conferences, plans were formulated and the conference committee has held meetings with the local operating heads of the various mining corporations. Furthermore, a series of meetings have been held by the conference committee with members of the Scranton mine-cave commission, the purpose being to pick possible flaws in the present mine-cave agreement and to suggest to the operators signatory to it changes which would make it more satisfactory. These meetings tended to the development of a better understanding of the agreement in force; in addition several changes were unanimously agreed upon. The agreement should be enlarged, it is thought, to include any and all properties in its provisions; that the Delaware & Hudson Company be made a party to it, and that mining shall cease at once beneath the cemeteries.

Among the latest acts on the part of the citizens of Scranton in the mine-cave matter was the service rendered the community by the Scranton Surface Protective Association, in bringing William Draper Lewis to the city. He was formerly dean of the law school of the University of Pennsylvania and an authority on constitutional law. Mr. Lewis participated in a conference with the Mayor and the Mayor's cabinet. The Mayor's powers were outlined by Mr. Lewis in connection with his authority to act in meeting mine-cave questions. Mr. Lewis will also work on a local ordinance to regulate future mining, in the shape of a bill that will stand a constitutional test.

Interest also centers here on a quite recent request of the Mayor of Scranton, for an appropriation by the city council of $10,000, to be used in the employment of mining engineers, to make an examination of the mine workings underneath the city. This examination is to determine definitely just what mining is being done that is dangerous to the people of Scranton.

Pittston, Pa.

Pennsylvania Coal Co. plans to improve its Ewen and No. 14 collieries in South Pittston district. Cost $1,000,000. To sink new shaft. No. 7 shaft improved. To build modern steel and concrete breaker at No. 14 colliery.

The Pennsylvania Coal Co. is said to have completed plans for improvements at two of its collieries in the South Pittston district, that will cost $1,000,000. This development work when completed will expedite the handling of coal between the mine and the breaker, and will extend the life of the collieries.

The plans adopted for the Ewen colliery, in South Pittston, where a modern breaker was constructed last year, call for the sinking of a new shaft for the development of all the seams of the territory tributary to this colliery. The proposed shaft will be so located as to permit of the handling of mine cars by gravity to the breaker, and also avoiding long and expensive outside haulage. On completion of the new opening, the old Hoyt shaft will be discontinued as regards the hoisting of coal, but will be maintained for hoisting men and handling material and supplies.

Old No. 4 shaft will also be abandoned as an opening through which coal is hoisted, and the coal will be hauled underground to No. 7 shaft, which has only recently been sunk to a lower level and provided with modern hoisting equipment. When the contemplated improvements are completed, all coal from the various workings of the Ewen colliery will be hoisted through the two modern shafts. It is expected that the improvements will expedite the handling of coal and reduce haulage expense.

At the No. 14 colliery of the Pennsylvania Coal Co., at Port Blanchard, which is also in the South Pittston district, a new steel and concrete breaker will be erected at a cost of $750,000. This modern structure will replace the old wooden breaker which has been in use for 15 years. However, the machinery in the old plant is modern and will be used in the new breaker, which will prepare the coal from the six mine openings adjacent to this colliery. The construction of an electric power house to furnish current for the operation of the Ewen and the No. 14 collieries is said to be under consideration.

Charleston, W. Va.

Car supply 40 per cent of requirements. Weather conditions bad. Influenza also lowers production. High-volatile coal still being confiscated. Kanawha production half of normal, due largely to car shortage. However, influenza also influences output. New River works three or four days out of six. Heavy tidewater tonnage goes to New England.

During the week ended Feb. 28, the mines in this area produced not more than half their potential output, although at the outset of the week there was a somewhat larger supply of cars than usual. Averaging the week as a whole, aside from the Monday supply, the service reached only about 40 per cent of requirements. The car shortage was of course the chief factor in holding back production, as it had been throughout the month.

Weather conditions were anything but ideal for satisfactory mining operations, inclement weather tending to reduce the number of men reporting for work outside the mines. The same factor was also potent in holding back the movement of trains and even the distribution of empties, especially in view of the fact that motive power was deficient.

Another element contributing toward a lowered production was the influenza, which toward the latter part of the month was just beginning to reach mining centers in this section. While the percentage of deaths was small, nevertheless the malady had reduced working forces at many mines, the principal effect of which was felt of course when enough cars were furnished to make work possible.

Much high-volatile coal produced in this part of the state was still being subjected to confiscation, though probably not to as great an extent as during previous weeks, yet a large tonnage was being secured by the Chesapeake & Ohio, Baltimore & Ohio, Michigan Central, the Pennsylvania and other roads. Tidewater shipments were much lighter in volume than would have been the case had not the permit system still been in effect. The belief existed in some quarters that all roads were holding on to their own cars as much as possible, during the last few days before the roads went back to private ownership, owing to the higher per diem rates which would prevail after March first.

With the coal output of the Kanawha region still subject to confiscation, and with production not more than half of normal during the week ending the twenty-eighth, it was impossible for producers to keep up with the strong demand from all quarters. Not only were the railroads securing a large tonnage of coal on contract, but confiscation was frequent and consequently a large proportion of the output was going to the railroads. A shortage of cars of course played the most important part in limiting the supply available. The average output of mines during the last week of the month was about 50 per cent. The weather was far from being satisfactory not only as it affected mining operations but also in its effect on the operation of trains, the coal movement in consequence being extremely slow. The influenza still has a tenacious hold in a number of mining communities and is preventing mines from producing as much coal as would otherwise be the case.

Conditions Against New River

The car supply for the New River field during the last week of February hovered around 40 per cent just as it had during the earlier part of the month and production was, therefore, less than half of the potential capacity of the district as a whole; the car shortage figured as the chief factor in restricting production and in holding mines down to about three or four full working days during the final week of the month. Even the weather conspired with the car shortage to put a damper on production, a heavy snow falling throughout nearly the entire week. Also influenza was reducing the complement of miners at various operations to a greater extent than had been the case during previous weeks. While tidewater shipments were rather heavy, not much of such tonnage was being exported. It was being sent for the most part to New England and was also used in the coastwise trade.

Bluefield, W. Va.

Most serious car shortage for more than a year past. Small operators may have to suspend entirely. Causes large labor movement. Adverse weather conditions and insufficient motive power hamper transportation. Winding Gulf operates two or three days out of six. Pocahontas output lowest of recent months. Car famine in Tug River region.

At no time during the last 14 months has there been such a serious shortage of cars as was the case during the last week of February. The supply was slim enough during the week ended Feb. 21, throughout the regions in the southern part of the state. It was infinitely worse during the last week of the month. On the Norfolk & Western R.R., the car supply was not equal to more than 40 per cent of requirements; whether because of the fact that the road was holding cars, or because the road could not secure cars from connections, it is not known. Be that as it may the transportation problem was critical.

This shortage had quite a grave effect on small operations and it is stated that unless there is immediate relief, which is not regarded as being in sight, many small companies will be forced to suspend operations entirely. Larger companies also are suffering serious losses; even when cars were furnished, the larger companies were hardly justified in attempting to operate, because of the exceedingly small number of cars furnished.

Car Shortage Brings Labor Troubles

The continued car shortage has been responsible for a large labor movement from one mine to another, especially noticable during the last week of the month. Miners have deserted the smaller operations for the larger ones in the hope of securing more regular work. Because of this shifting about from mine to mine some of the smaller operations have almost been deserted. The continued shortage of cars is demoralizing the mining industry almost completely in the southern part of the state. Few mines here worked more than two full days during the week, or three days at the most.

Weather conditions were so unfavorable that railroad operations were carried on under difficulty. Furthermore with motive power not up to the requirements, neither the distribution of empties nor the movement of loads was very satisfactory.

There was a slight improvement in the car situation in the Winding Gulf district during the last week of February, some mines securing as much as a 60 per cent supply of cars, thus being able to work about four days out of the six. During the preceding week mines were being operated about two or three days out of the six.

While there is still much sickness among the miners in this field, yet it is not now seriously affecting the output, the largest part of which is being consigned to tidewater, although little of it is being shipped to foreign markets. The demand however, for Winding Gulf coal at the present time is unlimited.

Production sank to a lower level in the Pocahontas region, during the last week of February, than at any time in recent months, the car supply not amounting to more than 40 per cent of requirements. In fact the shortage of cars threatened to be of quite grave consequence to operations, especially to the smaller companies. If this shortage is long continued, it will force the smaller producing companies to suspend operations entirely.

During the last week of the month, operations both large and small were unable to work more than two days out of the week. The supply was so meagre that companies hardly felt warranted in resuming operations just to load the few cars furnished. It was most apparent on the line of the Norfolk & Western, that railroads in the West were holding on to just as many cars as possible. No improvements from a car-supply standpoint was in sight at the outset of March. Confiscation of coal on a wholesale scale was still being continued as February drew to a close, and furthermore it was believed it was being increased.

Car Famine on Norfolk & Western

Coal loading in the Tug River field, for the week ended Feb. 28, totalled 61,450 net tons; production, therefore, being slightly better than during the previous week but way below that of other weeks of February. Indeed, a number of the Tug River operators had less than one day's full run during the last week of the month, and at the begining of March the outlook was extremely discouraging.

Thus on March 2 at Williamson where empties are assembled for distribution to the Tug River and Thacker fields, there were only 75 cars of all classes on hand (including coke cars) whereas the normal number for distribution per day is from 1,200 to 1,600 cars. The situation has become critical, the car shortage is approaching an actual famine.

Shipments for export are still rigidly curtailed to provide for domestic consumption; shipments under license for export were (at the end of February) being heavily confiscated. Though shipped under license for export, the export price could not apply because of the fact that confiscation occured while the coal was under transit or even in the pools. Small shippers found it almost impossible to get a cargo assembled under such conditions.

Huntington, W. Va.

Losses outweigh output in Guyan fields. Production far below that of strike period. Near return of railroads to owners influences official announcement of new regulations.

With almost 490 more cars available during the wind-up week of February, than was the case during the previous week, mines of Guyan field were able to increase production to the extent of about 25,000 tons, the output running to about 186,000 tons. That was far below the level maintained during the strike period, however, and consequently losses were still outweighing production, exceeding 200,000 tons or something over 50 per cent of the potential capacity of the mines. Despite the gain in production, the car shortage is still seriously retarding production in the Logan field, and operators in that field look for little relief in the near future.

Confiscation of Logan coal seemed to be somewhat less general than it had been in previous weeks, owing perhaps to the fact that the Government control over the mines and railroads was not quite so complete on the eve of the return of the railroads to individual ownership.

New Railroad Regulations

New regulations promulgated just before the end of the month, had not been felt to any material extent in the field, although it was believed the continuance of Government control over prices would cause some resentment among operators. Cancellation of all export licenses, with the requirement that such licenses must be renewed, proved to be highly disconcerting and caused a good deal of confusion at the end of the month among operators who had coal ready for export.

Coal movement over the Chesapeake & Ohio system as a whole, during the final week of January, was larger by 35,200 tons than it had been during the week ended Feb. 28. During the last week of January, 10,215 cars of coal, equivalent to 510,750 tons, had been handled; but during the last week of February a total of 10,919 cars or 545,950 tons were handled, the increase in the number of loads moved being 704.

Fairmont, W. Va.

Improvement but output still far below normal. About 400 to 600 cars available, 1,600 needed. Influenza spreads and curtails production. Coal goes West. Railroads absorb one-third of output of northern West Virginia fields.

The final week of February showed improvement over the previous week, from the standpoint of car supply, but there was still much to be desired by the mines in northern West Virginia. Production was still running far below normal. At no time during the final week of the month, however, were there as many mines idle as had been the case during the previous week.

There was a supply of about 1,100 cars on the Monongah division of the Baltimore & Ohio on Monday. During the remainder of the week the supply averaged from 400 to 600 cars. On other roads, however, even on Monday, the supply was below 50 per cent. Idleness at the mines reached its maxium on Tuesday in the Fairmont region when 135 mines were forced to suspend work because of absence of cars. From that time until Friday there were never less than 100 mines out of commission in the Fairmont field alone. It had been hoped to secure more cars on the Monongahela R.R. during the week by unloading slag, but few operators appeared to be anxious to enter into any such arrangement, two companies only co-operating.

Operations were curtailed in the last week of February to a larger extent than during recent weeks through the spread of the influenza. It had not assumed the proportions of an epidemic, but the malady had made its appearance during the week at a larger number of mines than during the earlier weeks of the month and had put many miners out of commission.

Considering the limited output, there was a fairly large movement of northern West Virginia coal to western points, particularly to Ohio and Michigan markets. On the other hand the tonnage destined for tidewater was rather light in volume. Virtually a third of the production of some of the northern West Virginia fields, however, was being absorbed by the railroads, particularly by the Baltimore & Ohio R.R. Northern West Virginia coal was being exported but in extremely limited quantities. By the time the railroads had secured enough coal to meet their requirements, there was a comparatively limited supply left for distribution to other consumers.

Birmingham, Ala.

Interesting test case in coal and iron ore tonnage tax matter. Suit against Republic Iron & Steel Co. Coal and iron ore not property until mined. Should not tax property twice. Tax arbitrarily discriminates between commercial and wagon mines.

Following a suit brought against the Republic Iron & Steel Co., by the state of [illegible] pending the determination of which all tax payments were made under the coal and iron [illegible] last summer, a brief has been filed in the [illegible] in the trial court and the only question to [illegible]

In the argument filed by attorneys for the Republic company they contend that: "Until they are mined, coal and iron ore [illegible] they do not become property until they are made available through mining, whether [illegible]

"Coal [illegible] separately from the fee or as part of it have been the subject of property taxes in this state since 1887 or earlier. To tax minerals through the years as they lay in the ground and then tax the act of taking them out, is to tax them twice."

"Furthermore, a discriminatory excise tax is offensive both to the state and federal constitutions. Thus, in levying the tax on those who mine coal and load it into railroad cars and not on those who mine coal and load it into wagons, is arbitrary and destroys the tax under schedule 66.

The attorneys also claim that, "the mining of its own coal and ore by the defendant, for use in its business of making and selling pig iron, is not an occupation or business. Not more so than is the defendant's transportation of these raw materials to the furnace, nor more so than any of its furnace operations."

Ashland, Ky.

Northeast Kentucky production little over half of capacity, due to car shortage. Chesapeake & Ohio mines lose tonnage; Louisville & Nashville mines gain. Return of railroads to owners and also return of equipment to proper lines, disturbs car supply. "Moonlight-schools" bill interests operators.

Mines in the northeast Kentucky field succeeded in making a net gain of 8,300 tons in production during the last week of February, the output reaching 135,990 tons or about 55 per cent of full potential capacity (249,000 tons), the total production loss being 113,405 tons. The car shortage represented 107,925 tons or 43 per cent of capacity. Mine disability and labor-shortage losses amounted to only 2 per cent. Mines on the Chesapeake & Ohio and branch lines produced a smaller tonnage of coal than during the week ended the twenty-first, the decrease being 4,000 tons; while on the other hand, the mines on the Louisville & Nashville worked during a much higher percentage of time, gaining 12,000 tons as compared with the previous week. During the corresponding period of 1919, the production was 99,133 tons or about a 50 per cent production losses at that time represented by "no market."

Operators in the northeast Kentucky field viewed with considerable apprehension, the return of the railroads to their owners. While it was true that the car pool was to be continued in a modified form, yet it was also true that the Chesapeake & Ohio was benefited by the use of foreign equipment under the pooling arrangement. Advice has been received that certain railroads, which own a relatively greater percentage of equipment than that which is furnished through the pool, are taking aggressive action toward the point of having the pool abolished, or at least to permit them to receive from the pool their proportion of the cars contributed to the pool.

It is also anticipated that in the return of the equipment to their owners, the Chesapeake & Ohio railroad finds itself at a distinct disadvantage, due to the great dislocation of shipments during the strike, when so much of its equipment was diverted far afield and has not yet been returned. On the other hand a great percentage of foreign equipment, that the Chesapeake & Ohio is now using, is claimed by railroads which connect directly with this system, over which a large proportion of the coal shipments are directed, so that these connecting lines will have an excellent opportunity to hold their individual equipment as soon as it is moved to their new lines.

The ultimate result will probably show a net loss to the Chesapeake & Ohio in available equipment and a corresponding loss in car supply to its mines. The only possible means of relief lies in the ability of the Chesapeake & Ohio, either to improve its transportation conditions, or to purchase the necessary additional equipment, the need of which the coal operators have brought to the attention of the railroad [illegible]

The car supply on the Chesapeake & Ohio during the last week of February, was such as to enable certain mines to demonstrate, in consecutive days' operations, their merits for proper increases in mine ratings; in certain instances some mines were able to show an ability to load in three consecutive days, a 25 per cent greater supply than their rating provided.

During the months of January and February, there was a total production of about [illegible] tons and a total loss of about [illegible] tons. Of the coal loss the car shortage was responsible for about 95 per cent or 950,000 tons.

Operators of the northeast Kentucky field are quite interested in the bill, recently presented at Frankfort, proposing to appropriate $75,000 a year for the next two years for the continuance of the "moonlight schools," which have been conducted throughout the mountain sections of the state during the last few years. The coal industry of Kentucky, almost to a man, supports the bill.

PENNSYLVANIA

Bituminous

Rimersburg—One of the largest coal deals closed in Clarion County for some time was consummated this week, when Colonel Lloyd C. McCrum, Robert F. Beerits, John H. Beerits and Harry Siehl of Somerset, Pa., acquired the property of the Cherry Run Mining Co. located at Huey, on the Sligo branch of the Pennsylvania R.R., about three miles from here. The property consists of about 500 acres of coal land besides the mine and equipment. The Lower Kittanning seam is being worked and the annual production is 100,000 tons.

Brookville—Mines and coal-land holdings, the property of the Corbett Coal Co. in Porter Township, Jefferson County, have been sold to the Mill Supply Co., a subsidiary company of the New York *World* and the Joseph Pulitzer estate, the consideration being close to $1,000,000. The present output of the mines is about 1,000 tons per day and the acreage is, roughly, 1,000. The coal will be used for power at the mills manufacturing paper for use in the plant of the New York *World*.

WEST VIRGINIA

Welch—L. C. Long, mine inspector, H. R. Sloan, mine foreman, and J. H. Blankenship, bratticeman, employees of the United States Coal & Coke Co., were suffocated in the No. 2 mine of this company at Gary, near here, according to information received by R. M. Lambie, chief of the State Department of Mines. The mine was closed on account of shortage of cars, but these men, to perform their usual duties, entered an old drainage heading not in use since 1918. There they encountered a small body of gas which caused an explosion. The men were overcome and died before assistance reached them. The explosion was slight, and no damage was done to the mine.

Elkins—The Inter-Mountain Superintendents', Mine Foremen's and Fire Bosses' Mining Institute has been organized here by officials connected with the mines in Barbour and Randolph counties, with a view to closer co-operation between mine officials and the State Department of Mines. The roster of officials of the Institute include: C. A. Blakeslee, of the Davis Coal & Coke Co., at Dartmoor, president; John T. Fallon, superintendent of the West Virginia Coal & Coke Co., secretary and treasurer; vice presidents—Thomas Davis, Mabie; Andie Huatt, Norton, Va.; N. A. Ford, Coalton, James Wilt, of Mabie. J. W. Bischoff, general superintendent of the Davis Coal & Coke Co., was the host to the visiting mine officials after the organization meeting.

Glen White—General discussion of mining problems, such as the cutting and shooting of coal, welfare conditions and numerous other phases of mining, featured the regular monthly meeting of the Glen White Mining Institute held recently at this place. Virtually all the officers and most of the employees of the E. E. White Co. attended the meeting of the institute held in the large auditorium in this community. One activity suggested by a miner of Italian birth was the teaching of English to foreigners. E. E. White, president of the E. E. White Co., was one of the speakers at the institute; Mr. White urged employees to take advantage of the numerous educational facilities provided by the institute as a means of fitting themselves for better positions.

Fayetteville—Another mining institute has been formed in Fayette County, to be known as Auxiliary No. 1 of the Fayette County Mining Institute, the auxiliary having been launched at a meeting of mine superintendents, mine foremen and fire bosses to the number of about 60. Officers elected at the first meeting of the auxiliary institute were: John McIlbone, of Summerlee, president; Thomas Donelson, first vice president; William Ward, Harvey, second vice president; John Robinson, Minden, third vice president, Jno. S. Mason, Dunloop secretary and treasurer; C. C. Wood, Kilsyth, and Frederick Chapman, Sun, members of the executive board. At the initial meeting the following papers were read: A paper on "Mine Management as Based on Three Essentials," by R. M. Lambie, Chief of the Department of Mines, and a paper by District Inspector Nicholson, on "The Recovery of Coal."

Thomas S. E. Hawkshaw, district mine inspector, has been elected the first president of the Upper Potomac Mining Institute, organized here recently at the instance of the West Virginia Department of Mines in order to insure closer co-operation between the department and those engaged in mining.

At the organization meeting, H. H. Pierce, superintendent of the Pierce operation of the Davis Coal & Coke Co., acted as temporary chairman. At the organization meeting, superintendents, mine foremen, firebosses and others engaged in mining were present; district inspectors Riggleman and Hawkshaw were also at the meeting. Other officers elected in addition to president Hawkshaw were: H. H. Harrison, Pierce, first vice president; Matthew Blair, Thomas, second vice president; J. J. Dobbie, Albert, third vice president; E. P. Brennen, of Thomas fourth vice president; Clyde A. McDowell, secretary and treasurer.

OHIO

Columbus—Among the first actions taken by railroad managements after the return of the roads to their owners was the announcement, in Ohio at least, that there would be no further confiscation of coal at the mines by railroads. Coal may be confiscated while entransit but the operator will have the satisfaction of knowing that the coal will be consigned to some buyer who is anxious for it. The other action was the order that all cars should be returned to their own lines as soon as practicable. This is expected to help the car supply in time.

Officials of the Ohio Industrial Commission and miners officials believe that one of the most important laws, for the protection of miners, was enacted at the close of the recent session of the Ohio General Assembly, which provides for the establishment and maintenance of five mine-rescue stations located in the important mining regions of the state. Each station is to be fully equipped with the latest devices for resuscitating asphyxiated miners; also oxygen outfits, breathing devices for entering dangerous mines, safety lamps, fire hose and first-aid supplies. Each of the stations is to be continuously in charge of a superintendent appointed by the Ohio Industrial Commission. The superintendent is to be under the immediate supervision of the district mine inspector.

ILLINOIS

Murphysboro—The Lincoln Coal Co., a Chicago corporation, is preparing to enter this Illinois mining field, according to reports from Murphysboro. This company has an option on the West Virginia coal mine on the Missouri Pacific, near that city, and some big developments in the vicinity are expected in the early spring. This is in the famous "Big Muddy" region, where the coal has proved to be of excellent quality and has an established reputation.

Benton—Both Benton, of Franklin County, and Harrisburg, of Saline County, are talking of erecting hospitals. The cost of the Benton hospital is estimated at $100,000, and the Harrisburg hospital at $150,000. Both towns are the centers of big mining districts and have need of hospitals. One of the plans for financing these undertakings is to secure help from the miners' locals of the two counties.

The No. 8 mine of the Old Ben Coal Corporation, at West Frankfort, has again broken its own hoisting record. One day recently this mine hoisted 5461 tons and made 1346 dumps in 7½ hours. Twenty-five minutes were lost during the day.

Duquoin—The Southern Gem Coal Co., of Chicago, having extensive operations throughout this district, has begun the opening of a new field which is located about ten miles north of here, due east of Tamaroa, near where they recently purchased an operating mine. The concern owns thousands of acres of coal lands in the vicinity of its new drilling, in Perry, Jefferson and Franklin counties. The company recently purchased large tracts south of here near the Union Colliery Co.'s land and expects to sink mines in that vicinity also. At the present rate of speed which this company is making in the way of new developments in the mining industry, it is very evident that it will be only a matter of time until it will have become one of the large producers in southern Illinois.

Recent transactions by the West Virginia Coal Co., of St. Louis, include the purchase of the International Coal Co. and the Taylor Coal Co., with mines at [illegible], north of here, located on the Baltimore & Ohio R.R. The consideration in the deal has not been made public but both the mines rank with the largest ones of the state. Other leases on coal lands have been made during the past three weeks by President John [illegible] (of the West Virginia Coal Co.) in Franklin County within five miles of the famous Old Ben collieries.

Reports [illegible] throughout the state indicate the sale of the mine owned by the Peabody Coal Co., of Chicago, located at DeSoto, 13 miles south of here, to Chicago capitalists. Details of the deal have not been given out in full, but it is understood that, on taking possession of the property, the new owners intend to make many improvements to increase the output of the mine.

The Lincoln Coal Co., of Chicago, has negotiations pending with the West Virginia Coal Co., of St. Louis, for the purchase of the Blair mine near Murphysboro, Jackson County. It seems that the Chicago concern already has an option for the purchase of the mine but the deal has not actually been closed. Other new developments in the near vicinity include a new mine which has been planned by the Big Muddy Coal and Iron Co., a concern having two mines in operation near Murphysboro.

A new scale, said to be the largest track scale in southern Illinois, has been purchased by the Moffat Coal Co. from the Fairbanks-Morse Co., and will be installed at the Moffat mine near Sparta. The scale which is of 150 tons capacity, will be put in just as soon as the weather permits the excavating of the large pit which it requires.

Personals

A. T. Shurick, who has been identified with the coal industry in both an editorial and engineering capacity for the past 20 years, has been elected to the vice presidency of the F. C. Thornley & Co., Inc., consulting and constructing engineers, specializing in coal-handling equipment. He will devote his attention particularly to the mining and distributing problems of the company.

Mr. Shurick received his engineering training at the Virginia Polytechnic Institute, and was engaged in the active practice of his profession for ten years as follows: He was with Rock Island Coal Co., the Mexican Coal & Coke Co., and was engineer of coal properties for the Anaconda Copper Mining Co. His work in these fields was of a varied nature, involving a multiplicity of mining systems, including many unusual problems.

A. T. SHURICK

Mr. Shurick joined the editorial staff of *Coal Age* when that journal was started in 1911; he was identified with its development up to the time of the war, when he entered the army where he served as a captain with the 209th Engineers. For the past year he has been, first, technical editor, and later business manager of the *Coal Trade Journal.*

F. C. Thornley & Co. are specialists in the development and construction of mechanical labor-saving methods as applied to transfer terminals, distributing and storage yards, industrial plants, locomotive coaling stations, etc. The company designs, erects and organizes for operation large or small capacity installations of the character noted. The Thornley Co. has just moved into its new offices at 31 West 43d St., New York City.

James McEwan, of Arcadia, Indiana County, Pa., has been named superintendent of the Pennsylvania Coal & Coke Corporation, at Beaverdale, succeeding E. H. Gray.

Robert Bonar, for the past five years superintendent of the Pacific Coast Coal Co., at South Wellington, has left for Michel, B.C., where he will make his home.

Emmett H. Erwin, for many years connected with various coal activities in southern Illinois in Williamson and Saline counties, has been appointed general sales manager of the O'Gara Coal Co., of Chicago, filling the vacancy of J. R. MacFarland, who resigned to become general sales manager of the Indiana Coal & Coke Co., of Terre Haute. Mr. Erwin in 1906 became associated with mining men at Marion, Ill., and later formed the Consumers' Coal Mining Co., which owned and operated two mines near there and of which he was secretary and sales manager.

Obituary

Robert J. Parks, of St. Louis, recently died at his home after many years of service as secretary for the Mt. Olive & Staunton Coal Co., of St. Louis.

William Frech, Sr., treasurer of the Golden Rule Co., which operates the Senior mine near Lenzburg, Ill., died recently at his home in Lenzburg. He worked up to his position from the bottom of the ladder, having at one time been a practical miner and helped sink the shaft for the mine of which he was an official.

John Hale, aged 88, a pioneer in the coal industry in the anthracite field, died recently at his home at Scranton, Pa. He was born in Trowbridge, England, coming to this country when a young man. In 1857 Mr. Hale entered the employ of the Delaware, Lackawanna & Western company and continued with this corporation until 1903, when he was retired on pension. He was superintendent of the Bellevue mine for 46 years.

Richard Henry Brown, one of the oldest mining engineers in Canada, died recently at the age of 82 years. In 1864 he succeeded his father, Richard Brown, as manager of the General Mining Association, of Sydney, a position which he retained until 1900, when the properties of the association passed into the hands of the Nova Scotia Steel & Coal Co. After one year's service as manager of the Nova Scotia company, he retired from active work in the mining field. As a tribute to his professional standing and work in promoting the coal mining industry, he was made an honorary member of the Mining Society of Nova Scotia. Mr. Brown is survived by three daughters.

Publications Received

Stratigraphy and Correlation of the Devonian of Western Tennessee. By Carl O. Dunbar, State of Tennessee State Geological Survey, Nashville, Tenn. Illustrated; pp. 127; 8 x 9 in.

Coal Resources of District V. Saline and Gallatin counties. By Gilbert H. Cady. State of Illinois Department of Registration and Education, Division of the State Geological Survey. Urbana, Ill. Illustrated; pp. 135; 6 x 9 in.

Report of the Distribution Division, 1918-1919. Part II—The Zone System. By Wayne P. Ellis. U. S. Fuel Administration. Distribution Division. Illustrated; pp. 124; 9 x 11½ in. Details about the zone system in use during the war.

Oil Investigations in 1917 and 1918. State of Illinois, Department of Registration and Education, Division of the State Geological Survey, Urbana, Ill. Bulletin 40. Illustrated; pp. 144; 7 x 10 in. Report on investigations.

Report of Progress in Warm-Air Furnace Research. By A. C. Willard, Engineering Experiment Station. Published by the University of Illinois, Urbana, Ill. Bulletin 112. Illustrated; pp. 68; 6 x 9 inches. First of series of warm-air furnace research.

California Oil Fields. Fifth annual report of the State Oil and Gas Supervisor. Published by the California State Mining Bureau, San Francisco, Cal. Illustrated; pp 72; 6 x 9 in. A summary of operations

Reinforced Concrete Construction. By George A. Hool. Vol. I—illustrated; pp. 254; 6 x 9 in.; Fundamental Principles. Vol. II—illustrated; pp 666, 6 x 9 in., Retaining Walls and Buildings. Vol. III—illustrated; pp. 688; 6 x 9 in., Bridges and Culverts. Published by McGraw-Hill Book Co., Inc., 239 W. 39th St., New York, N. Y.

Hendricks Commercial Register. Published by the S. E. Hendricks Co., Inc., 2 W. 13th St., New York City. Twenty-eighth annual edition (1919-1920). Illustrated; pp. 2,541; 7½ x 10 in. An annual register of producers, manufacturers, dealers and consumers of the United States for buyers and sellers.

Donnelley's Red Book. Published by The Reuben H. Donnelley Corporation, 652 So. State St., Chicago, Ill. January, 1920, edition (published semi-annually). Illustrated; pp. 1,716; 8½ x 11½ in. A national buyer's guide and sales catalogue. The service is offered in two phases—first, the book, and second, the service stations.

Report of the Distribution Division—1918-1919. Part 1. The Distribution of Coal and Coke. By C. E. Lesher. U. S.: Fuel Administration, Distribution Division. Illustrated; pp. 143; 9 x 11½ in. The report notes the requirements for coal in 1918; ability to meet requirements, and the organization, policy and work of the bureaus of distribution division.

Conservation Through Engineering.—By Franklin K. Lane, Department of the Interior, United States Geological Survey. Bulletin 705. Not illustrated; pp. 35; 6½x9½ in. Extract from the Annual Report of the Secretary of the Interior for the fiscal year ended June 30, 1919. A plea for constructive policies on the part of those developing the power resources of the country.

Panel System of Coal Mining, a Graphical Study of Percentage of Extraction. By C. M. Young. Bulletin 113. Engineering Experiment Station. University of Illinois, Urbana, Ill. Illustrated; pp. 76; 6 x 9 in. The conclusions reached in the investigation of mining methods in Illinois in 1917, led to the study of the panel system, here described

Coal Resources of District V—(Saline and Gallatin Counties). By Gilbert H. Cady. Bulletin 19. State of Illinois, Department of Registration and Education, Division of the State Geological Survey. Co-operative Mining Series. Illustrated; pp. 135; 6 x 9 in. A district in the southern part of Illinois, adjacent to the well known Franklin and Williamson county field.

Concrete Engineers' Handbook. By George A. Hool and Nathan C. Johnson; assisted by S. C. Hollister; with Chapters by others. Illustrated; pp. 885; 6 x 9 in. Published by the McGraw-Hill Co., Inc., 239 W. 39th St., New York, N. Y. This book was prepared to give concise knowledge about concrete and reinforced concrete, including complete data, details and tables. The book is intended as a working manual for the engineer.

Removal of the Lighter Hydrocarbons from Petroleum by Continuous Distillation. With especial reference to plants in California. By J. M. Wadsworth. Department of the Interior. Bureau of Mines. Bulletin 162. Petroleum Technology 45. Illustrated; pp. [illegible]; 6 x 9 in. Description of the methods of construction and operation of representative types of plants in the U. S. for removing the light hydrocarbons from petroleum by continuous distillation.

Coming Meetings

The American Association of Engineers will hold its annual convention at the Planters Hotel, St. Louis, Mo., May 10 and 11. C. E. Drayer, secretary, Chicago, Ill.

National Foreign Trade Convention to be held at San Francisco, Cal., May 12, 13, 14 and 15.

Chicago Coal Merchants will hold its annual meeting April 13, at Chicago, Ill. Secretary, A. H. Kendall, Chicago, Ill.

American Chemical Society will hold its annual meeting at St. Louis, Mo., April 13, 14, 15 and 16. Secretary, Dr. Charles L. Parsons, 1709 G St., N. W., Washington, D. C.

New England Coal Dealers' Association will hold its annual meeting March [illegible] and 25, at Springfield, Mass. President, W. A. Clark, 141 Milk St., Boston, Mass.

National Retail Coal Merchants' Association will hold its annual meeting June 10, 11 and 12 at Detroit, Mich. Secretary-manager, Ellery Gordon, Philadelphia, Pa.

Indiana Retail Coal Merchants' Association will hold its annual meeting April 27, 28 and 29 at the Severin Hotel, Indianapolis, Ind. Secretary, R. R. Yeagley, Indianapolis, Ind.

Industrial News

Hard Burley, Ky.—The Hardy-Burlingham Coal Co. will build a new coal tipple at its plant for increased operations. Plans for the structure are said to be under way.

Blacky, Ky.—The Rockhouse Coal Co. is having plans prepared for the construction of a new tipple at its local development, for increased operations.

Harlan, Ky.—The Black Mountain Coal Corporation, operating in the Black Mountain district, has had plans prepared for the construction of a new coal bin at its plant to have a capacity of about 100,000 tons.

Renton, Pa.—The Union Collieries Co. has awarded a contract to the J. G. Fullman Co., Pittsburgh, Pa., for the construction of about thirty new dwellings for miners' service. The buildings will cost approximately $4,000 each.

Birmingham, Ala.—Henry Neny and Leo Sossong, Carnegie, Pa., are understood to be arranging for the installation of complete mining equipment and machinery for the development of coal properties located in the Cahaba field in the vicinity of Birmingham.

Charleston, W. Va.—Stockholders of the Kanawha & Hocking Coal & Coke Co. have authorized a material increase in the capitalization of the company, which has been increased from $3,500,000 to $5,000,000. This company has large operations in the Kanawha field, although its general offices are at Cleveland, Ohio. Richard Inglis is the president of the company.

Bluefield, W. Va.—It seems to be pretty well understood, now that the railroads have been returned to private ownership, that the work of electrifying the Tug Fork division of the Norfolk & Western R. R., which was discontinued during the summer of 1919, because of lack of funds, will be resumed. If such is the case it will mean a better movement of coal on this railroad.

Pineville, Ky.—In the notice about the development of the Kentucky Colleries Corporation, which appeared in the Jan. 1, 1920, issue of *Coal Age*, it was stated that the initial capacity of this plant was to be about 400 tons per day. This company announces that it is running over 400 tons daily at present and it is proposed to ultimately have an output of about 4,000 tons in eight hours.

Beckley, W. Va.—Chicago people are largely interested in the Dearborn Coal Co., which proposes to operate mines in Town district of Raleigh County, near Stonewall, W. Va. This company has a capital of $125,000. In addition to J. W. Bell, of Bellewood, those who had an active part in the organization of the new company were: H. M. Hall, G. F. Stahmer, Edward Klineberg, W. W. Robson, of Chicago.

Oakland, Md.—The Penn-Mary Coal Co is arranging for the purchase of about 1,000 new coal hoppers to be used for the transportation of coal from its mines to eastern districts. The company operates extensive holdings in Preston County, W. Va., and is affiliated with the Bethlehem Steel Corporation. The company also recently completed negotiations for the purchase of property from the Davis Coal Co.

Blacky, Ky.—The Blacky Coal Co., which recently increased its capitalization from $40,000 to $75,000 to provide for expansion, is having plans prepared for the installation of mining machinery, equipment, etc., for the development of a total of about 500 acres of coal properties in the Blacky district. It is proposed to have a capacity of about 200 tons daily for initial operations. H. E. Taylor is secretary.

Huntington, W. Va.—The Hooper-Mankin Fuel Co. has been organized for the purpose of buying and selling high-grade bituminous coal. T. H. Hooper, of this company, formerly treasurer of the Amherst Fuel Co., and affiliated companies, has been made president; Robert Mankin, of the firm of R. Mankin & Co., has been made vice president; T. W. Wyatt has been made secretary and treasurer.

Buckhannon, W. Va.—Preparations are being made by the Buckhannon River Coal Co. to open another mine in Adrian, in Upshur County. In connection with this development, the company plans to build about 150 dwellings for miners. This concern now produces about 1,250 tons a day, employing about 300 miners at its various mines. The company has also resumed the manufacture of coke after its ovens had been in idleness for a period of about two years.

Welch, W. Va.—Development work on a large scale will follow the purchase of about 2,000 acres of smokeless coal land on the waters of Dry Fork in McDowell County, W. Va., by the United States Coal & Oil Co., of Holden, W. Va. This company also owns the Island Creek Coal Co., and the Pond Creek company, but it is now evident that the corporation plans to produce smokeless as well as high-volatile coal. It is understood that the company will soon sink a shaft near English, McDowell County, where the property is located.

Charleston, W. Va.—During the second week of February three West Virginia companies increased their capital stock as follows: The U. S. Block Coal Co., of Huntington, whose capital was increased from $50,000 to $75,000; the West Virginia Eagle Coal Co., operating at Boomer, W. Va., increasing its total capital from $100,000 to $150,000. W. G. Conley, of Charleston, president of the company; the Lewiston Block Coal Co., of which H. H. Weiske, of Charleston, is president, increasing its capital stock from $100,000 to $150,000.

Fairmont, W. Va.—A. Brooks Fleming, Jr., assistant to the president of the Consolidation Coal Co., will head the Northern West Virginian Operators' Association, having been elected as the successor of C. H. Jenkins, at the annual meeting of the association held in this city on Feb. 27. A. Lyle White, of Clarksburg, was elected treasurer and Geo. T. Bell, of Fairmont, secretary and executive vice president. President Fleming is a son of former Governor A. B. Fleming. During the war he acted as production manager for northern West Virginia.

Bellingham, Wash.—Otho Williams, coast manager of the Pacific Coast Atomized Fuel Co. and organizer of the Bellingham Atomized Fuel Co., will erect a $100,000 assembling plant and laboratory here. Mr. Williams plans to make Bellingham headquarters for the network of probably 15 plants on the coast and in British Columbia, forming a branch of the McLaughlin Atomized Fuel Co. of the Eastern states. A single-unit plant will be built here, capable of manufacturing 50 tons of pulverized coal every ten hours. The waste coal of the Bellingham coal mines, Glacier mines, Northern Island mines and other mines in the vicinity of Whatcom County will be utilized in the proposed plant.

Rome, N. Y.—The stockholders of the Rome Wire Co., of this place, have recently authorized an increase in the capital stock of this company to $4,000,000 (7 per cent) first preferred and $5,650,000 common, the shares in each issue being $100 par value. The company's main plant is located at Rome, N. Y., on the New York Central R.R. and on the New York State barge canal. The land comprises 22 acres with 348,000 sq.ft. of modern factory buildings, fully protected by sprinkler equipment. All of the buildings have been constructed since 1905 and the larger part of them since 1914. The equipment is all modern and first class in every particular. The Buffalo plant consists of 11 acres of land in the northeastern part of Buffalo, N. Y., on the D. L. & W. R.R., with excellent trackage facilities and well constructed buildings adapted to the manufacture of electrical wires and cables. A large addition is under construction at this branch, the J. W. Cowper Co., Buffalo, N. Y., being the contractors.

Huntington, W. Va.—W. E. Deegans, the prominent operator of southern West Virginia, recently organized the W. E. Deegans Consolidated Coal Co. with a capitalization of $5,000,000, fully subscribed. It is announced that this company has leased about 15,000 acres of coal land in both Kentucky and West Virginia; the coal acreage leased being on the Norfolk & Western, on the Louisville & Nashville and on the Greenbrier & Eastern railroads. The coal land on the last named road being in Greenbrier County, W. Va. The company plans to begin development work in the quite near future and to prepare for operations at ten different mines. When the operations are fully developed, the company counts on an annual production of 1,000,000 tons. Officers of the new company have not so far been chosen.

MARKET DEPARTMENT

EDITED BY ALEX MOSS

Weekly Review

Car Supply Shows Little Improvement—More Mines Forced to Shut Down—Tidewater Exchange Continued—New England Suffers Because of Successive Snowstorms.

SOME improvement has been noticed in the distribution of cars during the past week, but no great change is expected for at least a month. To the operator, the attitude of the railroad employees as regards wages, etc., is not pleasing for it is assumed that more attention will be given to the railroads internally than will be given to troubles outside.

Though domestic demand has eased off considerably, public utilities and large manufacturing plants are being pinched more and more, and so long as the weather continues to be cold, the situation will not show any change. Successive snowstorms through the week have contributed toward retarding railroad deliveries and consequently the dumpings have been far below normal.

On account of inadequate car supply forcing many mines to close, some districts are looking for their requirements from other sources where coal is available, and operators in those regions are now finding a market for their output where previously little attention had been given. For instance—Indiana coal is moving into Ohio, while Illinois coal is going into Michigan, as well as to points in the Northwest, such as North Dakota. These latter-named regions are usually served from other sources.

The situation at Hampton Roads is much easier and coal is moving from the mines in better volume. A large tonnage is again moving on export business. Now that the Shipping Board has withdrawn control of coastwise rates and so long as the use of the Tidewater Coal Exchange is made compulsory, it remains to be seen just how this will affect current shipments.

Some of the big users of anthracite steam sizes are still in the market. This is almost the end of the season, for in former years this business was closed long before March 15. Retail dealers have received rather meagre shipments of domestic sizes of anthracite, especially in New England, where great difficulty is encountered in clearing snowbound tracks.

Production of coke in the Connellsville region continues to increase slowly with occasional backsets. However, with adequate transportation, the present 85 per cent production can soon be increased to normal.

Much interest is being given to the coming week, for it has been rumored that the commission now investigating the bituminous-coal industry will make its decision public on or about March 10. Then, too, there is a possibility of a new wage argreement between the anthracite operators and miners. They are to meet in New York City on March 9. An increase in the price of anthracite is expected.

WEEKLY PRODUCTION

The weekly report on the production of bitumnious coal, anthracite, and beehive coke, compiled by the Geological Survey, Department of the Interior, March 6, 1920, states that a partial recovery from the decline of the preceding week is indicated by reports of coal loaded by the principal carriers during the week ended Feb. 28. Because of changes in organization attending the transfer of the railroads to private operation, no reports for the week have yet been received from many important carriers. Any estimates of production are, therefore, necessarily subject to revision. The returns so far received point to a total output for the week of Feb. 28 amounting to approximately 10,230,000 net tons. Compared with the 9,511,000 tons produced during the preceding week (Feb. 15 to 21), this was an increase of 719,000 tons, or 7.6 per cent.

Material improvement was also reported by the anthracite industry. Loadings for the week ended Feb. 28 (in part estimated) are placed at 33,079 cars. This suggests a total output of 1,699,000 net tons, an increase of 236,000 tons, or 16.1 per cent, over the preceding week. Compared with the corresponding week last year when the mild winter and the post-war slump in demand reacted unfavorably upon demand, the current week showed an even greater increase, amounting to 597,000 tons.

The weekly statistics of production of beehive coke published by the Geological Survey are estimates, based on reports of cars of coke loaded by the 26 principal coke-originating roads. In 1917 these roads originated 97 per cent of the total rail shipments of beehive coke.

On this basis production during the week ended Feb. 28 is placed at 433,000 tons, an increase of 6,000 tons, or 1.4 per cent, over the preceding week. Cumulative production during the first 51 working days of 1920 was 3,707,000 tons, a decrease of 12.7 per cent when compared with last year.

Atlantic Seaboard

BOSTON

Contract activity. Milder weather improves outlook. Movement increases very gradually. "Emergency" coal received only in light volume. Railroad requirements the chief factor. Hampton Roads situation easier. Receipts at Philadelphia and New York piers.

Bituminous—The withdrawal of the restricted price is being much discounted. Most of the Pennsylvania shippers are very active soliciting contracts for the year beginning April 1. There is a wide range of quotations, depending upon the grade, but it grows increasingly evident that coals available for export or bunker use are to be in strongest demand.

In other words, steam users here are trying to cover on the better grades while there is still opportunity, although at the same time there is a disposition to wait before buying coals that are only of fair quality. Taking into account all charges, the relative cost of the better coals does not show a very wide margin over those of poor quality. It is quite natural therefore that there should now be a vigorous effort to secure the quality coals from Cambria and Somerset

The milder weather has already changed the immediate outlook. When zero temperatures were prevailing a week ago there was much in the press about the serious situation confronting New England industries. It is of course true that stocks are being depleted, but the fact that the all-rail gateways are now open and that the thousands of cars frozen to the tracks are gradually being moved argues for much less apprehension than prevailed a fortnight ago. The Maine Central and the Boston & Maine are making great efforts to clear their sidings and when we consider the very large number of cars now under load it is clear that this section faces no immediate distress.

Movement has increased so gradually that even now only one of the gateways has been opened to anthracite. The New England roads are still unable to take from the intervening lines as many cars as are daily received, but a marked improvement is looked for during the next ten days. A large tonnage that left the mines a month ago has not yet reached the transfer points allowing for very heavy confiscations. Coal has been seized since Feb. 28, but in nothing like the volume that was taken previously. For real emergencies, on their own lines, certain of the railroads are commandeering, but expected arrivals of water coal will soon remedy this situation.

"Emergency" cargoes are arriving only slowly. Several of the ships specially allocated are still on the high seas with inbound cargoes. That this is true is rather fortunate for would-be purchasers. Certain ships that have arrived have met with extremely slow despatch, due to short car supply, and general lack of facilities. There have been cases where demurrage had accrued to more than a dollar a ton and these charges together with the export price have made the delivered cost very high. There is reason to think that any very considerable tonnage would not have been absorbed except with great difficulty, for it becomes more and more apparent that the only urgent requirements were those of the railroads

Much of our troubles can be laid at the door of the Railroad Administration. The effort to secure a very large proportion of engine supply by the all-rail, or cheaper, route resulted in a breakdown on the part of many of the contractors. What seemed the desirable move for the railroads was also desirable for consumers generally and the net result was the sheer inability of Pennsylvania operators to live up to the heavy obligations they had undertaken

The situation at Hampton Roads is much easier. The coal is moving from the mines in better volume and despatch is now seldom more than two days. The real delays have come at this end where it was not possible to make any real preparations for receiving coal in such volume. A large tonnage is again moving on export business and the agencies here are not counting upon very much tonnage for New England

The Shipping Board has now withdrawn control of coastwise rates and it is not to be expected that sales will be very heavy in this market so long as there appears a chance of getting liberal shipments during the season from Central Pennsylvania. Receipts at the New York and Philadelphia piers continue very light

Use of the Tidewater Coal Exchange is again made mandatory and it remains to be seen what will be the result upon current shipments. Those Pennsylvania operators in position to sell for export are keenly alive to the heavy tonnages being moved from Hampton Roads and there is apparent a real anxiety over the prospect for placing the better Cambria coals overseas

Anthracite—Demand continues very strong for prepared sizes. Egg, as well as stove and chestnut, is now in good request and retailers are making every effort to get coal forward. Water movement is improving slowly, but all-rail only the Boston & Albany is open. The embargoes against the New Haven and the Boston and Maine are expected to be lifted early next week, if not before, and we may then look for a very heavy movement all-rail.

Notwithstanding all the publicity given the dire need of industries here for steam coal, there has been no appreciable increase in the demand for steam anthracite The market for these sizes is, in fact, almost draggy although it is possible that later in the month they will be in better request.

NEW YORK

Anthracite demand active. Consumers are placing orders for next winter's coal supply. Law of supply and demand controls the situation. Steam sizes are in good call with prices strong. Bituminous in steady call.

Anthracite — Continuance of good coal consuming temperatures and the belief that price will advance on or soon after April 1 has kept the market on its toes. Usually dealers are taking life easy during March but because of the past few months of low temperatures resulting in bins being nearly emptied and the reasons stated previously they are busily occupied.

Consumers are not letting go unnoticed the warnings printed in the daily newspapers that coal prices are likely to advance, that the working agreement between the operators and their employers expire on March 31 and that the new demand of the mine workers ask for a 60 per cent increase in pay. Because of all this many have already placed orders for next winter's fuel supply to be delivered this month.

Supplies are not in oversupply either with the wholesale or retail dealer. The trade is ordering freely and are willing to have their bins filled when the new coal year begins. Most wholesale houses have sufficient orders on their books to take care of this month's output and the orders continue to come in.

All domestic sizes are in good demand. In some quarters egg is the shortest while other houses say they have the heaviest call for stove. Producers and shippers of independent product have no difficulty in obtaining the 75c. differential on their output.

A good call continues to be received from New England and northern part of this state, being accompanied by requests for quick shipments. The few days of moderate weather conditions last week aided the dumpers at the ports and resulted in the frozen release of many cars of coal.

There is much activity in steam sizes due to the continued lack of bituminous coals. No. 1 Buckwheat is in unusually heavy demand and independent product is bringing in some instances from 25c. to 50c. above the company circulars, with loaded boats bringing higher prices. Rice is in fair demand and in some cases is being held at 25c. above regular circulars. The supply of barley is not large due to frozen coal and the lack of washery product. Still it can hardly be had at concessions. Current quotations for company coal per gross tons at mine and f.o.b., Tidewater, at the lower ports are as follows:

	Mine.	Tidewater		Mine.	Tidewater
Broken..	$5.95	$7.80	Pea.....	$5.30	$7.05
Egg.....	6.35	8.20	Buck....	3.40	5.15
Stove ...	6.60	8.45	Rice	2.75	4.50
Chestnut	6.70	8.55	Barley ..	2.25	4.00
			Boiler...	2.50	4.25

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous — There is much optimism among the trade. While the situation has been anything but encouraging the past few weeks bright spots are now appearing to most of the trade and it is thought the worst is over. It is hoped that the next few weeks will see an improvement.

The trade here was interested in the newspaper report that the Bituminous Wage Commission had decided upon a 16 per cent increase for the miners, but would make no comment. They are anxiously awaiting the formal report which they expect will soon be made. Poor car supply continues to be a factor in low stocks, reports from the mines not showing anything like normal figures.

Buyers from New England are daily visitors to the local offices, but interruption of transportation due to the heavy snows prevents shipments. Meantime reports received from those states show that many factories are on the verge of closing down because of the lack of fuel. The raising of the embargoes on the railroads entering the New England States has helped deliveries but considerable coal is needed to relieve the situation.

The reported resumption of shipments through the Cape Cod Canal will help considerably in aiding the situation in and around Boston. The canal had been closed since the Railroad Administration relinquished control. New complaints are heard daily of the failure of the railroads to make deliveries, although the coal has been on the road for several weeks.

Higher water freight rates are looked for now because of another increase in wages granted the workers on the tugboats in the harbor and which is retroactive to March 1. Receipts at the piers are improving under private operation of the railroads. Local dealers are obtaining a fair share of their requirements and the bins of the various public utility corporations are being rapidly replenished.

PHILADELPHIA

Anthracite continues in active demand. Milder weather decreases consumption, but consumer wants coal despite it. Higher prices probable. Stove and nut in chief demand, although good tonnage of pea moved. Egg well cared for. Receipts below normal need.

Anthracite —With mild weather prevailing for most of the week the calls for coal by the consumer were not so insistent, but it must not be taken from this that the dealers are not busy, for that is far from true. Everybody has plenty of orders on the books and most of this is filling in of depleted stores. With the weather again turning cold toward the end of the week, with some snow, there was also a good current demand for fuel.

As has been the case all winter long the demand continues to be centered on stove and nut sizes and despite all efforts of the dealers to turn the customers on pea, they are met with the reply that pea is too small. As a matter of fact the dealers knew this to be a fact and in the event that the operators do not consent to the changing of the sizes it is more than likely that they will be called upon to bring pea up to the standard, and in addition make the margin in prices such as will be attractive to the old-time consumer of this size.

Yet with the reluctance of the consumer to take pea it is a fact that the dealers are moving a fair-sized tonnage of this size It is simply a case with the small consumer of taking this size or doing without, as there is not near enough of the large sizes to go around. The companies report that they are moving all the pea they make without any difficulty, but the individuals have nearly all dropped from their premium price and are making sales at the company figure of $5.30 or close to it Some of the strictly brokerage houses have independent pea coal for sale and are asking from $5.40 to $5.50 a ton for it.

Of the large sizes egg is the only one that is not eagerly sought for by the dealers, although they are also putting out a good tonnage of this size. However, the producers are having but little trouble to dispose of this size, as the gas making plants in this territory are in the market for large anthracite sizes since there has been such a shortage of bituminous-gas coals.

The consuming public is becoming stirred up over the coming wage conference, especially since the miners demands are being given considerable newspaper publicity. It is really believed that 50 per cent of the calls upon the dealers these days can be traced to that fact, as the consumers are anxious to get in next winter's coal before another increase in price becomes effective.

Activity in Buckwheat

There is a fair amount of activity in the steam trade, particularly in buckwheat. The regular users of this size are calling on their shippers for increased deliveries of buckwheat, and it looks as if they were trying to stock up in the face of a probable price increase. In addition there has been quite a demand from new trade on this size, anxious to help out depleted stocks of bituminous coal. The boom, though, if it can be called that, has not affected the individual shippers to the point that they can get premiums, as most of them are still satisfied to move all the produce at $3.40 figure.

Naturally when buckwheat is all taken the demand for rice becomes stronger, and while the independents are still willing to shade the $2 75 price, some sales being made around $2.40 to $2.50, even then they are not moving it as rapidly as they would like to. The big companies are picking up heavy tonnages of rice from the storage yards, although little of this is going to line trade, most of it being intended for the piers. Barley, the smallest size, still lags and there is little call for it.

Some of the big users of anthracite steam sizes are making inquiries for contract prices, as this is the time of year when this business is ordinarily closed. So far as the shippers are concerned they show no inclination whatever to make a figure, as in the face of the conditions at the mines they have nothing on which the base a price.

In any event it is figured out that buckwheat will be able to command a good price in the market this coming year, as for the past several years the companies have been just able to meet the demand for it. With rice and barley it is a different story and in the case of extremely large users of these sizes it would not be surprising to hear of some concerns taking a chance on the price and closing business at this time.

The local dealers have received rather meagre shipments of family coal lately and it is reported that with the New England roads finally clearing their tracks and with the embargoes lifted a heavy tonnage of these sizes is going forward there all rail and it is feared that the local market will feel the effect of this for some time to come.

Bituminous—The most that can be said about bituminous is that it has not grown worse. It is believed that most plants hereabouts have been able to resume and are running with very little ahead of them. Most of them have always had a fair amount of coal under way, but suffered severely from the policy of the administration in diverting coal. Lately there has been very little coal diverted, although a rumor was broadcast and had considerable currency that there would again be wholesale confiscations to help out needy points to the North.

Little Car Improvement

We have been unable to find any shipper who was willing to admit that the car situation had improved, although the various road managements have assured them that now with the lines cleared of snow there should be a very decided improvement from this time onward, barring, of course, any severe snow storms such as the month of March has been known to produce.

Consumers are very anxious as to contracts for the coming season and the inquiries in this direction have increased very considerably of late. All of the anxiety in this direction is not on the part of the buyer, either, as more than one operator is quietly sounding the market to find out if his competitor is making a price and thus give some basis for setting a figure.

It is rumored that one of the largest shippers has closed some business at a figure close to $3.60 at the mines. The story persists in such a way as to make one believe that there is some element of truth in it, but even at that it is believed that that in the event of a wage increase that would make this price unprofitable, th figure will be changed to conform thereto

Coal cars continue to be used for every other purpose than coal, and the demand for them for other uses seems to get the preference.

BALTIMORE

Coal trade as a whole far from satisfied by failure to remove uncertainty with passing of government railroad control. Hand of regulation heavier than ever. Car supply and general run of coal wretched. Exports at an end. Hard coal dealers think of spring.

Bituminous—The feeling of disappointment is paramount in the Baltimore coal trade, which finds uncertainty still hanging heavily over business with the passing of government control of the railroads. The action of the president in re-affirming orders of October and December by which the Central Coal Committee through regional directors still holds control of distribution, etc., and the creation of a special committee on exports and bunkers which has let it be known that the foreign trade is for the "dim future" means that the hand of control is heavier than ever.

There is wide talk of action through the American Wholesale Coal Association and individual agencies of a test of the law of control, but the length of time that would be required is a discouraging feature. Meanwhile the car supply and fuel supply has gone from bad to worse. Starting with the early part of last week with a 71 per cent car supply on all the Baltimore & Ohio System and a daily car loading of 3,329 cars, the fall was sure until the closing days of the week saw the supply running between 30 and 40 per cent and the daily car movement decreased to around 1,800 to 2,000 cars. At the piers here the supply was wretched.

The Baltimore & Ohio supply at tide ran at times as low as 100 cars and seldom over 200. One ship took all week to load with difficulty at Curtis Bay, taking on around 7,500 tons, while another has sailed away from the Canton pier of the Pennsylvania with 3,609 tons of cargo and 1,200 tons of bunker coal, both coastwise.

Anthracite—Hard coal men are looking toward spring and in the meantime not forgetting that they have some immediate problems. One of those at present is to head off some "fool" legislation before the Maryland General Assembly which would allow almost "any Tom, Dick or Henry" to stop coal cars on the street and order them to be weighed, and allow only a 1½ per cent margin for underweight before a fine was imposed.

As to spring the coal men are already discussing the idea that they must "sell as they buy." In other words it may be no surprise if it is decided to make the price that of time of delivery, the coal men assuming no responsibility for traffic breakdown, strikes, etc. This would mean that a big part of the Baltimore business which has been done on the plan of payment at the time of order, coal to be dumped at any time over summer or fall, must be revised.

The method of the mines at present for monthly payments has forced this issue to prevent serious loss by retailers. The supply of coal just now is fairly good, except for the fact that many dealers would like to have more of the nut and stove sizes.

Eastern-Inland

PITTSBURGH

Steel-mill operations affected by coal shortage. Coal operators pleased at railroad officials again being in authority. Robinson Commission expected to authorize higher coal prices.

Coal shortage affected operation of steel mills more last week than for several weeks. The Youngstown Sheet & Tube Co. had to close several finishing departments for the last two days of the week, while the Republic Iron & Steel Co. had its entire Bessemer department, including the finishing mills, idle for three days. This week receipts of coal at Youngstown have been somewhat better, but coal operators do not report any general improvement in the car-supply situation

Practically the unanimous opinion in the coal trade is that improvement in transportation conditions will come chiefly if not wholly from improvement in weather conditions. While shippers are pleased that the railroads have been returned to their owners they do not expect the transfer to work much improvement in the actual movement. Much satisfaction is expressed on one point, that shippers can now approach railroad officials and ask to know precisely what the officials expect to be able to do, whereas during Government control the railroad officials were much disposed to place the responsibility for everything upon Washington.

No definite opinion is expressed as to what finding the Robinson Commission will make in the matter of wage rates, but the finding is expected to be made within a fortnight. It is regarded as altogether probable that even with a settlement on the 14 per cent basis a higher schedule of coal prices will be permitted, to run to April 30.

There are more rumors of coal transactions at above the Government limit, but such sales if made are put through secretly. The market remains quotable at the Government limits. Slack, $2.10, mine-run $2.35, screened, $2.60 per net ton at mines Pittsburgh district

COLUMBUS

While the domestic demand is not quite so pressing as formerly, still the situation in Ohio is rather complicated. Steam demands are growing stronger and many sections are extremely short of fuel. Production is still at a low point.

Bituminous—With production still restricted below the 50 per cent mark in all Ohio producing fields, there is an increasing demand for fuel among large steam users. Reserves are being gradually depleted to a point where many of the public utilities and iron and steel concerns have no reserves to speak of. They are operating from hand to mouth, as it were, with little hopes of improvement in the fuel situation.

Rubber plants are rather short on reserves although the situation in that field is not serious. General manufacturing plants, especially in the northern part of the state are low and in some instances they are compelled to restrict operations in order to conserve coal. The worst situation appears among the lighting plants where fuel is being conserved.

In some northern Ohio cities reserves are exhausted and only a few hours supply of fuel is available. Schools and hospitals have been supplied by taking away from commercial purchasers.

Domestic demand is strong in every particular. Retail stocks are low and dealers are making strenuous efforts to secure shipments. Some dealers are entirely out of stocks while others are dividing up the available supply in order that they can give all purchasers a portion of their orders. In Michigan the situation is bad and some sections are entirely out of coal. Retail prices are firm at the levels which have prevailed for some time. Some difference is noted because of the different prices at which the coal was purchased. A margin of $2 per ton, over and above the cost of the coal at the mines and freight charges is allowed the dealer.

Car supply in the Hocking Valley field during the past week has been slightly improved and is estimated at about 45 per cent. Crooksville and Cambridge districts had about 40 per cent supply. In the Pomeroy Bend field the supply was about 50 per cent which is an improvement over the previous week. In the eastern Ohio field there is little improvement noted and reports show that cars have totalled about 35 per cent of requirements. This is restricting operations in that field to about one-third of the usual tonnage.

CINCINNATI

Trade suffered somewhat the past week from the lack of tonnage, although there is not a famine in this section of the country, there is a famine in spots.

The demand is many times as great as the present output, and many jobbers are "up a tree" as to how they are going to fulfill orders taken last summer and fall. Collections from confiscated and diverted tonnage are improving weekly and it is the opinion of many operators that this end of the business will be cleaned up before the warm weather sets in.

Car supply continues to be erratic and no general confidence may be placed in it. It is the opinion of many operators that the biggest task now faced by the railroads since their return to private ownership is that of locating their own cars. For as conditions now exist one road may be unable to furnish cars to any great extent, while another road will have no trouble in meeting its demand with cars which rightfully belong to the road that is unable to furnish transportation equipment.

The market of course hinges on the car supply, and this has failed to improve, running from 39 to 45 per cent of normal. Reports from the country districts assert that the people are going back to burn wood as they did during the coal strike. Free coal is extremely scarce and very little smokeless is arriving at this end. It is not expected that any amount of free coal will be available until next month. Steam demand is continuing strong and there have been many concerns outside of this territory trying to place orders on the local market. From the present outlook it is thought that the supply of nut and stove sizes will be completely exhausted within two weeks, unless something unforseen occurs.

Most of the trouble in domestic delivery is the confiscation of coal en route by railroads leaving coal operators and distributors struggling still to get fuel to points where there is real distress. Locally some of the industries are living from hand to mouth.

There is little talk of a price list now. Most of the representative handlers are sticking to government prices on the little coal moving not under higher contracts, although there is no doubt that other prices are being asked and paid at times. Receipts by river were fairly good, but they are still hampered by inadequate transportation facilities.

Lake Region

BUFFALO

Terrible car shortage. Chief reason for difficulty in trade. Affects anthracite as well as bituminous. Situation grows worse.

Bituminous—The shortage of cars is becoming so distressing that the shippers do not talk of much else, for they believe that if cars should become reasonably plentiful the difficulties in the trade would mostly be over. It is no use to own a mine if there are no cars to carry the coal. Day after day the mines are obliged to close because there are no cars, or merely a small supply.

The shippers sit and wait and when a car that is to keep a customer from shutting down is finally started and it then is confiscated by the road the case seems about hopeless. Such is the situation here and it appears to be the case everywhere. Shippers go to Pittsburgh and bring back the same report of the situation there. Mines are running in this hand-to-mouth way mostly in the hope that something better will take place before long. And all the time things grow worse.

Shippers are saying that it is about time they took matters in their hands and at least put the Government out of control of the bituminous movement. One of them said this week that the report is of increased output, so the difficulty must be in the transportation. If that gets much worse the trade will go to smash. The report is general that cars are scarcer than they were in the worst of the war shortage and they are growing scarcer steadily. If the private ownership of the roads is to be assumed in full now the thing to do first of all is to see that cars are to be had.

There is another complaint against the roads. They are using the coal supply just as if it was their own private property. Sometimes they promise not to confiscate this or that shipment, as it covers an emergency case, but they seldom keep their promises according to shippers, and they are accused of taking coal and turning it over to private concerns., as for instance the Standard Oil Co., and occasionally of even stocking it. Whether such reports are authentic or not, the abuse is such that the shippers ought to keep up their opposition to all confiscation till the roads are made to buy coal as other consumers do and pay for it in the same way.

It is enough to drive a small shipper out of business, to rob him in this way of coal he has bought and pay him when one gets ready. As to prices, all that can be said is that some shippers are adhering to government figures: $4.70 for Allegheny Valley sizes, $4.50 for Pittsburgh and No. 8 lump and three-quarter, and $4.25 for all mine-run and slack, per net ton, f.o.b. Buffalo. Even some of the heavy operators say they cannot run long on these prices and will shut down if no relief is afforded before long.

Anthracite — The situation is pretty acute at present, for the cars have been so hard to get that the supply has not been up to the demand since the big storm of the middle of February and the local distributors and retailers are entirely unable to meet the requirements. Consumers have become alarmed, and though they know the winter is about over they are asking for coal in a way that makes it necessary to distribute it in one or two ton lots sometimes.

The arrival of warm sunny days now has been welcomed by the very shippers who used to dread the cancellation of orders that spring days brought on. It is not likely that the difficulty will last many days, for it is car shortage that is to blame for it all and it is now reported that empty cars are coming across the Niagara River from Canada at a good rate. It appears that they have just been dug out of the snow over in Canada and released

Some anthracite consumers are trying

to buy coal against a possible labor stoppage on April 1, but they cannot get it now and possibly the scare will be over before coal is again plenty. It is next to impossible to buy independent coal now and the car movement is so light that it would not help in this emergency to do so. There is no talk of change of price now, as other difficulties seem to take up everybody's attention. Another week may see everything straightened out.

TORONTO

Shipments coming in slowly. Local deliveries much behind. Bituminous very scarce. Further shortage feared. Prices rise with rate of exchange.

Shipments of coal have been much delayed by car shortage and snow blockades and the supplies received are by no means equal to the demand. The yards are empty and the coal is being delivered from the cars.

Local deliveries are much hampered by labor shortage, partly due to the prevalence of influenza and other sickness. Bituminous is very scarce, and the demand for industrial purposes increases, plants having no stocks on hand as a rule and buying from hand to mouth.

Dealers are apprehensive that labor troubles in connection with the termination of the anthracite miners agreement on April 1 may lead to a serious curtailment of the supply.

Prices are advancing and fluctuating with the rate of exchange. Quotations for short tons are as follows:

Retail —	
Anthracite egg, stove, nut and grate	$13.50
Pea	12.00
Bituminous steam	11.00
Slack	9.00
Domestic lump	10.00
Cannel	13.00
Wholesale f.o.b. cars at destination—	
Three-quarter lump	9.00
Slack	8.00

CLEVELAND

Domestic demand has eased off considerably, but public schools and factories are being pinched harder than at any time this winter. Dealers' supplies have grown. Plenty of anthracite but litle Pocahontas is being received.

Bituminous—Perhaps a score of plants in the Cleveland district have been forced to close an hour or two earlier in the evening and suspend Saturday operations altogether, while ten or twelve public schools have been closed for periods ranging from one to four days because of a shortage of coal. Warmer weather has greatly lessened domestic demand, but shipments from southern and eastern Ohio mines have decreased slightly, and the situation is tighter than at any time this winter.

Anthracite and Pocahontas—Receipts of Pocahontas are so small as to be practically negligible. Anthracite continues coming through in good shape, perhaps 70 per cent of normal for this period of the year. For the past few weeks demand for anthracite has been abnormal for this time of the year, but mild weather has cut heavily into the trade. Prices continue unchanged, with the bottom of the spread ruling.

Lake Trade—It now appears that heavy ice in Lake Erie harbors will be the chief obstacle to be overcome in opening the 1920 season. Some predictions say navigation will not be possible until late in April. Some starts have been made late in March, while mid-April is the usual date. Considerable lake coal has been placed, but so far as can be learned price has not yet been taken up

DETROIT

Neither steam nor domestic sizes of bituminous are plentiful, while there is an active demand for each. Restoration of the railroads to private control has worked no miraculous change.

Bituminous—W[illegible] and jobbers are hopeful that improvement of the transportation facilities will be a development of the near future, when the railroads [illegible]. Meantime bituminous coal is coming into Detroit very slowly. As nearly all of the stock is sold before it leaves the mines, there is almost no free coal to be found on [illegible] has resulted in considerable inconvenience for manufacturing plants that were accustomed to rely on their ability to supply [illegible] by day to day [illegible] coal on [illegible].

In a number of instances industrial plants have been obliged to make purchases from yards of [illegible] to [illegible] intervals when no other supply was available. One of the results of this method of buying is a [illegible] in the amount of [illegible] available for requirements of the household consumers, while the industrial plants are not materially benefited.

Successive snowstorms through the week have contributed in retarding railroad deliveries, while car shortage and shortage of locomotives on roads handling the coal continue to curtail shipments and prevent operation of the mines on anything like a capacity production. A recent survey conducted under the direction of the Detroit Board of Commerce disclosed that virtually all the manufacturing plants investigated are dependent on day-to-day receipts to continue in operation.

Anthracite—Household demand for anthracite has been maintained on an active scale by the long period of low temperature since Jan. 1. Though not much anthracite is being brought into the city, nearly all the retail yards have a small supply on hand.

Lake Trade—Vessel owners are inclined to the belief that it will depend on ability of the railroads to move lake coal, if shipments attain large volume early in the season. So far no coal is reported loaded for lake shipment, though at this time last season a number of cargoes were on shipboard awaiting navigation's opening.

Middle West

MIDWEST REVIEW

Very strong demand for all kinds and grades of coal. However, in spite of this, the coal market has a certain listless air, which to an outsider, is hard to understand.

Jobbers feel that there is but little inducement to them to do business on a 15c. retail market, and operators are still engaged on old orders, there being practically no tonnage of free coal offered. Purchasing agents from different parts of the Middle West continue to arrive in Chicago, in an attempt to place orders, and so far, they have been able to get better results from jobbers, than operators, as some jobbers have coal to offer which was purchased before Oct. 30, and which is still being shipped.

To date, this week, the car situation at Indiana and Illinois mines has been about the same, with little, if any, improvement. Operators are watching very closely to see what the private owners of the roads will do, now that the railroads are back under their control. It is expected, and hoped, that conditions will improve from now on.

Not much improvement is expected this week, nor will it be expected next week. Some improvement in the service from the railroads is, and can logically be hoped for, within the next thirty or sixty days. When the railroads went back to private ownership the morale of the railroad employees was at a very low ebb, but I understand the railroads are taking steps to revive the old spirit in their men.

CHICAGO

Chicago wholesalers and operators are planning to take steps against what is left of the U. S. Railroad and Fuel Administrations. Claim that in a great many cases their coal has been diverted without proper knowledge.

The center of complaint seems to be with a railroad official, at Cincinnati, who has been diverting coal destined to Chicago and this territory from mines in southeastern Kentucky, to a certain large steel company in Ohio. It is said Chicago wholesalers claim political influence has been brought to bear, and is responsible for these diversions. It is no exaggeration to say that the entire coal industry in the Middle West, as represented in Chicago, is sick and disgusted with the present administration.

ST. LOUIS

Car shortage continues in spite of change in railroad ownership. Railroads claim nearly all coal mined for company fuel. Winter weather prevailing.

Local situation is fairly good, everything considered, although there is a good demand for all kinds of coal, especially steam. The domestic demand has not not been very heavy and will not continue to be, but it will be an even demand for sometime to come.

Trouble in the Standard and Mt. Olive fields seems to be that the railroads are able to take the tonnage mined, leaving practically nothing for commercial shipments. The mines average about two days a week, some of them getting not more than a day and a half a week.

A better tonnage per man in this field is being produced with the passing away of the influenza epidemic. Prices are the same as last week.

MILWAUKEE

Coal in brisk demand, with an inadequate supply. Prices unchanged. An upward revision expected in the spring. Dealers claim coal has not kept pace with other necessities.

Anthracite coal is being doled out by the dock companies in small quantities in an effort to weather a period of extreme shortage. Even the soft-coal supply is threatened with stringency. Existing conditions in the coal market are attributed to congested freight service, unusually cold weather during the winter and decreased production at the mines.

Prices continue unchanged, but dealers agree that a rise is inevitable. A prediction was advanced that anthacite would command $15 per ton on April 1, but the president of the Dominant Dock Co. extends the assurance that there will be no undue change in the price list before the opening of lake navigation.

He says: "A change in prices is expected after the findings of the presidential commission investigation are made public. Coal will undoubtedly be higher next year. Return of the railroads to private ownership, higher freight rates, release of government restrictions on coal and lack of production at the mines, all tend to higher prices."

Coal dealers generally insist that coal has not kept pace with other necessities of life, which have jumped from 100 to 300 per cent, while coal has been restricted to 50 per cent.

CONNELLSVILLE

Coke production increases slowly, as attested by pig-iron production reports. Consumers lose interest in negotiations for second half coke.

Production of coke by the byproduct ovens continues to increase slowly, with occasional backsets, through there being somewhat heavier receipts of coal. After one week in which it fell behind the January and early February rate of output the Connellsville region has had a week showing the largest production for months.

During January and February there was loud complaint of coke shortage, and one would have inferred that the shortage was reducing the output of pig iron. Actual reports show, however that pig iron was produced at 15 per cent greater rate in January than in December, that February showed a rate 6 per cent. above the January rate, and that the rate March 1 was slightly above the February average.

The present rate of pig-iron production in the United States is 85 or 90 per cent of capacity, depending upon whether capacity is estimated on a conservative or on a fairly liberal basis. Production of beehive and byproduct coke combined is much less than 85 per cent of capactity, hence it is clear that with adequate transportation and labor supplies there will be no difficulty in making all the coke that can be consumed.

There is less talk now about second-half contracts for Connellsville coke, after coke operators had referred to $8 to $10 as probable prices for furnace coke. Blast furnaces are finding their pig-iron market very sluggish, with possibilities of prices declining, and are quite indisposed to enter into negotiations for second-half coke at what they consider fancy prices in view of the new circumstances.

There is no Connellsville coke to be had in the open market, at least at Government limits, except off grades, which readily bring the full price. The market remains quotable at Government limits, which are likely to come off April 30: Furnace, $6; foundry, $7; crushed, over ⅜-in., $7.30, per net ton at ovens.

The *Courier* reports production in the Connellsville and Lower Connellsville region in the week ended Feb. 28 at 248,035 tons, an increase of 12,878 tons.

BUFFALO

Situation is unchanged. It was hoped that the ore rates would be made by this time, so that the season's operations would be under way somewhat, but the shippers have not done anything yet.

The rates of 1918 seem to be assured, though, in fact, the vessel owners would not accept less. Coal has been rather scarcer than ore and between the two the Rogers-Brown furnace at Tonowanda is reported shut down. It is the only one that has had to close here, though some others came very near it. Coke prices remain on the basis of $9.60 for 72-hr. Connellsville foundry, $8,60 for 48-hr. furnace, $7 for off grade, $7.75 for domestic sizes and $5 for breeze, all per net ton, f.o.b. Buffalo. A better condition is expected real soon after March 15.

CURRENT PRICES—MATERIALS & SUPPLIES

IRON AND STEEL

PIG IRON—Quotations compiled by the Matthew Addy Company

	Current	One Month Ago
CINCINNATI		
No. 2 Southern	$44.60	$44.60
Northern Basic	42.80	42.80
Southern Ohio No. 2	43.80	43.80
NEW YORK, Tidewater delivery		
2X Virginia (silicon 2.25 to 2.75)	47.65	47.65
Southern No. 2 (silicon 2.25 to 2.75)	47.70	47.70
BIRMINGHAM		
No. 2 Foundry	41.00	41.00
PHILADELPHIA		
Eastern Pa., No. 2 x 2.25–2.75 sil.	45.35 46.35*	45.35–46.35*
Virginia No. 2	43.25*	43.25*
Basic	43.00†	43.00†
Grey Forge	42.50*	42.50*
CHICAGO		
No. 2 Foundry Local	43.25	43.25
No. 2 Foundry Southern	46.60	46.60
PITTSBURGH, including freight charge from the Valley		
No. 2 Foundry Valley	43.65	43.65
Basic	42.90	42.90
Bessemer	43.40	43.40
MONTREAL		
Silicon 2.25 to 2.25%	43.25	43.25

* F. o. b. furnace. † Delivered.

STRUCTURAL MATERIAL—The following are the base prices, f.o.b. mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

	Mill Pittsburgh	New York Current	New York One Year Ago	St. Louis	Chicago
Beams, 3 to 15 in.	$2.45	$3.97	$4.07	$4.04	$3.97
Channels, 3 to 15 in.	2.45	3.97	4.07	4.04	3.97
Angles, 3 to 6 in., ¼ in. thick	2.45	3.97	4.07	4.04	3.97
Tees, 3 in. and larger	2.45	4.02	4.12	4.04	4.02
Plates	2.65	4.17	4.27	4.24	4.17

BAR IRON—Prices in cents per pound at cities named are as follows:

Pittsburgh	Cincinnati	St. Louis	Birmingham
4.00	3.50	3.44	4.25

NAILS—Prices per keg from warehouse in cities named:

	Mill Pittsburgh	St. Louis	Chicago	Birmingham	San Francisco	Dallas
Wire	$4.50	$4.50	$4.15	$5.75	$5.50	$6.90
Cut	4.925	5.40	7.00	....	6.90	7.40

TRACK SUPPLIES—The following prices are base per 100 lb. f.o.b. Pittsburgh for carload lots, together with the warehouse prices at the places named:

	Pittsburgh	Chicago	St. Louis	San Francisco	Birmingham
Standard railroad spikes $\frac{9}{16}$-in. and larger	$3.35	$3.62	$4.44	$5.65	$4.75
Track bolts	4.90-5.00	4.62	Prem.	6.65	7.00
Standard section angle bars	2.75	2.75	3.44	4.60	....

COLD FINISHED STEEL—Warehouse prices are as follows:

	New York	Chicago	Cleveland	St. Louis
Round shafting or screw stock, per 100 lb. base	$5.50	$5.40	$5.50	$5.00
Flats, squares and hexagons, per 100 lb. base	6.00	5.90	5.50–6.00	5.50

HORSE AND MULE SHOES—Warehouse prices per 100 lb. in cities named:

	Mill Pittsburgh	Cincinnati	Chicago	St. Louis	Birmingham
Straight	$5.75	$7.50	$7.00	$7.25	$7.00
Assorted	5.85	7.50	7.15	7.50	7.25

Cincinnati—Horseshoe nails sell for $4.50 to $5 per 25-lb. box.

CAST-IRON PIPE—The following are prices per net ton for carload lots:

	New York Current	New York One Month Ago	New York One Year Ago	Chicago	St. Louis	San Francisco	Dallas
4 in.	$70.30	$70.30	$65.70	$75.80	$71.00	$92.55	$70.30
6 in. and over	67.30	67.30	62.70	72.80	68.00	89.55	67.30

Gas pipe and 16-ft. lengths are $1 per ton extra.

STEEL RAILS—The following quotations are per ton f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5c. per 100 lb. is charged extra:

	Pittsburgh Current	Pittsburgh One Year Ago	Chicago Current	Chicago One Year Ago
Standard Bessemer rails	$45.00	$55.00	$45.00	$65.00
Standard openhearth rails	47.00	57.00	47.00	67.00
Light rails, 8 to 10 lb.	2.585*	3.135*	2.585*	3.135*
Light rails, 12 to 14 lb.	2.54*	3.09*	2.54*	3.09*
Light rails, 25 to 45 lb.	2.45*	3.00*	2.45*	3.00*

* Per 100 lb

OLD MATERIAL—The prices following are per gross ton paid to dealers and producers in New York. In Chicago and St. Louis the quotations are per net ton and cover delivery at the buyer's works, including freight transfer charges:

	New York	Chicago	St. Louis
No. 1 railroad wrought	$28.00	$26.00	$28.50
Stove plate	25.00	31.00	34.00
No. 1 machinery cast	32.00	38.75	39.00
Machine shop turnings	15.00	13.85	16.50
Cast borings	18.00	14.25	16.50
Railroad malleable cast	25.00	30.00	28.50
Rerolling rails	33.00	32.00	32.50
Relaying rails	50.00	40.00 50.00	45.00 50.00

COAL BIT STEEL—Warehouse price per pound is as follows:

New York	Cincinnati	Birmingham	St. Louis	Chicago
$0.10	$0.16½	$0.18	$0.11	$0.15

DRILL STEEL—Warehouse price per pound:

	New York	St. Louis	Birmingham
Solid	14c.	13c.	15c.
Hollow	16c.		.

PIPE—The following discounts are to jobbers for carload lots on the Pittsburgh basing card, discounts on steel pipe, applying as from January 14, 1920, and on iron pipe from January 7, 1920:

Inches	Steel Black	Galv.	Inches	Iron Black	Galv.
BUTT WELD					
⅛, ¼ and ⅜	47	20½	¼ to 1½	34½	18½
½	51	36½			
¾ to 3	54	41½			
LAP WELD					
2	47	34½	2	28½	14½
2½ to 6	50	37½	2½ to 6	30½	17½
BUTT WELD, EXTRA STRONG PLAIN ENDS					
⅛, ¼ and ⅜	43	25½	¼ to 1½	34½	19½
½	48	35½			
¾ to 1½	52	39½			
LAP WELD, EXTRA STRONG PLAIN ENDS					
2	45	33½	2	29½	16½
2½ to 4	48	36½	2½ to 4	31½	19½
4½ to 6	47	35½	4½ to 6	30½	18½

Stocks discounts in cities named are as follows:

	New York Black	New York Galvanized	Cleveland Black	Cleveland Galvanized	Chicago Black	Chicago Galvanized
¾ to 3 in. steel butt welded	40%	24%	40%	31%	54%	40%
3½ to 3 in. steel lap welded	35%	20%	42%	27%	50%	37½%

Malleable fittings. Class B and C, from New York stock sell at list + 23%. Cast iron, standard sizes, net.

WIRE ROPE—Discounts from list price on regular grades of bright and galvanized are as follows:

	New York and St. Louis
Hercules red stand, all constructions	20%
Patent flattened strand, special and cast steel	20%
Patent flattened strand, iron rope	5%
Plow steel round strand rope	35%
Special steel round strand rope	30%–10% and 5%
Cast steel round strand rope	22½%
Iron strand and iron tiller	5%
Galvanized iron rigging and guy rope	+ 12%

San Francisco: Galvanized, less 5%, bright less 25%.
Chicago, + 12½ on galvanized, 30 off on bright

STEEL SHEETS—The following are the prices in cents per pound from jobbers' warehouse at the cities named:

	Large Mill Lots Pittsburgh	New York Current	New York One Year Ago	Cleveland	Chicago
Blue Annealed					
No. 10	3.55–4.00	5.57–6.80	5.17	5.35	5.27
No. 12	3.60–4.05	5.62–6.85	5.22	5.40	5.32
No. 14	3.65–4.10	5.67–6.90	5.27	5.45	5.37
No. 16	3.75–4.20	5.77–7.00	5.37	5.55	5.47
Black					
Nos. 18 and 20	4.15–4.80	6.80–7.30	6.02	5.95	6.30
Nos. 22 and 24	4.20–4.85	6.85–7.35	6.07	6.00	6.35
No. 26	4.25–4.90	6.90–7.90	6.12	6.05	6.40
No. 28	4.35–5.00	7.00–8.00	6.22	6.15	6.50
Galvanized					
No. 10	4.70–6.00	7.50–9.00	8.22	5.05	6.65
No. 12	4.80–6.10	7.60–9.10	8.27	5.10	6.70
No. 14	4.80–6.10	7.60–9.10	8.42	5.25	6.85
Nos. 18 and 20	5.10–6.40	7.90–9.40	8.72	5.55	7.15
Nos. 22 and 24	5.25–6.55	8.05–9.55	7.12	6.95	7.55
No. 26	5.40–6.70	8.20–9.70	7.27	7.40	7.70
No. 28	5.70–7.00	8.50–10.00	7.57	7.50	8.00

SHOP SUPPLIES

NUTS—From warehouse at the places named, on fair size orders, the following amount is deducted from list:

	New York Current	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago	St. Louis Current
Hot pressed square	+$2.00	$1.00	$1.25	$1.45	$0.98	$2.25
Hot pressed hexagon	+ 2.00	1.00	1.05	1.45	0.78	2.25
Cold punched square	+ 2.00	1.00	.75	1.05	1.00	2.25
Cold punched hexagon	+ 2.00	1.00	.75	1.05	1.00	2.25

Semi-finished nuts, $\frac{9}{16}$ and smaller, sell at the following discounts from list price

	Current	One Year Ago
New York	6[illegible]%	50-10%
Chicago	50%	50%
Cleveland	60-10%	50 10%
St. Louis	45%	....

MACHINE BOLTS—Warehouse discounts in the following cities.

	New York	Cleveland	Chicago	St. Louis
½ by 4 in. and smaller	2[illegible]%	50%	35-5%	50-5%
Larger and longer up to 1 in. by 30 in.	1[illegible]%	40%	25-5%	40-5%

WASHERS—From warehouses at the places named the following amount is deducted from list price:

For wrought-iron washers:

New York	$1.50	Cleveland	$4.50	Chicago	$3 00

For cast-iron washers the base price per 100 lb. is as follows:

New York	$7 00	Cleveland	$3 75	Chicago	$4 25

RIVETS—The following quotations are allowed for fair sized orders from warehouse:

	New York	Cleveland	Chicago
Steel $\frac{7}{16}$ and smaller	30%	55% off	45%
Tinned	30%	55% off	45%

Boiler, ½, ¾, 1 in. diameter by 2 in. to 5 in. sell as follows per 100 lb.:

New York..$6.00 base Cleveland..$4.00 Chicago..$4.97 Pittsburgh..$4.72

Structural, same sizes:

New York..$6.10 Cleveland..$4.10 Chicago..$5.07 Pittsburgh..$4.82

CONSTRUCTION MATERIALS

LINSEED OIL—These prices are per gallon.

	New York Current	New York One Year Ago	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago
Raw, 5-bbl. lots	$1 80	$1 49	$2 05	$2.10	$1 93	$1 66
5-gal. cans	2.00	1.74	2.25	2.25	2.23	1.86

WHITE AND RED LEAD—Base price.

	Red Current Dry	Red Current In Oil	Red 1 Year Ago Dry	Red 1 Year Ago In Oil	White Current Dry and In Oil	White 1 Year Ago Dry and In Oil
100-lb. keg	15 00	16.50	13.00	14.50	15 00	13.00
25 and 50-lb. kegs	15.25	16.75	13.25	14.75	15.25	13.25
12½-lb. keg	15.50	17 00	13.50	15.00	15 50	15.50
5-lb. cans	17 00	18.50	....	.....	17.00	15.00
1-lb. cans	18 00	19.50	.	.....	18.00	16.00

500 lb. lots less 10% discount. 2000 lb. lots less 10–2½% discount

COMMON BRICK—The prices per 1000 in cargo or carload lots are as follows:

Chicago	$14.00	Cincinnati	$19 00
St. Louis, salmon	14 00	Birmingham	15 00

PREPARED ROOFINGS—Standard grade rubbered surface, complete with nails and cement, costs per square as follows in New York, St. Louis, Chicago and San Francisco.

	1-Ply C.l.	1-Ply L.c.l.	2-Ply C.l.	2-Ply L.c.l.	3-Ply C.l.	3-Ply L.c.l.
No. 1 grade	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25
No. 2 grade	1.70	1.95	2.15	2.40	2.50	2.75

Asbestos asphalt saturated felt (14 lb. per square) costs $17.00 per 100 lb.

Slate-surfaced roofing (red and green) in rolls of 108 sq.ft. costs $3.00 per roll in carload lots and $3.25 for smaller quantities.

Shingles, red and green slate finish, cost $7 25 per square in carloads, $7.50 in smaller quantities, in Philadelphia

ROOFING MATERIAL—Prices per ton f. o. b. New York and Chicago

	Carload Lots N. Y.	Carload Lots Chicago	Less Than Carload Lots N. Y.	Less Than Carload Lots Chicago
Tar felt (14 lb. per square of 100 sq.ft.)	$84 00	$82 00	$86.00	$84.00
[illegible] 400 lb. [illegible]	21 00	18 00	22.00	19.00
Asphalt pitch (in barrels)	34 00	34 00	37.50	37 50
[illegible]	88 00	88 00	90 00	90.00

HOLLOW TILE—Price per block in carload lots for hollow building tile:

	4x12x12	8x12x12	12x12x12
[illegible]	$0 087	$0.158	$0 248
[illegible]	12	.23	.31
[illegible]	.09	.175	.30
[illegible]	.082	.154	.236
[illegible]	165	.22	.325
[illegible]	.065	.115	......
[illegible]	1062	.199	....
[illegible]	101	.18925	.2864
[illegible]	108	.192	

*[illegible], 4, 8 and 10 in.

LUMBER—Price of pine per M in carload lots:

	1-In. Rough 10 In. x 16 Ft.	2-In. T. and G. 10 In. x 16 Ft.	8 x 8 In. x 20 Ft.
[illegible]	$[illegible]	$46 00	$42 00
Birmingham	52.00	53 00	50.00
[illegible]	6[illegible]	[illegible] 00	55 00

EXPLOSIVES—[illegible] small lots and price per 25-lb. keg for [illegible]

	Low [illegible]	Gelatin [illegible]	Gelatin [illegible]	Gelatin 80%	Black Powder
New York		$0 [illegible]	$0 [illegible]	.	$2 20
Boston	$0 [illegible]	[illegible]	[illegible]	$0 35	2 40
Kansas City	[illegible]	[illegible]	[illegible]	.29	2.35
New Orleans	[illegible]	[illegible]	[illegible]		.
Seattle	[illegible]	[illegible]	[illegible]	2775	2 25
Chicago	[illegible]	[illegible]	[illegible]	325	2 25
St. Paul	[illegible]	[illegible]	[illegible]		2 25
St. Louis	[illegible]	[illegible]	[illegible]	295	1 80
Los Angeles	[illegible]	[illegible]	[illegible]	275	2 95

MISCELLANEOUS

GREASES—Prices are as follows in the following cities in cents per pound for barrel lots:

	Cincinnati	St. Louis	Birmingham
Cup	7-8	3.7-3.8	8 5
Fiber or sponge	7	7.2	8 5
Transmission	9-10	14.	8 5
Axle	5	5.	4 5
Gear	5	6.5	8.5
Car journal	5	4 7	8.5

BABBITT METAL—Warehouse prices in cents per pound:

	New York Current	New York One Year Ago	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago
Best grade	90.00	87 00	70.00	80.00	70.00	75.00
Commercial	50 00	42 00	[illegible]	21 50	15.00	15 00

HOSE—Following are prices of various classes of hose

Fire

	50-Ft. Lengths
Underwriters' 2½-in.	75c. per ft.
Common, 2½-in.	40%

Air

	First Grade	Second Grade	Third Grade
¾-in. per ft.	$0.50	$0.33	$0.22

Steam—Discounts from list

First grade 30% Second grade 40% Third grade 45%

LEATHER BELTING—Present discounts from list in cities named:

	Medium Grade	Heavy Grade
New York	2[illegible]%	25%
St. Louis	3[illegible]%	35%
Birmingham	35%	15%
Chicago	45%	40%
Cincinnati	30 5 2½%	40 2½%

RAWHIDE LACING—25% for cut; 86c. per sq.ft. for ordinary.

PACKING—Prices per pound:

Rubber and duck for low-pressure steam	$1.00
Asbestos for high-pressure steam	1.70
Duck and rubber for piston packing	1.00
Flax, regular	1.20
Flax, waterproofed	1.70
Compressed asbestos sheet	90
Wire insertion asbestos sheet	1.50
Rubber sheet	.50
Rubber sheet, wire insertion	70
Rubber sheet, duck insertion	.50
Rubber sheet, cloth insertion	.30
Asbestos packing, twisted or braided, and graphited, for valve stems and stuffing boxes	1.30
Asbestos wick, ½- and 1-lb. balls	.85

MANILA ROPE—For rope smaller than ¾-in. the price is ½ to 2c. extra; while for quantities amounting to less than 600 ft. there is an extra charge of 1c. The number of feet per pound for the various sizes is as follows: ⅜-in., 8 ft.; ½-in., 6; ¾-in., 4½; 1 in., 3⅓; 1⅛-in., 2 ft. 10 in.; 1¼-in., 2 ft. 4 in. Following is price per pound for ¾-in. and larger, in 1200-ft. coils:

Boston	$0 30	Birmingham	$0.29
New York	.26	Atlanta	.295
St. Louis	.265	Kansas City	.265
Chicago	.265	New Orleans	.255
St. Paul	.275	Seattle	.25
San Francisco	24	Los Angeles	.285

PIPE AND BOILER COVERING—Below are discounts and part of standard lists:

PIPE COVERING Pipe Size	Standard List Per Lin.Ft.	BLOCKS AND SHEETS Thickness	Price per Sq.Ft
1-in.	$0.27	½-in.	$0.27
2-in.	.36	1 -in.	.30
3-in.	.45	1½-in.	.45
4-in.	.60	2 -in.	.60
6-in.	.80	2½-in.	.75
8-in.	1.10	3 -in.	.90
10-in.	1.30	3½-in	1.05

85% magnesia high pressure		List
For low-pressure heating and return lines	4-ply	58% off
	3-ply	60% off
	2-ply	62% off

WIRING SUPPLIES—New York prices for tape and solder are as follows:

Friction tape, ½-lb. rolls	55c. per lb.
Rubber tape, ½-lb. rolls	60c. per lb.
Wire solder, 50-lb. spools	46c. per lb.
Soldering paste, 2-oz. cans	$1.20 per doz.

COPPER WIRE—Prices per 1000 ft. for rubber-covered wire in following cities:

	New York Single Braid, Solid	New York Double Braid, Stranded	New York Duplex	Birmingham Single Braid, Solid	Birmingham Double Braid, Stranded	Birmingham Duplex
14	$12 00	$13 90	$28 50	$12 50	19.50	$29 00
10	18 30	23 85	41 50	25 10	35.50	55 50
8	25 54	32 70	56 70	34 75	49.50	70 50
6		51 40		57 50	68.60	
4		70 00		81.65	95 50	
2		101 80			140 20	
1		131 86			190 90	
0		160 00			231.33	
00		193 50			281 23	
000		235 20			343 22	
0000		288 60			416 80	

Cincinnati 12% less

FREIGHT RATES—On finished steel products in the Pittsburgh district including plates, structural shapes, merchant steel, bars, pipe fittings, plain and galvanized wire nails, rivets, spikes, bolts, flat sheets (except planished), chains, etc., the following freight rates per 1000 lb. are effective

Boston	$0 30	New Orleans	$0 385
Buffalo	17	New York	.27
Chicago	.27	Philadelphia	245
Cincinnati	2[illegible]	St. Louis	24
Cleveland	17	St. Paul	495
Kansas City	59	Pacific Coast (all rail)	1 25*

Note—Add 3% transportation tax *Minimum carload, 80,000 lb

COAL AGE

Volume 17 New York, March 18, 1920 *Number* 11

Penalties of Usefulness

By R. Dawson Hall

LOOKING at the new Cummins-Esch railroad bill, we come upon unmistakable evidence of the fact that railroads are, or at least have been, of great public utility. If they had not been, what occasion would there have been for making the income of the railroads matters of close control by the Interstate Commerce Commission?

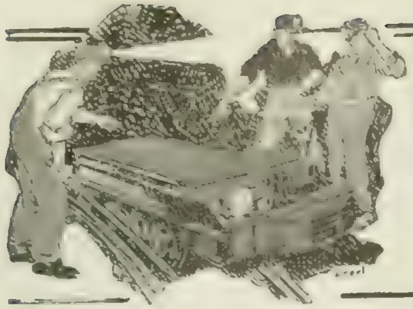
If the railroads had not been so essential, we would not have arranged that if they earn over 6 per cent, one-half of the excess is to go to the reserve fund of the road and the other half to the General Railroad Contingent Fund. The road can divide with its stockholders and bondholders nothing that is earned over 5½ per cent. The next half per cent earned is to make provision for improvements, betterments or equipment and all the excess above that percentage is to be either laid away for a rainy day or to be placed in the General Railway Contingent Fund to be lent to the railroads at 6 per cent.

This is the stigma and these are the penalties of usefulness—a mark of Cain and a consignment to penury. It will not be for long, however, for if it is continued such treatment is sure to make our railroads less and less useful year by year. A hobbled horse draws no load and competing with him there are still unfettered steeds. There is the auto truck which uses, without pay or with inadequate pay, the public roads, the public bridges, the city streets—that "flexible" unit which the automotive press so eloquently praises. Its profits are suffered to be as flexible as its services.

The auto truck and the electric wire will take the place of the railroad but they will be unquestionably regulated in their turn. In time the former will find that the public has put a brake on its axles, a skid under its wheels and a chain between its spokes. The automobile, gay and debonnair, richly painted and upholstered, may largely escape so long as privately owned because its usefulness is not so evident. But the auto truck and the taxicab will find the penalties of usefulness eventually crippling their prospects. Till that time, till auto trucks are numerous enough to satisfy the public, rates will be at the owner's whim and profits unregulated, and the railroads will suffer.

The utilities corporation newly seeking a franchise may find conditions favorable, while old utilities long ago established and having served the public for years will be required to give service without chance of a return equal to that granted less valuable servants. For a while we must pamper the auto truck, motor bus and power line, for we wish to encourage them to enter the battle of industrial life, but once established the iron heel of regulation will press out their life as it has already pressed out the life of the railroads.

Some day, perhaps the "iron horse" will be so crippled as to be useless and not useful. It is finding it hard today to haul enough coal to keep running. When it fails utterly we shall begin to realize that we still need it as we did in the days before and just after the civil war, when we prodigally offered anything and everything if the railroads would consent to come and serve us.



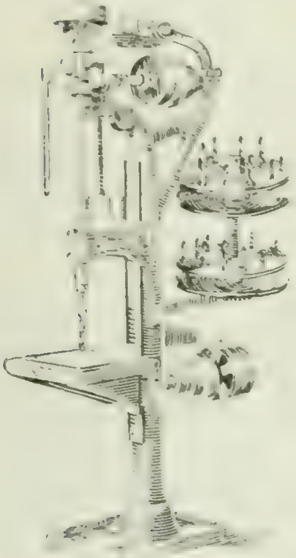
IDEAS AND SUGGESTIONS

PRACTICAL SCHEMES THAT MAKE THE DAY'S WORK EASIER

Drill Holder for Drill Press

On the drill press in the machine shop of the Burnside Colliery of the Philadelphia & Reading Coal & Iron Co. near Shamokin, Pa., there is installed a rather interesting stand for holding different-sized drills.

This holder is a double-deck affair consisting of two sets or pairs of circular disks as shown in the accompanying illustration. These disks have corresponding holes of various sizes in the upper and lower plates to hold the drills. The larger drills and therefore the larger holes are placed near the center while the smaller ones are at the edge. This allows the operator to select any drill he desires by simply glancing at the drill holder. Each pair of disks is arranged so that it can be rotated. It is extremely easy to increase the capacity of one of these drill holders, as all that is necessary to do is to increase the diameter of the plates which will permit more holes and therefore more drills. It is also possible to increase the capacity by having more sets of the horizontal plates.

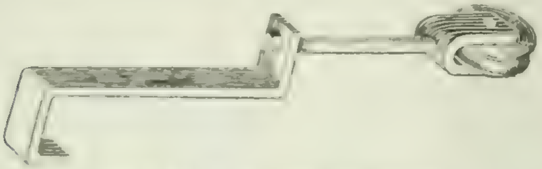


DRILL HOLDER AND PRESS

Arrangement for Closing Mine Doors

At the Burnside Colliery of the Philadelphia & Reading Coal & Iron Co. near Shamokin, Pa., a small portable pulley for use in closing a mine door has been designed.

This pulley is provided with a hook so that it can be hung over the lagging at any point desired. Over the pulley at the extremity of the hook a chain passes, one end of which is attached to the door, while a weight is fastened to the other.

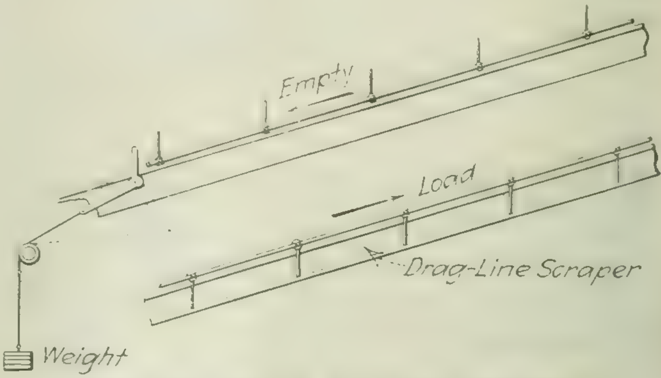


HOOK PULLEY AND BRACKET

The advantage of having this pulley adjustable is that it can be placed easily in any desired position and adjusted from time to time, thereby allowing the door to work to the best possible advantage.

Safety Stop for Drag-Line Scrapers

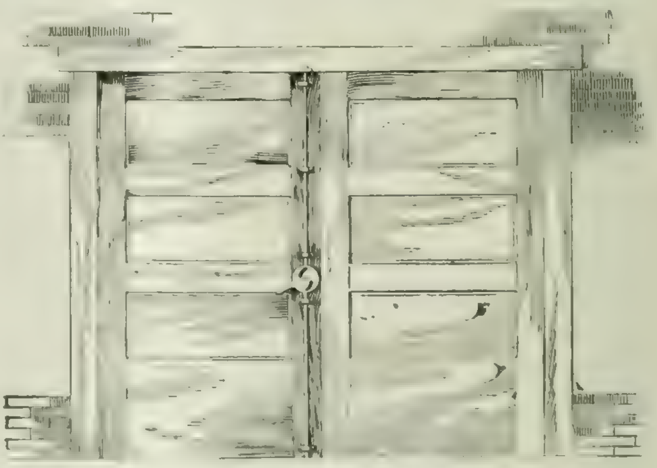
The St. Clair Coal Co. at St. Clair, Pennsylvania, has installed a safety device designed by one of its employees, John Bound. This prevents the drag line scraper from sliding back down the trough in case of a breakdown to any portion of the driving machinery.



DRAG LINE STOP IN PLACE ON CONVEYOR

Fastener for Double Doors

A home-made door fastener for double doors has been made at the Burnside Colliery of the Philadelphia & Reading Coal & Iron Co. near Shamokin, Pa. This consists of a steel disk ¼ in. thick with a handle attached. This disk is pivoted in the center and provided with two circular slots about ½ in. wide on opposite sides.



FASTENER FOR DOUBLE DOORS

Two pieces of bar steel ¼ x 1¼ in. are fastened by means of bolts at the end through the slots. The upper end of these bars engage in the casing of the door at top and bottom. By moving the lever on the disk the bars raise or lower, locking or unlocking the door.

A War-Time Plant in the Pittsburgh Field

A Plant Built During the Strenuous War Period Embodies Many Elements Tending Toward Reliability—Power Is Purchased, But a Gasoline Engine Driven Unit Is Provided as a Standby

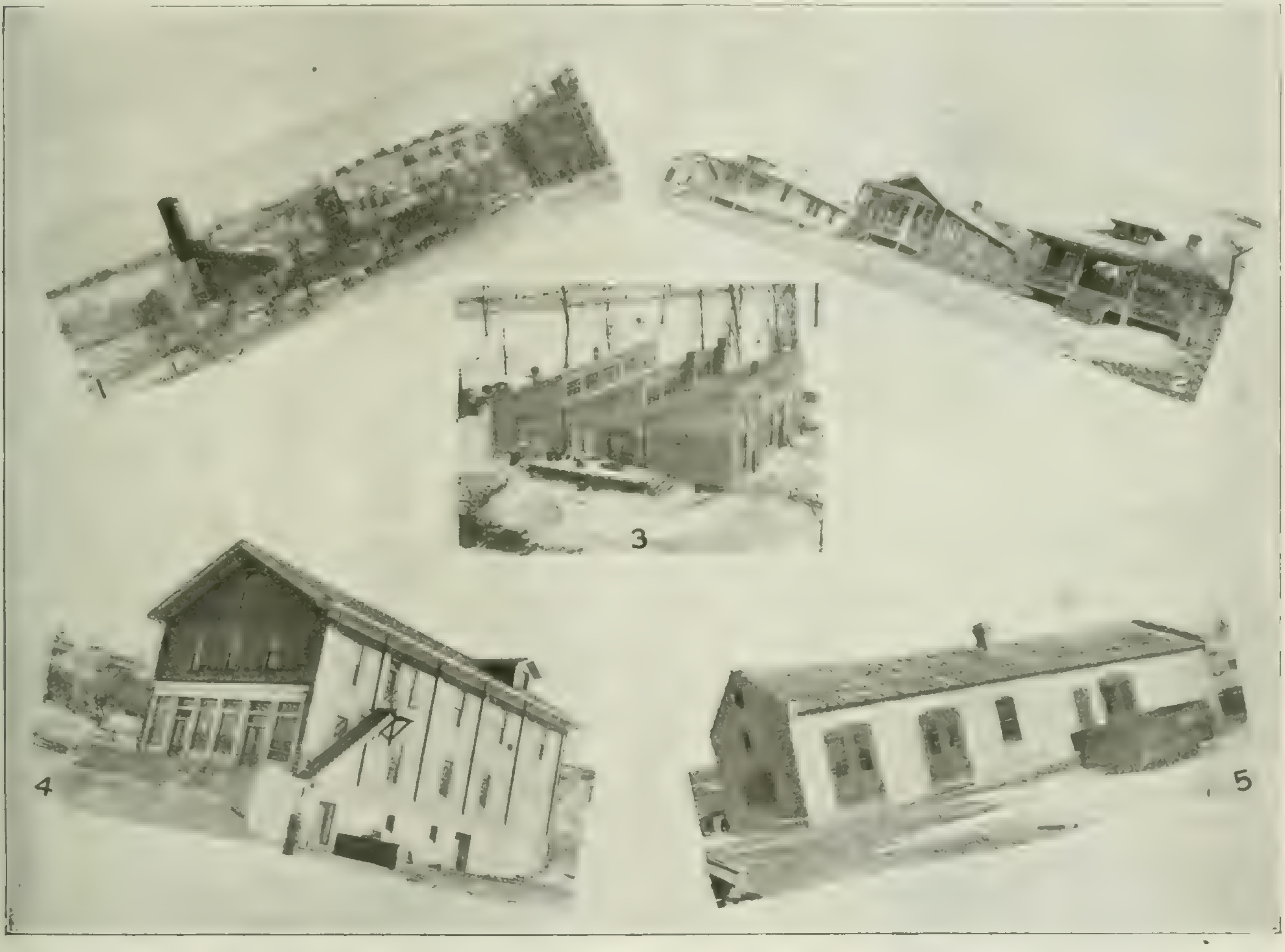
By Donald J. Baker
Pittsburgh, Pa.

DEVELOPMENT booms began in the Pittsburgh district during the early months of 1917 when operators, while sure that victory would rest with the Allied Powers, believed that the struggle would be long drawn out. Many of the new plants upon which construction work was started in the early months of the war are only now being completed. Construction of many of these developments began in April, May or June of 1917. Quite a few of the estimates made by competent military men then placed the duration of the war from three to five years. This fact undoubtedly bore considerable weight with the operators.

The wholehearted co-operation that was manifested by the coal industry in winning the war is now history. Although these plants were not subjected to the strenuous days for which they were designed, we find them today standing out in bold relief against the background of the older operations by reason of their sturdier and more complete equipment. They are now assuming the leading role as the greatest single producers in their fields.

With few exceptions, the design and general layout of the surface buildings has been made with but one end in view. That goal was to produce a maximum amount of coal under the exacting stress of war time and its resultant conditions. There is precious little time afforded for general upkeep or repairs in a period that cries for coal and more coal and if the mine is to be kept operating at full speed the original equipment must not only be made of the finest materials obtainable for the purpose in hand but the design, must be compact and convenient

These new operations around Pittsburgh reflect high credit upon their owners and will stand throughout



VIEWS IN AND ABOUT LINCOLN HILL
(1) General view of the tipple and surroundings. (2) Types of dwelling houses. (3) Blacksmith, carpenter and machine shop. The saw tooth roof affords excellent lighting. (4) Company store. (5) The material-storage or warehouse building

their periods of operation as monuments of their projectors' patriotism. When the war ended, the coal industry was just becoming organized. Had hostilities continued for two more years, the organization would have been nearly complete.

War caused these plants to be constructed as they have been, and in this respect the overt acts of the present Holland wood-cutter have placed the industry on a new level. In the younger days of the industry, a plant grew up over night. The surface buildings of the mine were constructed of the cheapest materials available and in the quickest possible manner. The houses of the workers were "thrown together" quickly and conveniences in them were overlooked. This fact has doubtless retarded the Americanization of the mining population—which is largely a foreign one—more than anything else; for to encourage interest in a house that is not a home is nearly impossible, or at best is accomplished under many difficulties.

HOUSES CAN BE MADE HOMES

We are told by psychologists that the base of real Americanism is the hearthstone. How can we then expect to lay a firm foundation against radicalism where there are no hearthstones? In the early days of the industry, the human element was cast aside when the mines were opened, and today we are in many respects to blame for the fact that "Soviet Arks" are plying between our shores and Russia.

Fortunately times have changed and today the industry is on a more solid footing, at least from the engineering and sociological standpoint. It is a pleasure to visit the new operations. An impression is gained that is refreshing, for the conviction is forced upon us that here is a business and not merely a venture. In the long run, the original capital invested will be returned much quicker than at those plants that had a mushroom growth, for there is a greater ease in handling the output and repairs are few and far between. It took the war to impress upon us some of our own shortcomings—things that should have been widely known and recognized long ago.

One of the plants that dated its growth from the month when war was declared is that of the Lincoln Gas Coal Co., which is situated at Lincoln Hill in Washington County about 3 miles west of Washington on the pike to Wheeling, W. Va. This operation is a subsidiary of the Pressed Steel Car Co. of Allegheny and McKees Rocks, Pa., and is allied with the Hillman Coal & Coke Co. of Pittsburgh—a company that has an annual production of 10,000,000 tons of coal. Twenty-two hundred acres of coal are embraced in the tract that will be developed. The coal is that of the Pittsburgh bed and averages 6 ft. in thickness.

The first stone in the construction of the plant buildings was turned on April 6, 1917 and on Aug. 26, 1918 coal was run over the tipple. This is a relatively short period of time and seems even shorter when the labor difficulties of that period are recalled. The labor problem was fraught with uncertainty, for the draft boards were in full session and men knew not when they must answer their country's summons. Furthermore, the railroads were decidedly unreliable by reason of war-time restrictions that included many embargoes on highly needed materials.

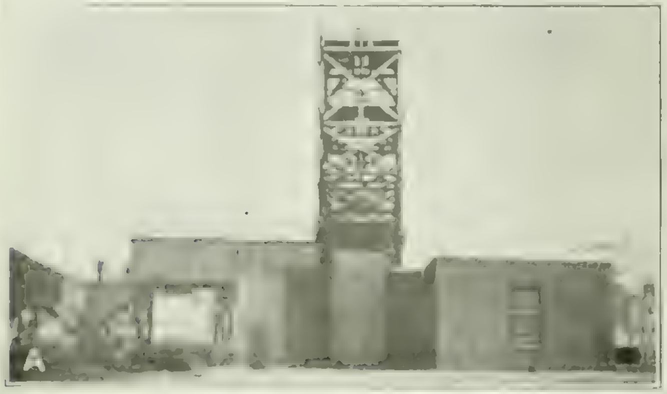
George Wilson, superintendent at Lincoln Hill, has been in charge of the property for the past two years or more. Baton & Elliott, mining engineers of Pittsburgh, designed and supervised the construction of the plant buildings as well as the underground layout. The Mather operation which was described in the Nov. 13 and 20, 1919 issue of *Coal Age* was also designed by the same firm as was the community amusement building of the Hillman Coal & Coke Co., at Hillcoke, Pa., a description of which appeared in the Oct. 9 issue of the same year.

BOTH SHAFTS ARE CONCRETE LINED

Two shafts have been sunk at Lincoln Hill, one 452 ft., and the other 469 ft. in depth. The latter is the main-hoisting shaft. It is concrete-lined and is 32 x 11 ft. in dimensions. It is divided into three main compartments, two of which are utilized in hoisting, while the other is an air compartment, 11 x 9 ft. in size. There is also a pipe compartment. Vertical ladders have been constructed that lead to a platform landing every 18 feet.

The air and material snaft is likewise concrete lined and is a duplicate of the hoist shaft in general overall dimensions. It contains two hoist compartments as well as one for the unobstructed passage of air. A vertical ladder in this shaft leads to a platform at a depth of 60 ft. where a pump has been installed. Both shafts are equipped with Connellsville Manufacturing & Mine Supply Co. cages; the self-dumping type being installed for coal hoisting.

The main tipple is of wood construction with corrugated asbestos siding. Keasby & Mattison of Pittsburgh supplied this latter material. The headframe



"A" [illegible] VIEW AND "B" QUARTERING VIEW OF THE SHAFT UPPERWORKS

One compartment in the shaft is an upcast connected to the fan located a short distance away. A second compartment is used for hoisting and lowering men and material here is of steel, 115 ft. high with 10-ft. sheaves. Both tipple and headframe were erected by John Eichleay & Sons of Pittsburgh. Within the tipple there is a weigh basket, gravity screens and car retarders, all manufactured by the Phillips Mine & Mill Supply Co.

The coal is not hand picked and considerable of the output will be loaded as mine-run, although some will be sized. All apparatus has been installed in such manner as to insure the least amount of labor being employed on the tipple. The cars dump into a receiving hopper that feeds by gravity to the screens from the weigh basket. From the screens there is an unrestricted run to the railroad cars beneath. Loading booms have been provided for the lump sizes. Rock is dumped into a special bin and later removed to the rear of the building by trolley-type slate larries.

Rock Disposal Is an Important Problem

Much rock and refuse have been encountered inside the mine and the rapid handling of this material on the surface had to be provided for in the design of the tipple. The hoisting apparatus has been laid out to accommodate 3,000 tons of material in 8 hr. but is is doubtful if that amount of coal will ever be run over the tipple because of the rock that must be moved during development work.

There is a decided contrast between this tipple, which is practically mechanical in its operation, and others that are more commonly seen, and which employ from 10 to 20 men.

The air-shaft tipple is a temporary wooden structure that is at present used for supplying domestic coal needs. This tipple is equipped with one hand-operated dump. It will be merely mentioned here as it is not one of the main plant units. A substantial wooden headframe is situated over the air and material shaft.

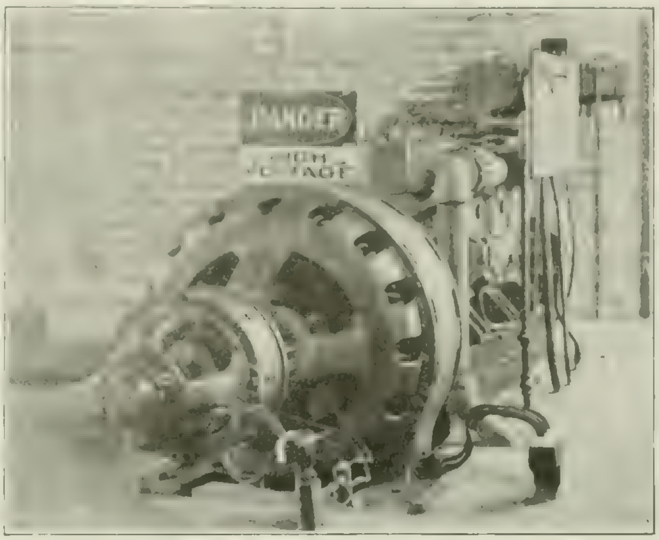
A combination lamphouse, hospital and mine-foreman's office is located near the air-and-material shaft and is of brick construction with tile roof and cement flooring. The location of this building is nearly ideal. It is in a direct line with the route taken by the men in going to and from work. The hospital entrance faces the shaft. The main portion of the building houses 400 Edison safety lamps which are shelved and recharged through rheostats. There is an electrically operated Rochlitz water-still in this room.

TIPPLE AND HOISTHOUSE

This equipment has been designed to hoist and prepare 3,000 tons of coal daily. The tipple is practically mechanical in its operation throughout.

The mine-foreman's office adjoins the lamp room and contains the water-gage register. This little detail of arrangement might well be more generally followed, instead of having the location in the fanhouse. Dangerous diversions of air currents that sometimes occur through door sets being carelessly left open will be indicated on the water gage and show that something is wrong with the circulation. In the efficient and intelligent supervision of a mine, the water gage plays an important part and should be under surveillance at all times.

The hospital comprises one room which is adjacent to the mine-foreman's office. In it are contained four sets of Draeger breathing apparatus and a Draeger recharging oxygen unit. A lungmotor, manufactured by the Life Saving Services Co. is also part of the equipment. The room is fitted with table, desk, medicine cabinet and lavatory. The nearness of the building to the shaft is an important first-aid factor.



A STANDBY GENERATING UNIT

In case of power failure this gasoline engine-driven generator may be put to use operating the plant and feeding any excess energy into the transmission line.

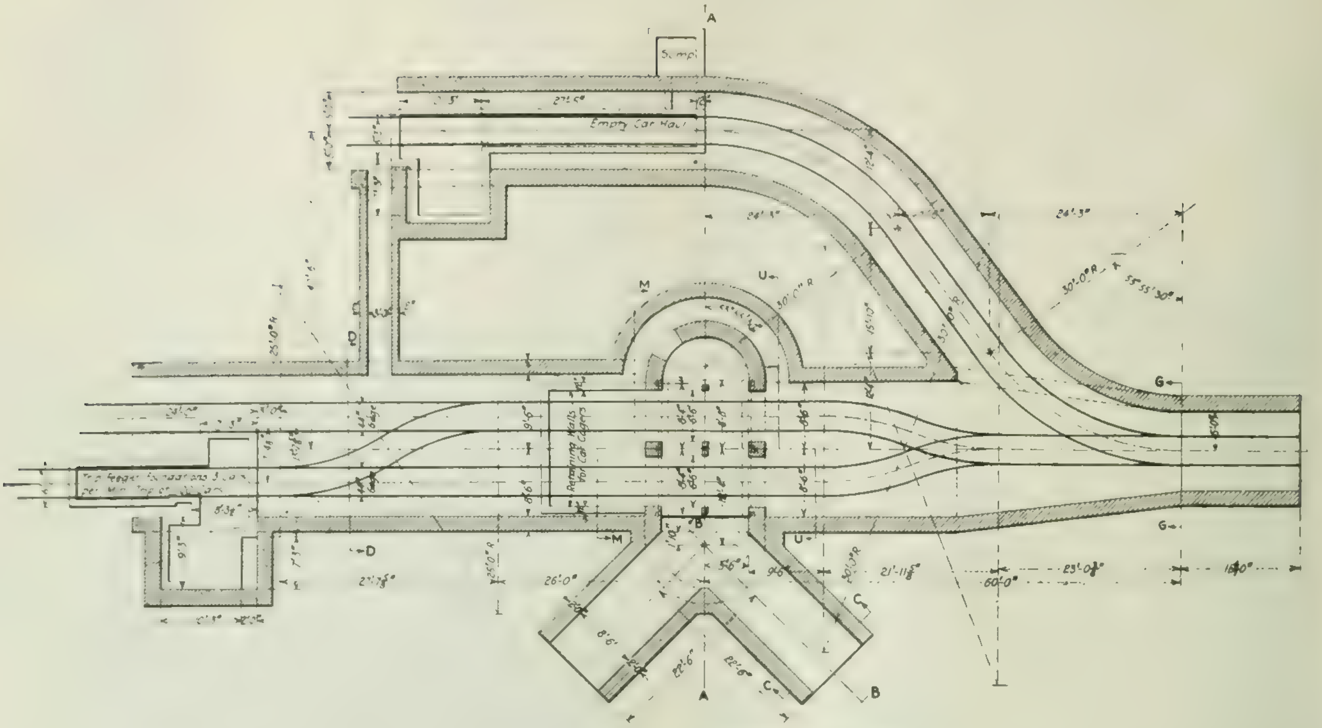
The secondary hoisthouse is divided by a brick partition so as to bring the substation under the same roof. This building, 72 x 32 ft. in dimensions, is of the same characteristic construction as the rest of the plant units; viz., cement floor, brick walls, tile roofing, carried on steel roof trusses. Power for the operation of the mine is purchased from the West Penn Power Co.

The reduction of the high-tension line of 22,000 to 2,200 volts is made at an outdoor transformer station that is located in the rear of the building.

Two Westinghouse 200-kw. 60-cycle transformers are employed in stepping down the current. From the transformers, the 2,200-volt lines pass to two 290-hp. Westinghouse motors driving two Westinghouse 200-kw. 250-volt direct-current generators. These machines operate at 900 r.p.m.

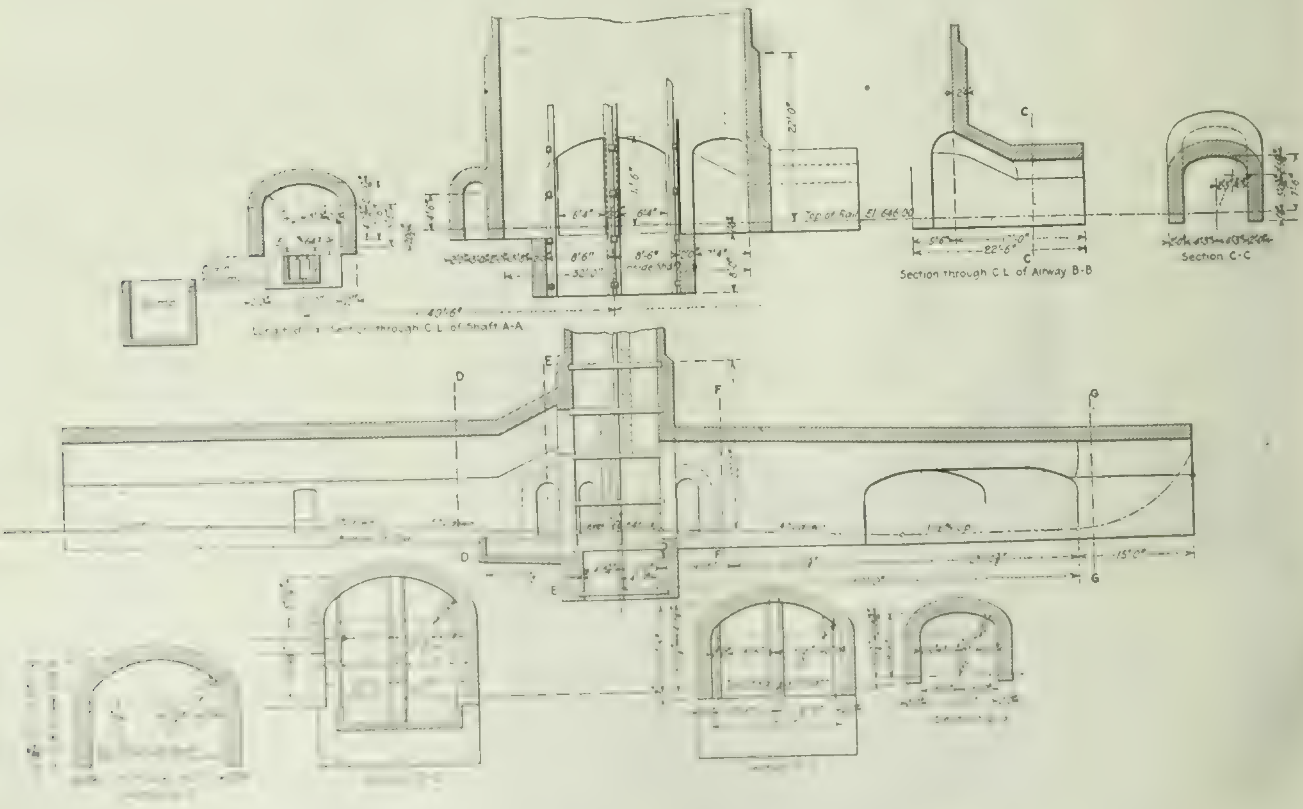
One unit in the substation that has not been generally installed elsewhere is a Van Blerc high speed marine gasoline engine direct-connected to a 100-kva. 2,400-volt Westinghouse alternating-current generator. This unit is equipped with a Leece-Neville automatic circuit-breaker. This auxiliary power plant will only be operated during such times as the service over the high-tension lines is below par.

The idea of driving an alternating-current generator by a gasoline engine is not a new one but it is a practice that might well be more generally followed. The arrangement is highly compact, a fact that in



PLAN OF TRACKS AT THE SHAFT BOTTOM

Tracks kickback, car feeder and car haul are arranged relative to the shaft so as to secure rapid and efficient handling of the loaded and empty cars. Speed and reliability are here of the utmost importance.


23'0"
Top of Rail El. 646.00
Section through C L of Airway B-B
Section C-C
Longitudinal Section through C L of Shaft A-A
40'-6"
22'-6"
6'4"
8'6"
30'0"
D
E
F
G
15'0"

CROSS-SECTION OF THE ARCHING AT SHAFT BOTTOM

Roadways, air courses and passageways generally near the caging point are concrete-arched. This secures a neat as well as substantial bottom obviating the danger from falls of roof rock.

itself is an influential one where minimum space is desired in housing the auxiliary power plant. However, the boiler house has its advantages, especially in those regions where the high-tension lines are liable to be out of commission for any appreciable length of time.

Gasoline consumption is an important cost item if the engine must be operated over long periods. A large slate-panel switch-board completes the equipment in the substation. All of the electrical installations at Lincoln Hill are of Westinghouse manufacture.

A wing of the substation is utilized as a pump room and contains a 5 x 7 in. electrically-driven horizontal Scranton pump. This stands directly over a 19,000-gal. concrete reservoir which provides the water for town and plant consumption. The water is pumped from this point to a 57,000-gal. tank on one of the adjacent hillsides. From here it flows by gravity to the town through 4-in. cast iron pipe.

As has been already mentioned, the secondary hoisthouse adjoins the substation. Equipment here consists principally of a Vulcan hoisting engine with a 6-ft. drum which is direct connected to a 300-hp. motor. A cable 1⅜ in. in diameter is used.

The main hoisthouse is 43 x 38 ft. in dimensions, and contains a Vulcan hoisting engine with a conical drum that ranges from 7½ to 10½ ft. in diameter. This hoist employs a 1¾-in. cable and is geared to a 1,000-hp. Westinghouse motor. Both hoists are equipped with automatic safety appliances for regulating the speed of the drum, length of cable payed out, etc.

Another of the main buildings of the surface plant is a combined blacksmith, machine, and carpenter shop. As can be noticed in one of the accompanying illustrations, the design of this building is unique, in that the separate rooms are practically distinct buildings. The blacksmith shop is equipped with forges, and electrically-driven blower fans.

The carpenter shop contains an electric saw, shaper, etc., while the machine shop is provided with a power driven hack saw, pipe machine, lathe, and drill press. Equipment within the building as a whole is not complete as yet. The general design was primarily influenced by the desire to obtain as much natural light as possible. Work carried on inside these shops is thus made easy and effective.

VENTILATION PROBLEM IS SIMPLE AS YET

The fanhouse, which is 34 x 18.5 ft. in dimensions, contains a 5 x 14-ft. double-inlet, reversible Jeffrey fan. This is connected by belt to a 30 hp. Westinghouse motor. The ventilation problem is comparatively simple so far, since the main entries have been driven scarcely 1,000 ft. and development of the coal is still in the primary stages. In this respect the construction of the surface buildings has been keeping ahead of the underground work.

A supply house, 70 x 61 ft., is utilized for storing spare parts and various materials. Three other buildings might be mentioned, although these are not directly as important as the ones already described. One of these is a magazine, 20 x 14 ft., which is constructed entirely of concrete. It is, of course, located some little distance from the plant proper. An explosive cap or detonator house, 7 x 5 ft., is of brick and concrete construction while the other building is utilized for the storage of such materials as oil, sand and cement.

A spur is now under construction to this building and these materials will be unloaded as far as possible by mechanical means. Another track from the building to the air and material shaft will minimize the amount of labor required in handling these materials and at the same time bring them within easy access of the shaft. The rapid rehandling of all supplies regardless of their nature is a necessity if steady production is to be maintained. This can readily be seen.

Arrangements at the shaft bottom are rather elaborate. The main haulageways are 19 ft. wide, arched and concreted for a distance of 150 ft. on either side. The loaded cars on one side of the bottom are engaged by a car-feeder and are pulled nearly to the shaft. They then run a short distance by gravity and are caged. The empty cars as they come off the cage, run by gravity to a kickback after passing which they are engaged by a car haul and are pulled up a short incline to enter the storage tracks.

The mine cars are of 2½ ton capacity and constructed with steel sides and wooden bottoms. They were supplied by the Pressed Steel Car Co. A track gage of 44 in. is employed with 60-lb. rails on the main haulageways. Four 6-ton Jeffrey locomotives are in use at present. Heavier machines have not been purchased thus far as the development work has not reached a stage that necessitates their use. Other equipment underground includes two 7½-ft. breast machines and six Goodman shortwall gasproof mining machines. A cement gun has been purchased and is finding considerable use in the work of driving entries which are gunited as soon as completed.

DRAINAGE WATER WILL BE PUMPED

The water from the mine will be directed to one main pump and thence voided to the surface through a 4-in. discharge line by two 5 x 7-in. horizontal Scranton pumps. Other pump units probably will be portable ones. At present one 3 x 5-in. Austin field pump with a 2-in. discharge line is in use. However, it is a little hard to prophesy now, just how extensive the final pumping arrangements will be, as the mine is not yet in a stage of development that would justify an approximation of the amount of water that will eventually be encountered. From indications, however, there will be plenty.

Railroad connections are with both the Baltimore & Ohio and the Pittsburgh, Cincinnati, Chicago & St. Louis lines. A storage yard wherein 85 empty cars may be accommodated has been constructed as well as one with a like capacity for loaded cars. In less serious vein, this appears to have been the only "slip-up" in the surface layout. Where the cars are coming from to fill this yard is a secret that others would like to share. One answer to this question might be found by consulting either the ouija board or the gypsy dream book.

Duty to Keep Mine Premises in Reasonably Safe Condition.—Where a coal mining company's employee's duties in spragging tram cars diverted his attention from a runway along which he was required to move, the company is liable for injuries sustained by him through stumbling over an obstruction negligently permitted by the company to remain in the runway. (*New Mexico Supreme Court, Leyba vs. Albuquerque & Cerrillos Coal Co., 164 Pacific Reporter, 823.*)

How An Anthracite Breaker Was Remodeled—II

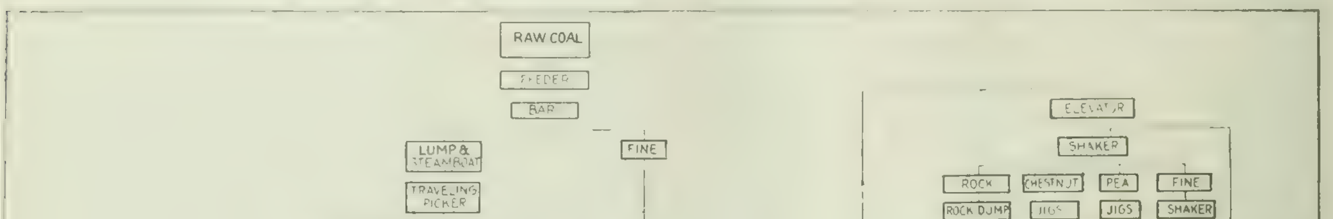
Imperfect Preparation Made Necessary the Remodeling of the Breaker, but the Change Paid Well, for the Payroll Also Was Cut $140,000 a Year—Wet Preparation Adopted Is Much Simpler and More Efficient Than Dry

By **Dever C. Ashmead**
Tarrytown, N. Y.

In remodeling the Old Forge breaker the first and probably the most important reason lay in the character of the coal itself since it did not lend itself well to the old method of preparation. The second reason was the fact that too much labor was employed and during the war every man's help counted. The third reason was that the cost of operation of the breaker had become too high; since the average pay roll for every man and boy was $1,000 a year, a reduction in the number of men from 156 to 16 made a considerable saving and warranted a large capital investment. The fourth reason was that the old structure showed signs of weakening after 18 years of continuous use and the foundations were rotting. It can be easily seen that the above four reasons were sufficient to warrant the cost involved in remodeling this breaker.

The old structure was a dry breaker and an interesting comparison can be made between the old and new flow sheets as shown in the article. Furthermore, the movement of the material readily can be traced in the cross-section of the new breaker as shown on p. 534, and when this movement is compared with that in the old breaker, as shown in the first part of this article in the issue of *Coal Age* on March 11, 1920, p. 483.

In the old breaker the coal was brought in mine cars to the top of the building by means of a car haul, and there dumped. A rotary feeder discharged coal to grizzeleys where the lump and steamboat were removed and delivered to a traveling table where bone and slate were picked out. The coal then went to a set of rolls and was crushed to the sizes of grate and egg. If it was not desired to make grate coal, this size was again crushed to egg in another set of rolls. If grate coal was to be made this size was run through an Emery picker and the refuse separated from the coal which went direct to a pocket. The refuse passed to a set of rolls and was crushed, then went over a shaker and the egg size passed through an Emery picker which separated the coal from the refuse. The coal went direct to the egg pocket and the refuse to the rock conveyor



FLOW SHEET OF THE OLD FORGE BREAKER BEFORE REMODELING

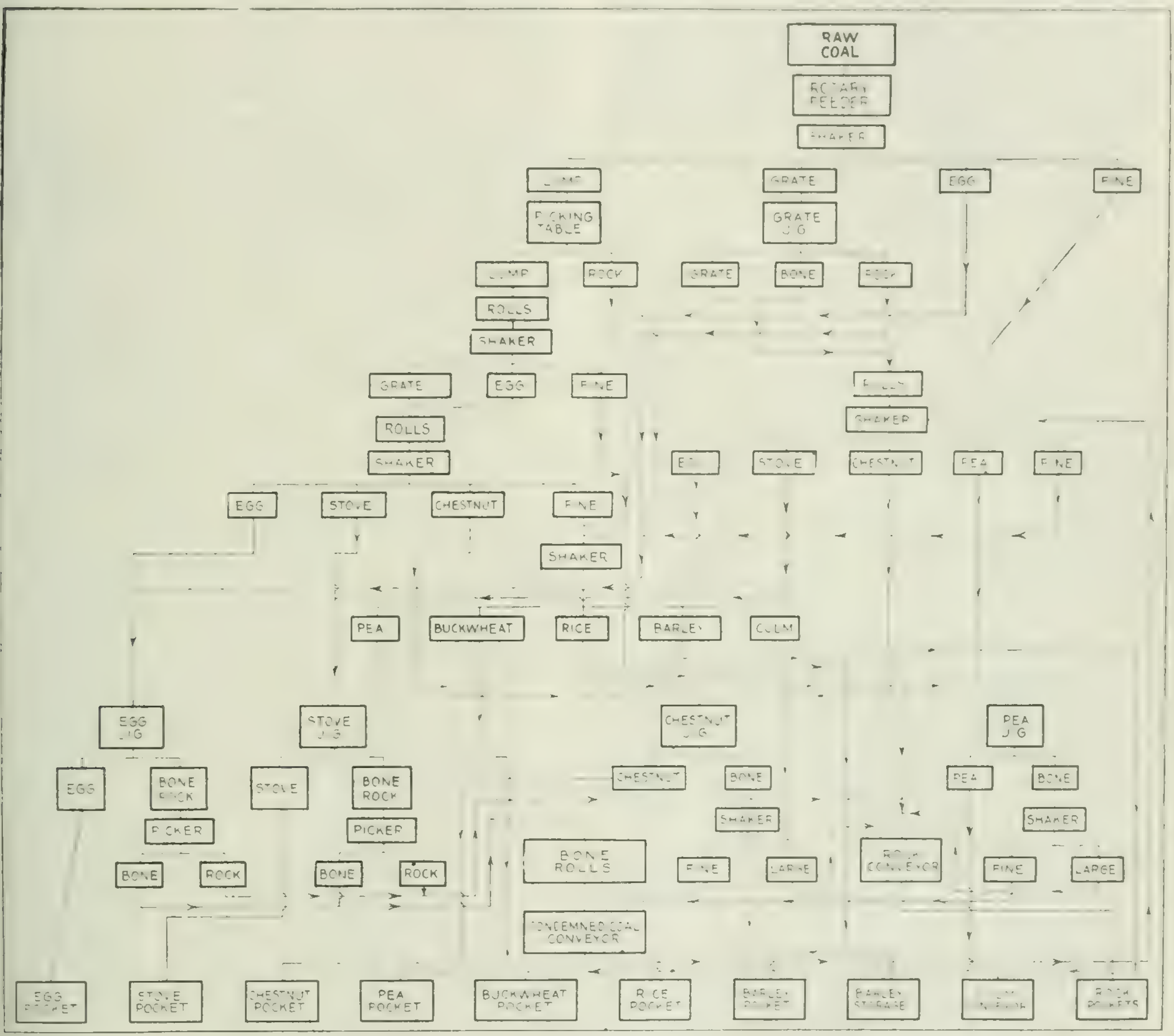
This flow sheet shows how the coal in the Old Forge Breaker was treated before being remodeled. By referring to the new flow sheet it will be seen what a vast difference there is between the two methods.

which took it to the rock dump. The fine refuse that passed through the shaker went to the condemned coal conveyor and was given retreatment.

The egg coal from the lump rolls received the same treatment that has just been described, except that when there were insufficient orders for the egg or grate coal these sizes were passed through a set of rolls and crushed, then passed over a shaker, the egg and stove removed, and the fine coal sent over another shaker separating the chestnut and the pea. The fine coal from this shaker was taken by a conveyor to the washery for further treatment. Each of the above sizes—egg, stove, chestnut and pea—received the same treatment that the grate coal received, as previously described. The clean coal went to the pockets, the first refuse produced to the condemned coal conveyor and the final refuse to the rock conveyor.

The coal that passed through the lump and steamboat bar screens was sent to an old-fashioned revolving screen and the grate and egg coal separated. The coal going through this screen passed to a set of shakers where the stove and chestnut sizes were removed from the fine material which was sent to the washery by conveyor for retreatment. The grate, egg, stove and chestnut were treated exactly the same as the grate coal and the refuse was handled in the same manner.

The washery had been remodeled since its original construction and the coal was carried from the breaker by means of a conveyor. This is discharged into an elevator leading to the top of the washery. Here the coal was passed over a wet shaker and the large rock, chestnut and pea were separated from the fines. The rock, when picked from the coal, went directly to the rock dump. The chestnut and pea passed to jigs, and from thence to the pockets. The refuse was sent to rolls where it was recrushed and sent back to the main shaker. The fine coal from the first shaker was passed over another shaker and the buckwheat, rice, barley and culm separated. The buckwheat, rice and barley went to their respective pockets while the culm went to the culm bank.



FLOW SHEET OF THE REMODELED OLD FORGE BREAKER

A great difference is shown between the two flow sheets, the old breaker was a dry one, while the new breaker is wet. The change in the method of handling the coal made a difference of 140 men. The old breaker required 156 men to operate while the new breaker requires only 16 men

In the main breaker there was a double set of pockets that would accommodate the grate, egg, stove, chestnut, and pea, while in the washery there were 5 pockets, one each for the following sizes—chestnut, pea, buckwheat, rice and barley. The rock was all carried to a rock pocket at the rear of the breaker from which it was loaded into cars and hauled to the rock dump by a steam locomotive.

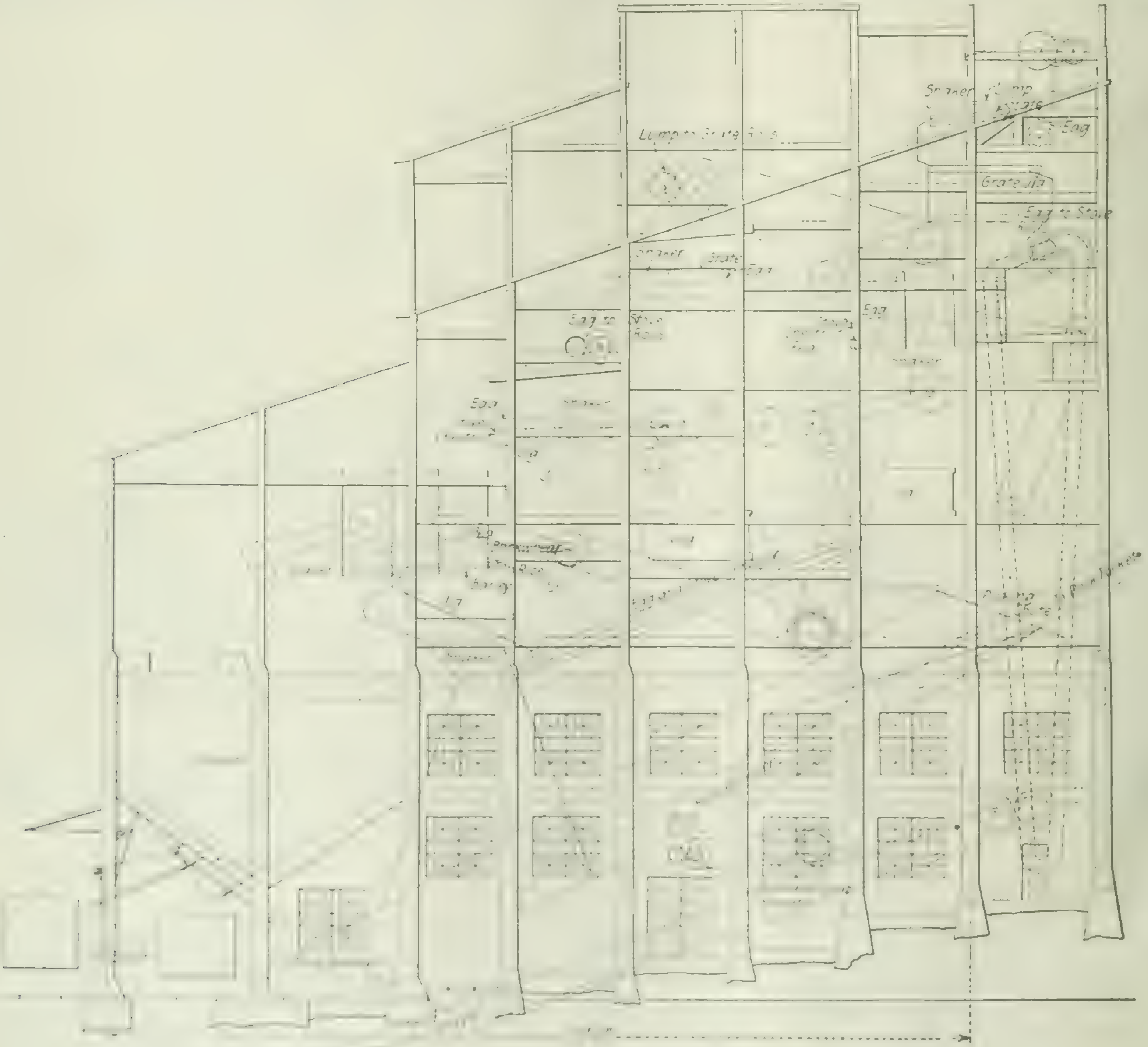
The method of treatment in the new breaker is entirely different from that employed in the old one. It is a wet method from start to finish whereas almost the whole treatment in the old breaker was dry, with the exception of that given the fine coals at the end.

At the present time the coal is brought to the top of the breaker on the old car haul but in the spring this will be changed as the Pennsylvania Coal Co. is making arrangements to install a drag-line scraper to convey the coal to this point.

The coal will then be fed to a rotary feeder as in the old breaker but at this point an entire change in the treatment begins. The coal from the feeder passes to a triple-deck shaking screen on which the lump, grate and egg are sized and the fine coal passes through. The lump coal passes over a picking table where the rock is separated and sent to the rock conveyor. The lump coal itself goes to a set of rolls where it is crushed to grate and smaller and then passes to a double-deck shaker on which egg, stove, chestnut and fine coal are made. The egg coal goes to the egg jig and the clean coal from the jig goes to the egg-coal pocket; the bone and rock from the jig are hand-picked and the rock is sent to the rock conveyor while the bone is taken to the bone rolls and is crushed and then sent to the condemned coal conveyor.

TREATMENT OF STOVE COAL

The stove coal from the egg, stove and chestnut shaker goes direct to the stove-coal jig where it is given exactly the same treatment that the egg coal received. The chestnut coal goes from the same shaker to the



LONGITUDINAL ELEVATION OF THE OLD FORGE BREAKER

As will be seen by comparison with the elevation of the old breaker as shown in the first half of this article, which appeared last week in *Coal Age*, Fig. 1, p. 487, there has been a vast improvement in the arrangements of the breaker.

chestnut jig and the clean product goes to the chestnut coal pocket while the bone and rock are passed over a shaker and the fine material goes to the bone coal conveyor while the large pieces go to the waste rock conveyor.

Now going back to the grate coal made on the first screen, this is sent to the grate jig and the rock is removed and goes to the rock conveyor, the coal and bone passes on to a roll and from thence to a shaker of 4 decks on which egg, stove, chestnut, pea and fine coal is made. The egg coal from the lump shaker as well as that from the grate shaker unite and go to the egg jigs for treatment. The stove coal goes to the stove jig, the chestnut to the chestnut jigs and the pea to the pea jigs. The fine coal from the lump shaker unites with that from the grate shaker and the fine coal from the grate shaker unites with that from the lump roll shaker and that from the first grate roll shaker and the whole combination passes to a shaker having 4 decks on which pea, buckwheat, rice, barley and culm are made. The pea coal goes to the pea jig for treatment but the buckwheat, rice and barley go to their proper pockets while the culm passes to the culm conveyor.

The coal from the lip screens, from the various jig screens, and from the bone coal rolls is taken by an elevator to the second grate roll shaker for retreatment. The rock from the rock conveyor is transported to a concrete pocket in the rear of the building and from there hauled by locomotive to the rock dump.

Are All Men Equal?

By Thomas Hogarth
McIntyre, Pa.

WE ARE reading in the papers a good deal about Bolshevism, communism and a lot of other" isms" that claim they are *it*. No one can deny that as far as human nature is concerned, we all come into existence in the same way. We are all on an equal footing at that stage of life, and up to a certain age remain so. But from the time when we commence to think for ourselves, we become individuals, and from then on it is next to impossible to find two persons either in temperament or personality identical. What gives one pleasure or satisfaction may be a bore to the other.

Some people tell us that the only true way to live is to be all on an equal footing. Communism as I understand it, is life as one community, all sharing alike; the farmer, tilling the ground and raising enough food to supply the other workers, the miner producing the coal for the farmers and other industries; the other industries producing their different goods, and pooling them each individual taking enough food and clothing for his needs. In such a state of society no money will be needed.

This looks beautiful on paper, and I expect to reach this state of existence in the next world, but not while we are living on the surface of this old earth as human beings.

Let us just look squarely at life. Take the farmer and any other individual. For about six months in the year the farmer is working all the hours that he can see and feeds his stock by lantern light. Then after he has all his crops gathered in, and the weather is too bad for him to work in the fields, he has a comparatively easy time of it, and his life is fairly worth living. Some farmers, however, that live near a mine or some industrial establishment and are anxious to make a little extra money, will go and work in, we will say, the mine, until the weather will permit their getting onto the land again.

Consider The Miner

Now consider the miner under a communistic regime. He works, we will say, normally, six days a week, and eight hours a day. If he (for any reason) desires a day off he will have to state his case to the soviet and if it can find that he has a good excuse he can go, but he must be back for the next day, or there will be nothing for him to eat. The miner will then find fault with the farmer, and say he has no business to be away from his business during the winter and will not want him to take food out of the pool during the days he cannot work.

What will become of the output? The men will go to work at say seven in the morning. It may be that each man will have to produce a certain amount of coal for his day's work. One man is a good miner and an efficient worker. He produces his stint in three or four hours. The man in the next place takes eight or nine to secure the same tonnage. Those two are not going to be friends very long.

Then there are some wet places to be worked. One man will say, "I am not going to work there. I want a dry place." There will be no boss. How can there be any boss when all are equal? Furthermore, some men will not be willing to load coal and receive the same pay as the man who runs the motor. All of these are fruitful sources of misunderstanding, contention and strife.

Then coming right down to equality, some men have a natural gift for music, some for painting, and still others for breaking in horses. What man will spend ten or more years of hard study and then receive the same consideration as the man who is digging ditches? It is not human nature. Some men are constantly scheming to do something bad; others spend their time in doing all the good they can. Some men delight in war and fighting; others take pleasure in nothing but peace.

I have had a long mining experience and I have always found that it was possible for two men to work together and agree. But it is next to an impossibility to keep four or more men working in the same place and have all satisfied to share and share alike.

Those people who profess to advocate all this communistic tommyrot know well that what they are preaching is an utter impossibility and that it is through selfish motives that they preach it. Communism may come when we step over that line called death—but not before. It may be immortal but it is not mortal. To obtain such a state of existence will be to attain a beautiful heaven. And this cannot be on this side of the grave. How is it that so many believe these impossible theories? It must be through ignorance.

Damages for Conversion of Coal.—Where a railway company appropriates to its own use coal entrusted to it for transportation to the shipper's customer the measure of compensatory damages recoverable against the company is the market value of the coal at the point of destination, less the cost of transportation.

The motive which controlled the railroad in the conversion of the coal is no defense, although it may be shown where exemplary, as well as compensatory, damages are claimed by plaintiff. (*Tennessee Supreme Court, Roth Coal Co. vs. Louisville & Nashville Railroad Co., 215 Southwestern Reporter, 404.*)

How Bituminous Coal Can Be Safely Stored*

Almost Any Coal Can Be Successfully Stored if Only Adequate Precautions Are Taken in the Storing Process—Methods by Which Coal Can Be Safely Stored With Costs of Such Storage

By H. H. Stoek†
Urbana, Ill.

Although the necessity for storing coal was brought prominently to the attention of every one by the coal shortage during the winter of 1917-18, this was considered merely as one of the incidents of the world war and the lesson was promptly forgotten. When on Nov. 1, 1919, only about 70 per cent of the bituminous-coal output was stopped by a strike, the lack of coal on which to draw soon made it necessary to impose many of the war-time restrictions, thus demonstrating that in peace as well as in war times, the coal supply of the country is being furnished on a hand-to-mouth basis with a small reserve for emergencies. In this connection, Secretary of the Interior Lane in his annual report says:

> The coal strike has brought concretely before us the disturbing fact that modern society is so involved that we live virtually by unanimous consent. Less than one-half of 1 per cent of our population quit their work of digging coal and we are threatened with the combined horrors of pestilence and famine.
>
> It did not take many hours after it was realized that the coal miners were in earnest for the American imagination to conceive what might be the state of the country in, perhaps, another 30 days. Industries closed, railroads stopped, streets dark, food cut off, houses freezing, idle men by the million hungry and in the dark—this was the picture, and not a very pleasant one to contemplate. There was an immediate demand for facts.

Among the facts mentioned by Secretary Lane are: "Who is to blame that so small a supply is on the surface?" "Why should we live from day to day in so vital a matter as a fuel supply?" Recently, when rereading the Presidential address of Abram S. Hewitt for the Institute at the Centennial meeting in 1876, I was struck by the following, which shows that regulation of the coal business is by no means a new problem:

> And besides economy in mining and care in preserving, there must be regularity and stability in the operation of the mine. There can be no real profit where these operations are subject to constant interruption, caused by strikes or other artificial impediments. The loss of interest on the plant at the mines and in the lines of transportation, caused by any serious stoppage to the works, would, of itself, be sufficient to render investments of this kind unprofitable. Hence, the output must be regulated

MANY THOUSANDS OF TONS OF COAL IN A BIG STORAGE YARD

One of the most flexible [illegible] yet devised for handling coal to and from storage is the locomotive crane equipped with a grab bucket. No less than three of these machines may be seen in this picture.

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*Paper presented before the February meeting of the American Institute of Mining and Metallurgical Engineers, New York.

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> and proportioned to the wants of the market. But this regulation must be continuous and not spasmodic. To enable this to be done, large stocks of coal must necessarily be kept on hand, in order that any sudden demand may be properly met without any serious increase in price; and in dull times, the accumulation and restoration of the stocks will give ready employment to the miners to whose families the cessation of work is a calamity of the most serious character.

The solution of this part of the coal problem is of vital interest to the miner and operator who furnish the coal; to the railroads that transport it, to the wholesale and retail dealers who distribute it, and to all who use it for domestic or industrial purposes.

The storage of 5 to 10 per cent of the total yearly output of anthracite at the upper Great Lakes ports, to take advantage of water transportation during the summer and near the seaboard and even near the mines, together with the increased summer buying for domestic use, has done much toward equalizing the monthly production of that field and has actually caused greater monthly production during the summer than during the winter months.

THIS CRANE SUCCESSFULLY "PUTS IT OVER"

To the left a locomotive crane provided with a special bent boom is shown in the act of discharging a bucket of coal that has been taken from the storage pile.

RIFLES A COAL PILE AS NEATLY AS A "TRANSOM JUMPER" ENTERS A STORE

At the right the crane is digging coal from the opposite side of the trestle. The special boom, with which this machine is fitted, permits this operation to be successfully accomplished.

SPECIAL MACHINES ARE SOMETIMES BUILT FOR STORING AND RECLAIMING COAL

The storage of anthracite and the storage of bituminous coals are by no means parallel problems; and certain difficulties must be overcome in connection with bituminous-coal storage that do not apply to anthracite. However, I believe that, although the problem is more difficult, it is feasible to store bituminous coal in large amounts so as to provide an adequate safety valve for the industry which will greatly help the present just complaint of miners, operators and railroads due to slack working of the mines during the summer months.

The seasonal nature of the demand for coal and the unequal distribution of working time throughout the year and similar statistics have been forcibly presented by Doctor Smith and others.

The reason for the purchase of greater amounts of coal during the spring and summer months than are needed for current consumption and for the storage of the excess are briefly as follows:

(1) To assure the consumer an adequate supply which protects him against strikes, other labor disturbances, and uncertain railroad deliveries.

(2) To take advantage of water transportation and low freight rates.

(3) To secure the advantages of low prices.

(4) To equalize the prices on different sizes of coal.

(5) To avoid the maintenance by the railroads of equipment that is used for only part of the year.

(6) To maintain a uniform rate of production at the mines.

These reasons and advantages are axiomatic to engineers and need no further comment. Assuming then that spring and summer purchase and storage of coal are advisable, the following questions naturally arise:

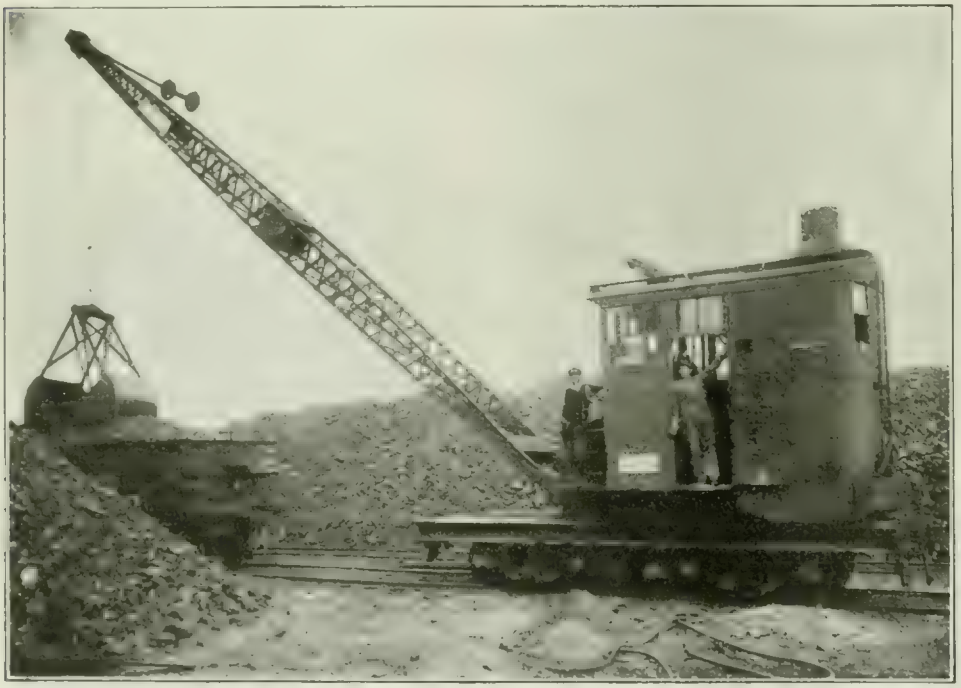
1. Where and by whom should coal be stored? The storage should be as near as possible and practicable to the point of actual consumption so as to insure to the user a steady supply and to avoid the extra cost and extra breakage incident to each rehandling and, also, so as best to utilize the transportation facilities. Storage at the point of actual consumption is, of course, frequently out of the question, for many householders have not adequate space in their cellars, since in the planning of houses sufficient attention is not given to the placing of the fuel supply. In the congested business districts of cities, space is too valuable for renting purposes to permit its use for storage; in such cases storage in any quantity at the point where the fuel is to be used is impracticable.

Many of the large users of coal provide a storage supply on the outskirts of the city or outside of the city limits, within the range of suburban railroad service or even motor-truck hauling distance. A striking example of this is the Commonwealth Edison Co., of Chicago, which in addition to storage piles at each of its power houses within the city keeps a supply of several hundred-thousand tons just outside the city limits. Some of this coal has been in storage for about 10 years; the supply is kept mostly for emergency purposes and is not drawn on for current uses. Most of the stored material is the ordinary central Illinois product from which all of the fine coal below 1¼ in. has been removed. There has been practically no trouble from spontaneous combustion. During the strike of 1919, this storage supply was reduced to about 15,000 tons. Public-utility companies, byproduct coke ovens, and other metallurgical industries must store to insure continuous operation of their plants.

The ordinary coal dealer handles a comparatively small amount of coal, frequently not over 5,000 to 7,000 tons per year. This means that he cannot install expensive storage appliances unless he combines with a number of competitors. I do not know of any such combination storage among retailers. One company in Rock Island, Ill., has a number of storage bins, which it rents to retail dealers.

The large wholesale dealers, notably those who distribute water-borne coal from the upper Lake ports, must store hundreds of thousands of tons of coal throughout the summer and fall for distribution throughout the Northwest during the winter season. Municipal storage has been suggested, but the nearest approach to such a scheme is the storage yards of the U. S. Government in Washington, D. C., administered under the Bureau of Mines.

The railroads are interested in storage, not only as a transportation problem, but because they are the largest users of coal, using 25 to 30 per cent of the entire output. The coal-mine operator is interested in storing as an operating proposition that will enable him to run his mine more days per year and per week than he is able to do under present conditions. The car supply at the mine during the early part is usually better than during the latter part of the week, and by placing coal in storage he can take advantage of any extra cars that may thus be on hand. The demand for the different sizes of coal varies with the seasons, and by having a storage pile he is able to supply this demand to better advantage. With storage facilities he can also fill out a day, even though the car supply may be short at the beginning or end of that period.



TRANSFERRING COAL FROM A CAR TO STORAGE

Flat-bottomed or gondola cars are particularly adapted to unloading by means of a grab bucket. Hopper-bottomed cars may be discharged from a trestle or into a pit and the coal picked up afterward.

Since the problem concerns the producer, the transportation company, the distributor, and the consumer of coal, the benefits and the burdens arising from the storage of coal should be shared by all concerned. In ordinary times, the householder and the power-plant user are interested in storage merely as a matter of personal insurance against lack of supply; they are not interested in the economic advantages that may accrue to the mining companies and the railroad. Their interest must be stimulated by a share in any economic advantage that may come from storage. It is, therefore, advisable, and under normal conditions necessary, that a reduction in price be made during the spring and summer months to stimulate storage by the user. Many cannot pay the winter coal bill in a lump sum, and to provide for deferred payments the coal dealer usually adds 25c. per ton, which nets him about 6 per cent on coal sold at $5 per ton. During the war certain banks and municipalities proposed the loan of money with stored coal as security.

If the mine operator is to be benefited by storage through the more steady operation of the mines, he should expect to pay for this benefit by a slightly lower price during the summer and spring. If the railroad is to benefit, it should be allowed to differentiate in freight rates during the spring and summer. Also, where storage can be made only part way between the mine and the market, a through freight rate should be granted, permitting storage at the intermediate point without losing the advantage of the through rate to the normal market.

A shifting of only 50,000,000 tons from winter to summer will cause the production curve to be more evenly distributed, and this 10 per cent of the total production should be easily transferred from the winter to the summer months and be absorbed by the various industries that will be benefited.

2. Are all kinds and sizes of bituminous coal equally adapted to storage? All of the evidence available seems to show that the size of the coal, its freedom from dust, and the way in which it is piled are much more important elements in avoiding the inconvenience, and sometimes loss from fire, due to spontaneous combustion, than the choice coal from a certain mine or mining district.

All varieties of bituminous coal have been stored without spontaneous combustion resulting, and it is equally true that all varieties of coal have fired when stored, except possibly anthracite. This does not mean that all coals store equally well, as there is undoubtedly a difference in storage qualities in coal from different districts and even from mines in the same district. The kind of coal that is to be stored should be inquired into and, when possible, coals that are known to be particularly liable to spontaneous combustion should not be selected.

Origin Does Not Determine Storing Qualities

There is an erroneous, misleading, but widespread opinion that the locality from which the coal comes determines whether or not it can be stored. One frequently hears such remarks as "Eastern coals (meaning those from Pennsylvania and West Virginia) can be easily stored, but Western coals (meaning those from Illinois and Indiana) cannot as they are much more liable to spontaneous combustion." Both parts of this statement are too broad, for scientific research and the experience of those storing coal, as shown by the questionnaire sent out by myself, agree that while there are undoubtedly differences in different coals that affect their liability to spontaneous combustion and also to degradation, these differences are of less importance than the size of the coal stored, the care with which it has been prepared, and the way in which it is placed in storage. The answers to the questionnaire indicate that any coal can be stored, if it is properly piled, and that any coal improperly stored will heat and may fire.

There are not sufficient data available at this time to classify coals as to their liability to spontaneous combustion and it is doubtful if this ever can be secured, because liability to spontaneous combustion does not seem to be an inherent quality of the coal from any given seam, district, or mine; it seems to depend more on the size of the coal, its freedom from dust, to a less extent the amount of pyrite (sulphur) present and to a great extent upon the way in which it is piled.

The spontaneous combustion of coal arises largely from the oxidation of the fine material and dust and the confining of the resulting heat; consequently, the liability to spontaneous combustion in stored coal is greatly reduced and in many cases eliminated, if dust and fine coal can be kept out of the pile; if the coal is of such size and is so piled that there is a sufficient air-current throughout the pile to carry off the heat due to the oxidation that goes on, so that the material is not heated at any point to the ignition point; if the coal is so closely packed that sufficient air cannot come in contact with the fine coal to cause oxidation. It should not be forgotten that for every case of spontaneous combustion in a coal pile many instances can be cited where no heating has occurred.

Many consumers are afraid of spontaneous combustion, or of deterioration in the value of coal. For such amounts as are required by the ordinary householder, say from 10 to 20 tons per year, it can be stated positively that there is little or no likelihood of spontaneous combustion. Even if the coal heats slightly, this can be detected readily and the coal moved and cooled off without danger of setting fire to the building in which it is stored. Coal usually heats slowly, and there is little fire risk to the building in which the coal is stored, even in amounts up to 500 or 1,000 tons. The heating is easily detected by the odor given off from the pile a considerable time before there is any danger of actual combustion.

Clean-screened coal of a uniform size should be chosen for storage if possible. The larger and more uniform the lumps the better, so as to give an open-texture pile. Coal of one size is, therefore, better than a mixture of sizes. Sized coal should not be stored upon a foundation of fine coal.

The coal should be handled in such a way as to prevent breakage as much as possible. If there is a choice of coals for storage, the least friable should be chosen and the one in which there is the least fine material. Breakage not only produces dust but the fresh surfaces of coal oxidize more readily than the weathered ones. Coal should not be dropped upon a pile from a height, but the bucket or other receptacle should be lowered to the pile before being dumped. In every case of a fire in so-called lump coal investigated, it was found that the coal had been dropped through a considerable height, so that coal on the pile was far from being lump coal and contained a large amount of dust.

Size Segregation Must Be Prevented

While many varieties of mine-run coal cannot be stored under ordinary conditions, because of the presence of fine material and dust, such coal has been successfully stored in small low piles. In storing, mine-run coal should be piled in uniform layers and segregation of the sizes prevented. The piles should be as low as space will permit, carefully watched, and provision made to move the coal quickly if heating occurs.

In general, fine coal or slack is more liable to spontaneous combustion than clean-sized coal or, usually, run-of-mine. If stored, it should be carefully watched to detect evidences of heating. If practicable, a slack pile should be rolled with a roller so as to compact it as much as possible, and thus exclude the air, so as to give, as nearly as attainable, storage under water conditions.

Fine clean coal and slack have been successfully stored, particularly where closely packed, but the only absolutely safe way to store slack is under water.

OXIDATION PRODUCES HEAT AND BREAKS COAL

Although experimentation has shown that the sulphur contained in coal in the form of pyrite is not the chief cause of spontaneous combustion, as was formerly supposed, the oxidation of the sulphur in the coal not only produces heat but also assists in breaking up the lumps, and thus increases the amount of fine coal in the pile. Any considerable rise in temperature, either from external or internal sources, promotes the oxidation of the iron pyrites and produces heat, and thus increases the liability of the coal to spontaneous combustion. It is wise to select low-sulphur coals for storage, if obtainable, but it must not be taken for granted that a low-sulphur coal will necessarily store well or that a high-sulphur coal will fire in storage.

3. What precautions should be taken in storing coal? It seems to make little difference in the liability to spontaneous combustion whether the coal is stored under cover or in the open, but under cover there is less degradation and weathering. Storage under cover is, of course, impracticable for large amounts. If possible, a place should be chosen that is dry and well-drained; or, if not drained naturally, drains should be provided about the storage pile, not underneath it, as a drain beneath a pile may admit air-currents sufficient to produce oxidation but not enough to keep down the temperature.

STORAGE SHOULD BE ON CLEAN GROUND

Coal should not be dumped on ground covered with ashes or refuse of any kind because, in addition to furnishing flues for the admission of an inadequate air supply to the coal pile, such refuse often contains material that will assist spontaneous combustion. Furthermore, it is likely to become mixed with the coal and, when it is reclaimed from storage, the value of the coal is thus depreciated. If possible, the ground should be cleared of vegetation and leveled off, so that the reclaiming of the coal may be done as easily as possible and so that dirt and refuse will not be taken up by the shovel or other devices used in reclaiming. Some of the objections of firemen to using coal that has been stored are justified because of the dirt and other refuse that has been mixed with the fuel in taking it from the storage pile. A hard clay bottom thoroughly drained is desirable, if a concrete floor is too expensive. If possible, adequate space should be provided so that the coal can be moved to another place, if heating occurs.

Coal should not be piled around hot pipes, against a boiler or hot walls, around a chimney, nor in any place where it will be subjected to outside heat, because the liability to spontaneous combustion increases rapidly with a rise in temperature. Coal should not be stored above flues that permit small amounts of air to enter the coal; hot air, such as that from a sewer, is particularly to be avoided.

Coal should be so piled for storage that any part of the pile can be moved promptly if necessary. Coal should either be so piled that air may circulate freely through it and thus carry off any heat generated in the pile by exidation, or else it should be so closely packed that air cannot enter the pile; i.e., approximate as nearly as possible underwater-storage condition. Slack has been successfully stored in piles 10 ft. high by packing the coal as it was placed in storage by rolling, or by running a heavy truck over the pile.

Stratification or the segregation of the fine and lump coal into layers should be avoided, since an open stratum of coarse lumps provides a passage for air to reach and oxidize the fine coal, and the stratum of fine coal does not permit the heated air to pass off rapidly enough to keep down the temperature of the pile below the point of combustion.

DUMPING AT ONE POINT IS DANGEROUS

Coal should not be dumped at one point at the top of a conical pile, since then the fine material stays in the center at the top of the pile and the lumps roll to the bottom. Many fires start near the top of the pile, where the fine coal has prevented the escape of the heated gases rising through the pile. In placing coal in a cellar or bin, the same precaution should be observed, for many fires are known to have started in the fine coal near the top of a sloping cellar pile and just below the window through which the coal was shoveled into the bin.

The depth and area of storage piles will be determined largely by the storage space available and the mechanical appliances to be used for storing and reclaiming the coal. Other conditions being equal, the deeper the pile and the greater its area, the greater is the difficulty of inspecting it and moving it quickly, if necessary. Hence a number of small piles, if practicable, are better than one large pile. Lack of space, however, usually prevents such spreading out of coal. It is impossible to advise exact heights, as much depends on the kind and size of coal and the local conditions, but the lower the pile the better.

Inflammable material, such as waste, paper, rags, wood, rosin, oil, and tar in a coal pile, often form a starting point for a fire; every effort should be made to keep such material from the coal as it is being placed in storage. Timbers extending to the outside of the pile may permit the entrance of air. The admission of air into a coal pile around the legs of a trestle, through a porous bottom such as coarse cinders, or cracks between boards, etc., should be avoided. Coal should not be piled about timber posts.

IS VENTILATION ADVISABLE?

The effect of ventilating coal piles is a disputed point, but the weight of evidence in the United States seems to be against the practice. This may possibly be due to the fact that ventilation has been inadequately provided. Imperfect ventilation, such as is generally attempted in the United States, is certainly disadvantageous. Reports from Canadian practice favor ventilation by pipes placed close together in the coal pile.

4. Is coal that has been in storage inferior to freshly-mined coal? The heating value of coal, as expressed in B.t.u., has been shown, by the experiments of the U. S. Bureau of Mines and by Professor Parr at the University of Illinois, to be little decreased by storage and practically not at all with underwater storage. The opinion is widespread, however, but by no means universally held, that storage coal burns less freely than fresh coal. It must be remembered that sometimes the apparent deterioration is due not to any change in the coal but to the fact that the clam shell, or other reclaiming device, digs into the soil under the coal pile and mixes soil or refuse with the reclaimed fuel.

Experiments at the University of Illinois indicate that storage coal may be burned as readily as fresh coal in a stationary plant if a thinner bed is kept and the draft regulated properly. Some of the prejudice against storage coal is due to the weathered condition of the outside of the pile. The amount of degradation due to storage depends on the kind of coal stored and the way in which it is handled. The coking properties of some roads seem to decrease after storage and also the gas-making qualities, but coals vary greatly in these respects.

PUTTING COAL INTO STORAGE

The long boom on the crane together with its full-revolution sweep permits a large amount of coal to be stored from one point.

5. What does it cost to store coal? Like all cost data, the expense of storing coal has been difficult to obtain. In the preparation of a Circular 6, I attempted to gather cost figures under the following heads:

Cost of	Storing	Reclaiming
Overhead		
Labor......		
Supplies..................		
Depreciation on mechanical equipment		
Interest on investment..................		
Rental on land on which coal is stored..		
Insurance on equipment...............		
Insurance on coal............		
Totals........		

Not one of the many questionnaires sent out brought such itemized costs and, in most instances, the cost of storage and reclaiming were not differentiated. Most of the costs furnished included only labor and, sometimes, supplies, with no account of truckage, rentals, and other overhead and capital items.

The figures collected in 1917-18 showed a variation of from 1.5c. to 34c. per ton for storage and 2c. to 20c. per ton for reclaiming and a total variation for storing and reclaiming of from 4c. to 54c. The cost for storage and reclaiming by steam shovel or locomotive crane averages from 10c. to 20c. for labor and materials.

The Great Lakes Dredge & Dock Co. gave the cost of an underwater pit to hold 10,000 tons of slack built for the Standard Oil Co. of Whiting, Ind., as $3.30 per ton. The same company estimates the cost of unloading cars with a locomotive crane as 10c. per ton and the cost of reclaiming from the pit with the crane as 10c. per ton. At this particular plant, there is adequate track room so that the train of coal cars can be quickly unloaded; and in any storage scheme a saving in car demurrage should be considered as one of the items to offset any additional cost of storage.

Heretofore, probably the commonest type of storage and reclaiming device has been the locomotive crane; but with the newer type of hopper-shaped "battleship" coal cars, there are so many rods and braces that a clam-shell bucket cannot be used. One utility company that has previously used the clam-shell bucket for storing and reclaiming large amounts of coal says, "Very soon some other form of unloading device must be adopted where the coal is delivered in battleship cars." A Byers autocrane costing $6,000, with a capacity of 300 tons per day, is said to handle coal for 8c. per ton.

In 1917, the cost of storing and reclaiming with the locomotive crane was reported, by the Atlantic Coast Line, as 4c. to 5c. per ton; the same company reports that at present the cost with the same apparatus is 8c. These costs are below those generally reported, which varied from 5c. to 10c. per ton for labor and materials for unloading and a like amount for reclaiming. The Atlantic Coast Line reports the present cost of storing when the pile is gradually built up from a track laid on top of the coal as 40c. per ton. The cost of storage in the government fuel yards at Washington is given as 27.8c. per ton.

A Barber-Green type of storage plant of combined fixed and portable conveyors at Mooseheart, Ill., cost $4,600; the cost of storing and reclaiming is estimated to be 20c. per ton.

The Macdonald Engineering Co. of Chicago reports that four concrete silos with a capacity of from 1,000 to 4,000 tons each cost $10 per ton of coal for erection; that the labor costs of unloading is only ½c. per ton; and the cost of reclaiming even less than this amount. This company has a new type of rectangular concrete bin, which it claims can be built for $4 per ton.

The Creamery Package Manufacturing Co. estimates, for round silo storage bins of not less than 1,000 tons capacity, a cost per ton of coal: $3.50 for building the main structure; $1 for a roof and machinery house on top of the silo; $1 to $3 for foundation and track hopper; and $1 to $3 for elevating and conveying machinery; a total of $6.50 to $10.50 per ton of capacity. The company estimates $10 per ton as probably a fair price at the present time.

J. L. Pipe, of Quincy, Ill., in *Black Diamond*, for Jan. 31, 1920, gives the following costs for handling 15,000 tons per annum through a concrete silo pocket holding 400 tons. This silo is divided into four compart-

A TRACK HOPPER OR PIT IN A STORAGE PLANT

Hopper-bottomed cars may be discharged to the pit under the tracks, and from here transferred to storage. Such a [illegible] some advantages over a trestle.

ments and a 50-ton car can be unloaded into it in 45 min. at a labor cost of 78c. as compared with 45c. in 1918. In 1918, electric power for operating the plant cost 30c. per car as compared with 40c. in 1919. The pocket cost $3,600 in 1916; at present, the price would be $6,000. The machinery, in 1917, cost $976; the cost today would be $1,700. The total cost, in 1916, was $5,035; the present cost would be $8,000.

In the same issue of *Black Diamond*, the storage plant of F. Schroeder of Mishawaka, Ind., is described. The plant consists of four concrete stave-construction silos, each holding 300 tons and each costing $1,200 for construction. The coal is handled by a Godfrey monorail bucket and the entire plant cost $3,300, the estimated cost for handling being from ½c. to 3c. per ton unloaded.

C. A. Pennock, chief engineer, Western Electric Co., gives the cost of storage at 8c. in 1919, as against 5c. in 1917; the cost of reclaiming as 9c. as against 4c. in 1917, a total of 17c. against 9c. two years ago.

The Brown Portable Conveying Machinery Co. quotes prices for a portable machine that would elevate to a maximum height of 12 ft., equipped with an electric motor, $729; or, equipped with a gasoline motor, $779. To elevate 9 ft., the prices are $600 and $663, respectively; and to elevate 6 ft. $487 and $558, respectively. All of these machines have a 16-in. belt suitable for handling run-of-mine coal. The Godfrey Conveyor Co. quotes the cost as being 5c. per ton for unloading coal from cars to storage and from 8c. to 10c. for reclaiming from storage point to point of consumption. The Brown Hoisting Machinery Co. gives the following capacities and operating costs for locomotive cranes:

OPERATING COSTS FOR LOCOMOTIVE CRANES

						Hourly Capacity		Cost per Ton	
Size, Tons	Boom Ft.	Maximum Capacity Cu.Ft.	Radius, Ft.	Price	Cost of Operation, Daily	Coal from Pit or Flat Bottom Cars, Tons[a]	Reclaiming from Pile to Car, Tons	Unloading, Cents	Reclaiming, Cents
30 40	50	70	45	$26,000	$25	75–125	100–150	3 1	2.5
15	44½	54	40–45	16,000	20	50–100	75–125	3.3	2.5
10	40	40	35	12,000	15	40–80	60–100	3.1	2.3

[a] Includes wages of operator, fuel, oil, waste, etc., 6 per cent. interest on investment, and 10 per cent. depreciation.

These figures are probably based on continuous operation and are seldom obtained in the actual practice of storing coal.

The method of storing coal may be included under the following general headings: Hand operated, wheelbarrows, etc., by motor trucks, side hill without a trestle, trestle storage, locomotive-crane storage, circular storage, combined trestle-and-crane system, mast and gaff, steeple towers, movable bridges, buckets moving on monorail or cableway, silo storage, conveyor belts, portable and semi-portable conveyors and underwater storage.

For the illustrations contained in this article *Coal Age* is indebted to the Link-Belt Co. of Chicago.

The photographs used herein show the equipment of that con[illegible]

Liability for Contract Interference.—One who by himself or conspiring with others induces another to break his contract of employment with a third person, to the injury of that person, is liable in damages for the injury sustained by him, whether the injury done was for the benefit of the wrongdoer or not.

Hence, if a coal company's officer, acting within the scope of his employment, wrongfully induced another company to discharge plaintiff from its employment, the coal company is liable to damages. *West Virginia Supreme Court of Appeals, Carter vs. United States Coal & Coke Co., 100 Southeastern Reporter, 405.*)

How Much Coal Does Ireland Have?

Needs Are Estimated To Be Five Million Tons Annually—No Coke Is Imported—Irish Coal Is Mostly Semibituminous

Consul F. T. F. Dumont, Dublin, Jan. 30, states that the coal production of Irish mines in 1919 was estimated at 95,000 long tons, the Castlecomer mines (Kilkenny) furnishing 60,000 tons, the Wolfhill mines (Queens) 14,000 tons, the Arigna mines (Roscommon) 17,000 tons, and the Slieveardagh mines (Tipperary), 4,000 tons. This is said to be the average production for some years. All of these mines, except the last-named, are in the Dublin consular district. Small deposits of lignite are reported to exist in Lough Neagh in the Province of Ulster and at Ballycastle in County Mayo. In addition, extensive peat beds exist throughout Ireland and a considerable amount of peat is cut for domestic use each year, but no estimate of the quantity produced is obtainable. To stimulate the mining of coal, a small grant was made by the Government a short time back, but no gain has been recorded as yet.

For the cheaper and better distribution of the coal mined an extension of 9 miles of railway from Athy to Wolfhill was completed during the past year, and there is under construction from Dunmore West Station, on a branch of the Great Southern & Western Ry., a 10-mi. railway to the Castlecomer mine. Enthusiasts predict that when these two railways are completed a great increase in output may be looked for from these mines. Various estimates, running as high as 300,000,000 tons, are made of Irish coal deposits that can be made commercially available. The coal is mostly of the English "anthracite" type.

IMPORTS AND CONSUMPTION

Irish needs in the way of imported coal are estimated to be nearly 5,000,000 tons a year. That this estimate is about correct is shown by the figures of imports for 1914 and 1915, which were officially reported at 4,470,833 and 4,578,627 tons, respectively. Official figures show that Belfast imported 1,321,434 tons in 1917 and 1,368,248 tons in 1918. Dublin imported 1,146,916 tons in 1916 and 1,217,516 tons in 1917. Outside of these two, Londonderry, Queenstown, Waterford, and Dundalk import considerable quantities, while Drogheda, Sligo, Galway, and Limerick are of minor importance in the trade.

The consumption of coal in Ireland is distributed as follows: Domestic use, 2,115,000 to 2,615,000 tons; industrial works, 1,400,000 tons; railways, 460,000 tons; gas works, 400,000 tons; miscellaneous, 125,000 tons. The item "Miscellaneous" includes electric-light plants. No coke is imported, but coke from gas plants is sold in the big cities. Peat is in use everywhere throughout the country districts. All of the coal imported is from Great Britain and is carried in English bottoms. Most of the steamers engaged in the trade are of small tonnage and carry no other cargo. Within the next year it is hoped that larger steamers will be available.

Both Belfast and Dublin quays are equipped with electric and hydraulic cranes ample in capacity to unload 150 tons per hour from each ship into railway cars alongside. Dublin has 12 electric cranes in operation, each of 50 tons per hour capacity, ranged three to each ship of any size, besides eight hydraulic cranes.

Canada's Coal Production Declines[*]

Decrease in Coal Output in 1919 Is 9.3 Per Cent, the Value Dropping 2.1 Per Cent — Canada Makes 8.9 Tons of Byproduct Coke to 1.1 Tons of Beehive as Against 5.4 Tons of the Former to 4.6 Tons of the Latter in the United States

EARLY estimates of the coal production during 1919 made in December underestimated the production during the last two months of the year. In the Province of Alberta there had been practically no production of bituminous coal during June and July and only a small production of lignite. These operations were but slowly resumed late in August, but during October, November and December, the production in this province exceeded the highest monthly rate previously reached. The total production of marketable coal during 1919 (comprising sales, colliery consumption and coal used in making coke, or used otherwise by colliery operators) was 13,586,300 short tons valued at $54,051,720, or an average of $3.98 per ton and was, with the exception of 1915, the lowest tonnage production recorded since 1911. The total value, however, on account of higher prices was but little less than that of the previous year, which had been the highest recorded.

Ontario, with no mines, produced two-thirds of a million tons of coke, an increase of nearly a quarter-million of tons. British Columbia's coke output declined over 52 per cent while Alberta made no coke at all, yet these are coal provinces. The gas from the coke ovens was equivalent to over one-third of the total production of natural gas in Canada.

The total production in 1918 was 14,977,926 tons valued at $55,192,896, compared with which the 1919 production shows a decrease of 1,391,626 tons, or 9.3 per cent, and $1,141,176, or 2.1 per cent in value. The total output of coal, including waste and unmarketable slack in 1919, was 14,041,655 tons, as against 15,460,385 tons in 1918. The 1919 production included 73,893 tons of anthracite, all from one mine in Alberta, 10,629,697 tons of bituminous coal, and 2,882,710 tons of lignite. The production in 1918 included 115,405 tons of anthracite; 11,636,190 tons of bituminous and 3,226,331 tons of lignite.

In Saskatchewan only has an increased production been shown in 1919. The largest decrease in tonnage was in Alberta, but the heaviest percentage decrease was in New Brunswick. The Nova Scotia production fell off by 116,246 tons or less than 2 per cent and has been exceeded in twelve out of the thirteen preceding years. New Brunswick's output decreased by 90,236 tons, or 33.6 per cent, though the 1919 production has been exceeded in the two preceding years only. Saskatchewan's production increased by 35,120 tons, or 10 per cent, and was the highest that has been reached in this province.

Although Alberta fell off 1,079,086 tons, or 18 per cent, the production was notwithstanding, higher than that of any previous year with the exception of 1918. The production during December, 1919, in this province was 742,482 tons, including 458,223 tons of lignite and 284,259 tons of bituminous and anthracite. British Columbia's production was less by 139,378 tons, or 5.4 per cent, and has been exceeded seven times in the past ten years.

The exports of coal in 1919 were 2,070,050 tons, valued at $12,438,885, or an average of $6 per ton, as against exports in 1918 of 1,817,195 tons, valued at $9,405,423, or an average of $5.17 per ton, showing an increase of 252,855 tons, or 13.9 per cent in quantity.

The total imports of coal of all classes in 1919, "entered for consumption" as recorded by the Department of Customs, were 17,308,837 tons valued at $61,160,799, as against imports in 1918 of 21,678,587 tons valued at $71,650,584. The record shows a slight increase in the imports of anthracite coal, but a decrease in the imports of bituminous coal.

The estimated consumption of coal based on production, exports and coal imported as "entered for consumption" amounted in 1919 to 28,768,099 tons, as compared with a corresponding consumption in 1918 of 34,771,832 tons.

The 1919 consumption included approximately 5,026,568 tons of anthracite; 20,858,821 tons of bitu-

OUTPUT[1] AND PRODUCTION[2] OF COAL IN SHORT TONS, 1918 AND 1919

	1918				1919			
	Output	Production	Value of Production	Average per Ton	Output	Production	Value of Production	Average per Ton
Nova Scotia	5,836,370	5,818,562	$21,095,470	$3.63	5,785,929	5,702,316	$21,920,047	$3.84
New Brunswick	266,585	268,312	1,331,710	4.97	177,307	177,976	792,876	4.46
Saskatchewan	348,988	346,847	722,148	2.08	382,649	381,967	834,358	2.18
Alberta	6,126,443	5,972,816	20,537,287	3.44	4,990,726	4,983,730	18,184,429	3.72
British Columbia	2,879,099	2,568,589	11,494,681	4.47	2,703,845	2,429,211	12,315,610	5.07
Yukon Territory	2,900	2,900	11,600	4.00	1,200	1,100	4,400	4.00
Total	15,460,385	14,977,926	$55,192,896	$3.68	14,041,655	13,586,300	$54,051,720	$3.98

[1] Output includes waste and unmarketable slack. [2] Production includes sales, colliery consumption, coal consumed by operators in making coke, or for other uses

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[*] Extract from the "Preliminary Report of the Mineral Production of Canada During the Calendar Year 1919," by John McLeish, Chief of the Division of Mineral Resources and Statistics, Mines Branch, Canadian Department of Mines Feb. 28, 1920. Presented in person by John McLeish at the meeting of the Canadian Mining Institute, March 8, 1920. The figures as to the United States coke output in the subtitle are not a part of this report.

IMPORTS OF COAL INTO CANADA, 1918 AND 1919

	1918			1919		
	Tons	Value	Ave	Tons	Value	Ave
Bituminous, round and run-of-mine	13,656,360	$37,291,057	$2.73	10,127,965	$24,750,717	$2.44
Bituminous slack.	3,237,067	8,351,639	2.58	2,228,197	4,814,388	2.16
Anthracite coal and dust......	4,785,160	26,007,888	5.44	4,952,675	31,595,694	6.38
Total.........	21,678,587	$71,650,685	$3.30	17,308,837	$61,160,799	$3.53

minous and 2,882,710 tons of lignite. The 1918 consumption included 4,900,565 tons of anthracite; 26,544,936 tons of bituminous and 3,226,331 tons of lignite.

The total output of oven coke during 1919 was 1,160,470 short tons made from 1,880,541 tons of coal of which 854,835 tons were of domestic origin and 1,025,706 tons imported. The output thus averaged 0.617 tons of coke per tons of coal charged. The total coke used or sold by producers during the year was 1,133,680 tons (941,111 tons used by the producers and 192,569 tons sold) valued at $9,775,748 (partly estimated), or an average of $8.62 per ton. Of the total output 1,036,229 tons, or 89.3 per cent was byproduct oven coke and 124,241 tons beehive coke.

In 1918 the total output was 1,258,284 short tons made from 1,983,242 tons of coal of which 1,348,232 tons were of domestic origin and 635,010 tons imported, the output averaging 0.634 tons of coke per ton of coal charged. The coke used or sold by producers during the year was 1,250,744 tons valued at $11,035,195 or an average of $8.82 per ton. Of the total output 879,066, or 70 per cent was byproduct coke and 379,218 tons beehive coke.

Production By Provinces

By provinces the production was: Nova Scotia 580,433 tons; a decrease of 197,180 tons; Ontario 649,506 tons, an increase of 224,419 tons, due to the operation of the new ovens at Hamilton; British Columbia 100,356 tons, a decrease of 112,214 tons; no ovens were operated in Alberta, though a few hundred tons were sold from stock pile.

The ovens operated during the year were those at Sydney and North Sydney, N.S., Hamilton and Sault Ste. Marie, Ont., Fernie, Michel, Union Bay and Anyox, B. C. At the close of the year 587 ovens were in operation and 2,209 were idle. There were completed during the year 60 Koppers ovens at Sydney; 25 Williputte ovens at Sault Ste. Marie, and 30 Lomax regenerative ovens at Anyox, B. C. Of the total number of ovens 2,796 listed as operating and idle, 1,010 were of the byproduct type and 1,786 Beehive, Bauer and Bernard.

The exports of coke in 1919 were 14,809 tons valued at $129,703, or an average of $8.75 per ton, as against exports in 1918 of 29,612 tons valued at $223,629, or an average of $7.55 per ton. The imports of coke in 1919 were 383,374 tons valued at $2,405,740 or an average of $6.27 per ton as against imports in 1918 of 1,165,590 tons valued at $8,975,445, or an average of $7.70 per ton. The estimated consumption of oven coke in 1919 was 1,502,245 tons as compared with 2,386,722 tons in 1918 and 2,192,373 tons in 1917.

The recovery of byproducts at Sydney, N. S.; Hamilton, Sault Ste. Marie, Ont., and Anyox, B. C., included: Sulphate of ammonia, 11,765 short tons and tar 12,394,249 gal. as compared with 10,825 tons of sulphate of ammonia and 8,009,327 gal. of tar in 1918. The quantity of gas recovered in 1919 was 9,340 million cu.ft., or equivalent to over one-third the total production of natural gas in Canada.

British Labor Votes Against Direct Action

Decides, 3,870,000 to 1,050,000, Not to Call General Strike to Force Nationalization of Mines

ARTHUR S. DRAPER of the New York *Tribune's* European Bureau states that on March 11 the moderate forces in British labor won a decisive and highly important victory when the Trades Union Congress decided by a vote of 3,870,000 to 1,050,000 against the use of direct action or a general strike to force the nationalization of the coal mines.

Few labor organizations outside of the miners themselves supported the proposition to use force as a means of compelling the government to take over the mines. After the congress the leaders of the different unions said they were sure the minority would accept the decision and that there would be no break in the ranks of organized labor.

The decision is considered of profound importance because it means there will be no decrease in production in the British Isles through the cessation of work.

Two arguments against direct action which carried weight with the delegates were developed by J. R. Clynes, former Food Controller. He said that a general strike would be welcomed by Premier Lloyd George because he would then call a general election and the country would support the Premier. His other point was that direct action would be unconstitutional and political labor couldn't afford to take any unconstitutional action if it hoped to govern the country later.

Clynes thought the abandonment of direct action might mean delay in attaining the political objective of the Labor party, but it was much wiser, he thought, to progress along orderly, constitutional lines.

The decision means that the Labor politicians are in control of the situation, and that henceforth labor will fight at the polls and in Parliament. A moderate labor policy is bound to win many recruits here, they believe, because of the widespread dissatisfaction with both the Liberal and Coalition parties.

The supporters of direct action, notably Tom Mann, contended that it was merely industrial organization under a new name, and that everything labor had won had been through the use of the strike weapon or a threat to use it. He upheld political action, but said it was only supplementary to industrial organization.

Intensified political propaganda, therefore, will be labor's substitute for force. The organization of the Labor party is to be strengthened financially and plans developed for contesting the majority of the seats in Parliament at the next general election.

As there are nearly 6,000,000 organized workers—the largest number in any country except Germany—whatever they decide carries great weight with labor all over Europe. The decision emphasizes the point that there is little Bolshevism in the British labor movement, and that it is fundamentally moderate in spirit. Had the congress accepted the principle of direct action the whole country would have been thrown into confusion, and now there is a feeling of relief and optimism.

A decision in the matter of the injunction asked by the American Wholesale Coal Association in its case against the Railroad Administration has been postponed by agreement until March 19. It is hoped on that date to have all briefs ready for submission.

Canadian Mine Experts Discuss Problem of Industrial Independence

With Coal in the West and in the East, but with no Coal in the Central Provinces and Only Low-Grade Fuel Deposits in Manitoba and Saskatchewan, Canada Is Trying To Find a Way of Rendering Herself Independent of Coal from the United States

By R. Dawson Hall

Need for a greater recognition of the financial straits overwhelming departmental officials as a result of increased living costs. Coal easily leads in Canadian output, having a value exceeding that of the combined product of nickel, silver, gold and zinc. Coal occupies an unhappy position in the eyes of all Federal Departments of Mines.

CANADA is considering her resources today much as the United States did during the war. She is thinking, that is, not so much how the well-recognized mineral riches can be produced most economically, most numerously and most conservationally, but rather how some makeshifts can be adopted such as will make Canada independent of her southern neighbors. With a growing friendliness on both sides of the international border one would imagine that the readiness to accept international interdependence without uneasiness or jealousy would make rapid growth, but war is apt to suggest to any nation that friendships and mutual forbearances, however long continued, are apt at some time and for some mysterious reason to be severed incontinently. This is how Canada views the situation and the United States' War Industry Board exhibits the fact that the people in the United States are thinking along similar lines.

Furthermore, during the war the supply of coal in the central provinces of Canada depended wholly on the willingness of the citizens of the United States to deprive themselves of needed fuel in order to keep the people of Canada from a complete industrial breakdown and extreme domestic distress. The United States shared its fuel readily, as did Canada its other less necessary resources, but there was a constant feeling of dread and uncertainty as to whether the people on the southern side of the border and their Fuel Administrator would recognize their duty and fully perform it.

Canada is not without gratitude for the accommodation that was afforded, even though it was one that might fully have been expected of a good neighbor, a merchant with whom business had been done for many years, a co-belligerent and a blood relative. And yet Canada is still wondering if it comports with her dignity and her necessity to be so completely dependent on the friendliness and courtesy of her neighbor.

What will interest the mining people of Pennsylvania, West Virginia, Ohio and Illinois is that Ontario is in a measure actually solving the problem of peat utilization and that Saskatchewan and Manitoba are hopeful that they will be able to carbonize and briquet their lignite. If that can be done the domestic needs of Canada will be solved.

Whether the open-hearth and gas needs will be thus served depends on the sulphur percentage of these fuels while their employment for manufacturing purposes will depend largely on the temperature at which the ash contained will fuse. Inquiry does not seem to be directed into these channels. For the present domestic needs seem to provoke most comment.

The Canadian Mining Institute's Twenty-Second Annual General Meeting, which is the subject of this article, assembled at the King Edward Hotel, Toronto, Canada, March 8 and continued in session on the two following days completing its proceedings with an interesting visit to the works of the International Nickel Co. at Port Colborne on March 11.

It is perhaps best for *Coal Age* as usual not to weary its readers with the details of the metalliferous discussions but to pass them by as if they had not been introduced or considered. The president of the institute, D. H. McDougall, president of the Nova Scotia Steel & Coal Co., made the opening address and acted as chairman of the first session. He laid stress on the unfortunate situation in Canada in regard to the salaries of departmental officials which have not advanced with the increased cost of living. The services of such officials are getting to be almost gratuities to the public.

Nothing but *esprit de corps* and a spirit of social service, keeps these men doing their valuable work with such inadequate pay. The progress of industry, its contributions to the welfare of mankind, depend not only on the activity of business men but on the discriminating judgment and patient labor of those individuals who interpret pure science to the needs of industry. Without their help progress will be slow and haphazard. Yet the public cannot expect them to go on serving well without larger remuneration.

The staffs of the Canadian departments comprise men of large intelligence and high public ideals and it is a shame to make them suffer because of their devotion to the public weal. The public would recognize their services and reward them better in all probability were they less modest and less conservative in self appraisement, but if they spread their wares more ostentatiously, the wares would suffer though the public might buy more readily.

The Department of Mines had prepared a "Preliminary Report of the Mineral Production of Canada During the Calendar Year 1919," ready for the present session. In fact the meeting of the Canadian Mining

Institute is to be credited with hurrying this valuable governmental report and making it available to the public at an earlier date than otherwise would have been attained. In another part of this issue will appear that portion of the report relating to coal.

The author of the statistical report, John McLeish, chief of the Division of Mineral Resources and Statistics, did not point out the relative importance of coal to other minerals. Perhaps the following rearrangement of his table will give an idea how coal dominates in Canada all other minerals as it does in all well-favored mineral-producing countries.

PRODUCTION OF MORE IMPORTANT MINERALS IN CANADA 1919*

		Quantity	Value
(1)	Coal, short tons	13,586,300	$54,051,720
(2)	Nickel, pounds	44,542,953	17,817,181
(3)	Silver, ounces	15,675,134	17,418,522
(4)	Gold, ounces	767,167	15,858,749
(5)	Copper, pounds	75,124,653	14,041,549
(6)	Asbestos, short tons	136,199	10,658,946
(7)	Lead, pounds	43,895,888	3,057,788
(8)	Zinc, pounds	31,738,859	2,328,998
(9)	Salt, short tons	148,302	1,398,968
(10)	Gypsum, short tons	306,947	1,217,345
(11)	Pig iron from Canadian ore, short tons	38,457	899,406
(12)	Cobalt, pounds	336,185	840,463
(13)	Petroleum, barrels	240,970	744,677
(14)	Pyrites, short tons	177,487	522,704
(15)	Arsenic, white iron ore, short tons	3,192	408,770

*From this table mineral waters, structural materials and clay products have been omitted.

Unfortunately for coal it finds itself always classed with non-metallic minerals and must take a place inferior to the metallic minerals which happen to have the benefit of a classification under a positive and not under a negative grouping. If we could have a classification by fuel minerals and non-fuel minerals, coal would stand easily and rightfully at the head of the list. Speaking politically coal might be unenviably placed at the head as a politically regulable mineral and all the rest as minerals which apparently can profiteer to their hearts' content, though during the war even these came into the regulated class.

These remarks are not, of course, a brief of Mr. McLeish's interesting observations. His summary of coal, it may be said, was important as it shows that the department's earlier estimates, those of Jan. 1, for the whole mineral production of Canada were in error about 3.6 per cent. Such errors are bound to occur.

To quote Mr. McLeish: "Sufficient allowance had not been made" in those figures "for the increased production and increased value of cement, clay, quarry and other similar structural material products. The coal-mining industry too, during the last three months of the year, responded quickly and extensively, particularly in the Province of Alberta, to the heavy demand for fuel."

Returning to the table of the "Production of More Important Minerals in Canada in 1919" it will be seen that the value of the coal produced exceeds the combined value of the output of nickel, silver, gold and zinc—nickel, silver and gold being respectively first, second and third in the list, and zinc being eighth.

The meeting of the afternoon of Monday was devoted to papers which had exclusive reference to iron and steel. In the evening illustrated addresses were given on "Mining and Smelting Operations of the International Nickel Co. of Canada," "Mining at Cobalt" and "Operations at the Alfred Peat Bog," the last being by A. A. Cole. J. C. Nicholl, general superintendent of the mining and smelting division, presented the first address named, describing the mines at Creighton, Ont., and the smelter at Copper Cliff. Interesting features emphasized were the covered way from the change house to the shaft and the heated room in which the men congregate before entering the cage. This provision protects them against the severities of the climate.

The tonnage per man at this mine is about 6 or 7 tons per shift. The methods of mining (shrinkage stoping) and the provisions for passing the mineral down to one of two levels, through a crooked shaft in the footwall, which lies at about 45 deg. to the vertical, were also described. When the ore reaches the level from which it is to be hoisted it falls into a large concreted chamber from which it goes to a measuring pocket and is dumped into a skip. The loading of the skip and its belling away takes only about 10 seconds.

In view of this address and the trip to Port Colbourne on the Wednesday following, it may be noted that the International Nickel Co. is the manufacturer of the well-known Monel metal, a natural alloy of copper (28 per cent) nickel (67 per cent) and other metals (5 per cent) made by direct smelting from Sudbury ores. Monel metal has the strength of steel and non-rusting qualities with maximum resistance to corrosion by acid and alkali and superheated steam. It furthermore takes and retains a high nickel polish, being used in mines and mills for screens, filter cloths, pump shafts and liners, signal wires and light wire ropes, also in power uses for water wheels, turbine impellers and blading, for feed-water pumps, valves and fittings on superheated steam lines. Consequently the interest in the plant is not confined to metal producers but is of direct interest to users of non-corrosive metals.

Two Plants Make Cheap Peat Bricks

Instructive and entertaining as the other papers proved, that of A. A. Cole on the "Alfred Peat Bog" was to coal men the interesting feature of the occasion. The Ontario Government, canvassing the coal shortage of the province, almost decided to build an Anrep plant for making use of the peat resources of Ontario. About that time, it discovered that the Federal Government had in mind experiments on a new plan proposed by E. V. Moore of Montreal. As a result the federal and provincial governments agreed to pool their experiments and divide the cost equally between them.

They proposed to make a thorough test of the older Anrep plant and of the untried Moore plan. R. A. Ross of Montreal, B. F. Haanel of the Mines Branch, Ottawa, were the authorities put in charge by the Federal Government, while R. C. Harris of Toronto, and A. A. Cole were given concurrent authority on behalf of the provincial government. E. V. Moore was appointed the engineer.

The plans tried are one of many "wet processes," the product being air-dried machine peat. Only the wet processes have attained success. They have been employed in Europe for the manufacture of millions of tons of peat. Their economy consists in letting the sun do the drying.

If the peat is dried by artificial means the expense of expelling the water turns peat drying into an unprofitable operation. The wet process consists of three operations—excavation, maceration and spreading. The peat bog is quite soft and spongy, an iron rod being easily pushed down in it for a depth of 6 or 8 ft.

and being quite readily drawn therefrom. There is about 88 per cent of water in the peaty mass, and this helps the process. Were it lacking, the water would have to be added; at least the addition of water would be advantageous.

The amount of maceration given to the peat determines the quality of the fuel produced, for the action increases the density of the finished product and hence its value. Unmacerated peat is a sponge-like body, whereas the peat made by maceration will have a specific gravity of 1.1.

ANREP PEAT MACHINE IS NOW SELF-MOVING

The peat is spread over the surface of the ground, being placed on areas as yet not excavated. It will dry in from two to four weeks. Near the end of the drying period it is turned over and piled in hollow piles so arranged that the air is drawn up through the center of the rough pile thus accelerating drying, which, however, is still not complete when the product is marketed. About 25 per cent of water in terms of the completed peat block remains. This means that 96⅔ per cent of the water is removed.

The Aleph Anrep Sr. machine has been bettered from the old construction by mounting it on caterpillars such as are in use for general farm-tractor purposes. The peat is cut by an Anrep bucket excavator working along the side of a ditch, which side is on a slope of 45 deg. When the material is excavated it goes to an Anrep macerator mounted on the same platform. This machine works much like a clay pug mill, the knives cutting up the excavated material and passing it along to a car from which it is taken by an endless-cable haulage system to the spreader on the spreading field. As soon as the car reaches the spreader it is stopped and discharged. After being re-engaged to the cable system which brought it to the spreader it is taken back round a track laid out in square form. Thus the cars arriving and returning are kept from interfering with one another.

The spreader lays down the macerated peat in about a four-inch layer and then with revolving discs cuts this mass into long narrow rows. The spreader is operated as a separate unit and in time it completes laying its section along the peat-spreading side of the square, that side being at right angles to the line of the ditch being excavated. As soon as the spreader has completed this work the rails are moved over and a new "spread" is started.

MOORE'S MACHINE CUTS MAN POWER 50 PER CENT

There is a considerable resemblance between the Moore plant and the Anrep plant just described, the difference consisting largely in the concentration of operations, the spreading and the loading being done with the same power unit. With the Moore machine, on leaving the macerator the peat is carried by an endless conveyor belt running on an arm of fabricated steel 150 ft. long which extends from the plant platform proper across the spreading ground and is located on the opposite side of the excavator from the ditch and runs at right angles to the line of the ditch. The plant itself travels on caterpillars, and the belt-conveyor arm, which of course needs additional support, is carried by a third caterpillar placed 100 ft. from the platform proper.

The spreader is operated by a chain-belt drive which runs through the belt-conveyor arm to which the spreader is attached. The same driver also operates the third caterpillar. The spreading in this case is in line with the ditch, for the spreading arm is at right angles thereto. As the arm is 150 ft. long the spreading field is just as long as the ditch and slightly under 150 ft. wide. To work to the best advantage, it is necessary that the ditch should be of sufficient length so that when the field is completely covered the first row spread will be ready for harvesting.

Much of this first row will already have been used in operating the plant so that the rest can easily be removed and the spreading of the first row started once more. While this is being done the remainder of the belt conveyor can be used to convey the peat from row No. 2 to the permanent track at the end of the conveyor, where it is delivered into small open cars and run in trains to the shipping platform.

D. H. McDOUGALL

President, Canadian Mining Institute for 1919, president Nova Scotia Steel & Coal Co. Mr. McDougall makes a pleasing address, is an extremely popular man and has done much to add action and purpose to an institution which formerly was devoted mainly to a study of mineral resources.

Mr. Moore's idea in this method of manufacturing peat is to make the handling of the material as far as possible mechanical, and in this he has succeeded to a marked degree. Thus the labor force required to run the old Anrep plant, which was in itself quite revolutionary in the substitution of mechanical operation for human labor, is from 13 to 15 men, while the Moore plant requires only seven. The obvious disadvantage of the latter is that it requires a long ditch to keep it operating continuously, but this, on the other hand will be overcome as the length of the arm is increased. The capacity of each plant is approximately six tons per hour and can be operated to best advantage two shifts per day.

In what has already been said no reference has been made to the cutting of the peat into blocks. The reader would judge from the description given that the material was in long strips the full length of the spreading field. It has been found possible by the use of a deeply grooved roller, which is propelled by two men along the spreading row, to cut the peat strips into blocks. The work only takes a few minutes and is most satisfactorily done. It leaves the peat in blocks of equal width.

The Alfred peat bog is situated on the main line of the Canadian Pacific R.R. between Ottawa and Montreal. While it is quite large, there are many others which could be advantageously used for the production of peat bricks. It was chosen because it had already one working face prepared and because the drying fields were already drained.

An analysis of the peat contained in a portion of the bog being worked when all the water has been driven off is: Volatile matter, 69 per cent.; fixed carbon, 24 per cent.; ash, 7 per cent., which the reader will notice totals up to 100 per cent. The heating value per pound is 9,300 and 9,500 B.t.u. As has been stated, the peat actually contains, as delivered to the consumer, about 25 per cent of moisture. Unfortunately the water in the peat is largely of a colloidal nature, and it would be hard, if not impossible, to squeeze the peat dry in a filter press.

THIS SURELY IS A SEASONAL INDUSTRY

The amount of peat which can be produced in a year depends upon the length of time during which the drying operations can be carried on. The season at Alfred, which is similar to that of southern Ontario, is from 100 to 120 days long. The peat is being sold f.o.b. cars at the Alfred station in carload lots at $3.50 per ton, the price allowing a reasonable commercial profit over and above the cost of production, and including an allowance of 10 per cent. for depreciation, and an equal provision for amortization.

It was interesting to note that when it was known that this peat was available for sale, there was a considerable demand for it by dealers in nearby towns, who had become acquainted with the merits of the peat manufactured in prior experiments. A ready market was obtainable in Ottawa and Montreal for many such machines as those built for the peat committee.

It is not supposed that peat fuel will entirely replace coal even where the bogs are most plentiful, but there are certain uses in which it has advantages over coal, and if it is used for these purposes, it will materially help the fuel situation. Peat can be used to advantage for open grates in cooking ranges, but is not recommended for use in domestic furnaces except in the fall and spring, when light fires are needed, or in conjunction with coal when a coal fire has to be hurried.

WILL TRY OUT A SMALL THREE-MAN MACHINE

The program laid out for the coming season is to work both plants to capacity, marketing the product and showing thereby what can be done on a commercial basis. It is also proposed to test out a small three-man machine which is now being built and which it is hoped will make available a great many small bogs of comparatively shallow depth throughout Ontario and Quebec that would be too small to endeavor to work with the larger machines.

Coal mining interests filled the entire morning session of Tuesday, March 9, the session opening with the suggestion that a coal section of the institution be formed. The failure of the iron and steel section to presage a strong self-perpetuating body made the forming of a coal section seem to most of those present an undesirable development, and the question was left for settlement at some later period. The Canadian Mining Institute army does not seem sufficiently large to divide itself into battalions.

Following this somewhat listless discussion J. T. Stirling's paper was read by Mr. McEvoy in the absence of the author. With the title of the "Coal Mining Industry in the Province of Alberta" it gave a general account of the coal operations which are the hope of the province and are already the quickener of its activities. With a trillion tons of coal and other bituminous minerals below the soil (1,059,975,000,000 tons to be exact) Alberta does not expect soon to be at an end of her wonderful resources. This is what Alberta did with her coal in 1918 and 1919:

Tons Sold in	1918	1919
Alberta	3,440,154	2,991,110
British Columbia	101,189	95,461
Saskatchewan	1,372,439	1,115,329
Manitoba	511,168	314,290
Ontario	629	308
United States	133,276	121,212
Total	5,558,855	4,637,710
Produced	6,148,620	5,022,412

It was stated that Manitoba and Saskatchewan were not favorably inclined toward Alberta coals, as the freight rates were high, especially in Manitoba, which is easily reached from the United States owing to the propinquity of the Great Lakes.

In 15 years 500 mines had been opened, 324 of which have been abandoned, the near-hand coal having been mined out. A 64 per cent death rate in so short a period of time is quite large. W. J. Dick not being present, his article on "Fuel Problems of Western Canada" was not presented. F. W. Gray, editor of the *Canadian Mining Journal*, read his paper on the "Coal Supply of Canada." Mr. Gray is strongly of the opinion that Canada should arrange to make use of none but Canada-mined fuel. A synopsis of his paper will appear later.

A. McLean read an article on "Lignite in Saskatchewan" and was followed by E. Stansfield with an address on the "Principles and Practice of Fuel Briquetting." Mr. Stansfield is making preparations to briquet lignite in the Estevan district of Saskatchewan, possibly near the town of Bienfait. He has made a most careful investigation of the briquet factories of the United States and finds that it is impossible to reconcile the many different theories as to the right process of briquetting to be adopted.

He found that about half the United States factories were using asphalt as a binder, while about another half were utilizing coal tar for that purpose. Sulphite pitch needs drying and does not make a waterproof briquet. It has the advantage, however, that it does not create a smoky fuel if used to bind a fuel that is smokeless.

The Saskatchewan lignite will be carbonized and so will give no smoke. It would be preferable not to bind it with anything that would make the fuel smoky. It is unfortunately the fact that a carbonized body like coke is full of cell spaces and has, therefore, an abnormal thirst for binder. This insatiable thirst is expensive and results in obtaining a fuel as objectionable as a soft coal.

Not only is there a division of opinion as to the right binder to use but there are many other strong differences among experts. Some would have small rolls and some big. The small rolls are opposed because they have a rubbing action and the large rolls are favored because they give a longer period of contact. The question is not settled, any more than is the one as to the advantage of adding steam or water to the mix. Some say that steam makes a better briquet, but it is answered that a briquet containing water is apt to be porous and drink up water if exposed to the air after it has been dried out. Mr. Stansfield was not disposed to act as arbiter on the questions raised regarding the proper course to pursue in briquetting coal or coke.

He said that the largest briquets made in America weighed 16 oz. and were fabricated for Italian consumption, work on such fuels being stopped during the war. The largest briquets made for use on the continent of America weighed only 13 to 14 oz. It must be remembered that wear makes a great deal of difference in the size of the briquet the rolls will make. As the rolls wear, the "fin" around the egg briquets gets larger, and the roll has to be turned down, thus lowering the capacity of the recess in which the fuel is compressed. Eventually the roll has to be scrapped and a new roll substituted, but prior to that time the briquets are below standard size and weight.

The "fin" around the egg is knocked off and can be turned back into the mixer but, of course, it is desirable that the fin be reduced to its minimum dimensions.

Briquets made from the fine coal screened from the lump piles at storage yards make an excellent product, for there is 20 per cent less ash in such abraded material than in the lump coal, the abraded particles being from the purer part of the coal. Briquets, however, made from the fine coal produced at the mines are high in ash as the slack or sludge is dirtier than the lump coal.

WHY NOT USE MORE SULPHURY COALS FOR GAS?

Dr. Henry Mace Payne, in the short discussion that followed, stated that the tendency was to demand the best coal for any given purpose rather than to choose a somewhat cheaper coal that would suit the need if correct handling were provided. Coal having 1 per cent sulphur or less is getting quite scarce, and gas plants should be willing to accept coal having 1½ per cent sulphur or even ¾ per cent, which can be utilized quite readily, provided proper purification plants are installed. In fact Dr. Payne declared that if the sulphur was of the right kind even 2 per cent was not too large a percentage for use in gas manufacture.

For lack of time M. A. McInnis' paper on "Coal Transportation" was delayed till the afternoon session. At the luncheon tendered to the visiting members Mayor Church, President McDougall and Bradley Stoughton of the American Institute of Mining and Metallurgical Engineers spoke, the latter felicitously comparing the balmy air and snowless streets of Toronto with the bleakness of New York City, where, as he put it, first-floor residents were unable to enter their apartments by reason of the snow.

In the afternoon a number went to the new plant of the Goodyear Tire & Rubber Co., while others attended the oil session, the patient coal men who participated being privileged to hear the paper of M. A. McInnis, which in part was as follows:

"The transportation of coal into Canada is such a large factor in its cost to the consumer that our facilities for handling and the future adjustments of freight rates will largely govern the distribution of this commodity and its cost.

"We in Canada are entirely dependent on the United States for anthracite. Our consumption of hard coal last year reached 4,782,000 tons. We are dependent on the United States for a bituminous coal supp'y of 17,275,000 tons, or over one-half of our requirements. At the present rate of importation of anthracite and bituminous coal combined, totaling 22,000,000 tons yearly, or 60,000 tons daily, it is to be expected that from time to time we shall have to deal with abnormal conditions, and for these and the ordinary increase in population and consequent increased coal consumption, we should be prepared.

GREAT GROWTH OF CANADA AS COAL MARKET

"The total coal consumption in Canada last year was 35,000,000 tons, or about 4½ tons per capita. When our population reaches 10,000,000—a number we may expect by 1925—our consumption will have increased by 9,000,000, making a total of 44,000,000 tons yearly. Unless our home production can be increased materially in the meantime, we will be forced to import about 27,000,000 tons yearly by 1925, or 74,000 tons daily. Of our total coal imports 42 per cent is water-borne, 46 per cent carried by rail, and 12 per cent by ferries."

Mr. McInnes said that there were 123 storage plants for coal on the St. Lawrence and Great Lakes, capable of handling millions of tons a year. He added:

"Saskatchewan, Alberta and British Columbia do not have to import fuel to any extent, the total imports from the United States being less than 25,000 tons yearly. The mine outputs of these provinces total nearly 8,000,000 tons. British Columbia exports about a million tons of its product each year. The enormous coal resources of this trio of provinces is estimated at about twelve hundred billion tons, and their value is just beginning to be realized.

"The territory at the head of the lakes, including Manitoba, imports 3,000,000 tons a year, of which 2,000,000 tons are taken by the railways. The greater part of this coal is carried by rail from the Pennsylvania mines to Buffalo and other lake ports, then by water to Fort William and Port Arthur—where the Canadian Pacific R.R. and the Canadian Northern R.R. have large storage and discharging plants.

WATER HAULS MAKE COAL INEXPENSIVE

"It is here loaded into cars and shipped as far west as Winnipeg and other points in Manitoba. Although this territory is about 1,500 miles removed from the mines, the water haul, with its comparatively low freight rates, keeps the price of coal in Winnipeg within $1.50 a ton of the price in Ontario and Quebec.

"Our greater difficulty in importing coal by rail is at Niagara, or what is known as the 'Niagara gateway.' The Canadian roads at this point are unable to accept as much freight as the United States roads can deliver. For the greater part of the year our roads can handle but 100 cars a day. Owing to the comparatively short haul from the Pennsylvania mines to the cities and towns of southwestern Ontario, or the territory bounded by a line drawn from Niagara to Toronto, and west to the shores of Lake Huron, these points have depended on rail coal rather than on the development of water facilities on Lake Erie and Lake Ontario. Toronto, Hamilton and other points in this area should eventually take more coal by water, for which adequate unloading and storage facilities will have to be provided. Last year central Ontario imported 10,000,000 tons of coal of which the railways consumed 6,000,000 tons."

The speaker said that the maritime provinces had no serious difficulty in providing themselves with coal. Last year Nova Scotia, New Brunswick and Prince Edward Island imported 175,000 tons of anthracite from the United States, nearly all by water. These provinces produce 6,000,000 tons of coal yearly.

As a means of successfully meeting the coal problem the speaker suggested: "Let the bituminous coal operator give some concessions to the early buyer as the anthracite operators do. The railways quote lower freight rates in summer, and if a price differential is provided the consumer will be quick to take advantage of it, and will provide storage room at points where the coal is used, thus reducing the cost of rehandling. Educate coal users to buy early."

"There Are Mines That Make Us Happy"

Tuesday evening, under the shepherding of Col. J. J. Penhale, most genial of presiding officers, was held the annual smoker. With him was to have been associated G. G. S. Lindsey, but much to the regret of the assemblage he did not feel it was safe to be present as he was none too fully recovered from a surgical operation. The song sheet had a parody on "Smiles That Make Us Happy" which was sung with gusto and which ran:

"There are mines that make us happy,
There are mines that make us blue,
There are mines that steal away the tear-drops
As the sunbeams steal away the dew;
There are mines that have the ore-shoot faulted,
Where the ore's forever lost to view;
But the mines that fill my heart with sunshine
Are the mines that I sold to you!"

"Foghorn" McDonald, beloved of the North County, in stentorian voice rendered "Drill, Ye Tarriers, Drill" to the chorused accompaniment of all present. Eddie Collins, of Cobalt, after many calls, narrated some French-Canadian stories in inimitable manner while songs and the cries of the three colleges represented filled in the interstices in the program.

A Metal Day Followed by Pleasing Banquet

Wednesday morning's session covered the problems of mine assessment for taxation purposes, prospecting especially in Manitoba, Saskatchewan and Alberta, particularly in the first-mentioned province, the sources of cyanide and "Engineering Standardization, with Special Reference to Standardization in the Mining Industry"—this last by J. B. Porter.

In the afternoon the subjects treated were the Quebec asbestos deposits, nickel coinage, lost placers of Ontario, methods of mining and milling in the Cobalt, Gowganda and Kirkland Lake districts, the geology of Silver Islet and vicinity and the minerals of eastern Ontario.

The banquet in the Pompeian room of the King Edward Hotel lasted till a late hour, there being an unusually long list of speakers, including the Lieutenant Governor of the Province, Harry Mills, who is Ontario's new Minister of Mines; E. P. Mathewson, Henry M. Payne, Bradley Stoughton, D. H. McDougall, O. E. S. Whiteside, R. Dawson Hall and F. W. Gray. That does not entirely exhaust the long list. E. A. Collins recited; many furnished songs; so it was at a late hour that the goodly company retired.

The United States contingent divided among them the subject of the possibilities of the Canadian Mining Institute filling at Ottawa the functions which are being performed by the American Mining Congress at Washington, and in lesser degree by the American Institute of Mining and Metallurgical Engineers at the capital and in New York. The Institute, according to the United States visitors, could give a composite view of the mining industry's opinion to the legislators at Ottawa who do not understand mining and are quite willing to receive information from a reliable source.

The Canadian Mining Institute has ventured only a little way into the waters of political relations. It has regarded the political mess as a dirty matter to mix in. So was the war—a mess from which we may pray ever to be delivered. But the good citizen believed that just there his duty lay, pleasant or unpleasant, and he did his duty as he saw it. So with legislation. It is a duty of the good citizen to take part in its direction and his entry into legislative matters will purify it as does the entry of good citizens into the ranks of the army. Politics will always be unworthy, if worthy men stay out, as an army will not be reputable if honorable men fail to accept service in it. Strange to say, we do not see the army with just the same eyes that we do politics.

The Canadian Mining Institute is beginning to take views on political subjects, as is evidenced by the vote on introducing a pure 5c. and 10c. nickel coinage, the paper on legislation relative to the certification of engineers and the address on the need for mining laws and the abolishment of mining regulations in the Prairie Provinces and on the assistance to be extended by the government to prospectors.

Some of Political Subjects Discussed

One might also refer to the plea for the free admission of mining machinery, especially for such as would make oil-shale distillation feasible, and to the article relating to assessment of mines for taxation. The salary question in the mining department repeatedly recurred. The institute is chatting politics almost as often and as glibly as geology, but not at Ottawa. It is today gossiping politics at Toronto, Vancouver, Montreal and, let us add, Fort William. Shortly, it may be predicted, it will be speaking so as to be heard in Ottawa.

It will not be lobbying but rather counselling. It will forbear to threaten or cajole, but it will advise and instruct, and who shall say that its voice will not be heard with respect? Politics is like sickness or war. We cannot avoid anyone of the three. They are inevitable. We may regret them, but we must meet them nevertheless, and may we meet them like men!

The British precedent which restricts the activities of technical institutes solely to inquiry into matters of scientific concern has been long followed in the United States and Canada. The march of events has almost compelled in the Republic a revision of former standards. It is not unlikely that it will have the same effect in the Dominion, and if the Canadian Mining Institute does not lead, another body must undertake that function.

The trip to Port Colborne drew about 98 participants. The International Nickel Co. here receives nickel-copper matter and transforms it into nickel shot, blister copper and nickel oxide by various processes, in which roasters, converters, openhearths, filter presses and bleaching tanks all figure. The plant is built in a peat bog which is, however, only one to two and a half feet thick. Ontario has large peaty areas, and if the peat can be briquetted cheaply, there are great possibilities to be found in this low-grade fuel.

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Where Angels Fear to Tread!

The Tidewater Transshippers' Association is undertaking a serious problem when it proposes to classify the coal handled at Tidewater, and we venture a word of warning against any too confident application of the principles which we understand have been adopted as a basis for this assignment of coals to the pools which it will control.

It is reported that "classification shall be made upon the basis of analysis for volatile, ash and sulphur, as to steam coals; volatile, ash and sulphur, yield of gas per pound and illuminating power, for gas coals, *with such variations as shall be determined* by the executive committee ——." The italics are ours; we use them because this part seems to us the most important part of the whole quotation. In fact, unless the committee determines on important variations, and that right at the start, we venture the prophecy of dark and troublous days ahead for the new Association.

Are Our Public Utilities to Serve As Flunkies to Luxury?

When we are told that the public cannot stand to pay a fair price for coal, or an adequate transportation rate, we naturally ask if the public utilities are to continue to stand in deference to the comfortably seated luxury industries

First let us consider the case of steam coal. Has it occurred to the Classification Committee that the character of the volatile matter may be vastly more important than the percentage? Have they realized that 15 per cent of ash, if of reasonably high fusing temperature, may actually cause less loss than half that much ash which clinkers badly? Have they altogether forgotten that heating value, other things being equal, is what we want under the boiler and that sulphur, though important at times, is of far less significance?

In other words, does anyone for a minute seriously believe that the percentages of volatile, sulphur and ash are a satisfactory basis on which to classify steam coals? If he does, we seriously doubt the value of his work.

And again, consider the gas-coal proposal. The same points we make for volatile and ash in steam coal apply here also. Especially is the character of the volatile matter of great consequence; and "the yield of gas per pound and illuminating power" are a feeble reed on which to lean for support if one is to bear the weight of righteous indignation which the gas men will heap on him who makes this classification.

By what standard system does the Committee propose to fix upon this "yield of gas" and its "illuminating power?" We can refer them to methods, yes, a dozen of them; and we'll guarantee, too, that any one of the dozen will give a wide range of results for "yield" and of "illuminating power." These results depend upon temperature, and rate of heating, and length of heating, and pressure in the retort, the barometer, and the direction of the wind. And sometimes we even get to think that the day of the week and the color of the hair and height of the last man we met before we got to the office that morning are factors. In any event a multitude of factors beside the coal sample enter to render such tests of little or no value for a basis in pooling.

We fail to find any mention of the coking characteristics of this gas coal, but we assume this will be one of the "variations." Perhaps also the British thermal units in the total volatile matter may be noted after a time when the Committee learns from the gas men that only about a dozen places in the United States, and practically none in foreign countries, any longer worry themselves about the illuminating power of the gas. And moreover where illuminating power is required by law or rule it is water gas, not coal gas made from bituminous coal, which is used to meet this standard. We noted in *Coal Age* of March 4 that these tentative principles were adopted, "only one vote in the negative being recorded." We wish to extend our congratulations to him, whoever he may be, who saw the weakness of this system. We trust that his counsel will prevail before the classification committee in order that the new Association may not start out with the handicap of a poor system for assignments to its pools. In this connection we would suggest a careful reading of the opinions reported by our correspondent in the issue of *Coal Age* of March 4 pages 446-50.

For Coal Mining Is Relatively Stable

SEASONALITY is a misfortune of the farming industry, and the lumber trade partakes of the same infirmity. For this reason from the first the farmer and the woodsman have been attracted to the coal industry as being more stable than the one to which they belonged. It would be hard to tell the farmer that mining is a seasonal occupation. Its summer idleness does not begin to compare with the long winter slackness of the farm. In sowing time and in harvest the farmer is busy, the rest of the year he often merely cuts wood for his fire, takes milk, eggs and potatoes to market, beds down and feeds the cattle and horses and perhaps butchers some hogs.

Many farmers manage, by working in other trades, to make the year show a favorable balance in the profit and loss account. Nearly all help to maintain the township highways; many haul lumber, logs and stone; some work in small mines located on their own farms. But on the whole things around the farm usually drag along so slowly (at least they did before the war) that the banker who holds the mortgage wonders how soon he will have to foreclose. When the mines are opened, the farm laborer sees his first opportunity to have reasonably steady work. If he combines farming with mining he can make the whole year productive but even if he does not, mining work will give him bigger wages and steadier time than the work of the farmer.

The lumber jack in recent years has worked more steadily than before. Formerly no hauling was done except in the winter. If not located on a large stream, the mill was idle in the summer unless a freshet made it possible to float down logs. In the depth of winter, the logpond froze, and the mill was shut down though the woods might be busy. The sap only ran for a few weeks, and such timber as had to be spudded could only be cut during that short season. The railroad has improved the transportation problems; the thawing of the logpond by steam has helped to make winter milling regular while the decrease in the woods that are used for tanning has made cutting less seasonal. Nevertheless there is still a degree of irregularity from many causes, for there is still inequality of demand and seasonal difficulties such as those arising from high-water, excessive snows and rains. Under the old conditions there was a bad-load factor, as George Otis Smith would term it, in the lumber industry, and the workmen quite often gave up the lumber camp for the coal mine just because mining was more stable.

Why Waste Time With the Muck Rake?

Bunyan portrayed a man bowed over a muck rake, so intent on his foul work that he missed the vision beyond. If we would only look up, the vision of restored transportation service would be seen beckoning us to a brighter national existence.

In fact mining is about as stable as most country employments. All have their slack times and their times of activity. The clay works, for instance, find the fall is a period quite usually accompanied by slack work.

The study of stabilization is a large one. Perhaps it is well that the experiment is first being tried on an industry that is comparatively stable—namely coal mining. It is questionable whether it should be made wholly stable, whether farming and coal digging should not be made the two balls on the governor whereby the engine is kept in uniform rotation. If the railroad problem of transporting to market did not rise to the mind one would be inclined to urge that the mines might advisedly close entirely in the summer for say two or three months giving the farms the full benefit of the labor of the mine worker.

Certain it is that when he is growing wheat, grain and potatoes he is not subjecting the country to a financial drain as he is when he is idle. What would mine workers say to this proposition? This; that the pay obtainable on the farm would hardly meet with their ready acceptance. The miner may deplore that the bright skies and open air of the farmer are not a part of his lot, but he does not want the farmer's pay. If it had not been for the frugality of the farmer in most coal regions that worthy would not have been able to live at all through the unprofitable years that preceeded the war.

A Good Precedent

ONE OF THE most successful, hardworking technical societies of this country is the American Society for Testing Materials. Practically all of its activities are carried on through committees, and these committees are organized in a way that affords a splendid precedent for the consideration of the coal man. It is provided by this society that any committee dealing with a subject having a commercial bearing must be made up with either an equal number of representatives of the producing and the consuming interests, or that the consuming interests shall predominate in numbers, always, however, with the consent of the producing interests. The result of this policy has been that specifications for materials and proposed standards adopted by this society find wide acceptance as the basis for commercial work. It is proposed by the American Institute of Mining and Metallurgical Engineers that a committee be organized to strive for stabilization of the coal business. The basis upon which this committee should work has, of course, not yet been developed, but we believe that any measure of success which will be attained by it can only come after it clearly recognizes that a co-operation of the coal-producing and large coal-using interests of the country is essential if any recommendations are to secure general agreement and adoption.

We see no reason why the coal man should not welcome a frank study of these problems of the seasonal aspects of the industry. We do not agree that the coal business is more largely seasonal than many others, but anything that will reduce the seasonal variations should be welcome. We trust that the American Institute of Mining Engineers will properly constitute its committee so that all aspects of this important commercial problem will be represented. So constituted a real improvement in conditions may be confidently expected.

DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

Shifting the Worker

Letter No. 3—I am glad of the opportunity to express my view in regard to the situation presented by the letter of A. H., *Coal Age*, Feb. 12, p. 327, regarding his failure to secure the transfer he wanted to another position that would give him more pay and be better to his liking. At first sight, it would seem rather hard that the request of this worker to be transferred could not be granted; but we must defer judgment until we hear the other side.

It frequently happens that workmen try the patience of their foremen and superintendents, to the limit of endurance, and cause them to say and do things that seem unfair. It's all right for an outsider to say what a superintendent should do and what he should not do; but, believe me, a brief visit to the superintendent's office will often give one a different opinion on this matter.

Workers are not all alike; they differ in many respects. In my experience, the man who tries to make his foreman or superintendent believe that his services are being solicited by some other company rarely impresses either of them with the value of his services to themselves. On the other hand, the man who moves about is generally able to pick up better jobs, and secures more speedily the kind of work he desires. As a matter of fact, I would rather see the mine shut down than to depend on the services of a dissatisfied lot of men.

TRUE ATTITUDE OF SUCCESSFUL SUPERINTENDENT

As superintendent, I believe in throwing in my lot with that of the men in my charge, and making it as cheerful for them as conditions will permit. However, it is true that there are workers who will take a mean advantage of a foreman or superintendent thus minded, and impose on his good nature, unless they are suitably checked. The average mine worker always looks at his own interests. While it is true that a man should not allow his family to suffer, in order to please a whim of his foreman or superintendent, it is too often the case that the worker himself is selfish. It is human nature to be selfish. Indeed, every thought and every action terminates in that one idea of self. We all worship and bow down to the God of Self.

In the case before us, the worker states he had only been at the substation a short time. The chances are that the superintendent had to put a man with him for a couple of days to show the newcomer his duties. Then, this being done, the superintendent thinking all is moving smooth again, is suddenly confronted with the request for "another job." So it goes, when a new man is broken in and finds his job a little harder than he had supposed, he either threatens to quit, or else he stays at home when he is most needed at his post and his absence delays the work.

Speaking of selfishness, there are no doubt selfish superintendents and selfish foremen; but this kind do not last long and never meet with much success in the handling of their men. It hurts none of us to give the helping hand to a fellow worker, providing it is done in an honest and whole-hearted way. In the present instance, however, it would be unjust to pass an opinion on the action of this superintendent in refusing the request of his man to be transferred from the substation into the mine where he was wanted to bond rails. Before passing judgment, let us wait to hear from the superintendent, who, if he is the man we may suppose, will not permit this worker to get away without letting *Coal Age* readers know the exact conditions in the case. RICHARD BOWEN.

West Pittston, Pa.

Deal Squarely with the Miner

Letter No. 1—Having been a constant reader of *Coal Age* for eight years past, or since its first issue came off the press, my feelings for the miner have been frequently stirred by the attitude assumed by different writers toward the unionized miner. The reading of the article, "Deal Squarely with the Railroads," *Coal Age*, Feb. 5, p. 274, leads me to make a similar appeal for the workers underground, and for that purpose I have chosen the same heading with the change of but a single word.

While some years have past since I could be classed, strictly speaking, as a miner, my whole anatomy is so impregnated with the mine atmosphere through continuous contact with my former associates, by reason of my calling, I naturally feel hurt when I hear the miners' union unjustly condemned.

There is little question in my mind that many other readers who, like myself, were formerly miners at the face, have the same feelings aroused in them by the agressive attitude of the press toward the union miner. Personally, I am at a loss to know why this attitude is so prevalent. Unless, like the old rhyme I read somewhere, a time ago, which runs:

"I do not love thee, Doctor Snell,
The reason why, I cannot tell,
But this I know and know full well
I do not love thee, Doctor Snell."

Certainly, I know that the miner is often radical, irrational in his demands and not infrequently tyrannical when the opportunity is presented. But, after all, is that not human nature and can we blame the miner for being human like ourselves? Many of us there are who have, during our lives, shown the same unreasonable vindictiveness, either as employer or employees.

Twenty years is not so long a period to look back upon and yet, in my experience as a miner during such time, it has been my lot to feel the severity, if not the tyranny, of an employer when, with a few fellow workers, I dared to join a miners' organization in the valley, not 40 mi. from Pittsburgh. The purpose of the organization was to protect the interests of the men who toiled, for 10 and 12 hr. out of the 24, exposed to all the hazards and dangers of coal mining. The employer's attitude was: "The mines are mine; take what I give or leave; but you cannot organize." Will not the readers of *Coal Age* feel, with me, that such an attitude was unjustified and tyrannical?

UNION MINER BECOMING A SUPERINTENDENT REALIZES THE TYRANNY OF LABOR

Later, as manager of mines in an organized district a few miles outside of Pennsylvania, I have experienced the same *tyranny of labor*, until I almost prayed for the destruction of the very principle of unionism. But, after all, something tells me that, between these two extremes, there is or ought to be a happy medium where employer and employed can meet and confer on equal terms in respect to their common interests.

Viewed from a safe distance, the observer recognizes that organized labor always demands more than it really expects to get, just as organized capital contends for more than what is its just due. Notwithstanding all that has been said respecting the radical demands of the miner and the exorbitant wages he is paid, we who are closely associated with his work and know by experience the conditions under which it is performed, his hours of enforced idleness and the dangers to which he is exposed, know that he earns all that he receives.

LACK OF SYMPATHY AMONG WORKERS IN DIFFERENT, ASSOCIATED INDUSTRIES

Unfortunately, there is a lack of sympathy, in this world, between workers and individuals of different classes. Too frequently, we refuse to look at the situation from any angle but our own, with the result that we do the other fellow an injustice. A few days ago, sitting behind two sheet-steel workers, in a trolley car, I overheard their remarks on the mining situation. The "roller" was speaking: "That's Bolshevism in this country, a demand for 60 per cent. increase and a 6-hr. day; and they tell me the miner makes from $10 to $12 a day. The Government ought to put guards at the mines and keep those fellows digging coal."

Then their conversation drifted to their own work. There had been trouble at the rolling mill, the previous night; a roll had broken and the men had to quit. Again the "roller" spoke: "A d—— bad shift; I figured my tonnage and found I made but $24.40, the whole d—— night." Yet, by this man's estimate, the miner he quoted as earning half that amount, in a longer shift in the mine, was a "Bolshevik," because he was demanding an increase in wages and shorter hours.

Knowing something of the work of the two men here mentioned, I can say that $24.40 is a very low figure for a shift of 8 hr. in the rolling mill. In my opinion, the man is no more entitled to that pay for a "d—— poor shift," by reason of his skill and intelligence, than any intelligent, practical miner employed in our mines today, who would consider the amount named was a d—— good night's wages, in return for his skill and experience in the mining of coal. It's a case of "Whose ox is being gored?" Let us hope and ask for a square deal for the coal miner in the near future.

Houston, Pa. SIM. C. REYNOLDS.

Markers on Mine Trips

Letter No. 6—Having always believed in the value of the practical discussion of mining problems and questions, it is with some degree of satisfaction that I cite the following incident to show the value of this department to the readers of *Coal Age:*

For some time back we had been unable to find a lamp that was at all satisfactory for use in the mine as a trip-marker, when our interest in this matter was suddenly aroused by the inquiry of J. J. S., *Coal Age*, Aug. 28, p. 397, giving a similar experience to our own. I was led to take part in the discussion that followed this inquiry, and my remarks in Letter No. 5, Oct. 23, p. 693, drew the attention of the Wolf Safety Lamp Co., with the result that we now have a satisfactory trip-marker. This lamp is a Wolf acetylene handlamp, No. 856, with a No. 860 reflector. It has now been in use as a trip-marker, in our mine, for over a month, and the results are entirely satisfactory.

One of the strong points of this lamp when used for that purpose is that it will hold a charge lasting the entire working day and, therefore, requires little or no attention from the triprider. The lamp gives a strong, bright light, which is thrown well in advance of the trip and makes the road plainly visible far enough for all practical purposes. The lamp is strongly constructed and simple in operation. My opinion is that, with a few minutes' time spent each day in cleaning the lamp, it should last a long time. Knowing a good thing when its use proves its merit, I am glad to pass it along for the benefit of others.

JEROME C. WHITE, Asst. Supt.
Portage, Pa. The Penker Coal Mining Co.

Supporting Mine Roof

Letter No. 2—Supporting the roof in a mine is a timely subject for discussion. The all-absorbing topic among mining men, today, is that of ridding the mine of the tremendous expense for timber. It cannot be denied that the available timber supply is growing less each day, while the demand for timber suitable for mining purposes is rapidly increasing, owing to the opening of new mines and the extensive development of old ones. It is not surprising that these conditions have increased the cost of mine timber and it is now high time to look for substitutes.

In considering this question, numerous methods and means suggest themselves as affording a practical solution from the standpoint of economy. While some of these will apply only locally, others will prove of general application in mining. Among the more helpful and promising of these suggestions may be mentioned the following: (a) Changing the method of attacking the coal, from advancing the excavation, to the retreating method of working. (b) Adopting the plan of driving narrower openings, as rooms or stalls, and leaving larger pillars between them. (c) Using fabricated steel in place of timber supports, wherever this is practicable from the standpoint of economy and safety. (d) Using concrete reinforced props instead of timber posts. (e) Building permanent masonry supports. (f) Planting timber to replace that cut each year.

Heretofore, the timber account in mining has not proved so large an item in the cost of operation. Today, however, the rising price of timber has made it necessary to consider the problem of its conservation as being a question of the utmost importance. Notwithstanding the fact that much thought has been given this matter, the problem is still in its infancy in this country. Even the casual observer, noticing the extra care taken in the stacking of timber at the mines, the planning of mines with larger pillars and the introduction of the so-called "steel timbering," cannot fail to realize the growing importance of the timber question to the coal-mining industry.

TIMBER AND COAL SAVED IN RETREATING

In the winning of coal by the retreating system much of the expense of operation will be saved, on several accounts: 1. The entries and air-courses being driven in the solid coal, less timber will be required for the support of the roof. 2. The solid coal supports inclosing the entries insure less breakage of the posts and collars of timber sets and lessen the expense of their renewal. 3. Retreating methods of mining require less timber than advancing methods and a shorter period of service, which decreases the cost for renewals, and practically no timber is lost in the waste. 4. The extraction of the coal is more complete when retreating than when advancing, and there is less trouble caused by stumps left in the waste, which throws the weight over unto the pillars, crushing the coal and causing much loss. 5. The larger percentage of recovery, in the retreating system, is reflected in the reduced cost of production by that system.

The plan of driving narrower openings and leaving larger pillars between them saves timber on two accounts at least: 1. Less timber is required for the support of the roof in the rooms, which means less waste by decay and dry rot. 2 When drawing back the pillars, less timber per foot of coal face is needed, more timber is recoverable and there is less need for replacement of timber lost or broken.

On entries where heavy or strong timbering is needed, fabricated steel of suitable lengths, sizes and shapes are manufactured in large quantities for mine use. Much research work has been done, in recent years, by the engineers of the Carnegie Steel Co.; and experiments made, in the heart of the Pittsburgh coal fields, have proved the practicability of steel timbering.

This method of support has not come into general use, in the coal mines throughout the country, for several reasons: 1. The high first-cost of steel supports. 2. A plentiful timber supply available in certain localities. 3. More attention has been given, in steel timbering, to the question of *sets of timbers*, rather than to single props. Notwithstanding these drawbacks, it would seem that steel timbering will be, ultimately, indispensable to the mining of coal; and the manufacture of single units of suitable lengths, sizes and shapes may be expected to increase.

REINFORCED CONCRETE MINE TIMBERS

The use of reinforced concrete in mine work has proved successful, both for permanent construction and for single units, as posts and bars. I recall that an excellent article on the use of concrete timbering appeared in *Coal Age*, Vol. 14, p. 362. The article was entitled "Reinforced Concrete Pit Props," and set forth the methods of testing used in the Manchester University, England, besides giving the comparative strength of timber and steel supports as used in English mines. The Manchester tests showed a large excess of strength in the reinforced concrete props, as compared with the strength of similar props of Welch larch timber.

The fire hazard is also a large factor in favor of concrete construction in mining. The strength and life of the concrete mixture is treated in an interesting article by H. W. Eldridge, which appeared in the Contractors' Atlas, New York, November, 1918. Speaking of concrete mixtures, the author writes:

> Concrete has always been thought of as a mixture of cement, sand and pebbles or crushed stone. It has been found, recently, that we have been disregarding one of the most important constituent materials in mixing concrete, namely, the water. It has been shown by laboratory experiments that a concrete mixture with 7.5 gal. of water (1 cu.ft.) to one sack of cement, after due allowances, gave a strength of 2,000 lb. per sq.in.; using 6 gal. of water, per sack of cement, 3,000 lb. per sq.in.; and using 5.6 gal. of water, per sack of cement, 3,300 lb. per sq.in.
>
> These results show that when a mixture of 1:2:3 is used, the water content should be from 5⅔ to 6 gal., per sack of cement. The data emphasize the fact that more care should be used in measuring the amount of water used.

Another excellent article entitled "Concrete in Coal Mine Service" appeared in *Coal Age*, Vol. 13, p. 916, and gives much interesting information on the use of concrete in mining.

EFFORTS IN CONSERVATION OF TIMBER

Speaking of planting timber to replace that cut each year, I understand that this has been started, on a small scale, by some coal companies, but am unable to give the results of their efforts. In Pennsylvania, there are forest preserves in several places, some being located in Somerset County and others in Westmoreland County, almost at the door of the Pittsburgh district mines. I believe that these timber preserves will be available for mining use later. In this regard, the commissioner of forestry, at Harrisburg, Pa., will probably be able to state more definitely.

Before closing, I want to draw attention to two interesting articles that are to be found in *Coal Age*, Vol. 13, pp. 370 and 407. These articles relate to supporting roof in coal mines and contain a fund of information along this line. In the second article (p. 407), which is a continuation of the first, is treated the preservation of timber and a list of the different preservatives is there given. I would advise a careful perusal of these articles, as forming a basis for future thought and action.

R. Z. VIRGIN,
Assistant Professor of Coal Mining,
Carnegie Institute of Technology.
Pittsburgh, Pa.

Letter No. 3—Speaking of the growing scarcity of mine timber, I quite agree with the suggestion that the time is opportune for considering the best means to adopt for supporting the roof when the timber supply fails in the vicinity of the mines.

Realizing that we are approaching this condition in Pennsylvania, we have been trying steel timbering to a limited extent. In my opinion, the best material for this use is the I-beam or double channel, sometimes called the "H-bar." In some cases, we have used heavy rails that have been so worn as to be unfit for trackwork, and have found them of great advantage in securing the roof over roads and in air-courses.

For several years, I have adopted the method of using iron rails as roof supports on roadways. Where the coal is hard, it has been my practice to make a needle hole, or hitch, in one rib near the roof; and then cut a slip-hitch in the opposite rib. Having cut the iron rail to the right length, one end is first inserted in the needle hole and the other then slipped into the hitch in the opposite rib. I frequently place a small block of wood in the back of the needle hole before inserting the rail, which gives the best satisfaction in the use of this type of timbering. In order to hold the bar in place, a hard oak wedge is driven behind it in the slip hitch.

When no longer needed, these rail bars are easily taken out and put aside for future use. Where the coal is of a friable nature, it is necessary to use a post on each side of the road to support the crossbar. When the bar is in position, suitable wedges are driven over the bar, or lagging is inserted to support the roof slate above it.

A form of telescope post made of sections of tubes that slip into each other has been used. Also, lengths of iron pipe are sometimes employed, by driving a wooden plug in the lower end and filling the pipe with sand, after which another wooden plug is driven in the other end of the pipe. These short wooden plugs are often gaged so as to give the desired length to the posts. Old broken posts come in handy for this purpose. Where the floor is soft, or where there is any possibility of the iron posts corroding, a heavy wood sill should be used on which to set the posts.

McKeesport, Pa. ANDREW O. BAIN.

Coal Mines in Scotland

Letter No. 3—Looking over a recent issue of *Coal Age*, Dec. 11, on page 899, I came across the excellent letter of Andrew O. Bain, discussing a previous article by an unknown writer, who may have been taking a holiday in Scotland, where he had obtained some curious ideas of the coal mines in that country.

Now, Scotland is famous for a celebrated brew known as "Scotch Whiskey," and it appears to me that our friend, while sojourning in that hospitable country, had partaken too freely of the beverage, which would account for his wrong conclusions in regard to the coal mining he attempted to describe.

Fearing that a wrong impression may be conveyed in respect to coal mining in Scotland, should the said article be taken seriously, I desire to add my little to the testimony of Mr. Bain and that of a previous writer, John A. Douglas, Oct. 2, p. 586, regarding the conditions existing in and around the coal mines of Scotland at the present time, as compared with conditions elsewhere.

The majority of coal seams mined in Scotland are thin, at times not exceeding 2 ft. in thickness. These lie at a considerable depth below the surface. The mining of the coal in the deep thin seams suggests innumerable difficulties that can only be met by mine managers (foremen) who are highly qualified for their position. So different are these conditions from those relating to coal mining in the United States and Canada, that it is impossible for any writer to give a true picture of Scotch coal mining, except he is able to view the subject through Scotch eyes.

Certainly the article of our friend is ridiculously amusing. His reference to securing a mine manager's certificate in that country is absurd, when it is known that the holder of such a certificate has obtained it through his own individual effort. The Scotch certificate cannot be obtained through family connection or political pull. Reflecting on the serious situation of coal mining in Scotland, where it is necessary to conserve every atom of coal, one will realize the impossibility of running a bluff and getting away with it, in an effort to secure a certificate. I regret that the same cannot be said of some other countries.

COMPLETE EXTRACTION OF COAL NEEDFUL

Regarding the extraction of coal in Scotch mines, it can be said that every possible ton of coal is taken out. The prevailing practice there is that the content of the coal area worked is carefully computed and all the coal must be paid for on the basis of that computation, whether it is mined or not. The result is that the complete extraction necessitated is a fair test of the mine manager's ability.

In sharp contrast with this condition is that prevailing here today. No one will deny that obstacles to the complete extraction of coal, in American mines, generally result in the abandonment of the territory; and thousands of tons of coal are thus lost beyond recovery, the chief object of the coal operator, in this country, being to show a good cost-sheet. It will be readily granted that such conditions afford no real test of the ability of the foreman in charge. I admit that the conditions in Scotch mines are not favorable to a low cost-sheet. Neither will the production, per capita, in that country, compare with the same in the mines of other countries where it is possible to introduce modern coal-cutting machines.

These conditiones, however, are no reflection on coal mining in Scotland. They even make it possible to ship soft coal across the Atlantic, in competition with the output of Scotch mines. Only recently it came to my notice that an American firm had secured a contract to deliver several thousand tons of soft coal, in Ireland, at a figure far below the cost of production in Britain, which is due solely to natural conditions.

SCOTCH *vs.* AMERICAN MINING

While it is not my meaning that the Scotch mine manager (foreman) is the last word in efficiency, I firmly believe that a just comparison of the results of the extraction of coal, in Scotch mines, with the same item in the mines of this country, would give a superior rating in favor of the former. The comparison would undoubtedly show that many of the certificates held by American mine foremen are relatively worthless.

Running a coal mine is no one-man's job. The successful mine foreman, in any country, must be a man with a true sense of proportion. His knowledge of coal mining, however good, will not offset the lack of skill in the handling of men. He must be an organizer, a student of human nature, a leader and not a driver, as the bully type of foreman is passing today. I am not a prophet or the son of a prophet; but it is far from a wild guess to say that the time is not long when it will be necessary to mine 2-ft. coal, in this country. It will then be possible to make a just comparison of the ability of foremen here with that of Scotch mine managers. However, our friend may not then be available that we may convince him of his errors of judgment.

J. H. MCMILLAN, Supt.,
Pocahontas, Alta., Canada. Peabody Coal Co.

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Indiana Mine Bosses' Examination, Indianapolis, Indiana

(*Selected Questions*)

Ques.—What are the causes of dust explosions in a mine, and what is the best known method to prevent them?

Ans.—Dust explosions result from the undue accumulation of fine coal and slack in the working places and on the roads and travelingways in a mine. The danger is much increased where the coal is blasted off the solid, or by the excessive use of powder, insufficient tamping or other causes that may produce a blownout or windy shot. The best method of preventing dust explosions from occurring in a mine is to remove all accumulations of fine dust regularly from the mine roads and working places. Where blasting is performed strict regulations should be enforced limiting the weight of charge and the number of holes fired at one time. The safest plan, in blasting, is to employ competent shotfirers to charge and fire all shots that in their judgment are safe. In a gassy mine where the coal is highly inflammable and forms much dust, no shots should be fired before the place is examined and found free from gas.

Ques.—What is the danger arising from working a mine adjoining an abandoned mine? What is the law regarding the method of approaching abandoned mines?

Ans.—The workings of the abandoned mine may be filled with explosive or poisonous gases that would enter the live workings when an opening is made. Or the abandoned mine may contain a dangerous accumulation of water that would burst the barrier pillar and flood the live workings.

Section 14 of the Mining Laws of Indiana requires that excavations "approaching abandoned workings which are supposed to contain dangerous accumulations of water or gases . . . shall not exceed eight feet in width, and there shall be constantly kept, at a sufficient distance (not less than three yards in advance) one borehole near the center of the workings and sufficient flank boreholes on each side."

Ques.—What are the causes of mine fires? How would you proceed in case of a fire in a mine of which you had charge? Give full details.

Ans.—The causes of mine fires are numerous. Among the more common causes may be mentioned the following: The careless handling of open lights or use of matches in proximity to combustible materials, such as hay, powder, waste, canvas or board brattice, etc.; careless shooting in presence of gas; ignition of gas feeders; improper wiring and installation of electrical equipment; spontaneous combustion of fine coal and slack in the gob or abandoned workings, or from accumulations of oily waste in pumprooms and shanties; sparking of electric wires and brushes or blowing of fuses.

The manner of dealing with a mine fire must always be determined by the conditions regarding its location in respect to the air current and proximity to shafts or any combustible construction or material; and the headway gained by the fire when discovered; also, the means available for fighting the fire.

In any event, notify the men working in the mine, instructing them to withdraw at once and directing them by the shortest and safest route to escape to the surface. At the same time, summon help and lose no time in getting water to the fire. If the fire is on the intake and has gained some headway it may be possible to short-circuit the air so as to prevent the smoke and gases from being carried into the workings and suffocating the men before they have opportunity to escape.

Ques.—Give method of procedure in case an explosion occurred at a mine of which you had charge, by which the ventilating devices had been injured, and there were men to be rescued.

Ans.—The fact that the ventilating apparatus has been injured suggests the force of the explosion was considerable and makes it probable that much damage has resulted in the mine whereby the circulation will be cut off from reaching the workings, even when the apparatus is repaired and the air current restored. While immediate efforts must be made to effect temporary repairs to again put the ventilating machinery in commission, no time must be lost in organizing and equipping a rescue party for entering the mine and rendering any possible aid to the men in the mine.

Rescuers must be equipped with reliable breathing apparatus and approved safety lamps, without which no advance can be made ahead of the air entering the mine. The lack of available breathing apparatus will mean much delay in reaching the men, as the air current must then be established at the entrance of the mine, and the work of erecting brattices, building stoppings and repairing air bridges be started and carried forward as the rescuers advance.

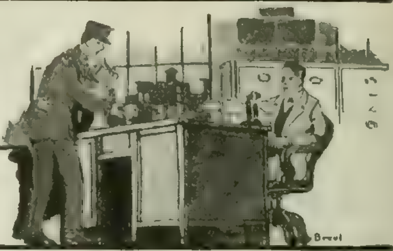
No lights other than approved safety lamps can be used and the lamps must be closely watched to detect the presence of explosive gas. The rescuers must also carry with them one or more caged birds or mice as a means of detecting the presence of the deadly carbon monoxide, which is very liable to be present in dangerous quantity.

Ques.—How would you proceed to rescue a person caught by a fall of roof?

Ans.—Summon quickly what help is available nearby. Do not delay; but approach the place with caution, noting the condition of the roof above and around the fall and the position of the victim. Make no attempt to disturb the roof by setting timber, or removing loose pieces of slate that seem ready to fall. Instead, give immediate attention to releasing the man, by cautiously and expeditiously dragging him from beneath the debris if this can be done without further injury to the victim. Notify surface and foreman, and summon first-aiders.

INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD



Save Fuel by Heating Feedwater

Kindly permit me to ask two questions, which are as follows: (a) What percentage of fuel will be saved by heating the feedwater to 150 deg. F., by means of the exhaust steam, before introducing it into the boiler, instead of feeding the water to the boiler at a temperperature of 50 deg. F., taking the total heat of vaporization or the heat above 32 deg. F., for a boiler pressure of 100 lb. per sq.in., at sea level, as 1185 B.t.u.? (b) Assuming this percentage of fuel is saved, at a mine using 1200 lb. of coal per hour, what weight of coal will be saved in a day of 8 hr.?

————, Pa. EXAMINER.

Using the exhaust steam and heating the feedwater from 50 deg. to 150 deg. utilizes 150 — 50 = 100 B.t.u. per lb. of steam generated in the boiler. This heat is abstracted from the exhaust steam and would be otherwise wasted. Since the total heat, per pound of steam generated, at 100 lb. per sq. in. boiler pressure, is 1185 B.t.u., the saving in heat units is (100 ÷ 1185) 100 = 8.4 per cent. This saving in heat units represents the percentage of fuel saved.

(b) The weight of coal burned in a day of 8 hr., in this case, is 8 × 1200 = 9600 lb. Under the assumed conditions, the weight of coal saved, per day, is therefore, 0.084 × 9600 = 806.4 lb.

Fan Installation

In my trouble I am coming to my old friend, *Coal Age,* which has benefited me many times during the three years since I first made its acquaintance. What is worrying me now is the fact that the ventilation in our mine is not up to standard. While it complies with the mining law, it is quite evident that before long the present fan will be unable to furnish the volume of air that will be required in the mine.

In view of this condition, we are considering the idea of setting up a second fan to assist the circulation and bring it up to the required standard. In turning over this proposition and casting about for material, I find that we have enough scrap lying about the place to build a 4-ft. fan. The plan is to set this fan in such a position that it will act in conjunction with the present fan to force the air through the mine. By a simple arrangement of trapdoors, the two fans will work, independently, on the same current.

The dimensions of the proposed fan are about as follows: Diameter, 4 ft.; width of blade, 2 ft. 6 in.; depth of blade 14 in. This will make the diameter of the central opening of the fan 4 × 12 — 2 × 14 = 20 in. It is the intention to run this fan at a speed of 250 r.p.m., that being the speed at which our motor will drive the fan without making any alterations. The size of the mine airway is 5 x 10 ft., in section; and the length, including the return, 4,000 ft., which gives a total rubbing surface of 120,000 sq.ft. I want to ask if *Coal Age,* or any of its readers can tell me if the dimensions of this fan are such as will give satisfactory results.

OSTEL BULLOCK, Supt.,
Hillside, Ky. Liberty Coal Mining Co.

The tip speed of a 4-ft. fan, operated at 250 r.p.m., is 250 (4 × 3.1416) = say, 3,140 ft. per min. The theoretical water gage corresponding to this tip speed can be calculated with close approximation by multiplying the diameter of the fan (ft.) by its speed (r.p.m.) and dividing that product by 900. The square of the quotient obtained will be the theoretical water gage in inches; thus,

$$w.g = \left(\frac{Dn}{900}\right)^2 = \left(\frac{4 \times 250}{900}\right)^2 = 1.23 \text{ in.}$$

The corresponding unit pressure is 1.23 × 5.2 = 6.4 lb. per sq. ft. Then, for a rubbing surface of 120,000 sq.ft. and a sectional area of 50 sq.ft., this pressure will produce an estimated velocity of

$$v = \sqrt{\frac{p\,a}{k\,s}} = \sqrt{\frac{6.4 \times 50}{0.00000001 \times 120{,}000}} = 516+ \text{ ft. per min.}$$

Therefore, estimating on, say a velocity of 500 ft. per min. in this airway, gives for the volume of air passing 500 × 50 = 25,000 cu. ft. per min.

Again, since the tip speed of the fan is 3,140 ft. per min., the area of opening at the center of the fan may be calculated for an intake velocity of, say 3,000 ft. per min. Thus, for a single-intake fan, the area of the center opening in this case is 25,000 ÷ 3,000 = 8⅓ sq.ft.; and its diameter is $d = \sqrt{8\frac{1}{3} \div 0.7854}$ = say 3¼ ft., or 39 in., which gives for the radial depth of the fan blades ½ (4 × 12 — 39) = 4½ *in.*

This is a high-speed, multiblade fan having a large single intake area. The blades of the fan must be firmly supported by two annular disks and set a distance apart somewhat less than the radial depth of the blades. The blades should be cupped, the concave side being in the direction of motion. The lip or inner edge of the blade should make an angle of 50 or 60 deg. with the tangent to the intake circle, while the blade tip is normal to the outer circle of the fanwheel.

The power required to drive this fan at a speed of 250 r.p.m., assuming an over-all efficiency of 80 per cent, can be estimated as about 6 hp., or, say, 4½ kw. This power would consume a current of 18 amp., under a pressure of 250 volt.

The successful working of two fans in parallel, however, will depend much on the proper balancing of the two ventilators, which is a matter that can only be regulated by an experienced operator on the ground.

Inside Information as to Development of Coal Transportation Problems

Hines' Authority, Lost by Return of Railroads, Restored (?) by President's Order—Tidewater Coal Exchange Orders Too General To Be Explicit—Commission on Car Service Will Not Order Immediate Homing of Railroad Cars—Dangers Seen in Yielding to "Assigned Car" Promises—Shipping Board No Longer Boosts Rates

JOHN CALLAHAN, the traffic manager of the National Coal Association, speaking of recent transportation development in Washington stated that during the past week much dispute has arisen in Washington, D. C., as to the order of the President of the United States dated Feb. 28. It re-establishes in Walker D. Hines the authority conferred on him by Dr. Garfield's order of Oct. 31, mention of which was made in the President's order reinstating Mr. Hines' power over the "delivery, use, consumption, distribution and apportionment of coal."

This order of Oct. 31 says that "I, (Dr. Garfield) designate the Director General of Railroads and his representatives to carry into effect the said order of Jan. 14, 1918 and to make such diversions of coal which the railroads under his direction may, as common carriers, have in their possession, etc., etc." It has been seriously questioned whether the Central Coal Committee members cannot be held under the law for any action they may have taken in connection with the further distribution of coal since it is clear that Mr. Hines has no "railroads under his jurisdiction." This subject was referred to the Attorney General and it is understood Mr. Palmer stated that Mr. Hines had the authority to divert coal under the order of Feb. 28. It is easily understood why Mr. Palmer should so interpret the order since he is said to have written it.

WILSON RESTORES HINES' AUTHORITY

Nevertheless further discussion of the matter resulted in the President issuing a new order, dated March 5, 1920. This order avoids all reference to any carriers under the control of Mr. Hines and places the necessity for such an order on the present emergency and the necessity existing that provision be made for the fuel requirements of the country. It empowers the former Director General of Railroads, his successor in office and his representatives, to distribute coal in the order of priority set forth in the preference list of the United States Fuel Administrator of May 25, 1918, also to establish rules for the regulation of this distribution; and further to regulate the method of production, shipment, distribution, apportionment or storage among dealers and consumers within the United States.

Thus in an effort to make this order of March 5 really binding and productive of the desired results, the former Director General is given the powers which section 25 of the Lever Act provided the President of the United States should accord whenever and wherever in his judgment it was necessary for the efficient prosecution of the war, namely the regulation of the method of "production, sale, shipment, distribution and apportionment or storage thereof among dealers and consumers."

The order of Feb. 28 gave the former Director General and his representatives authority only in connection with the "delivery, use, consumption, distribution and apportionment of coal." There is, of course, question as to whether or not the President's order of March 5, quoting the order of Aug. 10, can give Mr. Hines powers in connection with the production of coal, for example, which were only given by the law in order to insure the efficient prosecution of the war.

NO OUTCOME YET OF PRESIDENT'S ORDER

Owing to the uncertainty there was little, if any, diversion of coal during the week ended March 6, although there were thousands of cars of coal held up simply because the carriers could not move them to their billed destinations. These because of lack of authority and organization machinery, have been allowed to stand unmoved during the past week. Mr. Hines has now re-established the Central Coal Committee although there is a question as to just how effectively it can act since it is understood that several members of the original committee will be actively engaged in other duties.

Special attention is directed to the fact that by the instructions of the former Director General: "Producers and shippers of bituminous coal under contract to furnish fuel to consumers and dealers within the United States, shall give preference in the shipment of such coal to such consumers and dealers to the extent necessary to supply their actual current needs and in the order of precedence established by the U. S. Fuel Administrator under date of May 25, 1918." Since the railroads head this list, it is not at all difficult to sense the real occasion for the order and it is indeed unfortunate that the failure of the Purchasing Section of the Railroad Administration to provide, during the contract period in 1919 for the proper supply of coal, should result in the necessity for such arbitrary action on the part of Mr. Hines.

DISTRIBUTION BY REGIONAL COMMITTEES

The regional Coal Committees that have been established, pursuant to the President's order, will only have authority to distribute in emergency to the first five classes of the priority list, namely railroads, army and navy, state and county institutions, public utilities and retail dealers. The new order, however, distinctly separates the powers of distribution of coal generally from the powers conferred upon the Tidewater Coal Exchange officials under the order dated Feb. 25.

The officials of the Tidewater Coal Exchange did not adequately supplement the order of Feb. 28, in relation to the Tidewater Coal Exchange, for the order under date of March 1 provides only that the exportation of coal will be permitted when, and to the extent that, the requirements of consumers within the United States will allow. Also that all permits to export must be secured from J. W. Howe, Singer Bldg., 149 Broadway, New York, applications for permit to export to include the name of the applicant, his address, the class of coal and purpose for which it is to be used, the amount of such coal, the name of the shipper, the district from which the coal will be shipped, the port of exportation, the terminal railroad, the date of the contract, the consignee, the foreign destination, the name, deadweight tonnage and flag of the carrying vessel, the condition and position of this vessel at the time of application and the name of the pool at which the coal is available at Tidewater.

SHIPPERS QUESTION STATUS OF PORTS

It is also provided that permits will only be issued when the vessel is in the harbor and the applicant has sufficient credit in the pool named to cover the request for privilege to export. Furthermore, these permits will expire by limitation on midnight of the seventh calendar day after issuance. The Tidewater Coal Exchange rules and regulations in effect Feb. 25, 1920, are to be continued operative.

Shippers at some ports much question what is the status of the tidewater pools, particularly in view of the action that has been necessary in the recent past in the way of diversion of coal. This uncertainty has made some coal shippers hesitate to ship to the pools until they have some assurance that they will be able to obtain the coal for which they establish credit in the exchange. Little difficulty is anticipated in this connection at Norfolk and less difficulty is looked for at Baltimore than at the two northern ports over which the Tidewater Coal Exchange has control, viz., New York and Philadelphia. This is because exportation from Philadelphia and New York was practically reduced to a minimum some 6 or 7 weeks ago, whereas there has been a continued movement of a considerable volume of coal through Hampton Roads. It is not necessary to add that the exportation of coal through New York has never been large.

CARS TO RETURN TO OWNER'S RAILS

On Wednesday, March 3, the Railroad Relations Committee of the National Coal Association conferred with President Aishton of the American Railroad Association and that association's Commission on Car Service. As a result of this conference it is understood that there is no present intention on the part of the Commission on Car Service to call on the railroads in an arbitrary manner for the return of open-top cars to home rails. On the contrary, it is the expectation of the Commission on Car Service to accomplish the return of cars to their owners' rails by a gradual transition process.

Efforts are being, and will continue to be, made to confine cars to home-line rails, and at the same time to require foreign lines to return to home lines all the cars that can be so handled, but at no time must this be done if the coal industry shall thereby be interfered with and coal loading reduced. Such liberality in the interpretation of the rules as is necessary to carry out this plan will be authorized and a maximum amount of elasticity will be provided in the new Car Service Rules.

Transportation officers of some 25 Eastern coal-loading roads will be in Washington shortly in conference with the Commission on Car Service and will discuss just what procedure is necessary to insure that this course is followed, and it is expected that as a result of this conference an understanding will be reached which will make possible a practically universal application of the rules, thus insuring the maximum loading of coal during the troublesome transition period through which we are now passing.

IF CARS ARE MISHANDLED OUTPUT WILL FALL

It was clearly understood by all interested persons at the conference that while coal operators will be requested to co-operate in every way to insure that cars will be used with maximum efficiency, they will not, because of the rules, be subjected to undue or unnecessary difficulties in the transaction of their business, and that when they wish to ship cars placed under their tipples to any destination for which they have orders, their wishes are to be respected. Coal producers should, however, endeavor to load cars so that they will move in the direction of, and therefore reach, the home line with a minimum amount of delay.

It is quite probable that further instructions will be issued by the Commission on Car Service in the near future making detailed arrangements to insure the return of certain cars to their home rails where this can be done without interfering with the transportation of coal and other commodities which are to be loaded in open-top cars. Cases involving roads, the coal production of which is to a large extent delivered to destinations off the originating line, will receive special treatment.

In the event that such action is necessary, cars will be arbitrarily moved to these roads to insure a coal production comparable with that allowed generally in the district in which such railroads operate. Coal operators should keep in close touch with their railroad officials on these matters and ascertain just how they should route cars so as to insure that the best possible use may be made of them.

There was some discussion within the commission as to the status of "assigned" cars. The Commission on Car Service has addressed all the railroads suggesting that it will be desirable to continue in effect circular CS-31 of the Car Service Section of the U. S. Railroad Administration and this should be of great assistance in continuing the assigned-car matter in its present status, and it is hoped that the railroads will not at this time arbitrarily return to the use of assigned cars.

SIGN RAILROAD FUEL CONTRACTS WITH CAUTION

Coal operators who are approached by railroad officials in regard to signing up contracts for railroad-fuel which include provisions for the use of assigned cars should carefully consider the provisions of the new law as passed in the railroad bill, which specifically requires that carriers must maintain and apply just and reasonable ratings of coal mines and count each and every car furnished to or used by any such mine for the transportation of coal against that mine and that it is not impossible that where any concessions are made in return for the assigned cars that the carriers making such offer may find themselves unable to carry out their portion of the bargain insofar as a supply of cars to such a mine, in excess of that which other mines on the same division receive, is concerned.

The Interstate Commerce Commission has also taken action in this connection through the medium of a letter signed by G. B. McGinty, and dated March 2, 1920. This is addressed to all carriers and shippers, and reads as follows:

> The supply of cars available for the transportation of coal is insufficient to meet the demand. Unusual movements incident upon the strike of coal miners has brought about an abnormal location of cars. It is desirable that cars be properly relocated as rapidly and with as little confusion as is possible. Critical situations will still exist in which fuel for essential industries and purposes must be provided. The railroads and the coal operators have all been working under the uniform mine-rating and car distribution rules established by the Railroad Administration and these rules seem to be generally satisfactory and to meet with general approval.
>
> To the end that conflicting and contradictory rules on different roads and in different fields may be avoided in the unusual conditions which now exist in the industries and on the roads, the commission recommends that until experience and careful study demonstrate that other rules will be more effective and beneficial and especially during the remainder of the early spring the uniform rules as contained in the Railroad Administration's Car Service Section Circular CS-31 (Revised) be continued in effect.

From this it will be seen that it is the desire of the Interstate Commerce Commission that the provisions of the mine-rating and car-distribution rules shall be continued until all the matters involved in them can be investigated.

Of interest to exporters of coal is an announcement by the Shipping Board that all its tariffs on freight rates have been cancelled. The shipping rates on ocean coal will be fixed hereafter and announced by private shipping companies managing and operating the government merchant ships. The Shipping Board has put in force an agreement reached with private shipping companies, by which these firms will determine rates to be charged for the transportation of coal by the vessels of the Shipping Board.

The private companies operating the Shipping Board vessels will receive a fixed rate of compensation from the Shipping Board for the service of managing and operating the ships, and will also share in the profits realized above the actual cost of operation. The Shipping Board will supervise rates on coal and other commodities to prevent them from ascending above a reasonable level. In other words, the action of the Shipping Board in this instance practically amounts to the ultimate withdrawal of the government from its continued regulation of the shipping business in such a manner that open-market competition could not be met.

Shipping-Board officials are of the opinion that the removal of the government embargo on coal export, when it comes, will cause a resumption of the flow of coal from this country to foreign markets which this time will be in larger measure than before. This will probably increase the demand for ships to the extent that practically the same rates as those now in effect will obtain.

Will the Anthracite Miner Receive an Increase?

Operators and Miners Meet at New York City on March 9—Demands Referred to a Sub-Committee—60 Per Cent Increase and 5 Day Week Urged

CONSIDERATION of a new wage agreement to become effective on April 1 between the anthracite operators and their employees began at the Hotel Pennsylvania, New York City, on March 9 and it is expected will continue, with the possible exception of week-ends, until negotiations are concluded. The demands were referred to a sub-committee of operators which consists of the following:

Operators—S. D. Warriner, Philadelphia, president of the Lehigh Coal & Navigation Co.; W. J. Richards, Pottsville, president of the Philadelphia & Reading Coal & Iron Co.; W. L. Connell, Scranton, president of the Enterprise Coal Co., and C. F. Huber, Wilkes-Barre, president of the Lehigh & Wilkes-Barre Coal Co.

Miners—John T. Lewis, international president of the United Mine Workers; John T. Dempsey, Scranton, president of District 1; Thomas Kennedy, Hazleton, president of District 7, and Christ J. Golden, of Shamokin, president of District 9.

Alvan A. Markle, of G. B. Markle & Co., Hazleton, Pa., independent operators, is the chairman of the sub-committee, having no vote, and James A. Gorman, also of Hazleton, is the secretary. Mr. Gorman is the secretary of the Anthracite Conciliation Board and Mr. Markle was the chairman of the sub-committee that negotiated the last working agreement between the miners and operators.

The demands presented to the operators were adopted at the Wilkes-Barre convention last August and later ratified at the National Convention held in Cleveland a month later. They consist in part, as follows:

(1) "The contract wage scales be increased 60 per cent, and that the increases secured in the supplemental agreements of 1917 and 1918 shall be included in the wage scale as the basis upon which the 60 per cent shall be added, and that all day men be granted an increase of $2 per day.

(2) "A uniform wage scale be established so that the various occupations of like character at several collieries shall command the same wage and that shovel crews operating for coal companies shall be paid not less than the rates paid by the contractors to shovel men.

(3) "A work day of not more than six hours from bank to bank be established for all classes of inside or outside day labor, five days per week, the uniform sales to be the basis upon which the advance above demanded shall apply with double time for Sundays and holidays.

(4) "A closed-shop contract, which means full recognition of the United Mine Workers of America as a party to the agreement."

W. L. Connell, of Scranton, presided at the general meeting at the Hotel Pennsylvania on the afternoon of March 9, when the demands were formally presented. Forty-nine operators and 37 representatives of the miners were present. President Lewis and Vice-President Murray represented the international organization of the Miners' Union.

Although the meeting was executive, it was stated that Mr. Lewis and Mr. Warriner made short addresses, the former telling the operators that the miners were approaching the negotiations in the spirit of utmost fairness and sincerity. Mr. Warriner stated that the demands would be given proper and fair consideration. These demands were explained in detail by Mr. Kennedy and by Mr. Golden. It was then decided to refer the demands to a sub-committee of operators and miners.

No session was held on the following day (Wednesday) but on Thursday the conferees met at the Union League

Club, Fifth Ave. and 39th St. Mr. Lewis was absent, it being announced that he had gone to Washington to confer with John P. White, a member of the Bituminous Wage Commission, a former president of the International organization of the Miners' Union.

At the conclusion of the first session of the conference on March 9 the representatives of the mine workers gave out the following statement containing the reasons for the demands:

"The mine workers insisted that the human element should be considered as well as the financial element in reaching a decision on the question of a new contract.

"Their demand for a 60 per cent increase in wages was based largely on the tremendous increase in the cost of living. The standard of living had advanced in the last few years to such an extent that the wages which would have been sufficient for the standard of living of a few years ago were not sufficient to provide for the standard of living in 1920. This they said was the natural result of changed and changing conditions throughout the world.

"The demand for the six-hour day was more misunderstood than any other demand that had ever been made before by the coal miners of this country. The establishment of a shorter work day would not result in a curtailment of production of coal but the miners insisted that the production would be as great in a six-hour day as it has been heretofore under the longer work day. Men retain their efficiency as workmen under the shorter work-day system better than in the longer work day and are more capable of doing effective work.

"On the subject of the closed shop, the miners said that the United Mine Workers of America has served its apprenticeship in the anthracite region, and that it is no longer merely a labor organization, but that it has become in the anthracite region a real institution which has done more to stabilize the mining industry and to bring and maintain peace, tranquillity and harmony in the industry than any other single institution, therefore they said it was entitled to full and complete recognition by the operators and the public.

"Since all of the miners in the anthracite region share in the benefits which the organization has obtained they should all become members of the union and share in its burdens and responsibilities. They held that the operators ought to aid in bringing about a 100 per cent organization because of the fact that the union has done so much and is capable of doing so much more toward the stabilization of the industry.

"John L. Lewis, international president of the United Mine Workers, told the operators in the conference that the miners were ready to approach the negotiation of a new contract in the spirit of utmost fairness and sincerity, realizing that the miners, the operators and the general public are the parties in interest in the entire matter. He said that the making of a new contract should be approached in the light of present existing circumstances and conditions with the purpose on both sides to reach an agreement that would do full justice to all parties."

Following the session on March 11 it was announced that it had been decided to eliminate the demand of the miners for an agreement to supplement that of Nov. 15, 1918, under which the contract miners received a wage increase of 40c. a day while the day laborers got an increase of $1.

The second session of the sub-committee was held at the Union League Club on Friday, March 12, at the end of which the following statement was issued explaining the day's work: "The request of the mine workers for payment for all dead work on the consideration basis and the demand for the abolition of the dockage system was before the committee. The operators' representatives sought from the miners the interpretation the miners place upon these two demands. A general discussion of these two questions followed."

Railroad Confiscations Declared to be Illegal

Ex-President Taft Sees No Reason for Government Price Control

CONFISCATION of coal by the Railroad Administration and the fixing of prices at which coal may be sold by the Government was recently held to be illegal in an opinion rendered to the Smokeless Coal Operators' Association by former-president William Howard Taft.

As to the question of government-fixed prices, Mr. Taft says: "In the absence of any finding of the President that these orders restoring old orders are necessary for the efficient prosecution of the war, I cannot see how authority to fix prices can continue so as to prevent coal operators from making contracts after April 1, in accordance with their usual custom, at prices mutually satisfactory to the parties and without regard to the prices fixed in the order of Oct. 30, 1919."

In regard to the right of the Railroad Administration to divert coal or issue orders or regulations for such diversion, Mr. Taft declares that the first answer holds. Further, he states that even the first order restoring the Government price on coal had no relation to the prosecution of the war.

Repeal of Excess Profit Tax Forecast

Senator Watson Says Relief from High Cost of Living Will Be Impossible Until These Taxes Are Removed

REPEAL of the present system of excess profits taxes and the substitution in their stead of direct sales taxes has been virtually decided upon by Republican leaders in Congress, according to an announcement last week by Senator Watson, Republican, of Indiana, a leading member of the Senate Finance Committee.

"The excess profits taxes are a direct burden on the people of the country and relief from the present high cost of living will be impossible until these taxes are removed," Senator Watson declared. It is explained by those who wish the excess profits taxes removed that manufacturing concerns are unable to gage their possible profits under such taxes until the end of the year. To cover up any possible loss under regular earnings additional charges are placed on commodities, they believe.

If the system of taxation is changed to a system of sales taxes the producer can charge the flat tax as part of production or expense and gage his profits accordingly. A conference will be held this month at which leaders of the Senate Finance Committee and the majority members of the House Ways and Means Committee will participate, Senator Watson announced.

Committee of Three Disagree Over Bituminous-Wage Problems

Bituminous Committee Dissolved Without a Unanimous Decision, Thus Ignoring President's Instructions—Two of Three Advocate a 25 Per Cent Increase, but White Refuses to Agree

IGNORING President Wilson's request to arrive at a unanimous decision, the coal commission after an investigation which lasted for more than two months disagreed and two of its members made a report, the commission discharging itself from its duties on March 10.

Chairman Robinson and Rembrandt Peale sent the majority report to the President, while John P. White, the former president of the United Mine Workers of America and mine workers' representative on the commission, is still working on his minority report.

Although the contents of the report are not officially known, a rumor, which has received confirmation, is to the effect that an increase of about 25 per cent was awarded to the miners in the majority report. No increase in the price of coal is recommended, but such an advance is suggested, the matter of making provision for it being left in the hands of the Fuel Administration. One hundred million dollars a year, it is estimated, is the increased figure that the public will have to pay the mine workers if the advance is granted. It is probable that this wage increase will not be retroactive and will presumably become effective after April 1. Some of the other points settled are as follows:

1. The check-off system is to be continued. 2. The question of differentials is to be left to a special commission to be appointed by the miners and operators. The report of this commission will be incorporated in the next wage agreement. Two years is given as the maximum time in which to complete this report. 3. A six-hour working day and a five-day week have been denied.

It is believed that White did not dare to conform with the majority report so long as the anthracite agreement is being investigated in New York City. Had not the anthracite negotiations been under way, White might have been willing to sign the document.

The President has requested that the commission reconsider the matter. Even if it is made unanimous the mine workers may reject the report, for they had large anticipations. White insists that the 31.6 per cent increase offered by Secretary of Labor Wilson is fair and should be granted to the miners, and he adds that the operators should be permitted to advance the price of coal in accordance therewith.

The anthracite mine workers are, of course, much interested in the decision relative to bituminous mine labor and should the bituminous men reject the decision, there is a possibility that a combined strike involving both anthracite and bituminous-coal miners will take place. This would affect about 550,000 men, 400,000 being the number of bituminous miners in union districts.

Premature publication of the salient points of the majority report caused much perturbation in Washington, as it had been intended to release both majority and minority reports simultaneously.

The commission summoned by President Wilson to investigate conditions in the bituminous-coal industry and recommend measures for the coming wage agreement in the Central Competitive district last week agreed to disagree and filed majority and minority reports with the chief executive. Neither of these reports has been made public, but it is understood that the representatives of the public and coal operators were agreed that a wage advance aggregating slightly in excess of 25 per cent with no changes in hour of labor might be granted. The miners' representative, on the other hand, was firm in his advocacy of increases stated variously as amounting to 30 to 35 per cent and the adoption of a 7-hour day.

Thus deadlocked, the commission dissolved, rendering its separate findings as noted above. The President, however, is not satisfied with this result and has "deemed it advisable" to again summon the members into session with instructions to reach a unanimous decision if possible. While he is free to accept either of the reports already rendered he much prefers unanimity.

It should be recalled that the miners struck last fall demanding a 60 per cent increase in wages, a 6-hr. day and a 5-day week. The anthracite miners reiterate these demands in their present negotiations with the operators.

Peale and Robinson Show No Bitter Feeling Against White

It is denied that there was, as reported from a few sources, a bitter altercation between Robinson and Peale on the one hand and White on the other, over the report of the Bituminous Coal Commission. It is understood that neither Peale nor Robinson is greatly exercised over White's dissent from their wage ruling.

French Miners in Sympathy Strike

It was estimated by officials of the French Federation of Labor on March 13 that nearly 400,000 persons in all were on strike in France at that time. In the Department du Nord some 20,000 coal miners have struck in sympathy with the strike of an equal number in Pas-de-Calais, and this development has strengthened the hope of the radicals among the labor leaders that a general coal strike may be brought about.

More Trouble for the President

There was much talk in Washington on March 12 about the President ironing out the differences between the two reports made by members of the Coal Commission. Interest is revealed in the still unpublished findings of the commission and much speculation was made as to whether President Wilson would accept or reject the majority report.

It is an open question whether Chairman Robinson, who represented the public interest, would consent to return to Washington to reconsider a decision that he believes to be in the public interest.

With the exception of the pay increase and the fixing of the working day at eight hours from bank to bank, the miners are willing to accept the majority report. They are more insistent on a shorter working day than they are on higher pay.

Indictments Brought Against 125 Bituminous Miners and Operators

Conspiracy to Limit Coal Production Is Charged —Identity of Indicted Men Not Revealed —Only Bituminous Operators Involved

AT INDIANAPOLIS on March 11 indictments charging 125 operators and miners with conspiracy under the Lever act to limit the production of coal, were returned by a special grand jury which has been investigating the coal industry for the past three months.

Judge Anderson of the Federal court fixed the bail at $5,000 and $10,000 on the men. Their names will not be disclosed until after their arrest. Punishment, if convicted, would entail a fine as high as $10,000 and imprisonment up to two years, or both. May 4 is the day set for the arraignment of the men now under the indictment.

Nearly all the indicted are operators in the Central Competitive field, and only a small number of mine workers' officials are named.

After perhaps the longest session in the history of the Federal court in the State of Indiana, which lasted 49 days, the special grand jury in charge of U. S. District Attorney Dan W. Simms, brought charges against the largest operators in Illinois, Indiana, Ohio and Western Pennsylvania. It has been stated that several leaders of the United Mine Workers of America will be forced to stand trial. No arrests are expected for several days. Much time must be allowed to give the Government officials time to prepare 125 capiases which are to be served upon the indicted men.

"No Large Increase—No Coal"—Say Bituminous Miners

Strike Is Eminent Unless Substantial Raise In Pay is Awarded

ON March 9 before the award of a 25 per cent increase was granted a statement was made by the United Mine Workers of America, whose headquarters are at Indianapolis. The statement as given to the press reads as follows:

"Nothing short of a substantial increase in wages and improved working conditions will be acceptable to the United Mine Workers of America. The miners are aawiting the decision with much anxiety. We believe the public will understand our position.

"Unless a settlement of the controversy is made on such a basis the miners will not feel that full justice has been done them. There has been a steady increase in the cost of living since the first of this year, in spite of the fact that the government represented to labor last summer that living costs would be reduced and that the government would see to it that this was done.

"Furthermore, promises of reductions in the cost of living would fall on deaf ears, as far as the coal miners are concerned, because they have had their experience with such promises in the past, all of which have gone unfulfilled."

What "They Say" About the Coal Commission's Award

Operators Unable to Formulate Opinions—25 Per Cent Increase Too Much For Mine Operators to Assume

OPERATORS and their representatives in Washington, at this writing, are unable to formulate opinions or plans based on the Coal Commission's award, because of the uncertainty as to just what the award covers. They are positive, however, that there must be an increase in the Government price or the withdrawal of control altogether, in the matter of price, if the nation's fuel requirements are to be met.

It is stated positively that an award providing an increase of 25 per cent in the wage scale cannot be absorbed by enough mines to produce the country's coal, while if a compromise should be reached on a still higher percentage of increase the situation would be worse. It is declared that even if price control is removed, it will be a serious matter for some districts, and that under such an award no commercial mines in the State of Washington could continue in operation.

In addition there are other fields where the matter of competition with other fuels is serious.

A wage increase of 25 per cent would add from 50 to 60c. a ton to the cost of producing coal. If these estimates are accurate it will mean a minimum increase in the cost of producing the country's coal, of $250,000,000. With such a victory to its credit, many are of the opinion that there will be a higher degree of inefficiency on the part of labor, thereby adding materially to the figure just mentioned.

A large number of operators were in Washington at the time the award went to the White House. Many of them were outspoken in denouncing it as an unwarranted burden to place on the shoulders of the coal industry and of the public in general. It is practically the unanimous opinion of those operators who followed the hearings before the President's Coal Commission that the war-time wages, calculated to bring out maximum production, afforded ample compensation to industrious miners.

The award, it was claimed by some, shows how fundamentally wrong it is to place in the hands of an informally chosen Governmental body, with no machinery for appeal, a hard and fast adjustment of personal relationships. It is an attempt, some say to give the men who work the least time a comfortable living wage, and allow those who really are industrious a wage out of proportion to the earning power of this class of labor in other industries.

Such an increase in salary, as is carried in the award, it was declared, strikes a most effective blow at our chief asset in the matter of foreign trade. Our ability to compete has been due largely to our cheap power. On the whole the award is regarded as a new and most important factor in increasing still further the cost of living.

An immediate effect of the award, it was pointed out, will be to necessitate increased freights whereby the railroads may meet the higher cost of their fuel. Much objection was voiced because the award has been made on a percentage basis. A percentage basis affects each district differently and will make for great difficulties in apportioning the increases.

It is believed that no consideration was taken by the Commission of the fact that many miners have an income from work done during the hours that they do not engage in mining. Such limited facts as are available regarding the awards, lead to the very geenral conclusion that it is a victory for mine workers and represents a long step toward the nationalization of coal mines, which is the objective toward which the mine workers are really working, some think.

Peale and Robinson Comment On Recent Decisions

Shortly after a decision of the Bituminous Coal Commission had been filed with the President, both Mr. Robinson and Mr. Peale, it was learned, were approached by correspondents from newspapers from all over the country, in an endeavor to hear what each had to say with reference to the outcome of the investigating committee.

Chairman Robinson, it is understood, is adamantine on the conclusion that with the world in its present condition of deficient production this is no time to talk of six and seven-hour working days. The increase favored by the majority will cost the country $100,000,000 a year, and a reduction of the working time would result, in either a shortage of coal or still higher costs to the public.

Mr. Robinson is represented as being impressed with the prospect that with a regularizing of coal production, which he considers entirely feasible, through storage by large consumers and other means, the miners can be kept steadily at work throughout the year and can easily produce enough coal for an export trade of 100,000,000 tons a year, provided they will accept an eight-hour day. With a slump in agricultural and manufactured exports as is very generally forecast, a large volume of coal exports may soon be expected.

It was authoritatively learned that Rembrandt Peale, representing the operators on the commission, was as much displeased with the majority report, which was dictated by Robinson, as White was, but as the only way of avoiding three separate reports finally acceded to Robinson's position, though he had to swallow such a bitter dose for the operators as the retention of the check-off system, which practically means that the opertors must continue to be the financial medium for keeping the union mine workers of America numerically strong and plethoretically financed.

National Coal Association Shows That Miners Make Good Wages

The accompanying tables are from the exhibit prepared by the National Coal Association for the Bituminous Coal Commission. While by no means all of the coal districts of the country are here represented, enough daily and monthly earnings are set forth to show the general trend of conditions. If these tables show anything clearly, it is that the men who work steadily earn more per day than those who work with great irregularity.

Take, as an example, the pick miners of the Pittsburgh Thin Vein Field. Table II shows that those of these men who worked less than 25 per cent of the time earned $5.50 per day, while those who worked from 75 to 100 per cent of full time earned $6.62 per day.

Comparing the figures throughout the entire table, it will be seen that the men who work reliably receive on the average not only greater compensation per month but also greater wages per day.

Table I. Deductions for Smithing and Explosives Compared with Gross Earnings of Pick Miners and Loaders for 10 Months, January to October, 1919

District	Pick Miners and Loaders: Average No. Men Working per Mo.	Average Daily Earnings per Man	Average Total Earnings per Mo.	Average Deductions per Month: Smithing: Amt.	Smithing: Per cent of Earnings	Explosives: Amt.	Explosives: Per cent of Earnings
Pittsburgh Thick Vein	1,405	$5.91	$138,974	$1,667	1.20	$1,641	1.18
Pittsburgh Thin Vein	2,516	5.79	225,806	1,983	0.88	1,968	0.87
Ohio No. 8	2,216	5.83	195,559	13	0.01	2,799	1.43
Southern Ohio...	2,462	5.97	165,295			2,755	1.67
Indiana.........	3,468	6.83	277,069	3,786	1.36	19,383	7.00
Illinois Nos. 5 and 9	2,604	7.20	232,805	269	0.12	9,127	3.91
Freeport	508	6.91	63,231	215	0.34	3,698	5.85
Central Pennsylvania........	3,897	6.02	352,828	2,719	0.77	5,344	1.51
Fairmont ...	2,384	6.0[illegible]	198,513	931	0.46	5,782	2.91
Kanawha	570	5.82	46,251	103	0.22	517	1.12
Western Kentucky....	942	5.70	52,762	372	0.71	2,924	5.54
Michigan ...	[illegible]	[illegible]	58,104	75	0.13	1,807	3.11
Iowa ...	[illegible]	7.45	73,001	823	1.13	5,251	7.20
Missouri.......	550	5.80	45,168	169	0.37	2,966	6.57
Arkansas.......	407	8.00	37,544	277	0.74	2,987	7.96
Kansas.........	1,188	6.26	172,302	1,172	0.96	15,212	12.44
Oklahoma .	304	6.66	24,330	123	0.51	1,200	4.93
Colorado.......	1,420	6.68	144,382	693	0.48	5,632	3.90
Montana .	59	7.75	6,030	61	1.01	414	6.87
Wyoming	572	7.64	68,888	51	0.07	1,867	2.71
Washington.....	458	7.80	58,30[illegible]	158	0.27	3,848	6.60

Table II. Earnings of Mine Labor, by Occupations, as Reported by Operators of Bituminous Coal Mines in Various Fields During the 10 Months, January to October, 1919

The number of calendar days each mine loaded coal is taken as 100 per cent opportunity for labor to work. Table shows average earnings of men in various fields per day and per month working specified percentage of full opportunity

Occupations	Less than 25 Per Cent	25 to 49 Per Cent	50 to 74 Per Cent	75 to 100 Per Cent	Worked more days than mine
Average Daily Earnings					
Pittsburgh Thick Vein Field					
Pick Miners...	5.38	[illegible]	7.01	7.26	7.15
Loaders..................	4.22	4.97	5.36	5.74	5.77
Machine Men............	5.53	6.17	7.34	[illegible].07	8.04
Inside Day Men..........	4.81	4.93	5.10	5.18	5.21
Outside Day Men.........	4.25	4.50	4.68	4.[illegible]0	4.94
Monthly Men............	2.80	3.93	4.03	4.51	4.45
Average Monthly Earnings					
Pick Miners.............	15.74	49.09	96.26	146.13	155.49
Loaders..................	12.95	37.53	77.62	118.67	113.63
Machine Men...........	12.57	35.35	105.61	165.59	165.14
Inside Day Men..........	14.48	44.51	74.07	109.05	131.29
Outside Day Men.........	13.52	38.56	65.52	99.83	127.50
Monthly Men............	14.00	29.50	62.10	90.63	135.92
Average Daily Earnings					
Pittsburgh Thin Vein Field					
Pick Miners	5.50	6.21	6.28	6.62	6.02
Loaders..................	4.50	4.90	5.25	5.76	5.90
Machine Men............	5.03	5.24	6.51	7.27	6.80
Inside Day Labor.........	5.06	5.10	5.07	5.16	5.23
Outside Day Labor	4.32	4.36	4.33	4.43	4.83
Monthly Men............	8.91	4.60	5.25	7.40	4.18
Machine Men and Loaders	5.38	[illegible].44	7.09	7.88	7.08
Average Monthly Earnings					
Pick Miners	16.07	50.80	87.08	129.41	12[illegible].00
Loaders	13.26	39.58	74.97	111.67	120.13

	Worked				
	Under 25 Per Cent	25 to 49 Per Cent	50 to 74 Per Cent	75 to 100 Per Cent	More than mine
Machine Men	12 67	43 94	84 66	149 63	128 73
Inside Day Labor	13 98	41 33	71 27	108 71	124 65
Outside Day Labor	12 24	33 92	62 71	95 67	118 97
Monthly Men	39 00	21 36	84 06	88 78	126 16
Machine Men and Loaders	23 33	85 42	112 92	171.33	157.50
Average Daily Earnings					
Eastern Ohio Field					
Pick Miners	5 83	6 12	6 45	6 31	6 06
Loaders	4 62	5 30	5 51	5 97	5 55
Machine Men	6 12	6 41	5 85	6 83	6 15
Inside Day Labor	4 62	4 76	4 96	4 71	5 22
Outside Day Labor	4 76	4 76	4 72	4 50	4 78
Monthly Men	8 52	7 46	5 52	5 73	4 84
Average Monthly Earnings					
Pick Miners	16 69	52 72	92 74	124 22	140 36
Loaders	12 92	38 16	72 80	109 02	118 38
Machine Men	15.94	46 67	72 61	126 81	140 36
Inside Day Labor	9 52	33 62	65 30	92 38	122 44
Outside Day Labor	13 11	34 55	61 40	91 40	113 91
Monthly Men	32 86	97 00	86 35	146 59	134,48
Average Daily Earnings					
Southern Ohio Field					
Pick Miners	6 17	6 49	7 04	7 68	7 28
Loaders	5 68	5 79	5 90	5 96	5 95
Machine Men	6 68	6 42	7 21	8 03	7 04
Machine Men and Loaders		7 19		8 77	
Contract Labor					7 08
Inside Day Labor	4 88	4 40	4 44	4 32	5 04
Outside Day Labor	4 32	4 38	4 67	4 53	4 87
Monthly Men	4 21	5 63	5 23	5 33	5 32
Average Monthly Earnings					
Pick Miners	17 90	46 47	91 50	113 85	152 07
Loaders	14 04	25 41	72 67	85 96	91 28
Machine Men	16 35	23 54	75 73	127 49	122 15
Machine Men and Loaders		57 50		131 60	
Contract Labor					177 00
Inside Day Labor	11 91	18 04	54 15	65 53	112 48
Outside Day Labor	10 48	18 37	57 02	68 59	109 66
Monthly Men	11 80	28 78	76 25	127 64	142 22
Average Daily Earnings					
Fifth and Ninth District Illinois Field					
Pick Miners	5 52	6 80	6.47	7.25	6 46
Loaders	6 58	6 82	7 03	7 42	6 22
Machine Men	6 71	6 50	6 81	7 94	6 36
Inside Day Labor	4 93	5 10	5 01	4 82	5 18
Outside Day Labor	4 73	5 05	4 71	4 72	4 95
Contract and Gang Labor					6 35
Monthly Men	....	4 39	7.19	5.58	5 44
Machine Men and Loaders	6 08	6 43	6.47	6 68	6 54
Average Monthly Earnings					
Pick Miners	11 51	27 04	72 36	115 31	106 55
Loaders	15 52	27 15	77 82	99 73	114 82
Machine Men	12 51	26 71	69 24	103 89	119 59
Inside Day Labor	8 87	20 10	54 16	70 65	95 91
Outside Day Labor	12 03	17 63	49 78	76 62	106 41
Contract and Gang Labor					197 00
Monthly Men		9 88	121 00	53 00	157 59
Machine Men and Loaders	20 55	55 63	89 28	134 95	158 07
Average Daily Earnings					
Freeport Thick Vein District, Pennsylvania					
Loaders	5 57	6 55	7 33	6 90	6 06
Machine Men	8 68	13 17	12 10	10 81	9 74
Inside Day Labor	4 99	5 23	5 37	5.21	5 44
Outside Day Labor	2 86	4 45	4 41	4.66	4 92
Monthly Men	4 00	3 50	4.77	5.16	5 21
Average Monthly Earnings					
Loaders	18 29	61 73	118 19	151 39	147 19
Machine Men	19 71	128 90	193 40	243.44	258 03
Inside Day Labor	17 17	49 73	84 39	121 16	147 26
Outside Day Labor	5 85	43 82	70 45	108 51	136 38
Monthly Men	16 00	28 00	74 67	105 80	154 25
Average Daily Earnings					
Michigan Field					
Pick Miners	5 85	7 28	7 94	7.88	8 02
Loaders	5 22	6 16	6 71	6 94	6 40
Machine Men	6 21	6 92	8 96	8 65	5 93
Inside Day Labor	4 74	5 01	5 10	4.65	5 01
Outside Day Labor	5.60	4 45	4 57	4.56	4 74
Monthly Men	.	5 00	....	6.15	5 13
Average Monthly Earnings					
Pick Miners	18 45	50 23	105 47	146 64	153 35
Loaders	16 28	39 06	87 99	129 44	140 74
Machine Men	30 00	49 41	100 58	164 75	116 79
Inside Day Labor	11 32	33 20	65 98	86 69	124 47
Outside Day Labor	16 69	27 43	62 58	82 68	119 60
Monthly Men	...	10 00	. ..	151.38	119 67
Average Daily Earnings					
Iowa Field					
Pick Miners	6 28	7 23	7 71	7 74	7 34
Loaders	5 77	6 15	6 37	6 56	6 09
Machine Men	7 34	8 82	8 23	7 87	6 82
Inside Day Labor	4 58	4 82	4 82	4 36	4 98
Outside Day Labor	4 23	4 48	4 72	4 42	4 81
Monthly Men	4 80			4 40	4 79
Average Monthly Earnings					
Pick Miners	15 41	42 68	87 93	110 24	119 25
Loaders	16 70	46 57	74 30	105 54	100 08
Machine Men	11 09	70 57	77 00	120 38	100 15
Inside Day Labor	9 87	33 24	58 04	75 89	98 92
Outside Day Labor	9 63	28 71	56 70	76 83	108 39
Monthly Men	8 00		. ..	96 08	142 85
Average Daily Earnings					
Kansas Field					
Pick Miners	[illegible]	[illegible]	[illegible] 87	6 42	5 68
Loaders		[illegible]	[illegible]	6 48	6 97
Machine Men	[illegible]	[illegible]		5 46	6 14
Inside Day Labor	4 86	5 03	5 32	5 41	5 22
Outside Day Labor	5 82	5 10	5 14	5 05	5 38
Monthly Men	7 50	7 50	6 91	6 28	5 50
Machine Men and Loaders			5 86	6.45	6 21
Average Monthly Earnings					
Pick Miners	13 96	46 75	81 73	122 74	139 56
Loaders		30 00	116 80	139 25	175 59
Machine Men	18 00	17 00		78 71	149 01
Inside Day Labor	8 81	41 94	71 88	109 47	129.13
Outside Day Labor	12 23	29 46	69 84	91 08	129 66
Monthly Men	18 00	57 50	95 71	132 88	152 58
Machine Men and Loaders			102 50	130.17	116 56
Average Daily Earnings					
Missouri Field					
Pick Miners	4 16	4 55	4 92	5 51	6 60
Loaders	4 54	5.23	5 48	6 27	6 18
Machine Men	5 28	4 40	4 80	5 03	5 18
Inside Day Labor	4.96	4 97	4 97	4 94	5.11
Outside Day Labor	4 85	4 85	4 59	4 78	5 28
Monthly Men			3 12	3 33	2 84
Average Monthly Earnings					
Pick Miners	10 90	26 76	64 78	97 01	104 71
Loaders	12 73	34 94	71 46	101.36	118 38
Machine Men	13 97	35 57	69 71	97.66	66 48
Inside Day Labor	14 42	33 86	64 93	99 90	109 23
Outside Day Labor	9 18	23 81	52.33	82.13	120 01
Monthly Men			50 00	60 00	85 54
Average Daily Earnings					
Arkansas Field					
Pick Miners	6 93	7 05	7.77	8 43	5 66
Loaders	4 27	5 43	5 94	7 08	5 87
Machine Men	4 50	5 65	6.14	6.29	6 07
Inside Day Labor	5 27	4.95	5 07	5.10	5 25
Outside Day Labor	4 52	4 79	4 56	4.69	5 04
Monthly Men	....	....	....	...	5 15
Average Monthly Earnings					
Pick Miners	15 82	46 59	84 79	113 70	118 66
Loaders	8 15	28 65	57 36	99 83	63 21
Machine Men	18 00	37.66	70 00	80 86	129 81
Inside Day Labor	11.33	26.16	55 36	74 48	103 51
Outside Day Labor	9 05	30.20	50 60	72 52	113.85
Monthly	....	....	....		153 44

Table III. Earnings of Steady Miners

Occupation	Average number of men per month, working full time and one day less	Per cent of average number of men per month	Average Daily Earnings	Average Monthly Earnings	Average days worked per month.
Pittsburgh Thin Vein Field					
Pick Miners	133	25 63	6 76	131 20	19 42
Loaders	637	31 91	6 06	113 72	18 76
Machine Men	132	46 48	7 34	154.53	21.05
Machine Men and Loaders.	13	65 00	8 06	175 36	21.77
Ohio No. 8 Field					
Pick Miners	24	63 16	7 49	112.77	15 06
Loaders	847	38 89	6 06	105 79	17 45
Machine Men	204	55 74	6 91	128 07	18 54
Southern Ohio Field					
Pick Miners	18	35 29	8 01	110 03	13.74
Loaders	703	29 16	5 83	48 96	8 40
Machine Men	154	60 16	7 93	113 56	14 31
Indiana Field					
Pick Miners	606	45 87	7 19	100 72	14 03
Loaders	1,161	54 08	6 98	89 33	12 80
Machine Men	208	63 22	8 37	124 73	14 91
Contract Labor	8	34 78	7 21	135 18	18 75
Fifth and Ninth Districts, Illinois Field					
Pick Miners	152	32 83	7 20	98 61	13 70
Loaders	1,378	64 36	7 49	93 18	12 43
Machine Men	194	61 59	7 95	99 51	12 51
Machine Men and Loaders	24	21 62	6 96	149 93	21 55
Freeport Thick Vein Field of Pennsylvania					
Loaders	124	24 41	6 70	156 46	23 35
Machine Men	18	27 27	10 65	251 63	23 63
Michigan Field					
Pick Miners	8	40 00	7 94	146 06	18.41
Loaders	213	46 30	6 99	129 51	18.53
Machine Men	47	73 44	8 73	166 76	19.10
Iowa Field					
Pick Miners	249	39 46	7 83	107 30	13 71
Loaders	43	27 04	6 58	104 56	15 89
Machine Men	12	48 00	8 01	124 69	15 57
Missouri Field					
Pick Miners	80	33 76	5 73	98 71	17 21
Loaders	157	50 16	6 49	102 56	15 81
Machine Men	32	28 57	5 15	98 15	19 07
Kansas Field					
Pick Miners	416	35 22	6 62	131 62	19 88
Loaders	7	100 00	6 83	111 62	16 34
Machine Men	1	12 5	5 38	64 50	12 00
Machine Men and Loaders	1	50 00	6 81	143 00	21 00

FOREIGN MARKETS AND EXPORT NEWS

High Coal Prices in China

As the high price of coal in Tientsin and Shanghai is an obstacle to the investment of American money in cotton mills there, counterbalancing to a considerable extent the advantages of cheap labor, a recently compiled table of prices may prove interesting, although, in view of the fact that prices constantly fluctuate, it can not be accepted as a standard price list

Coal is sold from the yard in Tientsin at lower prices than at Taku Bar in the harbor because of the competition of mines in the vicinity of Peking which ship their coal by rail and also because the cost of lighterage over the bar must be included in the latter prices. Manufacturers say that the cost of electric power in Shanghai is lower than in any other place in the world and that the output per Chinese workman of certain articles is as great as the output per workman in the United States.

The Kailin Mining Administration quotes as follows, per long ton (A = f.o.b. steamer alongside wharf at Chinwangtao, export duty paid; B = f.o.b. steamer at Taku Bar, near Tientsin; C = for delivery ex Hotung Yard, Tientsin):

	A	B	C
Loco lump	$9 00	$10.00	$9.00
Linsi lump	7 10	8.10	7.10
No 1 slack	6.50	7.00	6.10
No 2 slack	5 35	6.35	5.35

Mexico Imports 89 Per Cent of United States Coal

Consul Cornelius Ferris, Jr., Mexico City, Jan. 31, 1920, states that statistics have just been received from the Mexican Department of Commerce showing the importation of coal into Mexico for the year 1918, statistics for other years not being available. The total amount imported in 1918 was 132,209 tons. Approximately 89 per cent of this was imported at points on the United States frontier, and was for mining and smelting operations and railroad motive power; the remainder was imported at seaports for coaling vessels.

British Export Licenses for Coal-Tar Products

Consul General Skinner has cabled from London under date of Feb. 19, 1920, that the British Board of Trade announces that export licenses for the exportation of all coal-tar products excepting finished dyestuffs, but including aniline oils and salts, granted before Jan 1, 1920, are revoked The revocation is to take effect Feb 21 1920. Applications for the renewal of licenses will be considered if special cause is shown

Heraclea Source of Coal for Italy

Commercial Attaché Alfred P Dennis, Rome, Italy, Jan. 6, 1920, states that the high prices of English and American coal, together with transportation difficulties, have caused Italians to turn their eyes anxiously toward Asia Minor as a possible source of coal supply. There has been much in the papers as to the immense reserves of coal in the Heraclea (Eregli) basin, and emphasis has been laid upon the fact that Italian interests have been upon the ground for some time with a view to developing coal-mining concessions in that region. The carboniferous basin of Heraclea lies within the region still under Turkish sovereignty and the actual mining of coal is conducted under concessions from the Turkish Government.

The cost of getting a ton of coal from the Black Sea ports to Constantinople is 13 Turkish pounds, or 156 Italian lire, $12 per ton at the present rates of exchange. When it is considered that American coal is transported 4,000 miles to Italy at a freight charge of $25 a ton, the charges for this 150-mile haul are substantial, to say the least. Furthermore, the best Welsh coal can be laid down in Constantinople for around 400 lire a ton, while the prices on the inferior Heraclea coal range around 375 lire a ton. The chief factors in the high costs are the primitive methods employed in mining and transporting the coal

Quality of Coal

The quality of the Heraclea coal is poor in calorific energy; it averages 6,344 calories for mine-run and 7,645 for washed coal, with an average ash content of 18 per cent. A coal is judged rather inferior that does not range up to 8,000 calories. The Heraclea coal is quite friable.

Bohemia's Coal Production

In 1917, states the *Colliery Guardian,* the Bohemian coal mines produced 3,318,277 tons of coal, as follows: Mies, 979,174 tons; Pilsen, 169,801 tons; Prague, 371,233 tons; Schlan, 1,798,069 tons. The output in 1916 was 3,779,421 tons. The number of workers, however, increased from 16,630 to 18,741, giving a production per capita of 227 and 177 respectively. The average selling price per ton was 21.7 kr in 1917 and 15.95 kr. in 1916

In addition, there were produced in 1917 17,794,964 tons of brown coal valued at 9.93 kr. per ton, as against 18,902,513 tons, valued at 6.68 kr. per ton, in 1916; 31,992 work people were employed, as against 26,641 giving an average output per head of 556 tons in 1917, as against 710 tons in 1916. In 1917, 3,685,869 tons of brown coal and 186,758 tons of coal were exported by rail, and 409,787 tons of brown coal and 166 tons of coal by water

The rail-borne exports of brown coal were distributed as follows: Saxon State Railways, 1,908,526 tons; Bavarian State Railways, 1,381,404 tons; Prussian State Railways (including coal transferred from barges into wagons in the Elbe ports), 311,460 tons; Wurtemburg State Railways and other system in Southern Germany and Swiss and Italian lines, 12,479 tons. The bulk of the coal was carried over the Bavarian State Railways.

United States Coal is Sent to Ends of the Earth

Evidence that America is supplanting Geat Britain in coal markets of South America and Europe is seen by the *Shipping World*, London. The paper attributes this to restrictions imposed on shipping that otherwise might be available for carrying British coal

"The result is that traders abroad who want coal are getting it from other regions," it says; "The South American trade has fallen almost inevitably into the hands of ship owners from the United States; but more ominous still is the fact that shipments from Virginia are coming almost daily to ports of Europe.

"Gothenburg, Dunkirk, Antwerp, Rotterdam, Lisbon, Genoa and other ports of Italy are receiving American coal at freight rates which only their urgent needs can justify. Even to Port Said American coal has been shipped.

"The question arises whether this is merely a passing phase due to the present scarcity of tonnage, or whether these American ships are the pioneers of a few forms of enterprise of the Western continent which is destined to become a permanent feature of trade.

"It must not be assumed that with the increase of British shipping that will assuredly come in a year or two, the old lines of trade will so easily be regained. The River Plate trade may to a considerable extent be written off

"The greater proximity of European ports to the United Kingdom will be an advantage to British ship owners in their endeavor to regain the continental trade, but it will be no easy task to break the trade connections that American competitors are now engaged in forming."

Shipment of Coal in Tons to Foreign Countries and British Possessions from the Various Districts in the United Kingdom in 1919*

	Bristol Channel Ports	North-western Ports	North-eastern Ports	Humber Ports	Other Ports on the East Coast	Other English Ports	East Scotland	West Scotland	United Kingdom
January	1,582,184	38,057	589,256	70,702	1,580	45	39,445	28,304	2,349,573
February	1,407,993	8,652	1,078,211	68,336	2,036	57	90,087	53,867	2,709,239
March	2,430,618	6,561	1,230,494	20,033	661	35	116,331	75,895	3,380,628
April	1,560,183	242	800,517	5,723	2,466	35	142,374	56,556	2,568,096
May	2,307,716	7,123	1,154,691	29,829	4,548		211,397	81,772	3,797,076
June	1,793,104	4,836	1,098,803	81,532	13,531	10	193,809	72,817	3,258,442
July	1,664,788	3,662	1,315,705	84,120	4,131	14	241,692	113,444	3,427,556
August	1,297,214	12,140	635,783	7,871	3,616	25	151,988	62,176	2,170,813
September	1,553,015	658	984,037	887	5,080	20	102,951	30,541	2,677,189
October	1,542,029	714	911,555	10,574	966	174	204,742	58,871	2,729,625
November	1,581,508	2,806	863,571	48,151	3,301	201	189,388	58,550	2,747,476
December	1,509,450	1,277	1,038,812	102,713	7,473	52	220,972	53,106	2,933,855
Total	20,229,802	86,728	11,701,435	530,471	49,389	668	1,905,176	745,899	35,249,568

Courtesy of *Colliery Guardian.*

Domestic Exports of Coal and Coke—Bunker Coal Supplied to Vessels in the Foreign Trade During January, 1920*

Countries	Coal Anthracite 172 Tons	Coal Bituminous 173 Tons	Coke 174 Tons
Azores and Madeira Islands		2,420	.....
Belgium			1,467
Denmark		17,843	
France	2,234	50,337	2,270
Germany		12,812	.
Italy	3,009	128,502	
Netherlands		112,846	
Norway....		5,427	174
Portugal .		8,830	
Sweden		4,035	.
Switzerland		33,438	
Turkey in Europe..		6,553	
England..............	2	1,085	
Bermuda		8,096	1
British Honduras.......		51	3
Canada..............	291,542	457,909	29,424
Guatemala	51	100	6
Honduras	450	550	2
Panama		34,067	
Mexico	530	6,197	19,286
Newfoundland and Labrador	2,727	25	
Barbados	9	3,904	
Jamaica................	50	8,609	
Other British West Indies	1	7,207	3
Cuba	4,263	99,620	12
Danish West Indies			2
French West Indies		2,820	
Haiti	2		
Dominican Republic	1,199	672	
Argentina		145,455	
Brazil.................		48,205	50
Chile		3,311	5,241
Colombia...........		10	3
Ecuador			5
Falkland Islands		3,073	
Peru..................		60	75
Uruguay		11,405	
Venezuela			2
French Africa		23,693	
Total	306,069	1,249,167	58,026

Customs Districts	Coal Anthracite 172 Tons	Coal Bituminous 173 Tons	Coke 174 Tons
Maine and New Hampshire	83		153
Vermont..........	1,251	867	502
Massachusetts	291	25	
St. Lawrence	70,901	65,324	1,136
Rochester	3,939	29,832	145
Buffalo	212,070	262,980	13,032
New York	10,515	95	2,516
Philadelphia	4,258	68,441	
Maryland...		139,118	6,708
Virginia.		535,221	1
South Carolina		23,583	
Georgia		7,533	
Florida		5,159	
Mobile		3,621	
New Orleans	493		41
Sabine		42	
San Antonio	240	918	44
El Paso	236	4,515	9,882
Arizona	2	715	9,333
Southern California	10	6	
San Francisco	50	1,001	77
Washington	304	151	44
Dakota	746	2,372	554
Duluth and Superior.	508	7,943	
Michigan	97	83,480	13,858
Ohio		6,045	
Porto Rico	75	180	
Total	306,069	1,249,167	58,026

BUNKER COAL

Customs District	Tons
Maryland	42,479
New York	43,996
Philadelphia	27,198
Virginia...	158,[illegible]37

*[illegible]

England Adopts American Industrial Policies

[illegible] the report, "are 70 authorities that supply electricity to the public, owning 70 generating stations, with 50 different types of systems, 10 different frequencies, and 24 different voltages."

The average generatng capacity of the 600 establishments in England that sell electric current is only 5,000 horsepower each. This is about one-fourth the capacity of a generating plant of economical size. So unorganized is the whole electrical industry that "one can not purchase a simple electric bulb without specifying the partcular type of socket" in which it is to be used.

Coal Production in Venezuela Shows Decrease

Consul H. C. von Struve, La Guaira, Jan. 26, 1920, states that there has been a gradual increase in the output of coal in Venezuela, as shown bv the following statistics, the quantity being in long tons of 2,240 pounds: Average of 1911-13, 6,222; 1914, 8,755; 1915, 13,551; 1916, 18,289; 1917, 19,846; 1918, 24,779. Statistics for 1919 are not yet available.

The imports of coal were as follows: Average for 1911-13, 19,676 tons; 1914, 23,280; 1915, 19,305; 1916, 20,243; 1917, 14,927; 1918, 8,746.

Years	From United States Tons	From Great Britain Tons	From Holland Tons	From Germany Tons
Average for 1911–1913.	3,268	14,246	331	1,660
1914	3,982	12,573	5,840	885
1915	11,216	6,721	1,368	...
1916	10,110	9,802	331	.
1917	10,266	4,662		.
1918.	4,570	4,176		

The only exports of coal shown are 500 tons in 1916, 2,000 tons in 1917, and 340 tons in 1918. These shipments were all made to Curaçao and were doubtless due to the difficulty of obtaining coal in the United States and Great Britain during those years, owing to war conditions

The coal produced is practically all mined at Naricual, Capiricual, and Tocoropo near Barcelona and a railroad line has been built especially to transport this coal to the port of Guanta. Both mines and railroad are operated by the national government.

Coal imported at La Guaira is partly used there and partly carried by railroad to Caracas; that imported at Puerto Cabello is used principally in that town, but some of it is carried inland by a railroad line extending from Puerto Cabello to Caracas.

Coal Situation in Vienna Becomes Acute

The coal situation in Vienna is so acute, owing to the German railway strikes, the strike of miners in the Ostrau coal field, and the discontinuances of supplies from Poland, states the *Colliery Guardian*, that the Ministry of Commerce has ordered the complete suspension of the tram service and the closing of all places of amusement, including the theatres and cinemas.

Further restrictions are also placed on the consumption of electric current for lighting purposes, and almost the entire supply of electric power for industry has been suspended, as from Feb. 16.

Belgian Coal Owners Protest Interference by Government

The coal owners of the Charleroi have registered an emphatic protest, states the *Colliery Guardian*, against the action of M. Wauters in dispossessing them of their rights to discuss points at issue with their workmen, and asserting that the new charges upon the industry will involve an increase in cost of 10 fr. per ton on coal, 15 fr. on boulets, and 20 fr. on briquettes. It is stated, moreover, that the Minister's procedure has not given complete satisfaction in Government circles.

There is a great shortage of rolling stock, and in some cases two-thirds of the output is being placed to stock, whilst the night shift has been discontinued at the briquette factories. The Minister of Economic Affairs has now authorized an increase of 6.50 fr. per ton to compensate for the supplementary charges involved by the recent rise in wages. This is regarded, however, as a provisional adjustment, and an investigation into the cost of production and profits is to take place immediately.

As some indication of the enormous rise in prices, it may be stated that the smalls used on the State Railways will now realize 66.50 fr., as compared with 16 fr. on July 1, 1914. Thomas pig has risen from 61 fr. to 600 fr., steel bars from 115 fr. to 900 fr., and cement from 25 fr. to 135 fr.

The position in Birmingham, Eng., is difficult. Merchants complain, states the *Colliery Guardian*, that supplies are not coming through freely from the collieries. Emergency stocks are fast disappearing, and householders are on small rations. Nuts are in constant demand, but supply is short.

New York An thracite Exports for January Increased

Compared with January of last year, there was more anthracite and coke shipped through the port of New York in January of this year. Shipment of bituminous showed decreases when compared with the corresponding month of last year.

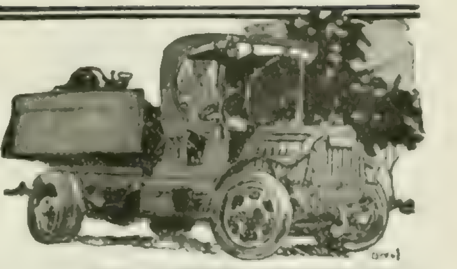
During January anthracite was sent to eleven countries as compared with three countries in January of last year, bituminous was shipped to four countries in January of this year as compared with six shipments a year ago, and coke was shipped to eight countries in both months.

The following tabulation shows the shipment of anthracite, bituminous and coke in January of this year as compared with January of last year. The total anthracite shipment for January 1920 was 10,515 tons.

SHIPMENTS FROM NEW YORK DURING JANUARY, 1919, AND JANUARY, 1920, COMPARED

Country	Anthracite 1919 Tons	Anthracite 1919 Value	Anthracite 1920 Tons	Anthracite 1920 Value	Bituminous 1919 Tons	Bituminous 1919 Value	Bituminous 1920 Tons	Bituminous 1920 Value	Coke 1919 Tons	Coke 1919 Value	Coke 1920 Tons	Coke 1920 Value
Argentina					700	$5,600						
Barbadoa..			9	$142								
Brazil											50	$564
Canada	8,375	$69,839	1,572	$13,533	524	$4,223						
Colombia..							10	$280			3	75
Cuba			5	94					15	$430	12	300
Danish W. I.					508	3,404					2	60
Ecuador									16	360		
England			2	20								
France			2,234	2[illegible],951			23	253			2,270	32,[illegible]0
French W. I.									6	168		
Haiti			2	37								
Italy			3,009	32,487	1,349	10,117						
Jamaica..			50	938								
Mexico					32	463			2	80		
Newfoundland	87	702	.507	21,316								
Norway											174	1,897
Other British West Indies			1	1[illegible]							3	70
Panama .							2	20				
Paraguay									3	115		
Peru					55	1,301	60	1,076	55	1,650		
Salvador									3	63		
San Domingo	1,905	13,734	1,024	9,264								
Venezuela									470	13,225	2	51
Totals	10,367	$84,275	10,515	$104,797	3,168	$25,108	95	$1,629	570	$16,091	2,516	$35,497

COAL AND COKE NEWS



Charleston, W. Va.

Mines Produce 50 Per Cent of Capacity No Change in Kanawba Output Variable New River Supply —No Hope for Exports

Variation from conditions existing during February was hardly observable in this section of the state at the outset for March, the transition from Government control to private ownership appearing to make little difference, from a transportation standpoint, at the start at least. Most fields had the usual large Monday supply which lasted about one day. As far as the Chesapeake & Ohio R.R., which supplies this section, was concerned there was possibly a slight increase in the number of empties furnished, but notwithstanding that fact, shipments from some regions were somewhat under even the loadings of the previous Monday.

Lack of proper transportation facilities, pure and simple, was principally instrumental in retarding production in this area. Because of such a lack mines were still unable to produce to a point beyond 50 per cent of potential capacity. No other factors entered into the limited output to any appreciable extent. The total tonnage handled by the Chesapeake & Ohio on March 1. was 143,000 tons.

The general impression seemed to prevail that while the number of cars furnished had been somewhat larger than anticipated, nevertheless there would be a marked decrease in cars for several weeks, owing to the effort on the part of railroads to corral their own equipment and to use the equipment of other roads, especially in view of the fact that the per diem rate was not such as to hurry railroads in sending cars back to home roads.

A large part of the tonnage produced in this section of West Virginia was used in meeting the needs of the railroads. In many instances confiscation was still being resorted to in order to secure railroad fuel, though it was the general opinion that such confiscation was not quite so general as it had been under Government control. Export shippers were required to secure renewal of licenses or permits, that entailing a good deal of confusion in many quarters. Furthermore, it was stated during the first week of private ownership, that until there was a sufficient production to more than meet the domestic demand, little might be expected in the way of an increase in export shipments.

Kanawha Output 50 Per Cent

The output of the Kanawha field, during the first week of March, was about on the same plane that it had been during the previous week; production not averaging more than about 50 per cent of normal. In other words the average daily loadings throughout the first week of the month were about 17,000 tons. A larger production than that became impossible owing to the scarcity of cars. There was a material decrease in the supply for the Kanawha field during the week, as the result first of a slide and then a freight wreck at Sandstone, Thursday night, empties not only being held up behind the wreck, but the movement of coal being interfered with quite materially.

A heavy demand is predicted in the Northwest when the Lake season is opened, and producers are of the opinion that it is going to be difficult to meet such a demand unless there is a material improvement in transportation conditions. With a limited number of cars, the shipments for one day fell as low as 12,000 tons in this field.

The end of Government control did not generally bring about a cessation of coal confiscation, since much fuel was still being seized during the first week of March, though such confiscation was believed not to have been on as large a scale as during previous weeks.

The curve of production varied to quite a material extent in the New River field at the outset of March. The first day of the week witnessed a fairly large production; for several days after that production was decidedly on the down grade, until the last day of the week when mines took a sudden spurt, owing to an increase in the car supply. Aside from the two days mentioned, production was curtailed to the extent of about one-half, solely because of an inadequate car supply, the supply in fact during the greater part of the week being just about 50 per cent.

Weather conditions were decidedly unfavorable during the greater part of the week to large shipments of coal. Traffic on the Chesapeake & Ohio was suspended in the neighborhood of Hinton on Friday, the fifth, through a slide followed by a freight wreck.

While it had been hoped that export shipments might be resumed on their former scale, such hope now has been abandoned by New River coal men, at least until there is a larger supply of coal available for this country. When the Lake season opens, the demand for all grades of coal will be increased, but operators generally feel that it will be difficult to meet the heavy demand in the Northwest owing to poor transportation facilities.

Bluefield, W. Va.

Decrease in Output of Smokeless Mines —Plants Work One or Two Days— Tug River Loads Frozen Solid— Pocahontas Issues S. O. S.

Mines in southern West Virginia in the smokeless area suffered to a greater extent from a car shortage than during any previous week of 1920, as a result of which production took another drop. While there was a slight improvement in other sections of the state during the first week of the month, conditions were far worse in Norfolk Western territory especially during the early part of the week. The supply of cars was so scarce at one time as to make the transportation question one of grave concern; it even became necessary to appoint a committee of operators to call on railroad executives in the hope of securing relief.

While the last week of February had been bad enough, from a transportation standpoint, the first week of March was worse. The car supply was so uncertain, so irregular and so scant that it hardly paid the larger companies to attempt to keep their mines going; while on the other hand the smaller companies were practically without cars and were unable to operate to any appreciable extent. Taking southern West Virginia as a whole, it is considered doubtful if the number of empties furnished reached more than 40 per cent of the normal supply.

While it was believed in the southern part of the state, during the first week of March, that there would be a gradual improvement after the adjustment stage of the railroads had been passed, yet the first week of the month was not conducive to any betterment of conditions, and apprehension was expressed that smaller companies might be seriously affected from a financial standpoint. With mines without number reduced to a point, where they were not able to operate more than one or two full days during the entire week, production of course was bound to undergo a marked decrease.

Highly unfavorable weather conditions prevailing throughout the entire week, only served to demoralize the transportation of coal. It was impossible either to move coal after it was loaded, with any degree of celerity, or to distribute empties with any promptness; at one stage of the week, one field in southern West Virginia was deprived of almost its full car supply.

The chronic car shortage is making for labor unrest in the southern end of the state, since miners are only able to make a fraction of their former earnings. In an endeavor to find more work, miners are beginning to drift from one field to another, and that of course disorganizes operations to quite an appreciable extent.

Car shortage gave production a downward trend in the Tug River region during the first week of March, the output being only 57,850 net tons, the lowest since the week ended Jan. 24. The weather was unusually severe in the region and was a potent factor in making the movement of coal extremely sluggish.

Adverse Conditions on Tug River

Tug River operators were more and more impressed at the outset of March, that a very large number of loads handled under the regime of the Railroad Administration, and passed on from one road to another during the winter months, had been exposed to the weather for so long a period, that they became frozen solid and could not be unloaded. This had been currently reported as one of the causes contributing to the shortage of empties; although Government control has been made effective to the end of April, there was in evidence at the outset of March, a rather more optimistic feeling in the industry than has been observed for some time.

Under date of March 5, a new priority list was promulgated by the Director General of Railroads; it was received in the Tug River field and provided primarily for ten classes of railroad needs and secondly for tidewater shipments. It is predicted in the region that such a priority list will just about do away with export business while the order continues in effect.

Car service in the Winding Gulf field, during the week ended March 6, was such as to enable the mines here to load a little more coal than during the previous week, although the supply of empties was far below normal. Coal movement on the Virginian was seriously hampered during the week by lack of motive power, which condition is becoming somewhat chronic. Little or no improvement in the car supply furnished by the Chesapeake & Ohio was observable. That road was badly handicapped during the first week of the month by two freight wrecks—one at Gauley Bridge, W. Va., and one at Sandstone, W. Va. Each wreck tied up freight traffic for many hours, affecting both the movement of coal and the distribution of empties.

Car Famine in Pocahontas Field

Little or no change in conditions was observed in the Pocahontas region in the period between March 1 and March 6, the usual large supply of cars in evidence at the beginning of the week lasting for a shorter period than usual. Once it had been exhausted, mines all over the field found it necessary to shut down and were able to operate during the week only at irregular intervals. As already related the supply of cars, about the middle of the week, reached such a distressingly low point that it became necessary for a special committee of operators to send out a call to Norfolk & Western headquarters for relief.

Production and loss, as a result of inadequate transportation facilities, was about a "fifty-fifty" proposition, mine disability and labor losses having little to do with such a loss in production as was sustained. With the disappearance of the influenza from many mining communities, the labor supply when March opened was about 95 per cent of normal. Owing to the shortage of cars, however, smaller labor forces would have sufficed to load all the coal for which there was cars.

With nothing to prevent confiscation, after a compliance with certain formalities, and with priority regulations now in force, export shipments do not constitute a very large part of the coal going out from the Pocahontas region. Weather conditions during the first week of March, were not particularly conducive to efficient operation of the railroads and hence the movement of coal was slow.

Huntington, W. Va.

Production Losses Largely Exceed Output in Logan Field—Railroads Take Considerable Coal—Chesapeake & Ohio Moves 11,367 Loads—Gain of 448 Cars

Production slipped several cogs in the Logan field during the first week under individual ownership of the railroads, the aggregate shipments from the field being about 9,000 tons under shipments for the last week of February, or the difference between 186,000 and 177,000 tons. Just how heavy the losses continued to be in the Guyan Valley it was easy to determine when a comparison is made with an output of 250,000 tons a week during the strike.

Ever since the strike was terminated, however, production losses have been far in excess of the amount of coal it has been possible to produce, and the first week of the month proved to be no exception in that respect; the car shortage cut into production to the extent of fully 50 per cent, costing the production more than 200,000 tons.

Figures covering February production disclose the startling fact that but for a car shortage, it would have been possible to produce 929,000 or almost one million tons more than was the case, the loss for the month from a scarcity of cars running up to 56 per cent. The total production for the Logan field in fact was only about 44 per cent of capacity.

When, with almost 1,000 cars on hand at the beginning of the first week of the month, the coal mined reached almost 50,000 tons, operators thought such a large run of cars might reflect an improvement in the supply. In that respect producers were doomed to disappointment, the daily supply of cars for the rest of the week fluctuating between 400 and 500.

Not all the coal produced was by any means reaching commercial consumers, the demands of the railroads being such as to require a large portion of the Logan tonnage, though the tonnage confiscated was far less than had been the rule during previous weeks.

In its first week under private control, the Chesapeake & Ohio managed to handle a somewhat larger volume of coal than during any week of February, although the gain was nothing to boast of. During the first week of the month the Chesapeake & Ohio moved over its roads 11,367 loads of coal, or a tonnage of 568,350, as compared with a movement of 10,919 cars, or 545,950 tons, during the last week of February, so that the additional number of cars amounted to 448.

Fairmont, W. Va.

Improved Car Service Under Private Ownership—Car Supply About Fifty Per Cent—Output Largely Taken by Railroads—Exports Precluded

If car service furnished during the first week of March, at least on the Baltimore & Ohio in northern West Virginia, be any criterion of what may be expected under private ownership, then there has been a material improvement in northern West Virginia; for the supply of cars in that part of the state, during the first week of the month was far superior to that in evidence at the end of February. However, operations were still being seriously curtailed because of the limited supply of cars.

It should be remembered, however, that the first week of February ranked as one of [illegible] in recent years, [illegible] as the supply of empties was concerned; it being [illegible] for the [illegible] month of the year [illegible] fell [illegible] for January [illegible] to the extent of 5,000 cars. Nevertheless [illegible] during the [illegible] month [illegible] for the first [illegible] March [illegible] available during the first six days of March than [illegible] on the [illegible].

[illegible] in the Fairmont region, were largely true in other northern West Virginia [illegible]. The supply for the week [illegible]. Notwithstanding conditions credit was given officials of the Baltimore & Ohio for their efforts to maintain a supply at least partly sufficient for loading. Transportation conditions on the Monongahela R.R. were not quite so favorable as on other roads during the week, the supply for this period being about 30 per cent. The Baltimore & Ohio was seriously in need of coal during the week and that might account for the unusual effort made to keep the mines supplied. At the same time the operators were willing to co-operate in order to secure cars.

The largest proportion of the output of the Fairmont and other regions was being taken by the railroads. Most of the northern West Virginia tonnage was consigned to the East during the first week of the month. Of the coal moved to the West quite a large portion was going to Ohio points as well as to Michigan markets. Curtis Bay shipments seemed to have been increased somewhat during the latter part of the week; but the necessity of taking care of the domestic markets has also precluded and will continue to preclude (in the opinion of mine owners) mines generally from shipping a very large tonnage abroad for several months to come.

Ashland, Ky.

Northeast Kentucky Output Shows Increase Over Preceding Week—Further Car-Shortage Relief Hoped for—More Cars or Serious Labor Turnever

Out of a total potential capacity of 245,000 tons in the northeast Kentucky field, there was produced during the first week of March, 150,125 tons of coal, or 61 per cent of potential capacity; the total production loss, on the other hand being 94,875 tons, or 39 per cent of capacity; all but 3 per cent, or 7,200 tons, having been lost through a car shortage, the loss from that source aggregating 87,675 tons. During the corresponding week of 1919 when there was no market for coal, the output was 103,700 tons.

Tonnage figures given disclose a marked increase over the preceding week; the car-shortage factor remains quite a predominant one, and unless immediate relief is secured, it can be expected that the present labor supply, greatly amplified from other union districts immediately following the recent strike, will suffer from the men seeking employment in other districts where more steady employment is offered; furthermore, the plowing season is approaching during which time large numbers of men temporarily leave the mines in some sections.

The greatly increased operating cost incident to decreasing operating time, occasioned by poor car supply and increased wages during the past two months, have made it necessary for northeast Kentucky operators to secure for their product a price in advance of the present authorized Government figure, consequently they do not feel justified in contracting at Government fixed prices for any lengthy period.

East Liverpool, Ohio

Coal Stripping Opposed in Columbiana County—Legislation Proposed—City Council Discusses Matter—Orchards Reclaim Lands

Plans are being developed here to prevent additional coal-stripping operations in Columbiana County. The movement is being backed in no small manner by Probate Judge Samuel W. Crawford, of Lisbon, the county seat. Lined up with Judge Crawford in this effort is the Trades and Labor Council of East Liverpool.

State Senator Charles A. White and state Representative E. M. Crosser of this district are also being interested in the opposition to coal-stripping operations, and it is strongly intimated that legislation will be attempted at the next session of the state Legislature to curb coal stripping throughout the state.

No small amount of land has been either bought or leased in Columbiana County of late for coal stripping. One large option which was permitted to expire cannot be renewed since opposition to such operations has developed.

A second meeting of the East Liverpool Trades and Labor Council was held here recently, when the idea of fighting any additional coal-stripping plans by the injunction route was discussed.

Coal men who have been planning to operate strippings in this county, have been watching the recent trend of events with unusual interest. Some effort has been made to stay this opposition to such development, but such opposition continues nevertheless. It has been pointed out that in Jefferson and Harrison counties, adjoining, stripped lands are being reclaimed by planting orchards and sowing the land in clover for pasture purposes, but even this scheme, it is said, is not meeting with much favor in the district.

Cadiz, Ohio

Wayne Coal Co. Uses Stripped Coal Land—Plants Peach Trees—Sows Land to Clover—Stocks with Cattle—Unity Coal Co. Pioneer

The Wayne Coal Co., with offices in Steubenville and also in Pittsburgh, Pa., a corporation which is conducting extensive coal-stripping operations in Harrison County and also in Jefferson County adjoining, does not propose to let farm lands so disturbed go to waste.

The method of obtaining coal by stripping has been much discussed, and at one time a bill was introduced in the Ohio Legislature to prohibit this method of obtaining coal, but it was not passed.

That the stripping proposition cuts up farm land is not denied, and to find a use for such land after the coal has been stripped, is a problem that has been talked over by farm interests since it was first introduced.

It now seems as if the Wayne Coal Co., has solved the problem. Ground that was torn up by the company, during one of its early stripping operations, is to be leveled, and 5,000 peach trees will be planted. As stripping operations proceed, more trees will be planted.

In addition to planting trees, the company will also sow these lands to clover, and then will follow the stocking of these farms with cattle, sheep and hogs. This is a matter in which the State Agricultural Station should be largely interested.

The planting of fruit trees, on land which has been stripped for coal-mining purposes, was first taken up and put into practice by the Unity Coal Co., which concern operates stripping propositions in Harrison and Jefferson counties. The advances made along this line by the Unity company have been pronounced a success, and this fact caused the Wayne company to adopt a similar plan to reclaim stripped land for fruit growing purposes.

Victoria, B. C.

Settlers' Right Act May Be Re-enacted—Of Interest to Vancouver Island—Dominion and Provincial Government Issue

It has been announced by Premier Oliver, that the Settlers' Rights Act of 1919, which has been disallowed by the Dominion Government, will be re-enacted at the present session of the Provincial Legislature. The settlers within the Esquimalt & Nanaimo Ry. belt, Vancouver Island, will be given a further extension of time, in which to make application for title to the coal rights in connection with their lands. This assurance was given a delegation, representative of a large body of the claimants, which waited on members of the Government and the Legislature at the Capital City.

It is to be expected, in conformity with the policy of the Dominion Government, that if such legislation is again placed on the statute books of British Columbia, that it will be again disallowed. However, the Provincial Government expresses a determination to maintain the right of the settlers to a fair deal, and it seems likely that the question of jurisdiction between the two administrations will come to a definite issue before long.

PENNSYLVANIA

Anthracite

Gordon—The Hillvue Coal Co. has had plans prepared for the construction of a new coal washery at its local mining operations, estimated to cost about $25,000. Frank B. Davenport, Coal Exchange Building, Wilkes-Barre, is engineer for the company. The company's headquarters are at Scranton. F. P. McLaughlin is general manager.

Pittston—Production of anthracite coal during March will be materially reduced as a result of the floods and storms that swept the coal region during the early part of the month. Continuous rains for two days resulted in dozens of mines being flooded with water. In most cases emergency pumps were able to prevent such high water as to cause suspension, but in two cases in the Pittston district shafts were completely flooded. Heidelberg No. 2 shaft, of the Lehigh Valley Coal Co., and Leadville shaft, No. 9 colliery, Pennsylvania Coal Co., are both out of service. The mine workings are completely flooded, and the water fills the bottom of the shafts, making it necessary in both cases to place steel water buckets in operation in the shafts. As soon as the water has been reduced in the level of the works, the pumps can be started and will aid in removing the flood.

Bituminous

Connellsville—Recently Colonel Lloyd G. McCrum, formerly of this place, Robert E. Beerits, John H. Beerits and Harry Siehl took over the Cherry Run Mining Co., including 500 acres, at Huey, Clarion County. Application has been made for a charter with a capital of $260,000.

Clarion—The Carnegie Steel Co. is getting ready to build the final battery of ovens at its mammoth byproduct coke plant here. Just before the war the company started to construct 1,280 ovens, but the war interrupted the program after 768 had been built. Now it is planned to go on with the work. The building of the additional ovens will require also the construction of about 600 new houses for workmen. There have been about that many houses built since the plant was started.

Masontown—That the H. C. Frick Coke Co. is planning to make Masontown of equal rank with Scottdale as an office center for the company, with the ultimate possibility that this place will become the main headquarters of the coke corporation, is the belief in well-informed Fayette County fuel circles. It was strengthened recently when it became known that option has been secured on the New Mason Hotel, a modern brick structure, for the purpose of converting it into an office building. An option has also been given on a hotel in Smock, it became known at the same time, in which may be installed branch offices for the Redstone region.

WEST VIRGINIA

Welch—The mining men of McDowell County, on March 6, organized the McDowell County Mining Institute with a charter membership of 51. The association after being organized elected the following officers: S. P. Flannagan, president; S. E. Houston, secretary; W. P. Kearns, treasurer; a vice president for each of the various districts in the county as follows: Northfork district, J. A. Shuster; M. Hatmaker, Dry Fork district; H. T. Graham, Anawalt district; H. P. Kline, Davy district; Con Weymouth, Welch district.

Huntington—This city has been selected as the new headquarters of the Logan Operators' Association, announcement to that effect having been made during the first week of the month by A. J. King, who acted as a committee in securing suitable quarters for the offices of the association. A decision was tentatively reached on Feb. 26, to move the offices of the association from Logan to this city, the latter place being more centrally located and more accessible. The Huntington offices will be in charge of J. W. Colley. Associated with Mr. Colley will be a Mr. Manley who will act as traffic manager for the association, this being a newly created position. Mr. Manly before March 1 was connected with the U. S. Railroad Administration as a traffic expert. The new offices of the company will be opened March 15.

Glen White—The regular weekly session of the Glen White Mining Institute, held recently, was largely attended by the officials and employees of the Glen White operation. There was a general discussion on the cutting and shooting of coal, power facilities, underground haulage and housing. Several colored miners took the floor and made a number of good suggestions. Along the line of educational work suggested for the night school curriculum was the teaching of the English language to men of foreign birth. This suggestion was made by a young Italian miner who only came to America six years ago, and who by persistent effort has mastered the language, both oral and written. E. E. White, president and general manager of the company, gave the men a good talk. He advised all to take advantage of the educational facilities provided by the institute, so that they may become fitted for advancement in the business they have chosen.

Wheeling—New directors were elected by the stockholders of the Hanover Coal Company at a recent meeting held at Bellaire, Ohio. The Hanover company, with a total capitalization of $500,000, has one of the largest if not the largest coal-stripping operations in the Washington County, Pa., field where 1,500 acres of coal land are owned. On the new board of directors are: J. B. McFadden and Hiram Teater, of Wheeling, W. Va.; W. J. Sprow and Bert D. Smith, of Sandusky, Ohio; Dr. A. C. Beetham and C. N. Wyrick, of Bellaire, Ohio.

KENTUCKY

Louisville—The Pittsburgh Fuel Co., of this place, recently formed to take over the Pittsburgh Coal Co. holdings from the Island Creek Coal Co., has announced plans for handling Island Creek coal by rail and river. The following are the officers of the new company: R. Baylor Hickman, of the Ewald Iron Co., president; Charles J. O'Connor, former Pittsburgh manager, at Louisville, vice president and general manager; Clifton Rodes, vice president; L. P. Ewald, vice president; G. O. Boomer, treasurer; B. A. Leonard, assistant treasurer; M. W. Ayles, secretary. The company is capitalized at $100,000. The same interests have incorporated the Pittsburgh Coal & Coke Co., which will look after river and rail transportation, mining, wholesaling, etc. The Pittsburgh Fuel Co., which has a large elevator on the Ohio River, with equipment for unloading barges to the elevator, has the best river-handling facilities in Louisville. It also has rail switches, but nothing modern in the way of equipment for unloading cars. Plans are now being considered for a large pit and conveying equipment for facilitating car unloading, which is now done by hand. A locomotive crane has also been considered but the pit plan is faster.

OHIO

Henryetta—The Star Coal Co., a new corporation with a capital stock of $30,000, has been authorized to engage in business in this field. Incorporators are: M. A. Berman and Earl Wells, of Henryetta; John Johnson, of Schulter.

Columbus—Confiscation of fuel by the railroad companies is causing considerable trouble between shippers and purchasers of coal. The railroad managements take the position that any coal shipped prior to March 1, is subject to confiscation by the railroads, in the same manner as previous to the return of the roads to their owners. As a result of this position taken by the railroads, a considerable amount of coal, especially from West Virginia, which was shipped some time ago, is being confiscated by railroads throughout Ohio.

Marianna—It is reported that the 160 coke ovens at this place are in full blast. The Union Coal & Coke Co. mines here have been in full operation for a year, with the exception of the time lost during the strike last fall. The company is planning to make these mines the best in the county, and it is stated that more than a million dollars will be spent in new equipment this year. The dwellings of the miners will be greatly improved and repaired so that the town will be the most attractive in the county as regards the permanent home of miners. Electric equipment will be installed throughout the mines of the Union company this year. The power will be secured from the West Penn Power Co.

INDIANA

Indianapolis—The Owen Coal & Oil Co. has been incorporated, with capital of $150,000 for general mining purposes, by Alexander McKnight, Fred H. Cutting and George B. Walls.

Petersburg—Material for a new stripping mine, to be opened by the Globe Coal Co., at Rogers, six miles east of this city, is arriving and the stripping of coal will probably start early in the summer. A railroad switch has been built to a point near where the work will be done.

It is said that the Pike County Coal Company, operating the Atlas mine, just north of this city, has surpassed all other miners in this vicinity in the production of coal. The mine is electrically equipped and has a capacity of 4,000 tons. Though less than two years old, the Atlas mine is averaging 2,000 tons daily, with a working force of 300 men. N. C. McClevy, general superintendent, reports the recent purchase of 7,000 acres of coal land in western Pike County. The company expects to open up two more mines at once.

Petersburg—Aldo Johnson, a coal operator of Vincennes, has leased 3,000 acres of coal land near Alford, two miles east of here; the company will bring a drilling rig to the field. Also the Indian Creek Coal Co., which owns the Blackburn mine three miles east of this city, is leasing hundreds of acres of coal land south of Blackburn, and will increase the capacity of the Blackburn mine. Furthermore the Pike County Coal Co., is increasing its acreage.

ILLINOIS

Litchfield—The slipping of a clevis pin at the Hoosier mine here caused the cage to fall with a loaded car 300 ft. to the bottom of the shaft. The miners had begun to assemble at the foot of the shaft to be hoisted out of the mine, and if that accident had occurred a few minutes later the cage would have been loaded with men.

Marion—Negotiations are nearing a close for the sale of the two mines at Royalton in Franklin County, of the Franklin Coal & Coke Co.; this company is headed by J. C. Mitchell, who, until about 12 years ago, was a prominent Pennsylvania operator. The Peabody Coal Co., of Chicago, is reported to be the purchaser. The Franklin company mines have a big tonnage and several thousand acres of coal lands. They have been the scene of two great disasters resulting in the dealth of many miners. If this sale is made to the Peabody Coal Co., it will give this interest four mines in Franklin County; the other two are at West Frankfort.

Johnston City—There is apparently good grounds for believing that the reported sale of the Johnston City Coal Co.'s two mines here, to the Old Ben Mining Corporation, will go through. These mines are big operations and are in the 3,000 to 4,000-ton per day class. P. H. Holland, of Chicago, has brought them up to their present state of development. It is said that the big holdings in Franklin County are passing into the hands of the "Big Four," namely: Old Ben; Chicago, Wilmington & Franklin; Peabody; Bell & Zoller. The two big companies that are increasing their holdings in Williamson County are: Peabody Coal Co. and Cosgrove & Co.

Murphysboro—Arrangements have been made for further drilling on the 640 acres of the Bandy farm for the location of the proposed No. 11 mine of the Big Muddy Coal & Iron Co., of St. Louis, Mo. This deal has, it is understood, been held up by an option (which has just expired) on all of the St. Louis firm's holdings in Illinois that called for more than $2,000,000.

The expected sale of the Gus Blair mine here from the West Virginia Coal Co., of St. Louis, to the Lincoln Coal Co., of Chicago, develops the fact that the real owner will be the Copley interests, which control several public utilities in Illinois, among them the lighting and gas plants here. This will take away the retail coal supply of the city and is the cause of much agitation.

Moundsville—Work is being pushed on the new shaft for the Panama mine of the Ben Franklin Coal Co., which has an operation just south of this place, the opening being 12 x 24 ft. It is practically a double shaft as the company plans to sink one side to the 4-ft. seam and the rest of it to the 6-ft. Pittsburgh seam. The shaft has already been sunk to a depth of 20 ft. and it will require about four or five months to complete the work now in progress. The shaft is to be concreted and a wall is also to be built at the top to prevent the possibility of flooding. While the shaft is being sunk, the company also has a new tipple under construction. Upon the completion of the shaft and tipple it will be necessary to rearrange the trackage around the mines. The company is now operating just across Big Grove Creek from the point where the shaft is being sunk.

Duquoin—The Johnston City Coal Co., operating at Johnston City, southeast of here, recently completed the construction of a new rescreening plant at its No. 2 mine. The mine at the present time has a 3,000-ton capacity. With this new improvement in operation the company expects a 6,000 tonnage daily.

Drilling has been commenced between this city and Belleville, along the right-of-way of the Southern Traction Co., of East St. Louis, which was recently purchased by C. B. Fox, president of the Aluminum Ore Co., of East St. Louis. The work is being done by engineers from Pittsburg, and, after tests have been completed, it is expected that several mines will be sunk by the new owners of the road; the road will be operated as a coal carrier.

After being closed down for five months the Springside mine near Springfield, owned by the Smith-Lohr Coal Co., has resumed operations. The mine was forced to cease operations last August due to a fire which destroyed the entire top works of the plant. Much new machinery and modern equipment, including a new steel tipple, has been erected at the mine since last summer.

KANSAS

Topeka—The Kansas Industrial Relations Court—the first and only court of its kind in the United States—recently began an investigation of coal-mining conditions in the State of Kansas. The court will open its hearings in Pittsburgh, and Attorney General Richard J. Hopkins will present the evidence to the court and make prosecutions. The information sought includes: Working conditions with reference to hours of labor, and provisions for safety and proper sanitary conditions. Miners' incomes with relation to living costs. Plan of mine operation as to continuity of operation and production efforts to meet public demands and returns accruing to both miners and operators. Housing conditions in mining settlements, and rentals required by the companies of those living in company houses; school, church and social conditions. Complaints of miners, operators and the general public, if such complaints are made. Judge Clyde M. Reed and Judge George W. Wark are members of the court.

WASHINGTON

Seattle—Five Japanese connected with the Nitsi Bishi Coal Mining Co., of Tokyo, Japan, arrived here aboard the "Katoria Maru," on a tour of the coal mines of the United States. A. Nomi is the head of the party. The visitors after learning American methods of mining will go to England and other countries.

Pocatello—It is stated that a resolution has been passed by the Chamber of Commerce, here, endorsing the Teton basin coal-mine proposition, located on the Driggs branch of the "Short Line" railroad. The resolution passed by the chamber stated that after investigation, it was estimated that there were 13,000,000 tons of available coal in the Teton properties, and further that indications were that when the mines started operation the coal could be put on the local market at "25c. a ton lower than Utah Coal." The coal was also stated to be high grade. The property is located in Bannock County in the extreme southeastern part of the state. Mr. Simpson, who represented the coal company at the Chamber of Commerce, is vice president of the Lincoln Trust Co., of Spokane.

ALASKA

Eska—S. S. Smith, chief mine inspector of Alaska, reports that at Eska mine No. 11, new 3,600-lb., 3-ft. gage mine cars have been constructed and the mine trucks have been changed from 2- to 3-ft. gage. At the Chickaloon mine, the installation of a small electric-light plant has been completed and 161 short tons of coal were mined.

CANADA

Sydney, N. S.—Alex Dick, sales agent of the Dominion Coal Co., states that it is impossible to forecast coal-trade conditions, as the company hesitates to contract for future deliveries until labor and wage conditions become more settled. Business that the company might obtain is being diverted to American ports where cheaper costs of mining prevail, and coal is being produced under more favorable natural conditions. The total output for February at the Dominion Coal Co. collieries was 248,338 tons, which is several thousand tons less than the previous month's production. A number of [illegible] at different times in the month. The management has decided to put [illegible] the "safety first" [illegible] and all [illegible] in the mines will be [illegible].

Personals

Newall G. Alford [illegible] chief engineer of the St. Bernard Mining Co., at Earlington, Ky. [illegible] Sept. 1, 1919.

O. Byrd Newton [illegible] tary [illegible] Coal, Iron & [illegible], Va., in the place of C. W. Owen, resigned to engage in [illegible]

E. J. Wallace resigned as sales manager for the Stephan Coal Co., on March 1, 1920, to engage in the wholesale distribution of coal and coke under his own name, with headquarters in the Pierce Bldg., St. Louis, Mo.

Fred Bateman has been promoted from the position of mine foreman of the Walston No. 3 mine of the Rochester & Pittsburgh Coal & Iron Co. to that of superintendent of the McIntyre mine of the same company.

F. M. Sackett, president of the Pioneer Coal Co., Louisville, Ky., and connected with the Speed interests (which operate the Byrne & Speed Coal Corporation) and several mines in the state, on March 15 sailed for London and Paris, on a combined business and pleasure trip.

William H. Howarth has resigned his position as chief engineer of construction with the George M. Jones interests in Ohio, and has joined the engineering department of the Hillman Coal & Coke Co., of Pittsburgh, Pa., effective March 1. His headquarters is at Brownsville, Pa.

Edmund H. Dryer, referee in bankruptcy for the Northern district of Alabama, has been appointed umpire for the Fuel Administration and his appointment confirmed by Attorney General Palmer. Mr. Dryer succeeds H. C. Selheimer, who resigned on account of ill health and recently died in California.

E. H. Dulaney has been appointed coal and coke traffic agent of the Louisville & Nashville R.R., at Louisville, succeeding **C. D. Boyd**, who left some months ago to take up traffic work for the Hazard, Harlan and Southern Appalachian associations. Mr. Dulaney has been assistant to the third vice president, and connected with the traffic department of the Louisville & Nashville for some years.

Moroni Heiner, vice president and general manager of the United States Fuel Co., of Salt Lake City, was in San Francisco recently. He was the guest of James B. Smith, president of the King Coal Co. The United States corporation furnishes the King interests with coal for bunkering steamships plying to all parts of the world from the Pacific port.

J. W. Powell, who has served in the capacity of superintendent of No.'s 204 and 205 mines of the Consolidated Coal Co. at Jenkins, Ky., for about 2½ years, has been promoted to the position of general superintendent of Consolidation Coal Co. mines at Jenkins, Ky. Mr. Powell had an extensive experience as superintendent and mine manager for years in the Northwest before he became connected with the Consolidation company.

A. H. Sherrick, engineer in charge of the Brownsville Engineering Co., has sold his interest in the company to Walter Bowser of South Brownsville, Pa. Mr. Bowser has been connected with the Tower Hill Coke Co. at Republic, Pa., as its engineer for the past six years and prior to that he was employed by the Monongahela R.R. in the engineering department. The Brownsville Engineering Co. was organized on Jan. 1, 1920, when the company purchased the engineering business of L. G. Moslener.

James Pollack has resigned his position with the Fall Brook Coal Co., at Antrim, Tioga County, Pa., to take effect April 1. He took charge of one of the mines of the Fall Brook company Jan. 1, 1866, at Fall Brook, Pa., and has been in active charge of some of their operations ever since. In 1882 he assumed charge of the mining operations of this company at Antrim, where he developed and equipped two large mines. Mr. Pollack was a pioneer in the introduction of compressed-air mining machinery and designed and installed, what is said to be, one of the most elaborate and successful endless wire-rope haulage systems ever introduced in the state.

Obituary

George Washington Clackner, secretary of Dexter & Carpenter, Inc., coal operators of 12 Broadway, New York City, died on March 7, in the Broad Street Hospital, New York City, of peritonitis following an operation for appendicitis. He was 57 years old and lived at 350 Clermont Ave., Brooklyn. Mr. Clackner is survived by two sons and two daughters.

William W. Watkins, a prominent anthracite operator for many years, died at the home of his daughter, Mrs. Charles Hauenstein, Carbondale, Pa., at the age of 82 years.

John A. Mitchell, 76 years old and a pioneer coal prospector, died at a hospital in McAlester, Okla., recently. To Mr. Mitchell's explorations may be credited, it is said, the location of practically all the large coal-bearing seams in the McAlester territory. He was also an extensive coal operator.

Judge H. C. Selheimer died recently at San Diego, Cal., where he went to recuperate from an attack of influenza. Until a short time ago he acted in the capacity of umpire for the Fuel Administration, to adjudicate differences between operators and mine workers, resigning on account of ill health. Mr. Selheimer was 61 years of age and had been a resident of Birmingham, Ala., for the 35 years preceeding his death. His remains were sent to Lewistown, Pa., his former home, for interment.

David E. Jones, one of the best known mine-tunnel and shaft men in western Pennsylvania, died recently at his home at Duquesne Heights, Pittsburgh. He was born in Wales and came to this country when a young man, settling in Uniontown. Since that time he has been employed as superintendent of construction of mine tunnels and shafts in Montana, Idaho, Alaska and Pennsylvania and is said to have had charge of the sinking of more coal shafts in western Pennsylvania than probably any other man. Mr. Jones had resided in Pittsburgh for 15 years and was employed by the Dravo Construction Co.

Walter Scott Harkins, one of the best known residents of eastern Kentucky, died recently at his home in Prestonsburg, Floyd County, after an illness of but a few hours of acute pneumonia. He was known throughout Kentucky and southeastern West Virginia as a lawyer of ability and as a man of kindly humor and strength of character. He was an extensive land owner and was heavily interested in coal, timber and oil operations. He was 62 years of age. Besides the widow, four children survive. They are: Joseph, Walter S., Jr., and Josephine, of Petersburg, and Mrs. Grover Howard, of Maysville. A number of kinspeople are residents of Huntington.

Thomas Jeremiah, superintendent of the Willis Coal & Mining Co., Willisville, Ill., died suddenly of heart trouble March 4, aged 51 years. His wife and six children survive him. Thomas Jeremiah had a wide acquaintance among Illinois miners because of his varied activities. He began his official career as a member of the Illinois District Executive Board, later serving as national organizer in the southern states under John Mitchell. In 1901, he became associated with the Willis Coal & Mining Co., and at the time of his death was a member of the board of the Fifth and Ninth District Coal Operators' Association. In 1911, he was appointed a member of the Mining Investigation Commission of Illinois, and served as chairman of that commission four successive terms. He was also a member of the Illinois Mine Rescue Station Commission until its work was taken over by the State Department of Mines and Minerals.

Coming Meetings

National Coal Association will hold its annual meeting May 25, 26 and 27 at the Traymore Hotel, Atlantic City, N. J. Secretary, W. B. Reed, Commercial Bank Building, Washington, D. C.

The American Association of Engineers will hold its annual convention at the Planters Hotel, St. Louis, Mo., May 10 and 11. C. E. Drayer, secretary, Chicago, Ill.

National Foreign Trade Convention to be held in San Francisco, Cal., May 12, 13, 14 and 15.

Chicago Coal Merchants will hold its annual meeting April 13, at Chicago, Ill. Secretary, A. H. Kendall, Chicago, Ill.

American Chemical Society will hold its annual meeting at St. Louis, Mo., April 13, 14, 15 and 16. Secretary, Dr. Charles L. Parsons, 1709 G. St., N. W., Washington, D. C.

New England Coal Dealers' Association will hold its annual meeting March 24 and 25, at Springfield, Mass. President, W. A. Clark, 141 Milk St., Boston, Mass.

National Retail Coal Merchants' Association will hold its annual meeting June 10, 11 and 12 at Detroit, Mich. Secretary-manager, Ellery Gordon, Philadelphia, Pa.

Indiana Retail Coal Merchants' Association will hold its annual meeting April 27, 28 and 29 at the Severin Hotel, Indianapolis, Ind. Secretary, R. R. Yeagley, Indianapolis, Ind.

American Society of Mechanical Engineers will hold its spring meeting May 24, 25, 26 and 27, at St Louis, Mo Secretary, Calvin W. Rice, 29 West 39th St, New York City.

National Federation of Construction Industries will hold its first annual meeting at the Hotel Sherman, Chicago, Ill, March 24 and 25. Executive secretary, John C. Frazee, Drexel Building, Philadelphia, Pa

Chamber of Commerce of the United States will make its eighth annual meeting, to be held at Atlantic City, N. J., April 27, 28 and 29, an Increased Production Convention.

Trade Catalogs

Graphic Instruments in the Field of Transportation. The Esterline Co., Indianapolis, Ind. Folder. Pp 4; 8½ x 11 in.; illustrated. Indicates what graphic instruments are doing on various transportation lines.

High Efficiency Centrifugal Pumps. De Laval Steam Turbine Co., Trenton, N. J. Pamphlet. Pp. 8; 8½ x 11 in.; illustrated. Description of official tests made by two municipalities upon a 20-in. and 12-in. centrifugal pump, respectively. Of interest to all who are concerned with the handling of water by electric power

Keystone Rivetless Chain. The Wilmot Engineering Co., Hazleton, Pa., manufacturers. **Frank W. Watts Co.,** sales engineers, Pennsylvania Bldg., Philadelphia, Pa. Catalogue 19. Pp. 52; 6 x 9 in.; illustrated. Details of chain for conveyors and elevators; complete description and adaptability noted for various installations.

Sullivan Plug Drills and Air Compressors; bulletin 70-N. pp. 4. **WA-6 Air Compressor;** bulletin 75-P. **Valveless Stoping Drills;** bulletin 70-M, **DX-61, Water Hammer Drill;** bulletin 70-I. **Portable Air Compressors, Gasoline Engine Driven,** Class WK-31; bulletin 75-T. **Angle-Compound Power Driven Air Compressors;** bulletin 75-S. **Tandem Compound Corliss Air Compressors.** Class WC; bulletin 75-U. **Utility Forge Hammer;** bulletin 72-D. **Power-Driven Air Compressors;** bulletin 75-R. These bulletins are published by the Sullivan Machinery Co., Chicago, Ill. Each bulletin in 6 x 9 in.; illustrated. Description of machines noted.

Industrial News

Clearfield, Pa. — The Clearfield Bituminous Coal Corporation announces the removal, on March 1, 1920, of its general offices from Clearfield to Indiana, Pa. This change also includes the office of the general manager, general superintendent and purchasing agent.

Chicago, Ill.—The January, 1920, issue of *Electrical Mining* published by the Goodman Manufacturing Co., of this place, contains articles descriptive of the Goodman scraper loader and its operation in coal mines. Excellent illustrations show the device at work in various mines.

Philadelphia, Pa.—The Cortright Coal Co., of this place, announces that it has been appointed exclusive sales agent for the Cambria Fuel Co., which mines a low-volatile coal from the Scalp Level district of Pennsylvania. The offices of the Cortright company are in the Pennsylvania Building, Philadelphia.

Williamson, W. Va.—Early development of the large holdings of the United States Coal & Coke Co., on Ben Creek in the Williamson field, is presaged through the presence of several engineering parties who are making plans and surveys with a view to the beginning of early development.

Eagle Pass, Tex.—The International Coal Mines Co.'s property near here has been sold to Dr. R. R. James and associates of Cotton Plant, Ark., by J. D. Quinn and others. The property brought $100,000. It is announced that the purchasers plan to continue operation of the mines, and also to make extensive improvements and enlargements.

Charleston, W. Va—Among other improvements contemplated by the West Branch Mining Co., at its plant at Dry Branch in the Kanawha field, is the construction of a large number of dwellings for the accommodation of miners, the company having in view an increase in its output. Operations are under the direction of William Farrel, superintendent.

Logan, W. Va.—Logan lands are to be developed by the newly formed McCall Coal Co. in which Logan people are largely interested, this corporation being formed with a capital stock of $200,000. Headquarters of the company will be maintained at Logan, W Va Those active in the organization of the new company were: W. R. Lilly, J. R. Slack, H. A. McAllister and W. C. McCall, all of Logan, W. Va.

Betsy Lane, Ky—The Pike-Floyd Coal Co., recognized as a part of the Pittsburgh Coal interests, is making splendid progress on its large new operation near here in Floyd County. It is planned to make this operation the largest individual producer in the district and the most modern machinery is being installed; the early construction work is being done by the Dravo Construction Co., of Pittsburgh, Pa.

Thurmond, W. Va. — The Cadle Ridge Coal Co., which recently increased its capital to $100,000, has perfected arrangements for the development of about 900 acres of coal properties. Machinery will be installed for all features of operation, and electric equipment will be utilized wherever possible. It is proposed to have a daily capacity of about 800 tons. J. M. McVey is president and manager; Harold E. Willson, consulting engineer.

Welch, W. Va.—Preliminary organization of the Little War Creek Coal Co., has been completed with a capitalization of $500,000. This company was organized by J. C. Sullivan, of Tralee, W. Va., in order to develop certain coal territory recently purchased by him near this place. The incorporators of the new company were: Duke W. Hill, Charles G. Davis, S. H. Harrison, Vena Stapleton and Arthur B. Hodges, all of Charleston, W. Va.

Bastrop, Tex.—The Consumers' Lignite Fuel Co., recently incorporated with a capital of $50,000, has perfected its organization and is arranging for the development of a total of about 640 acres of property. Complete mining machinery and equipment for all features of operation will be installed. L. S. Johnson is president, H. M. Handshy, vice president and manager; J. T. Crysup, secretary and treasurer. H. M. Handshy will also act in the capacity of construction engineer.

Philippi, W. Va.—A tract of coal land in the Philippi district of Barbour County is to be developed in the near future by the Tygart River Coal Co. This corporation has been organized with a capitalization of $150,000, Pennsylvania capitalists being principally interested as follows: A. L. Gaphart, of Knoxville, Pa.; David S. Smith, of Hays, Pa.; Carl Breitweiser, of Pittsburgh, Pa.; Geo. F. Martin and R. D. Carkhuff of Westford, Pa. Headquarters of the company will be in this city.

Ashland, Ky.—The Marrowbone Mining Co. suffered a complete loss by fire at its power plant recently. It is hardly expected that this mine will be in shape to resume operation within three months. Plans have been quickly consummated for the replacement of adequate electrical machinery to take care of the present requirements of the company as well as the new operation of the company on which development work was recently started.

Morgantown, W. Va.—The offices of the Penn-Mary Coal Co. will be moved, on April 1, from Morgantown to Reedsville, Preston County, W. Va., it is announced by Samuel Steinbach, chief engineer of the company's West Virginia division. The company recently acquired the coal and other properties of the Elkins Coal & Coke Co., in Monongalia and Preston counties, and the removal of the offices is for the purpose of placing the management in closer touch with the actual operations.

Pittsburgh, Pa.—The Koppers Co. has nearly completed the coke-oven plant which it has under construction for the Jones & Laughlin Co., and it is expected that this works will begin operations within two months. This plant is constructed with triangular flues according to the plan which had been developed as a result of the use of oil at St. Paul, Minn., where a small battery of these ovens has been tried out for two or three years. This plant which is nearing completion is the first one to use this type of oven extensively.

Lewisburg, W. Va. — The Greenbrier Smokeless Coal Co., recently incorporated with a capital of $100,000 has perfected its organization, and is arranging plans for the development of about 900 acres of coal properties in the vicinity of McClungs, Greenbrier County, W. Va. Complete machinery and equipment for all features of operation will be installed. R. M. Bell is president, and W E Nelson, treasurer.

Cassville, W. Va.—The Lee R. Shriver Coal Co has been organized for the development of coal properties in the Cassville, district. Plans are being arranged for the installation of machinery and equipment for the development of about 225 acres of coal land, the plant to have an ultimate capacity of about 1,000 tons daily. Machinery and equipment will be installed. Nat C. Burdette is president; Lee R. Shriver, vice president; Frank Shriver, treasurer; and Robert L. Brock, secretary, all of Morgantown, W. Va.

Mullins, W. Va.—The Mullins Light & Power Co., of this place, has recently changed hands and will be known hereafter as the Union Power Co., Inc., with the following officers: C. H. Elsom, president; F. B. Lamb, vice president; H. P. Musser, secretary; M. W. Gilliam, treasurer; S. T. Preston, general manager. This company supplies the town of Mullins and neighboring coal companies with light and power. Extensive improvements are contemplated. The main offices of the company are located in Charleston, W. Va.

Straitsville, Ohio—The Straitsville Coal Co., of Columbus, has been chartered with a capital of $5,000, which will be increased later to develop large coal areas on the Hazelton estate on the Baltimore & Ohio RR. between Straitsville and Shawnee. The incorporators are: F. H. Spencer, C. H. Gibbs, E. E. Hazelton, A. T. Seymour and E. L. Pease. F. C. Spencer will be in active charge of the development work, and offices have been established in the Columbus Savings & Trust Bldg, Columbus. A good deal of storage slack is on the property and it is planned to load this for commercial purposes.

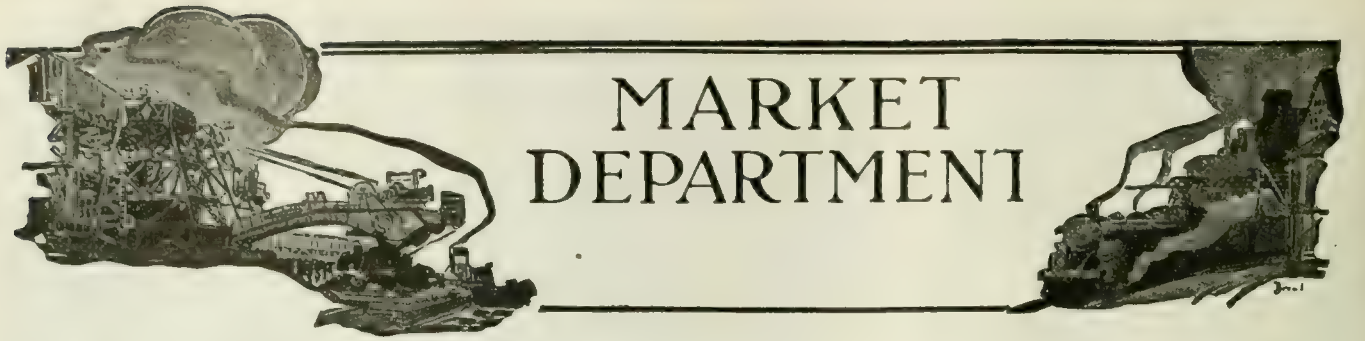
Scranton, Pa.—A large contract has come from the state of Ohio for pumps for industrial purposes to the Scranton Pump Co. of this place. The Goodrich Rubber Co. has contracted for the machines. There are three of them, each 42 ft. long, 14 ft. wide and 10 ft. high and weighing 90 tons. The price to be paid for the three pumps is something less than $100,000. Two of the mammoth pumps are to be ready for shipment within 3½ months from date of contract and the third must be ready a month later. The pumps are the largest that the local concern has ever attempted to build.

Williamson, W. Va. — Colonel T. E. Houston, one of the largest operators in the Pocahontas field, has materially increased his coal holdings in the Williamson field having just completed a deal for the extensive properties of the Red Jacket Consolidated Coal & Coke Co., the transaction involving the sum of about $2,000,000. The deal was consummated about the first of the month. All the Houston holdings in Mingo County, it seems to be pretty well understood, will be brought under the supervision of W. A. Wilson who for several years has been the superintendent of the Thacker Coal & Coke Co., a large producing company in the Mingo field. With the acquisition of the Red Jacket company, Mr. Houston becomes one of the largest producers in the Mingo section. Not long ago Mr. Houston became interested in a large tract of coal on Wolf Creek, Marlin County, Ky.

Chicago, Ill.—The Ben Franklin Coal Co., of West Virginia, has contracted with Jacobsen & Schraeder, Inc., of Chicago, for a complete new tipple to be built at its Moundsville mine. This tipple will include a Jacobson balanced horizontal screen and picking table, crushing and loading facilities for three tracks, belt conveyor and concrete storage bins.

The Tasa Coal Co., of Pittsburgh, Pa., has also contracted with this Chicago engineering and constructing firm for the design and installation of a modern tipple for its stripping operation. This tipple will include retarding conveyor, Jacobsen equipment and facilities for loading on three tracks.

Heyl & Patterson, Inc., of Pittsburgh, Pa., has awarded a contract to Jacobsen & Schraeder, Inc., engineers, Chicago, for the design and Jacobsen balanced horizontal screening equipment for the screening plant which they are constructing for the North Western Fuel Co., of St. Paul.



Weekly Review

Higher Prices Likely to Be Soon Effective—Car Supply Is Slightly Improved—Export Shippers Protest—Demand, Though Strong, Has Eased Off in Some Places and Grown Stronger in Others.

SOME relief from the tightness of the coal trade has been experienced during the past week. Although car supply is still far from normal in some sections of the country, conditions have improved in a measure. Reports of confiscations of cars by the railroads are few and far between. Now that more cars are available, the demand for domestic coal, because of higher temperatures, has eased off somewhat.

The final decision of the Bituminous Coal Commission is awaited with interest if not suspense. The increase favored by Mr. White, states Chairman Robinson of the Commission, will cost the country 100 million dollars per year, and any reduction in the working time, if granted, would result in still higher costs to the public. With statements such as the above before them, consumers are beginning to realize that the discontinuance of Government control will result in an increase in prices.

There is a certainty that the price of anthracite will also increase. While it is not likely that the 60 per cent wage advance now being demanded will be conceded, it is likely that an increase similar to that likely to be received by the bituminous mine workers will fall to the anthracite men. However, the final decision of the committee now in session in New York City is not expected for some time.

Continuation of Government prices has quite seriously disturbed the routine of the bituminous-coal industry. At this time of the year negotiations for the next winter's supply are usually made, but with Government prices still in effect and the award of the President's commission not definitely settled, neither the operator nor jobber knows where he stands.

Stocks of anthracite in the Midwest are low and domestic orders in Milwaukee have been limited to one ton. Due to the scarcity of cars, no Eastern coal is being received, and the consumers in that district are drawing upon Illinois and Indiana to meet their requirements. The prospects that there will be a strike of the bituminous miners, not at all an unlikely eventuality, has caused an increased demand for coal in the Midwest.

The fact that the Shipping Board has granted the right to ship coal overseas from Newport News and Charleston, and has refused export coal rights to Baltimore, Philadelphia and New York causes much complaint from shippers engaged in that trade. This, they claim, is doing permanent injury to the ports refused this right, and the Baltimore Import and Export Board of Trade has filed a complaint with the Government along that line.

Anthracite steam trade has had a healthy tone in the past week, though buckwheat is rather difficult to procure from the large companies. Once again the individual companies are in a position to demand premiums for this particular size.

ANTHRACITE SHIPMENTS FOR FEBRUARY

Shipments of anthracite for February, 1920, as reported to the Anthracite Bureau of Information at Philadelphia were 4,913,664 tons as compared with 5,713,319 tons in the preceding month and with 3,871,932 tons shipped during February last year, which has the distinction of being the smallest monthly shipment of anthracite for the past fifteen years with the exception of shipments made during the strike period.

Even with the shorter working time, February of this year would have recorded considerably more tonnage had it not been for the exceptionally severe weather conditions which prevailed during the entire month, it being impossible at times for some of the collieries to operate, which of course, cut down production as well as shipments.

Total shipments for the coal year or eleven months ending Feb. 29, 1920, have amounted to 63,737,213 tons as compared with 67,728,849 tons shipped during the previous coal year ending Feb. 28, 1919, a decrease of approximately 4,000,000 tons, which is made up entirely of steam sizes. Shipments in tons by carriers were as follows:

	February 1920	February 1919	Coal Year 1919-1920	Coal Year 1918-1919
Philadelphia & Reading Railway	1,038,303	725,809	12,934,447	13,339,828
Lehigh Valley Railroad	928,208	643,551	11,628,611	12,586,368
Central Railroad of New Jersey	408,052	334,697	5,720,217	5,928,059
Delaware, Lackawanna & Western Railroad	827,172	597,604	9,871,581	10,233,528
Delaware & Hudson Co.	455,003	629,929	7,137,786	8,162,731
Pennsylvania Railroad	394,366	273,031	4,545,955	4,755,812
Erie Railroad	491,608	371,033	6,929,201	7,588,336
New York, Ontario & Western Railway	135,957	108,029	1,840,232	1,749,351
Lehigh & New England Railroad	234,995	188,249	3,129,183	3,384,836
Total	4,913,664	3,871,932	63,737,213	67,728,849

WEEKLY PRODUCTION

The weekly report on the production of bituminous coal, anthracite and beehive coke, issued by the Geological Survey for the week ended March 6, 1920, states that the total output of bituminous coal (including lignite and coal coked) is estimated at [illegible] net tons, an increase of 207,000 tons or [illegible] per cent.

A 5 per cent decrease in the production of beehive coke occurred. The total output for the United States is estimated on the basis of railroad shipments at 412,000 net tons, a decline of 23,000 tons when compared with the previous week. All districts except West Virginia reported a decrease. Production in the Connellsville region, as reported by the *Connellsville Courier*, was 9,719 tons less than during the week of Feb. 28. As before, the factor limiting production was shortage of cars. No definite report from the anthracite field has as yet been reported.

Atlantic Seaboard

BOSTON

Better movement, especially all-rail. Brisk contract demand. Fewer confiscations. Light supply at Tidewater piers. Hampton Roads despatch normal. Anthracite embargoes raised, except via Maybrook. Trade closely following developments.

Bituminous—The milder weather has very much changed the immediate outlook. The railroads have made good progress the past week in clearing up congestion, both on their own sidings and at the gateways, although Maybrook, N. Y. is still the source of much anxiety. Water power has improved also in many parts of this territory and the general thawing-out process is beginning to show results.

There are still large numbers of cars at different points awaiting motive power, and it is not at all unusual to find cars that were started in January still hundreds of miles short of destination. Coal moving inland from the various rehandling plants is also reaching destinations in better time and the trade shows a distinctly more hopeful tone than a fortnight ago.

There continues to be a lively interest in season contracts, especially on the part of those who require the better grades from Pennsylvania. As was the case last year the all-rail route has very much the preference and it will be interesting to see how the Pennsylvania shippers stand up under the pressure. Car supply has been much better the past ten days, it having been reported that the New York Central showed very nearly 100 per cent.

So keen is the desire for offshore business, whether cargo or bunker, with its probabilities of a continuing permissive premium while home buyers are not allowed to pay a competitive price, that there have been several cases lately where very desirable offers have been turned down in favor of foreign orders. On the latter there is little discussion of price; the buyer who pays a very high rate of ocean freight is not disposed to quibble over differences of 50c. to $1. In consequence it is growing more and more difficult for the New England steam-raiser to be assured of supply from operations that he prefers.

The rumored decision of the Wage Commission has caused very little comment thus far. On every understanding that at all approaches the status of a contract a wage increase of some sort has been discounted, and nobody here seems to care very much how much the operators are to pay. Coals of recognized efficiency are today certainly in good request, and so long as the present Government price holds there is apparently little chance of getting April and May coal without making contracts for the twelve-month period.

At the New York and Philadelphia piers there is only a scant supply. Much of the coal available is held for foreign shipping; a fair proportion is being received on contract, but the volume for the spot market is extremely light. Invoices with the wage increase added look puny beside some of the sales that are reported to the various transatlantic shipping lines. Even the authorized Government figure has been exceeded very frequently and it remains to be seen whether there will be any corrective functioning on the part of those now administering the fuel clauses of the Lever Act.

Confiscations Continue

Confiscations in transit have not yet ceased on the railroads, but the tonnage seized has very much decreased. There have been many cases where coal has been seized three times, the last time by the road on which it was traveling, for that road's current supply, even though the Regional Coal Committee has already commandeered it, first for the delivering railroad and then for some industrial or public service plant in distress. The various shippers feel they are earning the money through the extra burden thrown upon accounting departments.

At the Virginia terminals steamers are being loaded with customary despatch. Seldom, lately, have coastwise coal bottoms been obliged to wait for more than a day or two. Much less is being heard of "emergency" coal, and there is now an impression in the trade that much of it is quietly being released without being dumped for consignees in this section. All the publicity and heart-rending appeals that were so widely printed seem now to have amounted to very little.

Anthracite—The Boston & Albany and the Boston & Maine embargoes against hard coal had been lifted by March 8 and already much-needed shipments have been started for distribution via these roads. The New Haven is open via Harlem River but the large volume that usually pours through Maybrook is still shut off. Receipts all-rail will show a very heavy increase in March, as compared with April, the demand being very much accelerated by the practical certainty that prices will be advanced again when the present conferences are concluded.

By water the movement has as yet increased very little. Marine equipment suffered heavily from the extreme weather in February and recovery is only gradual. Dumping is of course much faster, and if only the tows would move a lot of coal could be got forward to New England this month. There are several communities, especially on the Maine coast, where there is practically no coal on hand. Local stocks of wood have also been much depleted.

Now that the embargoes have been lifted for most routes there is a slightly better demand for steam sizes. This trade is being actively convassed but the resulting tonnage is light.

Retail dealers are following very closely the press reports of the scale committee conferences in New York. The impression is that the mine-workers have fewer grievances than those who are in bituminous and that a just agreement can be more readily reached.

NEW YORK

Moderated weather conditions permit freer coal movement. Domestic sizes in continued demand. Consumption remains heavy. Consumers place orders for next winter's fuel and operators report heavy bookings. Free bituminous coals easily absorbed by bunkers.

Anthracite—Milder weather conditions have permitted a freer movement of coal, and while the dealers are anxious to receive all the supplies available they are not running short. Demand continues active and receipts are again nearing normal. The cold weather and delays in deliveries have resulted in heavy consumption and consumers are making strenuous efforts to refill their bins.

The approach of April 1 does not appear to cause any let-up in demand upon the retail dealers, householders apparently feeling there will be no reduction in prices, and having read in the daily newspapers that they may expect an increase of at least $1 a ton, many have already entered their orders for next winter's supply.

Demand is for the larger sizes, egg and stove, and these sizes are as scarce as they have been for several weeks. Chestnut is also in demand. The scarcity was increased because of the lack of production due to the severe storms of the early part of March, when many of the mines were forced to suspend operations.

The trade is closely watching the daily conferences now going on in this city looking toward a new wage agreement with the mine workers. It is conceded that whatever increase in pay will be granted the workers it will be eventually paid by the consumer.

Many buyers are going to the coal fields in an effort to close contracts, and in some instances have been successful, but railroad shipments have been slow. Moderate temperatures however are improving these conditions and operations at the piers are speeding up.

Independent operators do not have any difficulty to obtain the 75c. differential for their product, especially for the domestic size, and some report sufficient orders booked to carry them well into next month's output.

Buckwheat and rice are in good demand and easily absorbed, while barley is easier in supply and not so easily taken up. The continued lack of bituminous has not yet resulted in a let-up in demand for these coals.

Current quotations for company coal per gross tons at mine and f.o.b. tidewater, at the lower ports are as follows:

	Mine	Tidewater
Broken	$5 95	$7 80
Egg	6 35	8 20
Stove	6 60	8 45
Chestnut	6 70	8 55
Pea	$5 30	$7 05
Buckwheat	3 40	5 15
Rice	2 75	4 50
Barley	2 25	4 00
Boiler	2 50	4 25

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—There has been no relief in the bituminous situation. The trade sees no relief in sight. Considerable confusion exists because of continued Government control, and operators and wholesale dealers believing they could handle their own affairs better.

The reports of the Bituminous Wage Commission granting the mine workers 25 per cent increase in pay, the increase to absorb the 14 per cent increase granted last November, has not helped the situation any and many of the smaller operators are wondering what the outcome will be.

Dealers have been notified that regulations have been issued requiring permits for the bunkering of vessels to foreign ports and for the exportation of cargo coal by the Tidewater Coal Exchange, and that the permits must be filed with the Collector of Customs before clearance to vessels shall be granted. This order is to remain in force until midnight of April 30.

The demand for spot coal exceeds the supply. Receipts are coming to the dock better, but with few exceptions, are ready under contracts. Buyers of free coal meet with considerable difficulty in obtaining cargo lots. Contract coals are sold more freely and there is considerable bunkering because of the vast number of vessels now entering this harbor.

Numerous inquiries are being received regarding contracts for next year's supply, but in many instances are turned down, as many of the smaller operators find they are operating their mines at loss. Others are signing up, at the Government prices until Federal control ends, after which another price will be stipulated in the contract. These prices range from 25c. to $1 per ton more than the present. Maximum Government price of $2.95, the higher figure being for the high grades. Production does not improve rapidly. Cars continue to be short, some of the mines receiving not more than 10 per cent of their normal supply.

Loaded boats are in good demand. There are large numbers of empty boats lying off the loading docks, under contract and waiting for cargoes. Some of these bottoms have been there 35 days.

Government prices prevail on all coal not shipped on contract, which are as follows:

	Mine-Run	Prepared	Slack
Central Pennsylvania	$2 95	$2.95	$2 95
Western Pennsylvania	2.35	2.60	2 35
Fairmont (gas)	2.50	2.75	2 25
Georges Creek, Upper Cumberland and Piedmont Fields	2 75	3.00	2 50

PHILADELPHIA

Anthracite in strong position. Demand continues unabated. Despite warmer weather demand for current needs strong. Pea gains in strength. Stove and nut reach city in diminished volume. Companies care for New England. Strike talk and price increase urge consumer to order.

Anthracite—Even though the weather is the mildest since last November, the demand for anthracite continues unabated. The point has now been reached where the stocks put in by consumers during the summer have reached the vanishing point and the call upon the dealers is very strong. The dealers are simply choked up with orders and with very little prospect of being able to clear their books before the first of April.

Demand is, of course, all centered upon stove and nut, with egg just the least inclined to lag. However, no dealer is turning down egg, as even now they are receiving orders to store this coal in consumers' cellars for the next burning season. The public generally, at least those accustomed to use foresight, are convinced that coal will not be cheaper than it is during the present month and the retailers are being urged right along to stock up this month, but without question a large percentage of the trade will be disappointed, as the need of coal for current consumption is so strong that very little storing can be done this month.

Just at this time most dealers are shorter of the prepared sizes than they have been at almost any time all winter. Many of them have their bins entirely empty and with no shipments on the road. The shortage of tonnage is attributed to several causes, one of which has been the storms and floods in the region, especially the latter, as the collieries are having much trouble with water in the workings following the thaw of the last week. Then, again, with the lifting of the embargoes on the lines into New England, the companies have felt impelled to make extra heavy shipments there on acoount of the very urgent need.

Retailers in calling at the shipping offices have been very frankly told that they received much coal during the past few weeks that would have ordinarily have gone East and they must expect now to try and put up with the tonnage they are getting. As a matter of fact, it seems to be a custom of years' standing to ease off in this market at this time of the year and most dealers while needing coal, are not exactly disappointed.

Bituminous—The operators generally report some improvement in the car supply, but none of them are getting sufficient to bring their mines anywhere near up to capacity. One beneficial result of the situation is believed to have resulted in less confiscation of coal by the railroad companies, and many consignees who have been notified that coal would not reach them have been greatly surprised by receiving coal they did not expect. Even with this improvement it can only be said that the local situation is far from satisfactory.

There is hardly a plant that is not working on a reduced schedule on account of coal shortage, and the few that have not been affected have cut so heavily into their surplus that they are making the strongest efforts to replenish it. If anything, less coal has come into this market than for the past two weeks, as with the opening up of the Northern railroads much of the production has been rushed in that direction. In addition the bunker trade, at a better price, is also being take care of.

With the report of the coal commission being made to the President the consumers are waking up to the fact that they are in for still higher prices. Many of them, after having become accustomed to the 14 per cent increase which was added to the contract price had a sort of feeling that the price crisis had been passed for the time being. Now with a dispute on as to a 25 per cent or 35 per cent increase, they are beginning to realize that they are likely in for a further increase.

BALTIMORE

Business men climb into protest against continuance of export ban at this port through action by Export and Import Board of Trade. Car supply on Baltimore & Ohio has averaged around 50 per cent for week.

Bituminous—Instead of relief the coal men here find that each week is apparently bringing new complications to the general fuel situation. While the wage report would indicate considerable advances in the price of coal to consumers with the 25 per cent raise to the miners, no immediate knowledge concerning the basis is expected in local circles.

The possibility of disagreements in both bituminous and anthracite fields is not adding to the general comfort of the business situation. Uncertainty also is added by the suit of prominent coal firms to test the power of the Government to further regulate the domestic coal industry. The export ban is on tight, the only movement from this port in considerable time being the clearing of one ship with 1,029 tons for Colombia on March 6.

Meanwhile business men here are stirred by the belief that the Government action in refusing export coal rights to Baltimore, Philadelphia and New York, while granting them to Newport News and Charleston, is doing permanent injury to this port through the establishment of new lines of trade, especially with South America, for the latter ports, and which the Northern ports have held in the past but may never be able to regain.

The Import and Export Board of Trade has filed a formal complaint along that line with the Government. Car supply in the coal regions of interest here has run about 50 per cent only the past week. The Baltimore & Ohio on five successive days reported for its entire system this percentage of supply—74, 43, 42, 36 and 37. The daily loadings on the system ran ordinarily between 1,900 and 2,300 cars, although on one day the total of 3,596 cars was loaded. At Curtis Bay the daily supply for the past week ran between 268 and 351 cars the high, while the daily number of cars running to the pier varied between 138 and 419. Local industries are running close but none have been forced to curtail in any way.

Anthracite—Hard coal dealers saw a decided slackening of late ordering this week, when rather spring-like temperature arrived. The thoughts of the coal men are largely turning toward spring, and there are many underground rumors that there will be no spring cut this year, especially if the wage proposition is not worked out in satisfactory manner. There are already visions here of $14 and $15 coal unless the workers make decided concessions.

The local dealers met the past week to consider means to fight a bill introduced in the Maryland General Assembly which is designed to create new inspection rules for coal deliveries. At present the police have power to stop coal trucks and order the loads weighed, and the law provides for [illegible] inspection of scales.

Eastern-Inland

PITTSBURGH

Little information on Robinson commission report. Car shortage as bad as ever. No definite information in local coal circles regarding the coal wage commission's reports beyond the meager information contained in the statement given out in Washington.

[illegible] ment that the commission had completed its recommendations, there was a well defined rumor in coal circles that a part of [illegible] price control be taken off coal and coke at once. This may be true, but the fact that the commission has not presented a unanimous decision, as the President urged it [illegible]

It [illegible], that anything at all will occur until the [illegible] ports. Predictions continue that there would be [illegible] down.

The car shortage in general is not relieved to any extent, and in some quarters it seems to have grown worse. This means that on an average the car supply has been less since Feb. 15 than from the first of the year to that time. Return of the lines to their owners has had no appreciable effect, while as to the return of spring, that has been delayed by one belated cold snap after another, though at this writing the weather has been milder for two or three days.

Early improvement in railroad movement, however, is confidently expected. There has been an appreciable improvement in car supplies to steel mills for shipping steel, and it seems that the coal mines are to be the last to receive better service. The market remains quotable at Government limits: Slack, $2.10; mine-run, $2.35; screened, $2.60, per net ton at mine, Pittsburgh district, with a 15c. brokerage in addition in some cases.

COLUMBUS

Car supply is slightly better anl the coal trade is not as strenuous as formerly. Still an insistent demand for domestic and steam grades. No actual suffering in central Ohio is reported.

Bituminous—Some relief from the tightness in the coal trade was experienced last week when the car supply in most of the Ohio fields was improved slightly. On the other hand higher temperatures reduced the need for fuel and consequently the stress is gradually passing away. There is still a strong demand from all localities for fuel, mostly domestic sizes. Steam demand is strong although some of the larger steam users have been able to secure some reserves. The future is not very encouraging however, as any great improvement in the car supply is not expected soon.

Domestic trade is strong and many dealers are clamoring for shipments. Retail stocks in many places are entirely exhausted and some inconvenience has been caused. But with milder weather the stress has been relieved to a certain extent and retailers have been able to make out in some way. Dealers have been delivering only small orders, as they reduced loads to make the available supply reach all consumers. Steadiness characterizes retail prices. Pocahontas is practically out of the market although some West Virginia grades are arriving. Pomeroy Bend and the Hocking Valley fields are supplying the larger part of the trade in Columbus and central Ohio.

Steam business is moving along fairly well, although there is still a marked scarcity in stocks. Large manufacturing concerns have used every possible means to speed up shipments. Iron and steel plants are buying rather heavily. Public service concerns are also in the market for large shipments as their reserve stocks have been depleted. Railroads are confiscating a large number of cars and this is causing some trouble among commercial purchasers.

The Lake season will probably be one of the most active in years. Lake shippers are scurrying around for tonnage and have not succeeded in picking up any large amount. Producers are loath to make contracts, especially in view of uncertainty as to the wage scale. But some few Lake contracts have been made and others are in process of negotiation. The opening of the Lake season is expected to be late.

Retail prices in Columbus are:

Hocking Lump	$6 50
Hocking Mine-run	5 75 to $6 25
Pomeroy Lump	6 50
Pomeroy Mine-run	6 00 to 6 25
West Virginia Splints, lump	7 25
West Virginia Splints, Mine-run..	6 75 to 7 00
Pocahontas Lump	8 00
Pocahontas Mine-run	7 50

CINCINNATI

Market conditions are still unsettled, due to a combination of causes. The car supply is still about 50 per cent of normal with production on the same level. The demand for domestic sizes was rather heavy.

Railroad control has not been in the hands of the private owners a sufficient time to be of benefit to the coal trade, although much is expected of the return of the roads to the former managements and owners.

Industrial plants are beginning to feel the shortage of fuel and the schools in particular are almost out of tonnage. From present indications stocks are so low that there will be a fairly healthy demand for coal some months to come, although it is a question whether this district will secure a fair car distribution and be able to take on equal advantages of demand with other districts which have received greater favor.

Conditions have been bad here for more than three months and all the operators have received in the way of relief have been vague promises.

Telegrams have been sent to the Coal Association at Washington by operators urging them to hasten payments on confiscated and diverted coal which has caused them indebtness.

Although coal operators and distributors are abiding by Government prices there is considerable rebelling against the restriction. The early part of the week saw the terminal congested with coal, but this was relieved before the middle of the week by the re-routing of it to other points.

Receipts by river were larger than they have been for some weeks, due to the navigable condition of the Ohio River. Confiscation was not so general as it has been, distributors, however, were deprived to some extent, thus hindering them from fulfilling orders and taking on new business. No free coal was offered and from the present outlook none will be available for some time to come. Retailers in all sections are still greatly bothered in deliveries by the unprecedented bad conditions of the streets and much is heard about the high cost involved.

It is the candid opinion of the majority of operators that no material improvement will develop in the coal situation here for many months to come. One fact is certain that the operators are not alarmed over conditions but are treating them as they come to light to the best of their advantage.

Southern

LOUISVILLE

Retailers reporting considerable difficulty in getting coal. Conditions at mines showing no improvement. River shipments coming in better. Domestic shortage in Falls Cities.

Louisville retailers have been having considerable trouble in securing coal for several days past, while demand has been heavy due to severe weather and snow as late as March 7, which has resulted in empty yards. Due to the fact that bad weather is reducing stocks carried over winter, consumers are running short and trying to place immediate delivery orders, which retailers can't handle. There is a general domestic shortage in the Falls Cities, and a heavy demand for all grades.

Industrial demand continues heavy, but mine run is in better supply comparatively, as there are many mines that are producing little other than steam. River shipments have been somewhat better. The steamer *Julius Fleischman* came into the harbor with fifteen barges of West Virginia coal a few days ago, and brought conditions around nicely with concerns which have facilities for handling river coal.

In Jeffersonville, Ind., the United Gas & Electric Co. placed its surplus supply of coal at the disposal of the retailers last week in order to fill an acute shortage of fuel at that point. Operations at the mines show very little improvement and merely go from bad to worse. Last week the Harlan field got in two days, due to car shortage. Influenza and smallpox in that field are causing some trouble.

Demand for byproduct and gas coal continues heavy, and Harlan field operators are meeting with a heavy demand for all the coal they can produce. The Hazard field also reports steady car shortage, and excellent demand for all grades, but with labor troubles facing the field. Western Kentucky mines, both on the Louisville & Nashville, and Illinois Central, are short of car supply.

The Louisville & Nashville reports that it is 10,000 cars short of requirements at the present time, and unable to meet demand of the operators.

BIRMINGHAM

Car suppiy from 60 to 65 per cent. Coal industry is badly handicapped. Demand for steam coal exceedingly good, while domestic inquiry is also insistent. Labor shortage and influenza contribute in a small measure in curtailing production.

The activity of the local coal market is practically dominated by the transportation problem. There is an urgent demand for coal from every quarter of the territory, which cannot be supplied, and the lack of coal to meet the requirements is attributable almost wholly to lack of cars to enable the mines to operate efficiently and have their product moved on to the consumer promptly.

The car supply for the past week has been between 65 and 70 per cent of the requisite amount of equipment. Slight relief is expected when the rail lines are working smoothly under private control. The reserve supply of fuel in the hands of consumers is negligible and deliveries are inadequate to meet the full requirements of daily consumption.

Because of the crisp weather domestic stocks in retail yards were well cleaned up and numbers of consumers felt the pinch of cold on account of inability to get fuel but temperatures have risen and the receipts of domestic fuel now, though small, are adequate for the trade. The prevalence of sickness in many sections of the coal field and the slight shortage of labor have contributed to some extent in holding down production.

Lake Region

BUFFALO

Still great scarcity of all sorts of coal. No real relief in sight. Complaint of discrimination. Car shortage the reason. No more cars in sight.

Bituminous—The situation does not improve as it was expected to after the big snow drifts were gone. The fact is the car shortage is too pronounced for any great increase of movement to take place till there are more cars. Some of the most-favored shippers are now able to report a small improvement, but they even admit that the situation is bad, and they do not look for a fuel supply of coal till the car supply is better. As to that nothing can be done but build more cars. It is a long time since any such a move has been announced.

It is stated that about 30 per cent of the existing cars are crippled and that the car shops are not taking care of them at all fast. That is the real reason for the shortage and it will continue to be till the mines can have cars that are some degree up to their capacity. Day after day the miners are idle for want of cars. Then they are able to report that they are not earning much and demand more pay. The difficulty works out badly in all directions.

Complaints of confiscations of coal by the roads continue. Since the weather has once more become mild the amount taken is much less that it was, but it is still much more than it should be. Shippers are joining together in an effort to stop it, but it is a difficult matter. At the same time this is not the worst of it. If the roads would pay for the coal promptly it would not be so bad, but to keep a shipper's money tied up, as the deferred payments do, is enough to ruin some who are not well supplied and it is an equal injury to all.

The bituminous prices are very unsteady. Some of the shippers are trying to hold to the government prices, which are still nominally in force. The quotations are $4.70 for Allegheny Valley sizes, $4.50 for Pittsburgh and No. 8 lump and three-quarter, $4.25 for all mine-run and slack and $4.70 for smokeless. The report is common that more and more of the trade is breaking away from these prices. Some operators claim that they cannot make profit on them and if they charge more the jobbers will have to do so or go out of business. As a rule the latter would prefer to abide by the regulations.

And now come reports of preferential shipments and though they do not seem to be enforced to any visible extent everybody fears that they will soon be considered necessary and be enforced as rigidly as they were before. This would be about the last straw and all because the car supply has been allowed to run down so low.

Anthracite—The supply has run down so that there is a cry of famine in the city and though shippers and distributers say it is exaggerated all agree that we are in need of much more coal than is coming this way. The Chamber of Commerce has finally taken it up and telegraphed to some of the anthracite operators for an explanation. The claim is that Canada was being supplied to the expense of Buffalo. Some shippers say it is true and it does not appear to be denied by anyone. The reason given is that the car supply is so small that an adequate movement is impossible.

It is not expected that the difficulty will last long, for the weather has now come to the rescue and not much over one-third the coal is now consumed that was during the cold season, which lasted from the latter part of November till March 10, a period never exceeded in the history of the city. But for the good supply laid in last fall the shortage would have been something frightful. It was a narrow risk to run, especially when so many railroads were blocked.

And now comes up the alarmed report that there is going to be a strike next month on the part of the miners and people who have permanent homes are teasing for coal to bridge over a suspension of production. Natural gas can be depended on to help out in mild weather, but it not only runs down badly in cold snaps, but often goes out. On March 15 it will be permissible to put the gas back into the furnaces, but last March there was a cold spell that was hard to meet with gas only.

It is time to begin loading anthracite into lake vessels and make spring rates, but nothing has been done and nothing is likely to be done for weeks yet. The shippers will not be able to secure a surplus for the opening of lake navigation as it looks now.

CLEVELAND

Shortage of fuel appears less acute because mild weather has drawn attention from it, but with steam coal users the situation still is a hand-to-mouth one. Demand for anthracite is unusually heavy for this time of year.

Bituminous—Coming of milder weather has eclipsed the coal shortage in the public eye, but the shortage remains just the same. Because of the higher temperatures demand has been decreased slightly, but not appreciably, as receipts from southern and eastern Ohio mines have not yet increased. Inasmuch as the district was able to operate practically full, though on the ragged edge, all winter, it is believed the present shortage will be outlived within a few weeks. That the worst is now past is the consensus of opinion. More efficient handling of cars and locomotives already can be detected. Domestic bituminous coal demand has tapered off to practically nothing, and all shipments have become available for industrial users. Little diverting, except occasionally for the benefit of the largest local utility, is being done.

Continuation of government maximum prices has quite seriously disturbed the routine of the industry here. At this time of the year contracting negotiations usually are on, but with government prices in effect and the Preisdent's Commission on the job neither operators nor consumers know where they are at. Operators are informally booking the needs of regular customers, with the question of price left open for future consideration. Tenders of $3 and $3.25 for No. 8 mine-run and slack are reported made to operators. Three dollars is the minimum most operators expect to be getting.

Virtually the only dark spot on the horizon here is the re-establishment of the preference list. That industrial users will suffer most heavily if cold weather recurs, is the general admission. So far, however, the Hines order has had little or no effect here.

Pocahontas and Anthracite — Slightly more Pocahontas is coming through just now, but it is only a drop in the bucket and insufficient to meet more than one-fifth of possible business. Anthracite, however, is holding up well and receipts are not far below normal for this time of the year. With rumors of an anthracite strike afloat, demand has increased and dealers are putting next winter's supply in the cellars of regular customers. Others still are limited to two tons. Prices of Pocahontas continue nominal, in the lack of sizeable trading. Anthracite quotations, while firmer, are unchanged. There are hints of advances, however.

Lake Trade—Prospects of an early opening have gone glimmering with the news that ice in upper Lake harbors is almost of a record-breaking thickness. In Duluth harbor the ice is 26 in. thick and the fields extend solidly 47 miles out in Lake Superior. Two Harbors has 21 in. of ice, Ashland 32 in., Escanaba 34 in., Port Arthur 24 in., while the St. Marys river is frozen over solidly its entire length and at Whitefish point the ice is 24 in. thick. Last season the first bulk freighter locked through the Soo canal on April 10 and reached Duluth April 11. Last season there was practically no ice, hence the belief that it may be the last of April before any lake coal can be carried this season. While considerable lake coal has been placed, the price has been left open.

Prices of coal per net ton delivered by dealers in Cleveland are:

Anthracite—Egg, $12.20@12.40; Chestnut, $12.50@12.70; Grate, $12.20@12.40; and Stove, $12.40@12.60.

Pocahontas—Shoveled lump, $9.00@9.25; and mine-run, $8.00@8.25.

Domestic bituminous—West Virginia splint, $8.50; No. 8 Pittsburgh, $6.85@7.00; Massillon lump, $7.40@7.65; Cannel lump, $11.00; and Coshocton lump, $[illegible].

Steam coal—No. 6 slack, $5.75@6.00; No. 8 slack, $5.80@6.00; Youghiogheny slack, $5.90@6.10; No. [illegible], $6.25@6.60; No. 6 mine-run, $6.30@6.85; and No. 8 mine-run, $6.30@6.85.

DETROIT

Indifference of Federal authorities to Detroit shortage of coal arouse Board of Commerce to action.

Bituminous—Detroit Board of Commerce is arranging for a conference with similar organizations from other towns of the state to determine what can be done to bring a more liberal supply of bituminous to Detroit and Michigan. This action follows failure of an attempt to obtain relief through a direct appeal to representatives of the Federal government in Washington.

An appeal to Washington was made by E. J. DuBois, fuel commissioner of the Board of Commerce, who sought to stimulate action by presenting to the fuel authorities the information gathered in a survey of Detroit industries. This investigation disclosed that many of the large manufacturing plants are being kept in operation by the coal they are receiving from day to day and that numerous important industries are daily confronting the contingency of interrupted shipments forcing them to close down.

Mr. DuBois also informed the Federal officials that an investigation of 125 coal yards in Detroit has shown their combined stock to be only about 1,570 tons of bituminous or less than 15 tons apiece. He emphasized the fact also that the Detroit Edison Co. having daily consumption of about 4,100 tons, has reduced its reserves to something like 14,000 tons in contrast with a usual reserve of about 100,000 tons.

Government representatives gave Mr. DuBois no encouragement to expect improvement. H. B. Spencer, chairman of the Central Fuel Committee, told Mr. DuBois that while perhaps it would be possible to provide coal for household consumers and for public utilities, no assurance could be given that Detroit industrial plants would not be forced to close.

Jobbers say the railroads are continuing the confiscation of coal sent to Detroit, despite the protests of consumers and the trade. The present shortage of supply is ascribed principally to the action of the railroads in seizing and diverting shipments sent to Detroit.

Anthracite—Very little anthracite is coming into Detroit, but dealers are of the opinion that temperature conditions will moderate speedily and that household consumers will be able to provide for their requirements without hardship.

Middle West

MIDWEST REVIEW

Big consumers of coal in the Middle West are beginning to be worried because they are having great difficulty in getting contract propositions from either operators or distributors.

Operators cannot, most certainly, afford to take on big contracts on a basis of the present Government prices, nor can they afford to take on contracts over and above the Government prices. Consequently, they are selling their output almost entirely on a day-to-day basis. This proves very unsatisfactory both from the standpoint of the operator and consumer.

The car situation is improving slowly in Illinois and Indiana, although mines on the Pennsylvania Lines, in Indiana, are reporting a very much better car supply than any other mines in that territory. The railroads, it appears, are not going to follow the tactics inaugurated and carried out by the late lamented U. S. Railroad Administration. In fact, we know that several mines who worked on railroad contracts last year have been approached, within the last few weeks, by the railroads, asking that their contracts be renewed, and of course on a different basis. So far we have not heard of any large contracts that the railroads have made.

The market continues very strong on domestic sizes, and steam coals. Apparently the coal shortage in the country is very much more serious than at first supposed. That there should be a shortage of steam coal can be easily understood, both on account of the strike, and the tremendous industrial activity in the West.

The shortage of domestic coal is hard to understand because normally at this time of the year, dealers are not buying at all, but are cleaning out of their bins what has been left of their winter coal supply.

We have been having some very mild weather, but, irrespective of this, dealers are buying coal as fast as they can place their orders and I expect that the public is buying coal from the dealers just as fast as it arrives. It is predicted that the domestic trade will boom right straight through the summer months, because the public is showing a desire to stock coal this year in order to avoid future uncertainties and difficulties. If this trend of early buying continues, it will be a very satisfactory thing for the whole industry.

CHICAGO

Railroads still confiscate coal. Shippers' situation is bad. Demand for domestic coals.

During the coal strike, and continuing from the end of the strike up to now, it is said that the Pennsylvania R.R. has been confiscating a large number of cars of coal. The shippers of this coal claim that they are unable to get payments from the Railroad, and have bills against that railroad dated as far back as October, 1919. They claim, in addition, that the Pennsylvania R.R. does not even answer their letters asking for payment, let alone forwarding checks for confiscated coal.

The situation is growing so bad, we understand a number of Chicago shippers and wholesalers have made up their minds to send a delegation to Pittsburgh to call on the proper authorities of the railroad and see if something cannot be done. Market conditions in Chicago differ very little from the general conditions existing throughout the Middle West. All domestic coals are in great demand, and very hard to get. Buyers of steam coal are placing orders wherever they can, and it looks as if a strong market will continue for some time.

ST. LOUIS

Car shortage in all fields continues and coal is more scarce than at any time in years, excepting in strike periods. Much dissatisfaction among miners.

Car conditions instead of getting better apparently seem to be the reverse. Throughout the Standard and Mt. Olive fields with the exception of one or two roads conditions have been worse the past week than at any time in many years as far as car shortage is concerned.

The exceptions were the Vandalia and the Baltimore & Ohio which roads showed considerable improvement. There was a slight improvement on the Wabash, but the other roads fell down with the exception of the short line coal roads which kept about where they had been for the past week or two.

There is much dissatisfaction among the miners throughout these districts, first because of the short working time, and secondly because the commission appointed to look into the new wage scale have up to the present failed to make any satisfactory progress. On the Illinois Central and Mobile & Ohio two days a week seems to be about the maximum.

Railroad contracts are being filled nearly, all the roads are short of fuel and are taking everything they can get. From the Mt. Olive district the movement of coal North and West for the railroads is heavy.

The demand still exceeds the supply on everything. Domestic demand is easy, so far as the demand is concerned but the supply is so short that [illegible] are [illegible] on Mt. [illegible]

The domestic demand in the country is [illegible] with no chance of [illegible] until [illegible] or after [illegible] develops. Steam [illegible] coal [illegible]

[illegible]

Everything in this field indicates a heavy early buying of coal and the railroad tonnage is heavy and will likely continue so. The miners in these districts do not show as much discontentment as in others.

In the Duquoin district conditions are considerably worse, that section being served only by the Illinois Central. There is much speculation throughout the field on the part of the miners as to what the commission at Washington will recommend in the way of an increase. The miners seem to think that they must have at least thirty per cent.

The twenty-five per cent increase reported on March 11 as being recommended at Washington seems to satisfy some of them but many are not contented with that and it will take a few days to get any information as to what the majority seem to think about it.

A condition that is confronting the railroads in the Middle West is the substituting of oil for coal if the price of coal continues to go up. Oil is as high now, they figure, as it will be and is likely to come down but coal will go up and the problem is receiving serious consideration at the hands of the big Western roads, and especially those in the southwest.

There is practically no anthracite coming into St. Louis and no smokeless. The tonnage of Franklin County is still small. There has been no change in prices and, generally speaking, local conditions are satisfactory.

MILWAUKEE

Severe winter weather in March caused a heavy demand on the coal supply and forced dealers to measure out orders gingerly. No change in prices.

Sub-zero weather during the first week in March put the coal business of Milwaukee into an acute stage from which it was subsequently rescued by a burst of spring-like atmosphere. The market is now entirely dependent upon rail supplies. Cars are scarce and the service in general has been demoralized by cold and snow. The stocks of anthracite are so low that consumers are limited to one ton orders.

No Eastern soft coal is being received at present, Illinois and Indiana being drawn upon for steam coal. Domestic sizes of Pocahontas are as scarce as anthracite, but there seems to be an abundance of mine run. There will be no relief from the present situation until navigation opens. Prices remain unchanged on coal and coke. The suggestion of $15 anthracite on April 1 is no longer heard.

Prices in Milwaukee are:

Anthracite	
Chestnut	$12 70
Stove	12 60
Egg	12 40
Pea	11 20
Buckwheat	9 75

Government prices are as follows

Bituminous	
West Virginia, splint screened	8 00
[illegible] Heat	8 00
Hocking, screened......	7 75
Pittsburgh, screened	7 75
Pocahontas mine run	8 75
Pocahontas, screened	11 00
Cheerful Chunks	9 50
Smithing	8 75
Cannel	12 00

Pacific Coast

SAN FRANCISCO

Car situation improved. Recovery almost complete. Bunkering business in fine shape.

More railroad cars are available for the transportation of coal from Utah and Wyoming to San Francisco, the main receiving point on the Pacific Coast. Recovery has been just about complete from the conditions at the time of the strike of the coal miners. Following that walkout, there is no longer any diversion of cars, normally used for the Pacific Coast business, to other parts of the United States. Both the bunkering and domestic trade are on a prewar basis, with business in healthy condition.

The bunker price at present is $13.55, which has been maintained for some time. For domestic use, bituminous prices from Utah and Wyoming, f.o.b. net ton, are: Stove, $3.65; Lump, $3.65.

SEATTLE

Quotations at the present time are as follows:

Seattle—$6.75 per ton 2000 lb., f.o.b. bunker tips.

Tacoma—$6.75 per ton 2000 lb., f.o.b. bunker tips.

Portland—$8.75 per ton 2000 lb., f.o.b. bunker tips.

Portland—$9.50 per ton 2000 lb., in the stream over the ship's rail.

The above rates apply to the standard grades of Black Diamond and South Prairie coal.

Quotations on British Columbia coal in Seattle Harbor are as follows:

Comox Lump—$10.00 per ton of 2240 lb., f.a.s.

Comox Marine Mixture $9.85 per ton 2240 lb., f.a.s.

Coke

CONNELLSVILLE

Market remains stagnant. Rise predicted in event of removal of price control but this might be short lived.

Coke market continues extremely inactive, as there is only a very limited tonnage offered in the open market at the Government limits, and this is chiefly off-grade coke though the full price is quoted.

The market presents all the appearance of an extreme scarcity, and it is predicted quite generally that if the Government control is taken off in the near future, as is thought in some quarters will be the case, prices will soar at once, say to $8 or $10 for furnace coke or even higher.

Price control will not come off, at the earliest, until the President has studied the majority and minority reports of the Robinson bituminous wage commission and acts upon it, for the commission merely recommends in the matter of price control. Meanwhile the transportation situation is expected to improve almost from day to day, if the present mild weather continues and that will necessarily have a great effect upon coke.

The coke market might advance very sharply but the situation has elements of eventual weakness in it, there being probably more than 100,000 tons of coke piled in the Connellsville region, awaiting cars, while a few of the furnace interests have chanced to accumulate stocks of considerable magnitude, even though others have not had enough for full operation. The furnaces with stocks would probably order contract shipments to be stopped or curtailed, in the event of transportation conditions being permanently improved, and only a few suspensions would be needed to give the coke market a chill.

The market, while practically nominal, remains quotable at Government limits: Furnace coke, $6; foundry, $7; crushed over 1 in., $7.30, per net ton at ovens.

The *Courier* reports production in the Connellsville and Lower Connellsville region in the week ended March 6 at 238,286 tons, a decrease of 9,749 tons, and a tonnage slightly under the January-February average.

BUFFALO

The situation does not improve much. Coke has all along been about as scarce as bituminous coal and it will not be really plenty yet.

The season's policy does not seem to be determined upon at the furnaces. They are far enough behind their orders, but so many difficulties come up that a bold forward movement seems out of the question. It is expected that a liberal output will be made the coming season, but it is far from assured. Ore has been sold in quantity, but none has been chartered yet. Prices f.o.b. here are $9.60 for 72-hour Connellsville foundry, $8.60 for 48-hour furnace, $7 for off grades and $7.75 for domestic sizes.

BIRMINGHAM

Demand for furnace and foundry coke here is very strong but there is none available for the spot trade or for additional contracts.

The curtailment in coal production has likewise affected the output of coke, and equipment for the movement of the product is also very short. Yolande foundry is being billed to contract consumers at $9.75 ovens, which is also the quotation on Brookwood foundry. All grades are quoted at government prices.

COAL AGE

Volume 17 New York, March 25, 1920 Number 13

To Be Fair Is To Be Fortunate

BY CARL SCHOLZ

AT the Coal Stabilization Conference held in connection with the February meeting of the American Institute of Mining and Metallurgical Engineers it was clearly demonstrated that there is "nothing new under the sun." Everyone of the measures proposed as likely to be helpful has been tried at various times, and even now the trick is not turned. Nevertheless there is still hope that by closer co-operation between all parties, beneficial results can be obtained.

Most essential is it that any movement to be applied by all the parties at interest be based on doing a fair day's work for a fair day's wage. It is necessary to eliminate selfishness and greed and to substitute fairness and justice in their place. No matter how many papers are read and schemes advocated, until correct principles are applied and practised by the legislators making our laws, by the coal operators and banks providing the capital and by the laborer in converting the raw material into a finished product, the goal will not be successfully reached.

It is only necessary to analyze the cause for the present high cost of production to prove the correctness of the above conclusion. Prior to the war, owing to various causes, the coal industry had reached an extremely low ebb. It was impossible to establish central selling agencies, as are now advocated, because the law prevented their formation. The railroads could not grant reduced freight rates in the summer because some of the railroad commissions had stated that if low freight rates were made in that season similar rates would have to be maintained during the winter. The storage of coal was not feasible because of the limited credit of the coal companies and the knowledge on the part of the buyer that cheap fuel would be available at the close of the year.

The war converted the surplus coal production into a shortage, with the result that coal operators made up for past losses by advancing their charges, a situation which brought about regulation of prices and increased wage demands. Higher prices for coal, in turn, resulted in a generally increased cost of living, although other commodities were perhaps equally or more responsible because they also had been depressed and needed assistance.

It really seems that the American people are now awakening to the true condition of the coal industry and realize its need, and the present seems the time in which to establish a propaganda, based on justice and fairness to the consumer, the producer and the laborer, of such a character as may eliminate the high peaks and the deep valleys in the curve of production that are so detrimental to true economy.

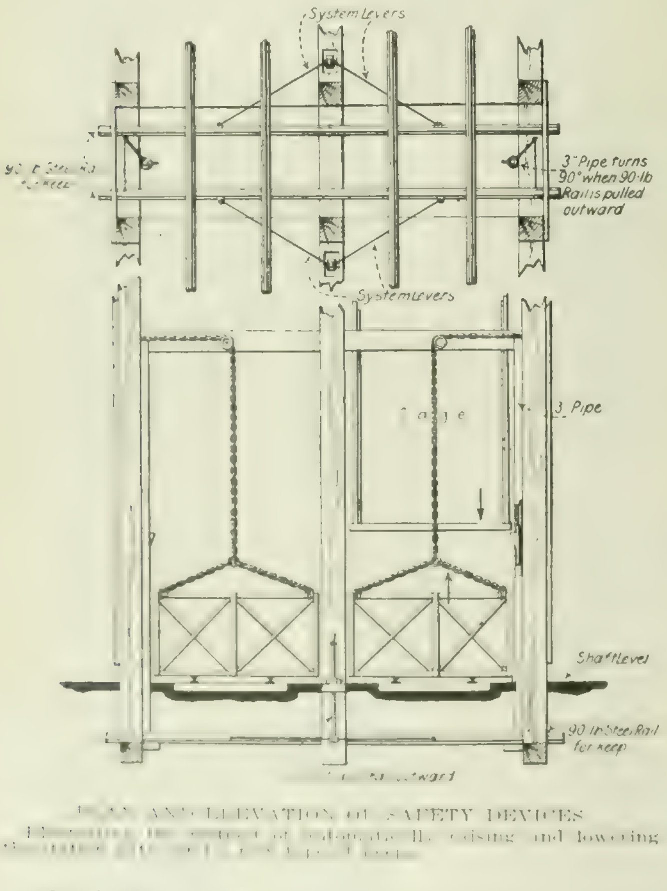
IDEAS AND SUGGESTIONS

PRACTICAL SCHEMES THAT MAKE THE DAY'S WORK EASIER

Safety Device for Shaft Station

AT THE Burnside Shaft of the Philadelphia & Reading Coal & Iron Co. near Shamokin, Pa., an interesting device for the protection of the men and also for stopping the cage at the proper point is installed.

By referring to the accompanying diagram it will be noted that there is a 3-in. pipe on one side of the shaft. This has been slit for a distance of about 8 ft. Through this slit a can projects about 8 in. into the shaft.. To the end of the cam within 3-in. pipe a chain is attached which passes over a pulley about 10 ft. up the shaft, then over another pulley marked "D," then down to the gate at the shaft bottom. The cage in its descent pushes down on the cam, which automatically raises the gate out of the way.


System Levers
3" Pipe turns 90° when 90-lb Rails pulled outward
System Levers
Cage
3" Pipe
Shaft Level
90 lb Steel Rail for keep

PLAN AND ELEVATION OF SAFETY DEVICES

Illustrating the method of automatically raising and lowering [illegible]

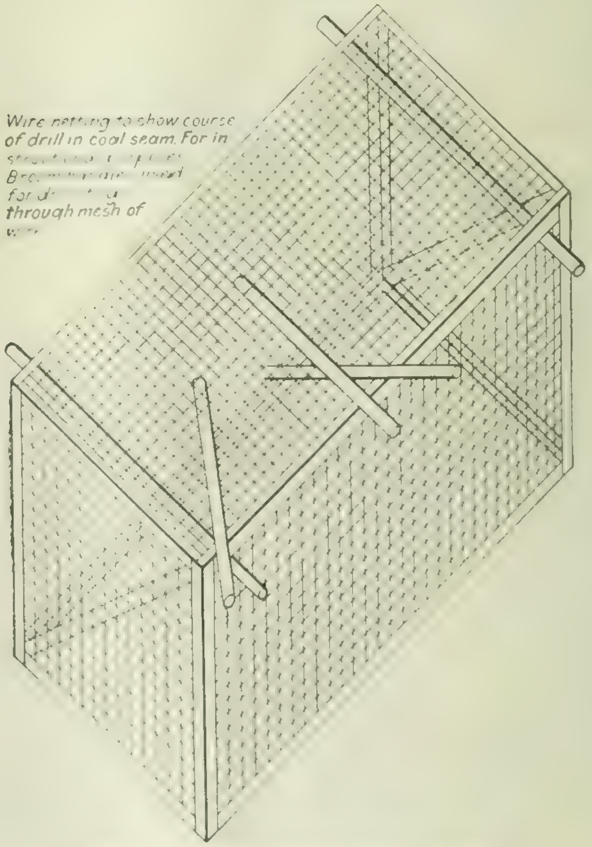
Besides this device a special seat for the cage is provided so that the cage will always come to the proper position and thereby allow the cage track to exactly register with the track in the shaft station. This cage seat consists of two 90-lb. steel rails which run the long (transverse) way of the shaft. These rails are so arranged that they can be moved by a lever out of the way to allow the cage to pass to a lower level. When they are moved out of the way a system of levers also changes the position of the 3-in. pipe, mentioned above, so that the cage in descending will not strike the cam and therefore will not raise the gates.

Wire Cabinet for the Class Room

By R. Z. Virgin

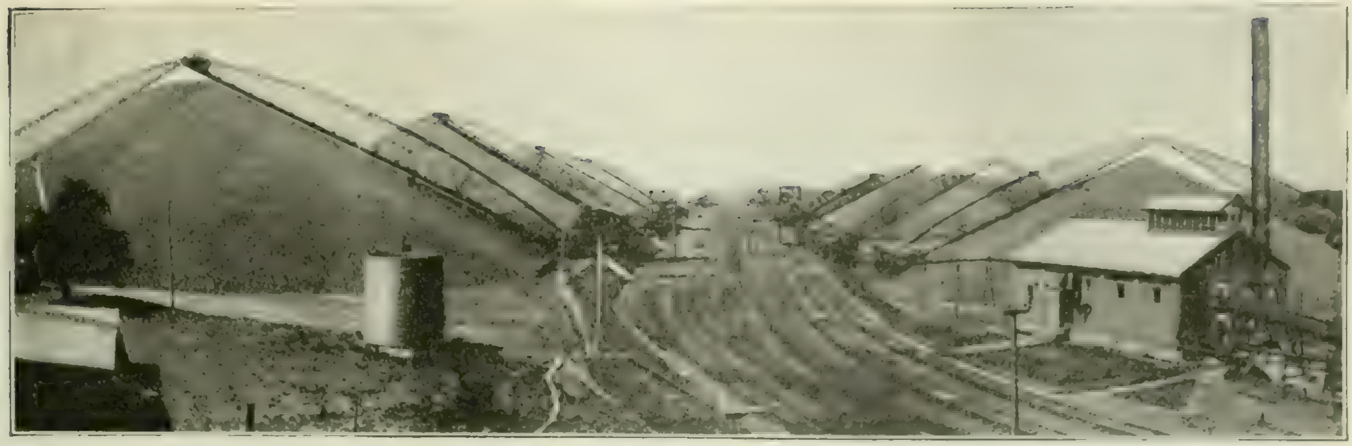
Pittsburgh, Pa.

A WIRE netting cabinet similar to the one shown in the accompanying illustration may advantageously be used in the lecture room, either at the mining night school or the college of engineering, to teach the proper method of drilling holes and placing shots. Broomsticks or similar rods pass through the wire and show the course and location of each hole throughout its entire course.



WIRE CABINET WHEN COMPLETED

When a blind top is temporarily placed over the cabinet an excellent opportunity is afforded the student to display his judgment in effectively directing the drill bit throughout its course so that the bottom of the hole and consequently the explosive charge may be in the proper position.



COAL PILES OF BRIDGEPORT TRANSFER YARD

This yard, unlike that near Schuylkill Haven, is constructed on level ground and operates entirely by direct mechanical equipment, whereas the other installation, forming the main subject of this article, is a sidehill and usese the power furnished by water under pressure. This installation has a total capacity of 520,000 tons of coal on its eight floors and was constructed by the Dodge Engineering Co.

Reading's Storage Yards Keep the Mines Running Steadily

Coal Storage, Regardless of Type, Has a Tendency to Decrease the Cost of Fuel to the Consumer by Equalizing the Demand—Other Benefits Than Those Which Are of Direct Financial Advantage Accrue to Those Who Operate Such Plants

By Dever C. Ashmead
Tarrytown, N. Y.

FOR some years past, in order to partially equalize the demand upon the mines, anthracite-producing companies have introduced storage yards. One of the largest of these is that belonging to the Philadelphia & Reading Coal and Iron Co., located a short distance from the town of Schuylkill Haven, Pa. This is what is known as a side-hill storage yard, and has a capacity of 1,000,000 tons. While it is not possible to state the average daily receipts and shipments to and from this yard, it may be said that the maximum receipts in one day have been 7,870 tons and the maximum shipments 10,195 tons.

Although it has been stated above that the capacity of the yard is 1,000,000 tons, this does not signify that this amount of coal will be handled in any one year. Even during the summer, when production is usually so much in advance of demand that coal is, in general, being stored, the demand for certain grades of coal might be such that the mines would be unable to fill their orders, and, in consequence, resort for such sizes would have to be made to the storage yard. The total shipments during the entire year might exceed 1,000,000 tons, or on the other hand they might not equal this figure.

Coal is brought to this storage yard in railroad cars which are placed upon the track on the upper side of the yard immediately above the place at which it is to be stored. From this point the coal is dumped directly into the pocket and when necessary is washed through steel chutes to its proper place therein. Different sizes of coal are kept separate by means of wooden partition walls, extending down the hill and transversely across the storage yard.

No permanent retaining walls are built to keep the coal in place, but temporary structures of this kind are erected that keep the coal from overflowing the limits of the pocket. These walls also greatly increase the capacity of each individual inclosure. They are often constructed as high as 16 ft.

Coal is removed from storage in either or both of two ways. Small sizes, such as rice and barley, when the bank in the pocket is high, may be washed through chutes directly into cars that are placed upon the track that skirts the lower edge of the storage yard. When such coal becomes low in the pocket it is washed to an elevator, by which it is deposited in the car.

If the coal is of a larger size, such as egg, stove, chestnut, pea or buckwheat, it is necessary to rescreen the material before it is shipped, thus removing the undersize resulting from breakage. In this case the coal from the pocket is washed to a scraper conveyor and taken to one of the screening houses, of which there are four. It is here elevated to the top of the house by means of a 36-in. bucket elevator, which delivers the coal to a shaker screen and it is resized. The resized products then pass for shipment to their proper pockets in the screen house, while the fine material is deposited upon a slush bank.

Besides handling material to and from the storage yards the company at this point also prepares coal from various culm banks, isolated but not remote. This material is brought to the storage yard in railroad cars and dumped into a pocket directly opposite the breaker. From this point it is conveyed to the top of the building by a dragline conveyor and is prepared by jigs and screens, the clean coal going to

SCHUYLKILL STORAGE YARD TAKEN AT THE HEIGHT OF THE

This yard has 16 main compartments with a maximum capacity of 1,000,000 tons of coal. Some of the separating walls can be readily seen but others where two sizes are stored in adjacent pockets are suffered to be wholly covered by dumped coal. At the time that this photograph was taken about 860,000 tons of coal were in the yard. The unused capacity can readily be seen, as the ends of the separation walls of such pockets near the bottom of the hill are not covered by a mantle of coal as are the others. In the

the various pockets in the breaker and the rock to a rock dump. The breaker is so arranged that it may be used solely as a screen house, the coal going direct to the pockets for shipment being bypassed around the jigs by a system of chutes. Thus one building serves two entirely distinct purposes.

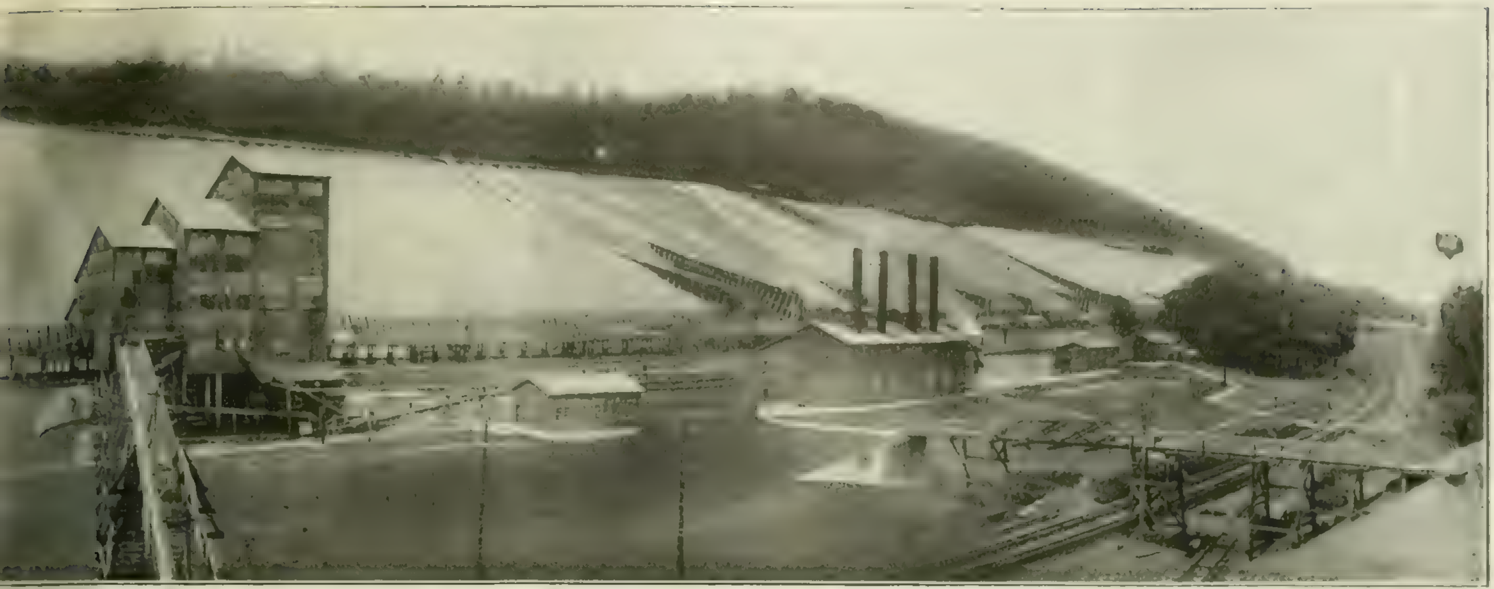
The plant at Schuylkill Haven is about a mile long and comprises 16 pockets, built to accommodate different sizes of coal. Such sizes as do not require repreparation before shipment are usually stocked in the pockets farthest from the screen houses, thus allowing the larger sizes to be stored in compartments adjacent to the screening plants. This reduces the distance over which any size must be handled, and consequently the degradation of the coal. Of course, a large amount of water is required in the operation of this plant, as the transference of the coal from place to place is largely secured by hydraulicking methods.

The supply in this case is secured from Mohannen Creek, the pumping station being located about a mile below the storage piles. The water is forced from the station by two pumps having a capacity of 1,200 and 1,400 gal. of water per minute. These pumps are of the centrifugal type and are electrically driven. The main pipe line is 12 in. in diameter and discharges into a small reservoir near the power house which has a capacity of 180,000 gal.

Thence the water is forced by a Jeanesville pump to

SCHUYLKILL STORAGE YARD IN THE WINTER

This shows the storage yard at a time when the [illegible] of coal [illegible] been [illegible] to approximately [illegible]. As a result of this depletion the separating walls of wood between the open side-hill pockets can be readily seen passing like huge snow-fences from railroad to railroad dividing one size of coal from another. The large coal banks shown at the extreme end of the yard consist of fine coal. The larger sizes are dumped within easy reach of the rescreening and breaker house, which is shown in the middle



SUMMER SLACKNESS—ITS MAMMOTH POCKETS ARE ALMOST FULL

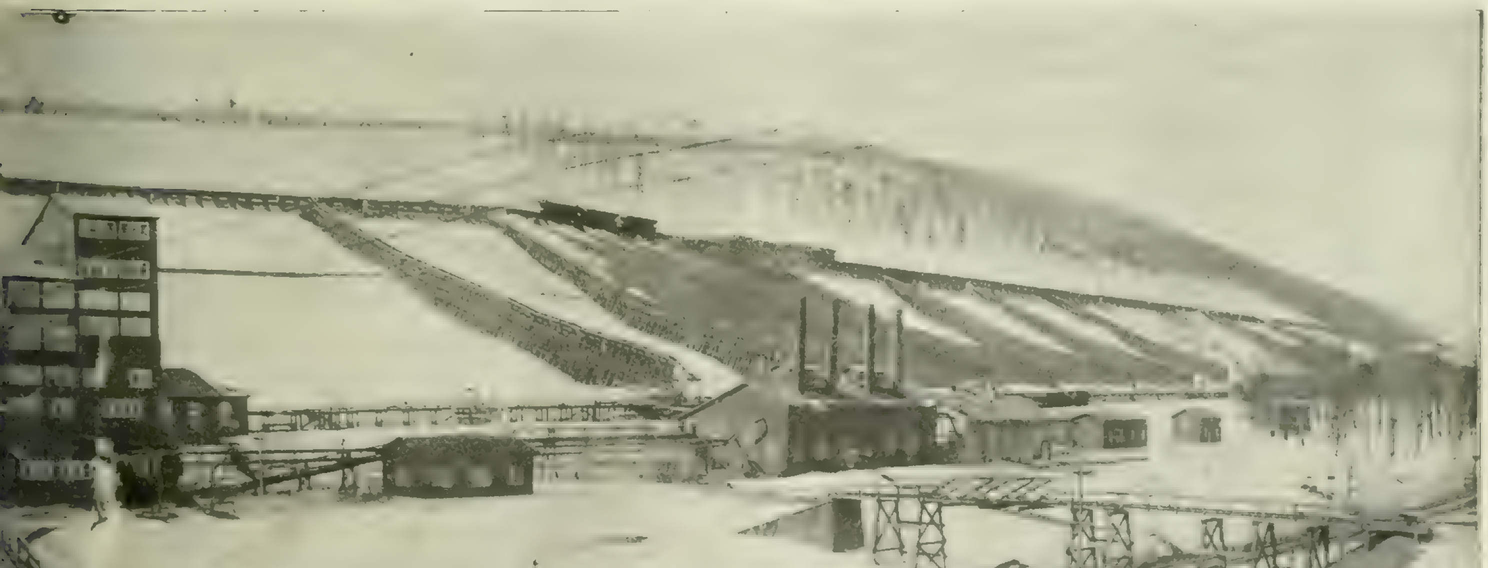
middle foreground is the breaker. To the right is the boiler house and immediately to the right of this is the power plant. At the extreme left are the screen houses while immediately under the trestle along the bottom of the coal piles will be seen the conveyors and on the top of this trestle will be seen one of the water supply lines, which during the winter is kept hot and so can be used to thaw the frozen coal for hydraulicking. Note the barricade at the foot of the coal slope, which is described on page 599 of this issue.

all parts of the plant. An 8-in. pipe line skirts the lower edge of the storage plant while a 6-in. line is laid along the upper side. The water from these pipe lines is used for hydraulicking the coal into place in the pocket or for washing it down the chutes to the cars or to the elevators or draglines, as already referred to.

Since coal in the pocket is liable to freeze during severe weather, it is necessary to make provision for thawing this material so that it can be loaded out from storage. This is accomplished by heating the water used for hydraulicking. To this end the water flowing through both the upper and lower pipe lines is heated in the power house to a temperature ranging from 115 to 120 deg. F. Although the pipe lines are uncovered and carried upon trestles, the temperature of the water in the remotest parts of the line even in severe weather is usually about 83 deg. F. By this warm water the coal to be reclaimed from storage, even though frozen solid, is quickly thawed out and washed down the chutes to its destination at the lower edge of the yard.

In addition to the water supply already referred to, water for drinking purposes is also furnished. This is secured from a horizontal borehole 800 ft. long, near the top of the mountain, and is piped to all parts of the plant.

The power plant at this storage yard is a concrete



WHEN THE SUPPLY OF COAL HAS BEEN DEPLETED

foreground, as it is necessary to rescreen the larger sizes of coal, which, owing to their storage, have been subject to degradation. The difference of elevation of the unloading and reloading tracks is 154 ft. at the breaker house. While the cars just above the breaker are unloading culm, those immediately to the right are unloading pea coal, for which at the time the photograph was taken there was a lack of orders. To the left of the [illegible] bridge can be seen a long flume which conveys the slush to a slush bank.

structure with an asbestos-covered roof. It contains a 500-kw. General Electric turbo-generator, furnishing alternating current at 440 volts for the operation of the plant. For lighting, another Westinghouse turbo-generator delivering alternating current at 440 volts, having a capacity of 125 kva., has been installed. A 125-kw. General Electric motor-generator set furnishes direct current at 250 volts. The motor element of this machine takes alternating current at 2,300 volts which has been stepped up from the 440-volt potential at which it is generated. High-tension current also operates the pumps at the pumping station.

In addition to these units there is also installed a Jeanesville pump having a capacity of 150 gal. per minute which supplies the yard and two boiler-feed pumps as well as two pumps supplying the breaker. These latter machines are identical in size, being 6 x 10 x 12 in., and were built by the coal company in its own shops at Pottsville, Pa. A 13-panel switchboard is installed in the plant for handling the electric current.

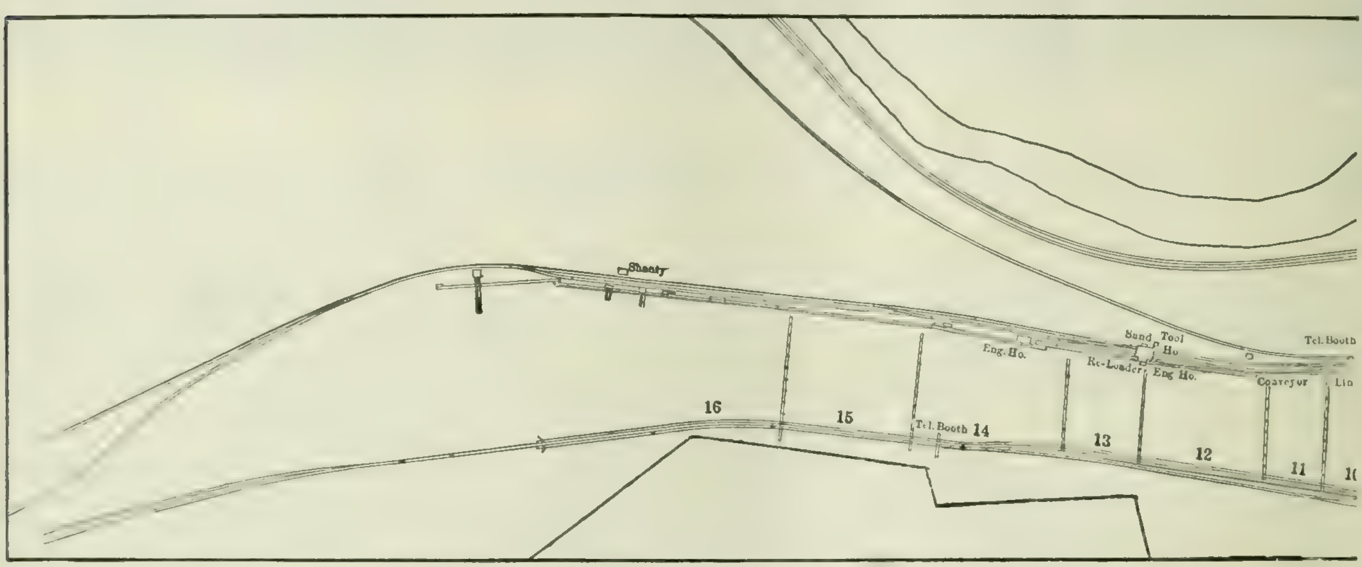
Storage Plant Needs 85 Men to Operate It

The boiler house contains four Stirling boilers of 300 hp. each, making a total of 1,200 hp. These are hand fired with fine coal produced in the breaker, which fuel is conveyed to the boiler house by means of a dragline scraper.

On an average throughout the year 85 men are employed to operate this plant. The maximum number of hands employed was 125, while the minimum during the extraordinary conditions prevailing during the recent war was about eight men, the plant at this time being practically abandoned. During one of the years of the conflict only 26,000 tons passed through the plant.

In addition to this storage yard the Philadelphia & Reading Coal and Iron Co. has a second plant, known as the Bridgeport Transfer. This yard is of an entirely different design, as may be seen in one of the accompanying illustrations. It is provided with eight floors and has a capacity of 520,000 tons. It was built by the Dodge Engineering Co.

It will be at once perceived that the expense of such storage yards as those above described is great both as regards installation and operation. The matter of wages alone amounts to a considerable sum. An average of 85 men per day at the Schuylkill Haven plant makes a payroll of $100,000 a year or more. To this must be added the interest charge upon the value of the stored coal and the degradation of the fuel as well as the expense of running the machinery and heating the water in winter. These latter figures are difficult to estimate. Another item of expense is the freight involved in bringing the coal from the mines to the storage plant. This varies considerably with the distance the coal is transported. The shortest haul to the Schuylkill Haven plant is about eight miles and the longest is approximately 40 miles.



PHILADELPHIA & READING COAL AND IRON CO.'S

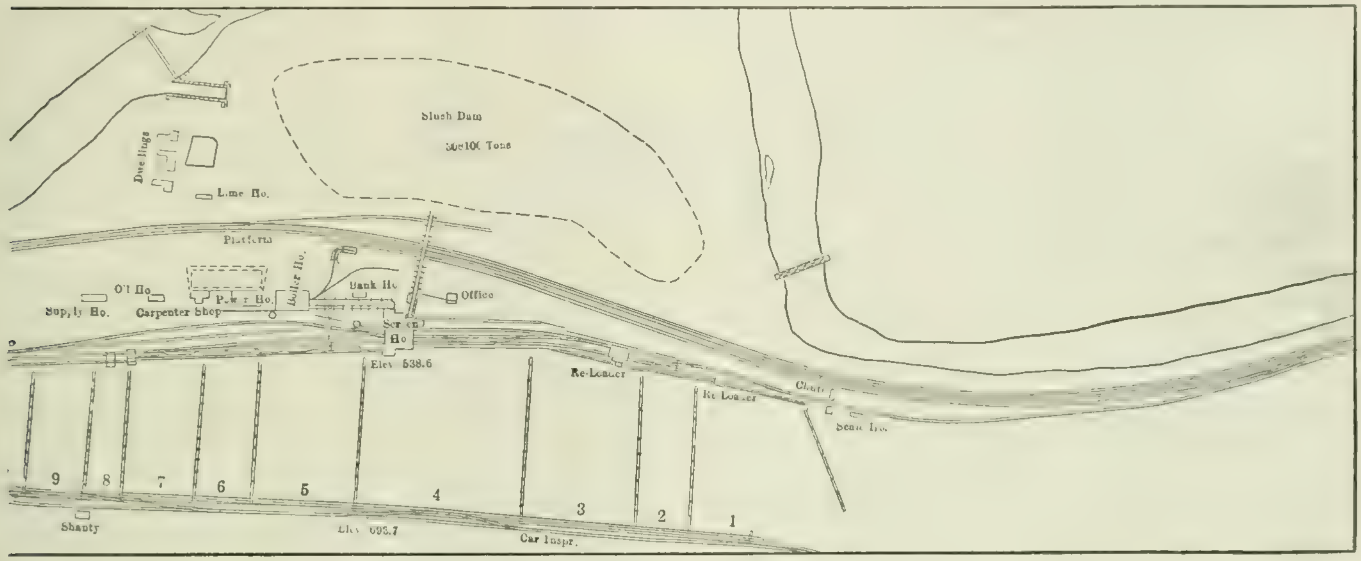
With a storage capacity of 1,000,000 tons of coal this yard is one of the largest storage yards in this country. Sixteen large open pockets are provided for handling the different sizes of coal. The yard has a total length of one mile. The coal is dumped from railroad cars directly into the pockets on the uphill side of the yard, and the coal is handled by hydraulicking in the pockets and from the pockets, to the railroad cars, for reshipment. Four rescreening houses reprepare some of the coal before it goes to the market. Pocket No. 4 is used for the dumping of the culm from isolated banks, where it is retained for preparation in the

It is logical to suppose that the advantages derived from storage are commensurate with the expense involved. It is doubtful, however, if all the advantages secured can be measured accurately from a strictly financial standpoint, and the element of increased service to both the miner and the public must be taken into consideration.

It might be well, however, to take up first the financial phase of the storage problem. How is the operator benefited financially by storage? It will first be necessary to consider how coal is disposed of. Coal is sold through agencies and sales offices, and at certain times there is a greater demand than at others. In the winter, for example, there is a strong demand for prepared sizes, that is domestic coal, while in summer the call for such fuel falls off considerably. Then again in cold weather manufacturing plants require greater amounts of fuel for the generation of power than during the summer. Furthermore, heating plants, of course, are always most anxious for coal in the winter, but unfortunately despite these facts the capacity of a mine is lower in winter than in summer, because of the difficulties in operation and transportation.

Production thus tends to decrease just when the demand increases. This is most acutely felt in the prepared sizes and in some instances in buckwheat, but it is not particularly troublesome in the case of the smaller sizes, which are used for fuel purposes exclusively.

On the other hand in the summer the demand for the larger coal is small, but in order to produce the sizes to fill fuel contracts the mines must operate, and if the orders for coal cannot be evenly distributed throughout the various grades one of three things must occur: (a) The larger coal must be crushed down to the smaller sizes. (It is impossible to consider this method because of the great difference in price between the large and small sizes of anthracite.) (b) The mines must shut down and production of coal cease or (c) Those sizes for which there are insufficient orders must be stored.



SCHUYLKILL HAVEN SIDE-HILL STORAGE YARD

breaker-screenhouse. The slush bank does not have to be held by walls or barricades. A low embankment about a foot high is built of dirt, and later the necessary height is secured by throwing dried slush on the top of the earth. This slush acts as a filter and permits the water to percolate through it and pass away. The material is easy to handle because the volume of slush to be deposited is not large. As a result the slush in the bank is in all stages of dryness dependent on the length of time it has been deposited and some of it is always in condition to act as a low dam.

Since the first condition is impossible of fulfillment it is unnecessary to consider it further. If the mines are shut down huge losses will occur, one of which arises from a continuance of overhead expense. This cannot cease, since it is necessary to continue ventilation and pumping in order to avoid irreparable damage. Repairs must be kept up whether the mines run or not, and, as for the machinery, it must be remembered that it frequently deteriorates quite as rapidly when idle as when in operation. Monthly men must be kept on the payroll as well as some of the day laborers. The interest charge on the investment continues, as does also the depreciation. The Government, furthermore, does not reduce taxes on an idle plant. In other words everything will be going out and nothing coming in under such circumstances.

This condition may last only a day or two or may continue for months. Shutting down the plant causes a loss to both the miner and laborer, which means that their work and with it their incomes cease. If such a shutdown were short, the men probably would stay at the plant, as they would wish to avoid the expense of moving from place to place, but if long continued, they would be compelled to move or starve. A mine that is periodically forced to shut down, soon gets a bad reputation, and it is difficult to hire men when, at last, orders are such that the company again becomes desirous of operating.

Another loss that the operator would sustain is that of his contracts. If he cannot fill a contract he must lose it, and if he escapes without a lawsuit for damages he is lucky. Furthermore, violation of a contract or its non-fulfillment renders the consumer timid about placing new orders with the producer, lest those orders should, similarly, fail of fulfillment. This naturally increases the difficulty experienced by the producer in disposing of his product.

The loss occasioned by a shutdown of the mine is one of which the public must assume a portion. If a mine with a certain output ceases operations, this decreases the amount of fuel placed upon the market, thus lessening the visible supply. When the demand increases this means that the price must increase, because price depends upon supply and demand. The closing of a single mine will not, of course, appreciably affect the market, but it frequently happens that many operations are simultaneously closed down tight, while others work only part time. As far as the public is concerned it can relieve this situation to some extent by so regulating its demands that they will be more evenly distributed throughout the year. Thus the consumers might place their orders in the summer, when the demand is low, and lay in a winter's supply of fuel, thus making the consumers' cellars the storage yards of the country.

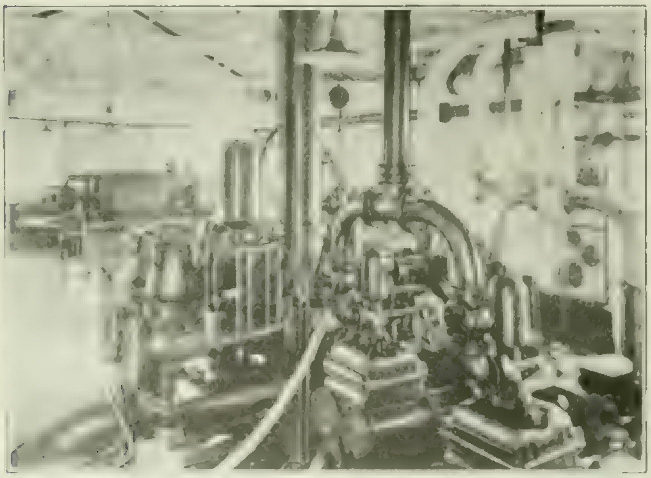
Only the last alternative remains for consideration. How does the storage of coal affect the operator, the employee and the public? As previously stated, the demand for coal is not regular but highly intermittent—greater in winter than in summer, although even in winter the demand is not uniform, frequently being insistent for certain particular sizes, while for others it may be almost nil. Individual mines cannot store their output since it would require too much space, and the cost of storage at any individual plant would run into prohibitive figures.

A large mining company, on the other hand—one operating a large number of mines—can resort to commercial storage with good results. The cost of operation of such a storage plant when distributed to a considerable number of mines, each having a large output, is not excessive, and the savings resulting from continued working of the mines will aid to a large extent in paying the cost of operation of the storage plant.

The benefits of storage are threefold—(1) Continuous operation of the mine; (2) Ability to produce coal for which there are no existing orders; (3) Opportunity to ship to the consumer those sizes which he requires and to ship to the storage yard those sizes for which orders are lacking, until a demand for such sizes of coal may be developed.

Continuous operation of the mines has a strong influence upon the price of coal, permitting the output to be greater during the summer or during those months when demand is ordinarily flat, but when the cost of operation is less than during the winter. Storage has a tendency to meet the requirements of an increased demand at a time when it is at the peak, and, as is well known, the nearer the supply comes to the demand the cheaper will be the coal. It reduces the overhead expenses that would arise from shutting down the mines because of a lack of balanced orders, consequently although the expense of storage may be greater than the actual saving in overhead, this saving tends to pay a part of the storage costs and therefore reduces the total expense.

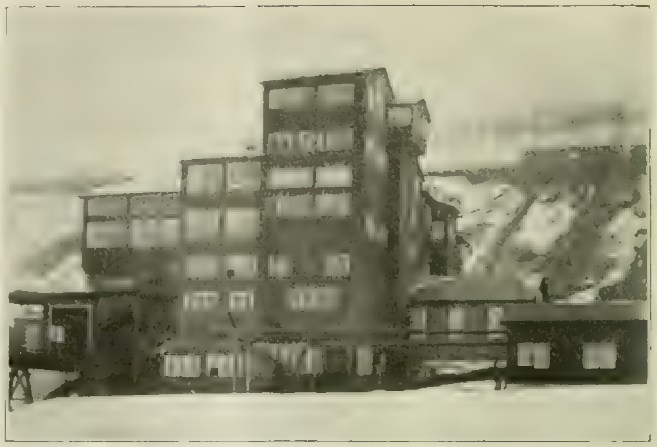
The miner is benefited by storage as it has a tendency to make his work more regular and continuous, regardless of the season of the year. This tends to render him better satisfied since it shows that his employer is working for his advantage. It has a direct financial bearing on the cost of operation, for it reduces the labor turnover. A more efficient mine force is assured when men are retained long enough to become familiar with the work at the mine at which they are employed. When the men are constantly changing from place to place, because of the slack work afforded at various times during the year, little dependence can be placed in their efficiency.



[illegible] SCHUYLKILL POWER PLANT

[illegible] and the large Jeanesville [illegible] in the foreground [illegible] coal is moved from place to place largely by hydraulicking methods.

Therefore the conclusion is obvious that although storage yards, as built and operated by the various anthracite companies, do not pay a direct financial return to their owners, they do perform a definite service to the producing companies, to the public and to the mine worker.



SMALL COMBINATION BREAKER FOR CULM AND RESCREENING HOUSE FOR STORED COAL

This breaker serves for the preparation of the culm from a number of nearby waste banks and for the rescreening of the stored coal without further preparation. In the background will be seen railroad cars dumping culm for preparation in the breaker.

Injury Through Fall of Rock.—Where a coal miner sued his employer for injury sustained through a fall of rock in an entry, and the employer relied on a claim that the injured man was guilty of contributory negligence in failing to discover that the roof was in defective condition, or assumed the risk, it was proper to receive evidence at the trial showing existence of a smoky condition in the entry, following a firing of shots.

This evidence was admissible as tending to show that the danger was not apparent and was hard to detect. (*Arkansas Supreme Court, Smith vs. Southern Anthracite Coal Mining Co., 215 Southwestern Reporter, 719.*)

Contracts to Sell Coal in Place.—If a consideration be paid for an option to buy coal in place, with a time limit fixed for exercise of the option, it cannot be withdrawn during that period without consent of the option holder. But if no consideration be actually given for the option, although one be recited in the contract, it is subject to withdrawal any time before acceptance. However, if the holder exercises the option before its withdrawal, a binding contract of sale results.

The holder of an option to buy coal in place will not be denied the right to a court decree requiring the other party to convey in accordance with the accepted terms of the option on the ground that the holder has invested nothing, being a promoter who would not have accepted the option except for having obtained a purchaser to whom he can sell the coal at a profit.

But a decree requiring conveyance under an accepted option will be denied where the option provides for a warranty deed containing provisions used for similar property in certain counties, and the evidence shows that there is no established and uniform form of deed so used, and where the option holder has not waived, as he might, any further provision than for an ordinary warranty deed. In such case there is no sufficient agreement as to the character of deed to be given. (*Illinois Supreme Court, Threlkeld vs. Inglett, 124 Northeastern Reporter, 368.*)

Hydrocarbon Gases Found in British Columbia Mines

By James Ashworth*
Alberta, Canada

Interesting facts relating to the outflow of gas into the mine, as influenced by periods of idleness and periods when the mine was working normally. These facts were determined by the results obtained in an extended series of analyses of mine air carefully taken, at different times, and analyzed in the laboratory, under the direction of the Minister of Mines, and tabulated in his Annual Report for the year 1918.

IN THE report of the Minister of Mines for 1918, many pages are devoted to the subject of "Mine-Air Sampling," in both coal and metal mines. Perhaps, the most unusual feature appears on page 336 of the report, in giving the analysis of a sample of air that was probably taken in the Beta Tunnel of the Britannia mine after blasting, although it is not so stated.

According to the analysis given, this sample of air contained 0.11 per cent carbon monoxide, which alone would mean a dangerous condition; but, besides, there is present in this air 0.73 per cent carbon dioxide, while the oxygen content is given as 19.49 per cent and nitrogen 79.67 per cent. A most notable feature is the presence of a "trace of ethylene" reported in this sample.

The chief inspector of mines, George Wilkinson, reports, page 319, the taking of 510 mine-air samples during the year, many of which were obtained from the mines of the Crow's Nest Pass Coal Co., adding further that much valuable information regarding the outflow of gas from coal seams and the effect of breaking the coal was secured.

It was claimed by the officials of the Miners' Union and the men that the adoption of a single-shift system would lower the flow of gas in these mines. In order to prove or disprove this claim many mine-air samples were taken during the months of April, May and June, 1917, when the mines were idle in the Crowsnest district. These samples were taken regularly each month to determine what outflow of gas took place while no coal was being mined. The results obtained were surprising, frequently showing as large a flow of gas from the coal at the end of 70 days as when the mine was being worked.

Analyses of Mine Air Taken to Show Outflow of Gas Under Varying Conditions

It is of interest to note the seeming discrepancy regarding the volume of methane generated, per ton of coal mined, as recorded in the last column of the table giving the data for the Corbin Colliery, p. 330. Comparing the results shown in the first two tests at this colliery when the same tonnage was mined, the outflow of methane is given as 362 cu.ft. per ton in the first test (Jan. 8), the percentage of methane in the sample being 0.53 per cent, and the reading of the barometer 24.5 in. In contrast with this, the second test (March 26) gives the outflow of methane as 749 cu.ft., per ton of coal mined, the percentage of methane in that test being 0.50 per cent, and the barometric reading 24.7 in.

The reason for this difference is not apparent, although we note the temperature of the first test was 50 deg. F., and advanced in the second test to 64 deg. F. In these tests the outflow of methane per min. is given as 63 cu.ft. in the first test, and 130 cu.ft. in the second.

Much the same condition is shown in the Michel Colliery when comparing the two tests taken May 9 and Aug. 10, respectively, p. 329, the output for this air split being 200 tons on each date. The first of these two tests showed 1,173 cu.ft. of methane generated, per ton of coal mined, the percentage of methane in the sample being 1.78 per cent, and the barometric pressure 25.9 in., temperature 53 deg. F. In contrast with this the second test showed 2,354 cu.ft. of methane generated, per ton of coal mined, the methane then being 1.81 per cent, barometric pressure 25.6 in., temperature 55 deg. F. The outflow of gas in the first test was 163 cu.ft. per min., and that in the second test 327 cu.ft. per min.

Much Methane Is Transpired

At Coal Creek, p. 327, a test taken in No. 1 East Mine, main-return airway, Jan. 24, when 600 tons of coal were mined, gave 3,712 cu.ft. of methane generated, per ton of coal mined, the methane being 1.28 per cent, barometric pressure 25.7 in., temperature 49 deg. F. A second test taken (July 23) in the same airway, when 500 tons of coal were mined, showed 5,120 cu.ft. of methane generated, per ton of coal mined, the methane being 1.27 per cent, barometric pressure 25.9 in., temperature 56 deg. F. In the first of these tests the volume of methane generated was 1,547 cu.ft. per min., and that in the second test 1,778 cu.ft. per min.

I will cite but one other instance along this line, namely, the two tests, p. 328, taken July 12 and Aug. 6, in the south level split of No. 3 mine, the coal mined being 200 tons and 220 tons, respectively. The first of these tests showed 7,704 cu.ft. of methane generated per ton of coal mined, the proportion of methane being 0.57 per cent, barometric pressure 26 in., temperature 59 deg. F. The second test showed the volume of methane generated as 3,888 cu.ft. per ton of coal mined, the amount of methane being 0.61 per cent, barometric pressure 26 in., temperature 58 deg. F. The gas generated in the first instance was 107 cu.ft. per min., and in the second instance 108 cu.ft. per min. These citations show that the production of methane does not depend entirely on the amount of coal displaced.

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Quoting from p. 320 of the report, the following statement is made:

> In No. 1 South Mine there is an increase of 0.22 per cent in 21 days, with the mine idle and the same quantity of air passing, and a decrease is shown when the mine is operating again, during the first nine days, with the same quantity of air passing.

The report continues, p. 321:

> From the results obtained it would appear that the breaking of coal has not much bearing on the gas flow in these mines, and from the results shown in the returns from samples taken every two hours, it is apparent that the conditions are not changed by the working of two shifts, the maximum raise at any time during the 24 hours being less than 0.3 per cent, while samples taken every half-hour, in No. 3 mine, showed a maximum raise of a little over 0.5 per cent.
>
> There is no doubt that a single shift inaugurated in some of the Crowsnest Pass mines would have very beneficial results on the dust conditions, and in any mine beneficial results for the prevention of accidents due to other causes at the working faces.

This last statement will not meet with general approval, since it is quite commonly held that the more quickly a working face is advanced the more safely the work is performed, in respect to accidents due to falls of roof and coal.

Controversy regarding the danger of double-shifting the mines in the Crowsnest district hinged largely on the question as to whether the generation of gas, in the mine, increased with the amount of coal broken, as claimed by the Miners' Union. Statements of the senior inspector of mines and of the chief inspector, appearing in the report on the No. 3 mine explosion, Coal Creek, seem at variance with the conclusions of the chief inspector, who recommends a 2½ per cent withdrawal limit to be embodied in the Coal Mines Regulation Act.

Robert Strachan, senior inspector of mines for the East Kootenay district, in his report, p. 447, states, "Since the resumption of work after the idle time, it has been very hard to obtain a fair test made of the outflow of gas under the single-shift conditions," but adds, "It has at no time reached the height shown under the double-shift system." Mr. Strachan says further: "Twice during the year has methane been reported as found in the analyses, both cases being in the High Line split of No. 2 mine, Coal Creek, Sample No. 308 showing 0.13 per cent, and Sample No. 396, a trace, while in some cases of blowout we have recorded 84 per cent of methane and no trace of ethane."

In his second report on the No. 3 explosion at Coal Creek, George Wilkinson, chief inspector of mines, remarks as follows, p. 347:

> Mr. Lane, who worked in the main level, stated in his evidence given at the inquest that on the morning of April 5, when he went in his place, there was a ½-in. gas cap in it and this was gradually increased to ¾ in., at the end of the shift. He also stated that this was no unusual condition, since the double shift was put on. (The double shift was put on to place the men thrown out of work by the "bump" in No. 1 East Mine last November.) He also admitted that Inspector O'Brien had withdrawn him, owing to there being a 1-in. cap of gas in the air. Lane, who is an old experienced miner, had worked for many y[illegible] a [illegible]

METHANE INCREASES WITH COAL BROKEN DOWN

This reference of the chief mine inspector, notwithstanding his previous conclusion to the contrary, p. 319, would seem to support the alleged claim of Inspector Strachan that a series of tests made in one of the mines showed that the production of methane increases and decreases directly as the work of breaking down the coal. The presence of the ½-in. gas cap referred to in the Lane evidence was confirmed by the examination of the place by the district inspector, the morning of the explosion.

To understand better the situation regarding the explosion in the No. 3 mine, at Coal Creek, it is necessary to note the statement made in the chief inspector's second report of this explosion, page 348, where he states:

> From evidence given at the inquest, it was brought out that almost continuously for 30 days there had been from a half to a three-quarter inch gas cap present in these places. At the time of the inquest it was taken [for granted] that a half-inch gas cap was equal to 2½ per cent of gas. From experiments made since in measuring flame caps and taking samples for analyses, and checking with the Burrell gas detector, it has been proven that a quarter-inch cap in the Wolf safety lamp is equivalent to 2½ per cent of gas, and that a one-half inch cap equals about 3½ per cent.

Following this statement, the chief inspector concludes that "If there was a three-quarter inch cap at the end of the morning shift, there must then have been upwards of 4 per cent in the current."

The chief inspector's report also shows, p. 348, that the district inspector had realized the danger of the double shift before the explosion occurred, and had suggested to the management "that only one shift of 8 hours out of the 24 be worked." This important suggestion of the chief inspector would appear to be ample justification for the adoption of the single-shift system, under the conditions stated. The suggestion is also supported by the senior district inspector and the officials of the Miners' Union, p. 319.

Referring to the explosion in No. 3 East Mine at Michel, Aug. 8, 1916, the senior inspector reiterates his opinion, p. 446, that the explosion originated in No. 17 room, No. 6 East Level, and was caused by the "ignition of gas at a defective lamp, the coal dust on the roadways and sides propagating it throughout the mine." He concludes his suggestion relating to mine accidents with the following statement, p. 448:

> In dealing with these blowouts or "bumps," the greatest danger, now that electric lamps are in use, is the likelihood of the workmen getting overcome by gas and asphyxiated, and I should like to suggest that investigation be made along the lines of either solving the problems or providing mine-safety apparatus for each individual workman employed in suspected areas.

Regarding the procedure permitted where electric lamps are used by the miners, neither the chief nor the senior inspector mentions how a miner examines his working place, as required by the rules; or whether the miner has any knowledge of his place being clear of gas while at work. This is an important matter, as the number of electric lamps in use at the end of 1918, in the province, was 2,665, or over 61 per cent of the total number of lamps in use. It is a matter of regret that the inspector does not explain in what way the lamp that caused the explosion was defective, and whether the defect should not have been detected before the lamp was given to the miner.

Before closing allow me to quote a paragraph from the report of the chief inspector of mines, p. 337, which reads as follows:

> From the evidence brought out at the inquest, in connection with explosion at No. 3 Mine, Coal Creek, and the subsequent tests made regarding the percentage of methane in the air cur-

> rent, [and its relation] to height of flame cap on a safety lamp. It is apparent that some rule should be embodied in the "Coal Mines Regulation Act," compelling the withdrawal of men when the percentage reaches a fixed quantity. The limit set by the British Act is 2½ per cent. A rule has been established by the management of the Crowsnest Pass Mine, at the suggestion of the Mines Department, to the effect of establishing the withdrawal percentage at 2½ per cent or ½-in. gas cap, but this rule should be embodied in the "Coal Mines Regulation Act."

It is with some satisfaction that I read this recommendation of the chief inspector, which follows up my own suggestion regarding the need of more exactly defining what is understood in the reports of "Gas" by firebosses, made in my own report on the Reserve Mine explosion of May 27, 1915, which report will be found on pp. 352-363 inclusive of the Annual Report of the Minister of Mines, 1915.

In transmitting my report to the Minister of Mines on that occasion, I inclosed a print of the card issued by the British Home Office, relating to the matter of reporting gas. Similar cards were issued by Sir Richard McBride, and the first of these were in the hands of the officials at Coal Creek as early as 1911; but no official ruling or alteration was made in the British Columbia Mines Regulation Act and, to the best of my knowledge, no provision of this nature is made in any act or rule to enforce its observance.

The chief inspector includes among his recommendations, p. 338, the request that there be placed a limit on the percentage of gas allowable in the mine air when blasting is permitted. It appears further that he is not satisfied with the "standardization of the ventilation in mines as to what an adequate amount of ventilation means" in the reading of the Coal Mines Regulation Act.

Mining men will quite generally agree that these are important matters and should be clearly defined so as to leave no room for doubt. Permit me to express the opinion that few will agree with the views of the chief inspector on standardization, if it is his meaning that the provisions of Rules 1 and 2, Part XI, of the Coal Mines Regulation Act, is not sufficiently explicit when they read as follows:

> RULE 1: Every mine while being worked shall be thoroughly ventilated and furnished with an adequate supply of pure air to dilute and render harmless noxious gases to the intent that the working places of the shafts, levels, stables and workings of such mine, and the underground traveling roads to and from such working places shall be in a fit state for working and passing therein.
>
> RULE 2. An adequate supply of pure air shall mean not less than 100 cu.ft. per min. for each man or boy, and not less than 300 cu.ft. per min. for each horse or mule employed in a mine, and as much more as the inspector of mines may direct, which shall sweep the face of each working place, and a notice stating the quantity of air required shall be kept posted at the mouth of the mine by the inspector of mines whenever he directs that more air should be furnished in a mine.

At the inquest, following the Mine No. 3 explosion, no one was found willing to justify the presence of gas, which was admitted to be in excess of the minimum ventilation required by Rule 2 to which I have referred. If this rule authorizes the inspector to require any amount of air that his judgment may dictate for the safe operation of the mine it does not appear to me that the rule requires any alteration. However, it has been the custom for many years, in British Columbia, to use the words "explosive gas," in making out a report, instead of the words used in the Mines Regulation Act, "inflammable gas."

That being the case, it may be claimed by the mine inspectors that the danger point is not reached until explosive gas is found. In concluding, allow me to state that a Davy lamp will pass flame in about 11 sec., in an air current containing 4 per cent of methane and having a velocity of 6 ft. per sec., whenever there is coal dust in the air to the extent that this small velocity will raise the dust from the floor without artificial means being used to disturb it.

Nottinghamshire Coal Fields

By Mark Meredith
Liverpool, Eng.

For some time boring operations have been in progress beyond the eastern border of the present known coal field in Nottinghamshire, England, with the object of proving, if possible, an extension of the valuable beds now being worked. This exploration and research work is being carried out entirely by private enterprise, the Butterley Co. and the Stanton Ironworks Co., Ltd., who own collieries nearby, taking a prominent part in this important undertaking.

An important discovery has now been made. The top hard bed has been reached at the boring at Boulton, about two miles east of Ollerton in the Dukeries. The bed is here nearly 2,000 ft. deep. The thickness of the seam is not known. Reference was made to the further development of the Nottinghamshire coal field at a meeting of the Midland Counties Institution of Engineers at the University College, Nottingham, on Nov. 22 last.

G. A. Longden, prior to reading a paper on "Recent Borings in the Nottingham Coal Fields," made reference to the absence of H. E. Mitton of the Butterley Co. He stated that Mr. Mitton was detained at the boring operations at Boulton, which place he himself had left to attend that meeting. The paper read by Mr. Longden contained notes on the strata which had been proved by the three borings carried out for the Stanton Ironworks Co., Ltd., at Kirklington, Nilsthorpe and Wellow. In the Kirklington boring, which was commenced on April 24, 1915, gas was given off at a depth of 1,911 ft., indicating the presence of a coal bed. At the Bilsthorpe boring, which is upon Lord Savile's property, it was found that the coal measures above the top hard bed were considerably less in thickness than they were at the adjoining colliery of Rufford. The bore hole at Wellow was the first to be made to the east of Bentinck and Kirkby collieries, where lower mines had been proved. This showed that three at least were good, workable beds extending over a large area where the top hard bed was being worked, thus providing an immense tonnage for the district.

A record was also given of the deep borings at Kelham and South Leverton. The Kelham boring, which was commenced in Sept., 1918, had determined beyond all doubt that the coal measures had ceased their easterly dip and were now rising. The successful results obtained by that historic boring had led to the further boring operations at Farnsfield, Kirklington, Bilsthorpe and Wellow.

The South Leverton boring was commenced in March, 1913, and had proved the whole ground down to the middle coal measures, and was probably within a short distance of the Barnsley coal bed. The outbreak of war in Aug., 1914, led to a stoppage of operations at this point, but these were about to be resumed again when it was expected to prove the extension of the productive coal measures to that point.

NEW APPARATUS AND EQUIPMENT

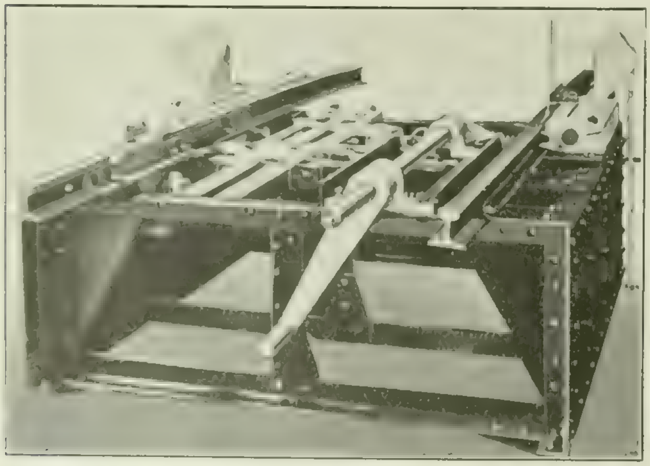
Single-Horn Car Feeder

A Mechanically Operated Device That Permits Only One Car At a Time to Enter the Cage

ONE of the new devices being manufactured by the G. M. J. Manufacturing Co. of Pittsburgh, Pa., is a single-horn car feeder. This apparatus is of simple but rugged construction. It depends for its operation entirely upon mechanical means and requires no overseeing. Primarily the device is intended for use at shaft bottoms but may be used at a dump on the tipple, or wherever it is desired to feed one car at a time.

The principal parts include two horns, an actuating lever, the operating mechanism, and a tripper. The last named part is a lever with a section that fits into a recess in the rail. The distance from the tripper to the horn is arbitrary, and is determined by the length of the wheelbase of the mine cars in use. The apparatus in its entirety is securely bolted to a structural-steel base with dimensions of 5 ft. 8 in. x 5 ft. 2½ in. x 24 in.

The device is installed by making an excavation that will allow the base to be buried. It is then surrounded with concrete or masonry or suitably supported on the tipple or other structure. The rails then lie flush in line with and against the rails of the adjoining track. This type of construction prevents the device from creeping forward toward the shaft bottom or dump which might ordinarily be brought about by too great a pressure against the horns opposing the force of the incoming cars. A grade of 5 per cent should be given to the track adjoining the apparatus in order that ease of operation may be assured against stiff-running cars.



SUBSTANTIAL MOUNTING MAKES THE FEEDER RIGID
[illegible] for the descending cage and close when it leaves the landing.

When the device has been installed at the landing stage of a shaft bottom, the downcoming cage strikes the actuating lever and forces it downward. This action is transmitted to the horns and they are forced outward and away from the rails. The obstruction against the front wheels of the incoming car has now been removed and it moves forward toward the cage. When the right front wheel reaches the tripper, this is depressed into the recessed rail causing the horns to again assume a vertical position. The horns are now in proper place to arrest the progress of the car directly behind, in which position they remain until the cage has been raised and again lowered, when the action described is repeated.

The horns are of solid steel and operate in bearing plates that lie flush with the rails. Coil springs absorb the shock resulting from the incoming cars striking the faces of the horns. The tread of the car wheels that lie against the horns is directly on and over the bearing plate of each horn. Any severe impact against the horns is thus transmitted from the wheels to the bearing plate. The mechanical advantage of this type of construction is manifest since the ends of the bearing plate near the car wheel are kept from working upward and becoming loose.

Head Protection in Mines

A Hat Strong Enough To Stop a 1-lb. Bolt Falling 40 ft. and To Hold Up a Light Person

BY GEORGE J. YOUNG
Pacific Coast Representative of *Coal Age*

IT IS an interesting fact that outside of the Michigan Copper Mining district, head protection in mines is seldom thought of. The ordinary felt hat and cloth cap, it is true, afford a certain amount of protection to the wearer, but for falling rocks of any size, little can be expected from them. In Freiburg, when that district was active, German miners made use of a visorless cap, something like a polo cap. It was made with a thick felt top with felt of somewhat less thickness on the sides. While it afforded good head protection, it had the disadvantage of being hot and uncomfortable.

In Cornwall, England, the Cornish tin miners invented a hat, shaped like a low crowned derby, which was light enough to be handy and stiff enough to stop stones up to fist size. Wherever Cornish miners went, the "hard hat" was used in situations where any considerable amount of "rock fallings" took place in the workings. In the Michigan copper district, the use of the hat is common, but in other mining districts of the United States, it is seldom seen.

Conditions which necessitate head protection are not common in coal and metal mines, but occasionally in steep pitched coal seams and in steep-pitched open stopes where small rocks or tools can fall, considerable distances and acquire sufficient momentum to become dangerous, some kind of a protective hat is highly desirable. The latest effort to meet this need is a miner's cap made by the Wagner's Protective Cap Co.* The cap weighs 7 oz. It is stiff enough to permit of a light person standing upon it. A machine bolt weighing a pound and falling from a height of 40 ft., is said to scarcely dent it. It is as light and comfortable as such caps can be made while the visor affords protection to the eyes. The cap is also said to be a nonconductor of heat and electricity. It is waterproof and will resist sulphuric acid. It would appear that the manufacturers of this cap have succeeded in incorporating into their design practically all the essential requirements save the one of cost. The price at which this hat is marketed, cheap enough when considered from the standpoint of safety, is so high that it is doubtful whether miners will purchase it.

For working in mines generally, in shafts, in the construction of buildings, the type of hat described appears to be worthy of consideration. Its use is advocated for superintendents, engineers, foremen, surveyors, headmen and footmen, pumpmen and miners.

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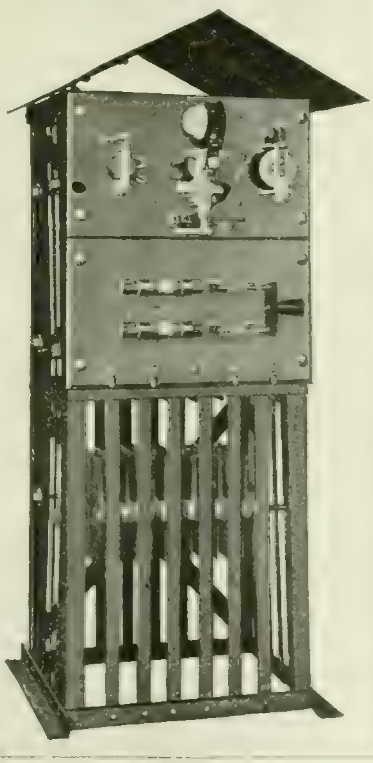
*454 Santa Clara Ave., Alameda, Cal.

Automatic Battery-Charging Equipment for Locomotives

This Device Renders Attendance at the Charging Station Almost Negligible

FOR the automatic charging of mine locomotives having Edison storage batteries the new C-H charging panel shown in the accompanying illustration has been designed by the Cutler-Hammer Manufacturing Co., of Milwaukee and New York. This may be connected to a 250- to 275-volt direct current circuit since this is the potential available at most mines. The equipment consists of a slate panel supported by a floor-type mounting frame having the charging resistance self-contained. A sheet-metal roof protects the charging resistance and the magnetic switches on the panel from mine drippings. The switch equipment on the front of the panel consists of a main-line knife switch with renewable fuses, magnetic main-line contactor, voltage relay and shunt trip relay.


Front View of Charging Equipment

The switchboard is supported well above the floor and protected from mine drippings by a suitable gable roof.

The main-line contactor, which connects and disconnects the battery from the line, is controlled through the voltage relay and the shunt trip relay. The former prevents it from closing unless the line voltage is of sufficient value for charging, and causes it to open if the power fails or the line-voltage drops below a predetermined value, thereby guarding against the batteries discharging back into the line. On restoration of the current after a power failure the main-line contactor automatically recloses, and the charge is continued.

The shunt trip relay is connected to the ampere-hour meter on the locomotive and when the battery is fully charged the ampere-hour meter will energize the relay which, in turn, causes the main-line contactor to open and disconnect the battery from the line. This relay also opens the contactor should the line-voltage become too high. Thus the voltage and shunt trip relays permit charging only when normal conditions prevail on the line, that is, the supply voltage must lie between the limits for which the two relays are set.

Authority to Demand Monthly Coal Reports Challenged

National Coal Association Seeks Injunction Against Federal Trade Commission

AUTHORITY of the Federal Trade Commission to demand coal-mining companies to make the monthly reports now being required has been challenged by the National Coal Association. An injunction has been asked in the Supreme Court of the District of Columbia. The suit is brought in the name of the Maynard Coal Co. and it is contended that the commission exceeds its authority in requiring coal-mining companies to file monthly reports showing costs, income and tonnage, and an annual report of financial condition.

It also is contended that if the act be construed as vesting authority in the commission to require these reports, the act itself must be held unconstitutional as being beyond the power of congress to grant such authority under the constitution. The bill of complaint also states that any power that was vested in the Federal Trade Commission to require such reports was transferred to the Fuel Administration by the President's executive order of July 3, 1918.

Before filing the suit officials of the National Coal Association conferred with members of the Federal Trade Commission. The commission recognizes that the suit was brought in a friendly spirit so that the courts may pass upon the fundamental questions of law involved. It is believed that the commission itself is not unwilling to have these questions determined by the courts.

Rush C. Butler, of Chicago, will direct the legal battle. In addition to members of his firm, Frank E. Harkness, former solicitor for the U. S. Fuel Administration, and Karl D. Loos have been engaged to assist in the handling of this and other cases which will be filed.

Alternative Propulsion Fuels Widely Sought in Britain*

Oil Fuel Is Already Replacing Coal to a Large Extent in Trans-Atlantic Liners—Its Use for Inland Transport and Industry Is Being Developed—Other Alternative Fuels Are Suggested

Pulverized coal and colloidal fuel are being considered. Search is being made for oil. Oil shales, some of which yield 90 gal. per ton, are being tested. Further arrangements are being made in Great Britain to store oil for vessels and in France to pipe fuel oil and gasoline from Havre to Paris. Use of steam, gasoline and producer-gas as propellants for motor trucks compared.

COAL shortage, resulting from strikes and shortened hours of labor in Great Britain, is leading to more intensified efforts to find substitutes for propulsion fuels so that the country's industries can be maintained. A development of considerable interest in this direction may lie in the application of pulverized fuel to railroad locomotives. Trials of this form of fuel have already been made in the United States, Sweden and Brazil, and locomotives also have been built for the Great Central R.R. which are adapted for this type of fuel. A further development is now projected in the application of colloidal fuel, which is a mixture of powdered fuel suspended in heavy oil. Oil, however, continues to be the most important fuel, and an active research is going on for all sources of oil production in Great Britain, under schemes approved and financed by the Government. Nor are foreign fields being neglected.

An earnest attempt appears to be under way to remedy Britain's dependence on other parts of the world for supplies of oil. In Mesopotamia, for instance, important developments are reported to be under the serious consideration of the Government in connection with the granting of oil concessions to such companies as the Anglo-Persian, its subsidiary the Burmah Oil Co., and the Shell Combine. No definite steps, however, can be taken there until the ratification of the Treaty of Peace with Turkey.

In the meantime, interest in oil research in the British Isles themselves shows no signs of slackening. Geological reports from Scotland are not of a favorable character, but in England a colliery at Retford, which has given indications of oil reserves, is about to be tried and developed on the same lines as the wells at Hardstoft, from which a steady, if small, supply of oil has been forthcoming since operations first started after the armistice.

The most promising indications in the line of oil fuel in Britain, however, come from the discoveries of oil shales in enormous quantities in Norfolk. These quantities are estimated at 2,000,000,000 tons, so that the development of a large British industry in that centre is confidently anticipated, as the prospects reported indicate yields of 30 to 60 gal. per ton. A seam of shale 11 ft. thick has been cut on property of English Oilfields, Ltd. It has given over 90 gal. of oil per ton of shale, or about four times the quantity obtained from Scottish shales.

In spite of these encouraging signs, British industries will remain for a long time dependent on foreign supplies of oil. A heavy demand continues for oil tankers of 20,000 tons capacity, such as are being constructed in America. Of interest in this connection are the large works in course of construction at Swansea, by the Anglo-Persian Oil Co., for the refining of imported crude oil.

From Liverpool also comes the report that the Mersey Docks and Harbor Board have decided to spend half a million sterling in the acquisition of the Dingle Bank Estate, where they propose to have installations erected to supply oil fuel to vessels. It is intended to prepare an oil distributing centre on a large scale, 20 acres of land having been set aside for this purpose.

This step is, of course, the outcome of a great development of oil fuel for shipping purposes. Five leading oil companies, including the Anglo-American, will participate, and they are starting without delay the erection of huge storage tanks designed to provide a capacity for many millions of gallons. Having in mind that oil is destined to play an important part in the industrial development of Great Britain, the Mersey Board proposes to link up the projected oil installations with the Liverpool railroad, so that tank wagons may be loaded on the spot for transport to inland centers.

The French Government is understood to have sanctioned the construction of a double-pipe line for oil between Havre and Paris, a distance of about 150 miles. One of the pipe lines, with an internal diameter of 10 in., is to be used for heavy fuel oils, and above it, the Chamber learns, will be a smaller pipe line of 4 in. for petroleum and motor spirit.

It is anticipated that 4,500 tons of heavy, and 1,000 tons of light oils and spirit can be pumped through those lines daily, thus materially lightening the difficulty of supplying Paris with coal by facilitating the use of heavy oils in its place. It is hoped to complete the lines in time for next winter.

The construction work, the Chamber is advised, will be carried out by a French company—the Compagnie Française des Mazouts et Petroles—which will also build a wharf at Havre for vessels bringing the oil, erect reservoirs with a total capacity of 60,000 tons, and provide pumping stations, etc. The estimated cost is

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*From *Anglo-American Trade*. With exchange at $3.655, a penny is equal to 1.52c., a shilling [illegible] equal to 18.27c., whereas at normal exchange a penny is equal to 2.03c., and a shilling is equal to 24.35c.

about three millions sterling at the normal rate of exchange.

An adequate and cheap supply of fuel being essential to the development of Britain's expanding motor industry, a great deal of attention is being devoted to finding a suitable substitute for petrol, the price of which is now 2s. 10½d. a gallon, to which a further increase of 8d. per gallon has been made. In 1919 the United States automobile output totalled 2,000,000 cars, which alone absorbed an oil consumption of 400 million gallons, and although between 60 and 70 per cent of the world supply of oil comes from the United States, no marked increase of yield there is reported.

Economy in the use of oil has been tried, but the one effective method of economizing would seem to be to run heavy cars on solid fuels. This is where the producer-gas motors are likely to receive favorable consideration. It is known that except in the case of anthracite all the solid fuels now in use involve a loss of byproducts.

D. J. Smith, of the Institute of Automobile Engineers, has been giving careful consideration to this problem, and is believed to have evolved a design which opens up new and wide possibilities in motor traction. In his opinion one ton of coal should propel a 5-ton steam-driven wagon 160 miles, whereas if subjected to distillation it would produce 13,000 cu.ft. of gas, of which 250 cu.ft. (the equivalent of one gallon of petrol) would propel a 5-ton wagon equipped with an internal combustion engine 312 miles. In making a comparative analysis of the cost of moving the same vehicle by steam, petrol, and producer gas, Mr. Smith works out a proportional cost which stands at 1s. 6d., 3s., and 2s. 8d. respectively, taking as bases for estimate coal at 50s. a ton, petrol at 3s. a gallon, and coke at 55s. a ton.

What Changes I Would Like to See in McAuliffe's Plan

Wants Inquiries Directed by Individual Effort Under Bureau of Mines—Would Have Differential Periods Shorter and More Numerous

By M. L. O'Neale
Gouverneur, N. Y.

Being merely an advisory body and not judicial or legislative, a head with subordinates would give better results than a council of seven. Such a plan would be less expensive and more productive of result. Seasonal freights with only two differentials annually would bulk purchases at, or near, the date at which the change in rate is made.

I WAS much interested in reading, in your issue of March 11, the paper by Eugene McAuliffe, entitled "Stabilization of the Bituminous Coal Industry," which was delivered before the February meeting of the Institute of Mining & Metallurgical Engineers in New York. I have not devoted sufficient time to this subject to justify a criticism of this estimable paper. However, one or two features of the remedies suggested struck me as possible of improvement. First, as regards the appointment of a General Coal Commission of seven members with a term of office of seven years, this commission to be largely a statistical and fact-gathering organization: This commission, according to the plan outlined, would be neither a judicial nor legislative body, and for that reason I see no object in dividing its authority and directive force between seven men. Concentration of this authority in one man, in my opinion, would better fix responsibility, secure better results and cost less in operation. This concentrated authority would lend itself to a division of duties among subordinates, each charged to collect data in a particular field of endeavor and responsible for its work in that field.

A publicity department would make known such facts and conclusions as the department head should deem advisable. This entire organization should be a part of the Bureau of Mines, and not a loose end dangling from the already overworked presidential hand. Unfortunately in some respects and fortunately in others, the coal resources of this country are so enormous that it is difficult, if not impossible, to hold the developed capacity of the mines within reason, particularly when bankers, lawyers, merchants, and others unfamiliar with the game are all too ready to put money into the development of a new property. An engineer may make the most accurate report on the cost of development of a coal property, figure out the mining cost in detail, give the prevailing selling price of this coal and the estimated profit per ton, but what avails all this if the market will not take care of this production, or if the railroad cannot furnish sufficient equipment, or if the labor market is already overbought, any or all of these factors resulting in running part time or at reduced capacity? If this commission could only keep capital and the public warned of the pitfalls in the coal industry, it would do a great service in tending to discourage the opening up of new mines with consequent overproduction.

The second feature of Mr. McAuliffe's treatise I would like to discuss is his plan of seasonal freight rates. With some modifications, I think this the most practical way yet evolved to reduce the seasonal fluctuations in demand. Of course any change of this kind, which alters the competitive status of established industries, is bound to hurt some and benefit others, no matter how fairly designed. A uniform percentage increase or decrease of freight rates has the same effect. Some will gain and some will lose. Some will favor and some will oppose. The problem is one of the greatest good to the greatest number. The industry whose coal cost is small relative to the total cost of its product, may, by the very reason of its small coal consumption, be able to gain the benefit of storing coal in summer, the physical problem of storing and the capital tied up being relatively small matters, while another industry, whose coal bill is a large percentage of the cost of its product, would not be able to spare the capital or find the room for storing sufficient coal to be of material benefit. Thus we have on the one hand an industry saving a percentage of a small cost item, and on the other an industry saving nothing on a large cost item. However, there may be enough of the first kind to somewhat equalize the seasonal demand, which is the object sought, industries adjusting themselves to the new conditions just as they do when freight tariffs are changed, or when import duties are revised, or when there is a change in any other of the many factors affecting a particular line of business.

I think, then, that seasonal changes in freight rates on coal is a step in the right direction. However, I am of the opinion that the plan proposed by Mr. McAuliffe may be bettered. He divides the year into two periods, March 1 to Aug. 31 inclusive, and Sept. 1 to Feb. 28 inclusive. It is highly improbable that industries would store coal in March, paying the same price that they would pay for the same coal in August, so that the tendency would be toward a weak demand in the spring and a heavy demand the latter part of the summer, resulting in the same congestion and crippling of railroad service that we now have in the winter. My idea would be to maintain the regular rates on coal in the spring and fall, with a 15 per cent higher rate in the winter and a 15 per cent reduction in summer. The rates then would stand in percentages thus:

January	115	July	85
February	115	August	85
March	100	September	100
April	100	October	100
May	100	November	100
June	85	December	115

The working of a seasonal-rate plant of whatever kind presupposes that the coal operator will charge substantially the same price for his product at the mine the year round, the transportation cost being the variable, this obviously being much easier of accomplishment than a seasonal schedule of prices at the mine under the scattered and disorganized state of the bituminous industry. The largest and most substantial operators would doubtless maintain this uniform price, but there would be nothing to prevent the advantage of a lower freight rate in summer being nullified by the price at the mine being raised at this season, which conceivably might be done, particularly if a strike or other contingency in the winter or early spring forced an unusual demand in the summer. For this reason also I think the rate changes should be at three-months interva's, as suggested above, rather than at six-months, as suggested by Mr. McAuliffe. The very inertia of the market would act as a stabilizer over the shorter period of three months, when it might not be effective over the longer period of six months.

This subject should bring forth more comments from your readers. Through discussion the best ideas can be presented for consideration and thereby the matter may be kept in the foreground ready for suitable action.

Precautions To Be Taken Against Lightning Where Shot-Firing Systems Are Used

An Inductive Charge of the Wire Will Do Little Harm if a Gap Is Provided, but, if the Wire Is Struck by Lightning, Accidental Discharge of Explosive May Be Apprehended

By George S. Rice and L. C. Ilsley

A REMARKABLE explosion of firedamp caused by a discharge of lightning at the new shaft at the Sitalpur coal mine has been reported by the Chief Inspector of Mines of India, who gave the following details:

"The explosion occurred during a thunderstorm, and the evidence showed that a flash of lightning had, to all appearances, passed down the shaft, causing disruptive discharges at certain points between the guides and the winding rope, rending the latter at two places situated respectively 228 ft. and 278 ft. from the surface. The distance between the winding rope and the side of the shaft was 5 ft. 4 in., indicating a spark gap of this width, and an intensity of discharge which could not fail to ignite the explosive mixture of gas and air known to be present in the shaft."

Compressed Air Magazine, January 1920 issue, which contained the above extract, also goes on to state:

"In 1915 M. Ferey described phenomena of a similar character to the above in a paper read before the Société de l'Industrie Minérale. In a pit liable to sudden outbursts of gas, for the sake of safety shots were fired from the surface. In regard to this pit we read in the *Colliery Guardian*, of London, that during a storm in the year 1905 shots went off in two places after the detonators had been connected to the conductors.

These shots were situated respectively 1,400 and 1,410 m. from the firing station. Realizing the possible danger from this cause, the precaution was taken to cut the conductors at the bottom of the shaft and to connect them just before firing. Even under these conditions a shot went off spontaneously, owing, it is believed, to lightning."

The Bureau of Mines, when it was investigating shot-

"[illegible] from Lightning" [illegible] Bureau of Mines firing from the surface some years ago, found a number of cases where lightning had passed underground. In one case, in a shallow mine in Pennsylvania, lightning entered, following the roots of a tree, and caused the death of a man in the main entry. In another case, in the Pratt City mine which came under the observation of the Chief Mining Engineer, lightning entering on shot-firing wires caused premature ignition. This led to the recommendation of making a gap of about 5 ft. in the shot-firing line, which was not to be closed by the flexible cable until the men had all been withdrawn from the mine.

Another case reported was that of a mine, temporarily abandoned, belonging to the United States Coal and Coke Co. at Gary, W. Va., where an explosion occurred following a flash of lightning which evidently entered the shaft and ignited the firedamp.

Lightning Arresters Are Not Sufficient

A system by which lightning will be prevented from entering the mines is difficult to arrange, especially in mines where electric shot firing is practised on an extensive scale. Ordinary types of lightning arresters are satisfactory protection against static electric currents produced by lightning discharges, but if a "lightning bolt" actually hits the circuit, there is such an enormous amount of energy to be dissipated that the ordinary devices do not suffice.

Following out the same reasoning, a gap of sufficient length to afford protection for static electric discharges resulting from electric storms would not necessarily be a proper protection if the circuit were hit by a "lightning bolt" and consequently received the full energy of the lightning discharge. There would seem to be need of still greater precautions than are suggested in the following paragraph from Technical Paper 108, Bureau of Mines:

"A suitable gap may be provided by inserting in each side of the circuit, near the bottom of the shaft or the slope, or about 100 ft. inbye from the mouth of the drift, a flexible conductor about 6 ft. long. Each of these conductors can be permanently joined to the end of the solid incoming conductors and the other end of each flexible conductor can be provided with a lug for fastening to one of a pair of screw studs in which the outcoming solid conductors should terminate. A similar pair of dummy studs should be installed 6 ft. distant from the live studs so as to provide a place for fastening the flexible conductors out of circuit. The dummy studs should be provided with a locked clamp or similar device for locking the flexible conductors out of circuit."

Discharge May Be Prevented from Jumping Gaps

It might be feasible to so arrange a firing circuit that the incoming lines could be connected to a high resistance ground at the same time a gap was made in the circuit. Such a ground would tend to dissipate extraordinary discharges and to prevent such discharges from bridging or jumping the gap in the firing lines.

Again, it might be possible to so arrange the ground, the gap and the direction of the incoming and outgoing shot firing lines with reference to the gap that the direction of the circuit to the ground would be a straight line, while the direction of the circuit through the outgoing lines through the gap made a right-angled turn. Since lightning tends to follow straight lines, this arrangement would probably be an added safeguard.

Finally, care should be taken that all metallic circuits, such as pipe lines of other power circuits entering the mine, be kept at a proper distance from shot-firing lines in order that they would not serve as possible paths for lightning discharge. If such precautions are not taken it is conceivable that a lightning discharge in a mine through a metallic circuit which is close to a shot-firing line may be partly communicated to the shot-firing lines at a point beyond the lightning gap.

It is thus evident that there are many things to consider in protecting outside shot-firing systems from lightning discharges, especially if the discharge actually hits a metallic circuit entering the mine.

Claims of Italians for Losses at "Ludlow Massacre" Rejected

Committee Holds That Remuneration Would Place Premium on Disloyalty

AT THE request of Governor Shoup, a committee was named by the last legislature to make investigations into the claims of the Italian Government because of losses to its citizens during the strike which prevailed in the Colorado coal fields during 1912-14 and particularly for the loss of life and property at the so-called "Ludlow Massacre."

The report of the committee filed with the Governor on March 5, rejecting the claim of the Italian Government and setting forth a brief of the testimony, states in conclusion: "This committee believes that to encourage, by remuneration, any citizen of any country to take up arms against the state or to pay those who lost because they took up arms against constituted authority would be to strike at the very foundation of our government and to undermine both the State and Federal Constitutions.

"From its investigations, conducted with an open and unbiased mind, and from all the evidence submitted, this committee is unanimously of the opinion that whatever loss these claimants sustained was the result of an attack on the State; that each one of the claims is unfounded and should be definitely rejected. Should payment be made on any such claims it would be nothing more or less than placing a premium upon disloyalty, rebellion and treason."

Mine Safety Measures in Iowa.—"It is a matter of common knowledge, as is illustrated in nearly every mining case coming before the courts of this state, that the organization and duties of workmen in coal mines are to a very great extent defined by customs and rules which are the outgrowth of long experience, and have come to be recognized and observed as the law of the mine by both miners and operators.

"Among them none is better established than that which, while requiring the miner to prop or otherwise protect the roof of his own room or other place where by his own excavation he is removing the natural support of the overlying rock, imposes upon the owner or operator the duty to make reasonably safe the entries by which communication between the shaft and the various rooms is maintained and passage is afforded for miners and laborers moving from place to place in discharge of the tasks assigned to them." (*Iowa Supreme Court, Owens vs. Norwood-White Coal Co., 174 Northwestern Reporter, 851.*)

New Electrically-Driven Hoisting Equipment at Kilton Collieries

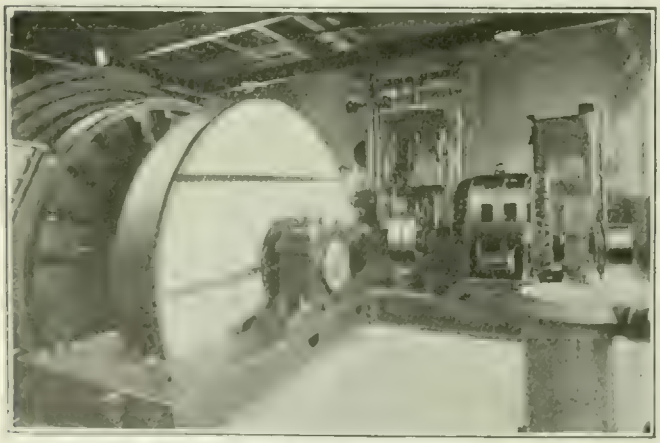
A Cylindro-Conical Drum Hoist, Driven Through a Flexible Coupling and Back Gears by an Alternating-Current Motor and Giving a Rope Speed of 1,300 Ft., Was Installed at an English Colliery During a Week End

By M. Meredith
Liverpool, England

RECENTLY there has been put to work at Kilton Collieries, an interesting example of an electric hoist, representing the latest practice in geared alternating current hoisting equipment in Great Britain. The hoist has been designed to suit the following conditions:

Depth of shaft	720 ft.	Turns on small diam	6 (three dead)
Net load (rock)	3.5 tons	Turns on scroll	4
Weight of cage and chains	3 tons	Turns on large diameter	9.7
Decks per cage	1	Drum speed	27.6 r.p.m.
Cars per cage	2	Rope	4½ in. circumference
Weight of one car	0.65 ton	Maximum rope speed	1300 ft. per min.
Output per hour	180 tons (iron stone)	Motor rating	370 hp.
Time of hoisting	45 sec.	Motor peak load	440 hp.
Discharge interval	15 sec.	Motor speed	255 r.p.m.
Total time of each hoist	60 sec.	Ratio of gearing	9.25 to 1
Drum, cylindro-conical	11 ft. to 15 ft. dia.	Supply	3 ph., 2750 v., 40 cy.
		Auxiliaries	3 ph., 440 v., 40 cy.

The hoist was built to replace a beam-type engine with overhead drum, which, although somewhat expensive to run as regards steam consumption, was on the whole free from costly repairs. Lately, however, this engine developed defects, and its replacement became increasingly urgent. It was imperative that the steam hoist should remain on duty until the last possible moment, and that the change-over should take place during a week-end.



[illegible] VIEW OF ELECTRIC HOISTING ENGINE
Power is transmitted to the hoist through a flexible coupling and an enclosed herringbone pinion and gear that dips into oil.

This was successfully accomplished, and the electric hoist started work promptly on Monday morning without any hitch. The new hoist house is built (relative to the head gear) immediately behind the old engine house; this incidentally resulted in the distance between the head sheaves and drum being increased in the rope plane, thus favorably affecting the angling of the ropes.

By this arrangement of buildings, the rapid transference of the ropes to the new drum, and the clearing of a way for them through the upper part of the old engine house were greatly facilitated, while at the same time no alterations whatever to the head sheaves were necessary. The new hoist house is constructed of reinforced concrete, with ample accommodation for the machinery, and adequate floor space has been allowed. Daylight is freely admitted from windows of large area. As a result, inspection of all machine parts may be easily made and perfect cleanliness is insured.

DOUBLE HELICAL GEARS DIP INTO OIL

The induction motor is geared to the drum shaft, the driving pinion being mounted on an extension shaft supported by two bearings, the connection to the latter shaft being made through a flexible coupling of the "pin" type. The gearing is of the double helical variety, and is mounted in a dust-tight gear box where the main gear dips into an oil bath. This wheel, which is about 10 ft. in diameter, is split in halves for the purpose of facilitating its erection and also its removal from the drum shaft should this ever be necessary.

In order that high peaks may be eradicated and the hoist cycle equalized to a considerable extent, a cylindro-conical drum was designed and installed. It is perhaps unnecessary to point out that the shorter the landing period can be made, the more efficient becomes the hoisting cycle. The discharge period in this case is 15 sec. Further equalization is not called for in this case, especially as the power company has installed within a short distance of this particular colliery a synchronous motor for correction of the power factor in the district. The drum brakes are operated by means of a compressed air engine that raises or lowers the main-brake lever, which is of the usual weighted type.

In the event of the operation of any emergency trips—for instance, when an overwind occurs—a solenoid-released trigger causes the main brakes to go into the "on" position immediately. The interlocks are such that the brakes remain in this position until the emergency condition is rectified or restored to normal and the power put on again.

The air compressor for the brake engines is of the two-stage type driven by a 10-hp. motor. It is supplied with energy from a 3-phase, 440-volt auxiliary transformer, which also supplies the solenoid and controller-pump motor. The hoistman's platform is placed at such a height as to give the operator a clear view of all the machinery under his care, a condition which is perhaps too often overlooked. The motor is controlled by a liquid controller of the weir type, fitted with oil-immersed reversing switches.

During the time the controller is in circuit, a continuous flow of electrolyte is pumped into the upper tank, returning over the sluice gate into the lower tank. The movement of the operating lever throws the reversing switch in one direction or the other, according to the direction of rotation, and at the same time raises the sluice gate. This causes the level of the liquid in the upper tank to be raised, and consequently the resistance between the electrodes to be decreased. When the operating lever is returned to the "off" position, the sluice gate is lowered again and the level of the resistance liquid is also lowered, this increasing the resistance in the rotor circuit. Just before reaching the "off" position, the primary circuit is opened on the reversing switch.

When it is desired to run at a slow speed, the sluice gate is lowered to an intermediate position only thus increasing the resistance as found necessary. Owing to the fact that the resistance liquid cannot follow the raised sluice gate faster than the pump can deliver the liquid into the upper tank, a certain minimum accelerating period of the motor must be adhered to, although it is possible to obtain a longer acceleration period. The duration of the acceleration period is adjustable within limits by means of a stop-valve in the delivery pipe of the pump.

When hoisting men, it is often necessary to adopt a different rate of acceleration than when raising stone, and the necessary adjustment may be quickly effected. The reversing oil switches are fitted with safety interlocks, which are so arranged that the oil containers cannot be removed without tripping the main oil switch.

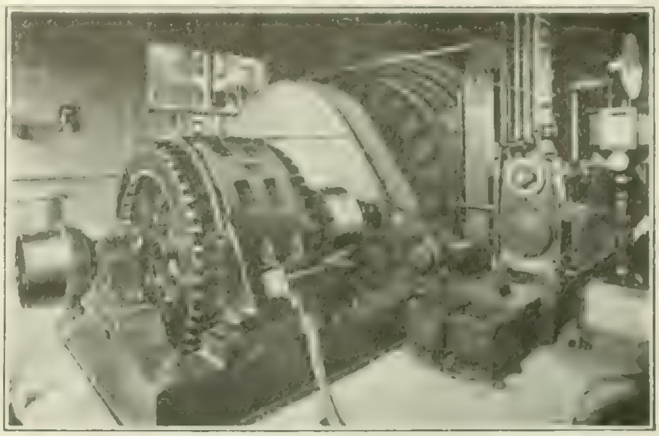
OVERSPEEDING IS PREVENTED

An electric overspeed-preventer device has been fitted to this machine. In this case this device consists of a direct-current series-wound generator, chain-driven from the motor extension shaft, and arranged to deliver its output through a bank of resistances, a relay, and an ammeter. These resistances are inserted into the generator circuit in a number of equal steps, each of which corresponds definitely to a certain number of completed turns or fractions of turns of the main drum during acceleration.

The resistance inserted will only maintain the current in the small series-generator circuit constant up to full speed, provided the generator speed or drum speed rises at a definite set rate. Put in another way, the drum speed as taken at short intervals must only reach certain values relative to the position of the rheostat. Should it exceed these, the resistance previously inserted would be insufficient to keep the current through the relay within safe limits.

In such a case the result would be that owing to too high a rate of acceleration having been permitted, the relay would trip the main oil breaker, and the equipment would be temporarily shut down. Similarly, when approaching the end of the hoist, the operator must not neglect to slow down his machine at the point for which the device is set, otherwise the resistances will be cut out more rapidly than the generator speed and voltage drop, which would cause the excess current to open the breaker.

It is therefore obvious that a hoist fitted with this device must always be driven in such a manner as will insure the maximum of safety, the hoistman being compelled to follow a definite accelerating and decelerating curve within safe limits. The governing device acts as an efficient overspeed preventer during the constant full-speed running time of the hoist, and also in the case of a loaded cage being lowered on the brakes only, and beyond "safe" speed.



REAR VIEW OF MOTOR AND HOIST

This 370-hp., 3-phase, 40-cycle, 2,750-volt, British Westinghouse motor operates at 255 r.p.m. Suitable control devices are of course installed.

The overwind switch is of the friction-driven type, being fitted with a flexible steel-rope drive working in a grooved pulley mounted on the switch spindle. The rope is attached to a lever which is struck, when an overwind occurs, by tappets provided for that purpose on the depth indicator. The flexible cord pulls the switch open and shuts down the hoist, but as the drive on the grooved pulley is by friction only, the switch may be reset quickly by hand, the rope slipping in the groove to permit this. It will therefore be perceived that should the hoist be started in the wrong direction following an overwind no risk is incurred, as the switch will always shut the machine down before the cage has moved one foot upward.

Existence of Employment Relation—Status of Certified Mine Foreman.—If a company chartered to mine coal and produce salt transferred the coal-mining business to its president and general manager for his own account, but that fact was not disclosed to employees, who were thereby induced to believe that they were working for the company, being employed and paid under the same conditions as the company's men engaged in the work of producing salt, an employee injured in the mining operations is entitled to hold the corporation liable on proving negligence toward him producing the accident.

A mine foreman who, in addition to his statutory duties, and by authority of the operator, employs and discharges miners and has general charge of the mining operations, is to that extent the representative of the operator, rendering the latter liable for injury to a miner resulting from a negligent order given by the foreman to throw a switch, thereby causing a train of empty coal cars to be diverted into a side entry and to strike a miner who, ignorant of the danger and obedient to a prior direction by the foreman, was shoving a loaded car from his place of work onto the siding. (*West Virginia Supreme Court of Appeals, Ward vs. Liverpool Salt & Coal Co., 92 Southeastern Reporter, 92.*)

Is the Health of Mine Workers Adversely Affected by Mine Conditions?

Mine Workers, if Anything, Enjoy Better Health Than Other People—Tuberculosis Does Not Seem as Prevalent Among Them as Among Other Workers—Nystagmus Is Apparently Unknown in Illinois, Where Investigation Has Been Made

By C. L. Green
Fairmont, W. Va.

CASUAL observers would be fully justified in pronouncing the occupation of coal mining one liable to affect adversely in a marked degree the health of the workers engaged in it. The miner works underground, shut off from the light of the sun, in places that are often damp or even wet, and in an atmosphere impregnated with coal dust. Every condition would seem to favor the growth, if not the propagation, of tubercular germs, and the promotion at least of respiratory diseases such as asthma, bronchitis, etc.

Where 188 in every 10,000 persons of divers occupations were found ill of diseases only 173.6 per 10,000 bituminous mine workers were ill from such causes and only 140.6 per 10,000 anthracite mine workers were likewise incapacitated. The general sickness from tuberculosis ran 7.5 per 10,000 while the bituminous and anthracite sickness ran 11.6 and 4.3 per 10,000 respectively.

That things are not always what they seem is clearly illustrated by the facts relative to the health of the mine worker, which facts have been proved by surveys, examinations and the close observation of mine workers by medical practitioners and specialists.

During the anthracite coal strike in Pennsylvania in 1902 the question of the miners' health was raised, and a health survey of that region and of a central Pennsylvania farming region was conducted. It was found, according to Prof. H. H. Stoek, that tuberculosis was far less prevalent in coal-mining sections than in farming communities.

In "Preventative Medicine and Hygiene," by M. J. Rosenan, professor of preventative medicine and hygiene, Harvard University, that authority says: "De Crocq speaks of the rarity of tuberculosis among Belgian coal miners. Arnold reports that in Germany tubercular diseases are rare among such men and that there is a prevailing opinion that anthracosis is antagonistic to tuberculosis. Goldman attributed the freedom of the coal miner from tuberculosis to an antiseptic action of the coal dust."

In "Occupational Diseases," by W. G. Thompson, professor of medicine, Cornell University Medical College, we find the statement: "Coal miners are fairly healthy workmen, despite the large quantities of dust inhaled, and are found to be less susceptible to diseases of the lungs in general than many other classes of workmen, provided they do not drink heavily. In fact, among the coal miners of England and Wales, the mortality from these diseases is actually less by one-fifth than the mortality among males of all other classes in general."

Professor A. C. Callen, professor of mining engineering, West Virginia University, College of Engineering, tells us: "Miners' nystagmus seems to be a common disease among coal miners abroad, as may be readily inferred by a study of various bulletins published on the subject. The consensus of opinion is that in the United States it is very rare. For example, Lane and Ellis, in their report on behalf of the Illinois Commission on Occupational Diseases, January, 1911, say: 'Of the 30,194 pick miners in Illinois, we examined the eyes of about 5,000, or one-sixth of the entire number, without finding a single case'."

George S. Rice, in U. S. Bureau of Mines Bulletin 132, tells us: "However, as to the effect of coal dust upon the lungs, two opposite opinions are held—one that the dust is not only harmless, but even conducive, to health, and the other that it is a danger to health. These discordant opinions are due to the fact that some workers are exposed to the inhalation of pure coal dust and others to the inhalation of shale dust with the coal dust, and frequently shale dust contains much free silica."

Here we have a number of well-known authorities agreeing almost unanimously that the inhalation of coal dust is not to be regarded as a menace to health. "These are opinions only," the reader may say. Let us, therefore, examine certain surveys that have been made by insurance companies which throw light upon the effects of the coal-mining industry upon the health of mine workers, as compared with the effects of other occupations and callings upon workers engaged in them.

Insurance companies made these surveys for business reasons, and upon the results of the surveys are based the rates for insurance. Being of greatest importance from a business point of view, it is reasonable to suppose that every means available is utilized to make the surveys accurate, and we are therefore justified in accepting them as records of facts.

The Metropolitan Life Insurance Co.'s survey of 579,197 white persons of both sexes and all ages over one year discloses that sickness so serious as to be disabling affects an average of 188 persons in every 10,000. This same survey showed sickness from tuberculosis among these 579,197 persons to be 7.5 persons per 10,000. Statistics which follow show a rate of sickness of 173.6 per 10,000 for bituminous miners and a rate of 140.6 per 10,000 for anthracite miners (accidents not included), and for tuberculosis cases a rate of 6.5 per 10,000 persons.

A sickness survey was made in March, 1917, by the Metropolitan Life Insurance Co. in Pennsylvania and West Virginian cities adjacent to the mining areas. The workmen in those cities were engaged in widely diverse industries. The survey compares the health of these men with that of coal miners.

Two main coal-mining areas were reached by the survey—anthracite and bituminous, the former located in northeastern Pennsylvania and the latter in fields situated in southwestern Pennsylvania, and near Fairmont and Wheeling, W. Va. The bituminous survey also was extended to a few coal miners and their families located near Parkersburg and Huntington, W. Va.

Facts as to sickness were secured in 17,110 families, representing 85,320 persons. Of this number, 22,235 were miners, 16,201 being employed in the anthracite and 6,034 in the bituminous mines.

Illness or incapacitation due to accidents is not included in the results of the survey as shown in the tabulation that follows, for this article deals with general health conditions only, and not with hazards. The results of the survey show as follows:

SICKNESS RECORDS OF 22,235 MINE WORKERS

	Bituminous	Anthracite	Rate per 10,000 Bituminous	Rate per 10,000 Anthracite	
Persons examined	6,034	16,201	.....	....	
Ill from all diseases	105	250	173.6	154.1	
Typhoid fever	0	2	0.0	1.2	
Influenza	10	24	16.5	14.8	
Rheumatism	10	30	16.5	18.5	
Tuberculosis	7	7	11.6	4.3	
Pneumonia	5	16	8.2	9.8	Respiratory Diseases
Pleurisy	1	8	1.6	4.9	
Asthma	9	34	14.9	21.0	
Miners' asthma	6	42	9.9	25.9	
Other respiratory diseases	4	5	6.6	3.1	
Other diseases and conditions	53	82	87.8	50.6	

The rate per 10,000 persons of diseases of the respiratory system shows 41.4 for bituminous miners and 64.7 for anthracite miners. This difference is accounted for by the fact that anthracite coal is harder and more flinty than bituminous coal and therefore the action from the dust of anthracite is more harmful to the respiratory system.

The findings clearly confirm the well-known facts from mortality statistics, which have shown for many years low death rates from tuberculosis among coal miners. The facts elicited from the survey strongly suggest the desirability of further and more intensive clinical study of pulmonary tuberculosis among coal miners. Such study may well serve to disclose the factors of environment which protect coal miners, and in a measure create an immunity from the disease.

48 Miners' Asthma Cases in 355 Sick Miners

It will be noted that but 6 of the 105 sick bituminous miners had miners' asthma, or a rate less than 10 cases to 10,000 men, or one in a thousand, while in the anthracite miners, one in every 400 had this disease. This is accounted for by the difference in hardness of the coal and the more flinty nature of the dust.

Among the families of the miners—persons not exposed to the effects of the mines—the sick rate was 162 persons to each 10,000, as against 173.6 per 10,000 among the miners, showing a difference of only 11.4 persons per 10,000 whose illness might possibly be attributed to the industry.

A tabulation of diseases of miners' families (not including the miners) shows as follows (disabilities resulting from accidents being excluded from the list):

SICKNESS RECORDS OF MINE WORKERS' FAMILIES

	Bituminous	Anthracite	Cases per 10,000 Persons Bituminous	Cases per 10,000 Persons Anthracite
Persons examined	19,416	43,669		
Ill from all diseases and conditions	306	597	157.5	140.6
Typhoid fever	7	2	3.6	4.6
Influenza	27	47	13.9	10.8
Rheumatism	20	36	10.3	8.2
Tuberculosis	11	18	5.6	4.4
Pneumonia	13	61	6.7	14.0
Asthma	1	13	0.5	3.6
Other respiratory diseases	15	31	7.7	7.1
All other diseases, etc.	212	389	109.2	88.8

A little less than 2 per cent of the coal-mining population, including the miners and their families, reached by the survey in Pennsylvania and West Virginia were found to be seriously sick. Among the miners themselves the sick constituted 2.7 per cent of the total canvass, the excess in the rate being largely due to the high incidence of the respiratory diseases and of accidents and injuries.

The bituminous miners showed a slightly lower sickness rate than did anthracite miners. Bituminous miners' families, however, showed a higher sickness rate than the families of anthracite miners.

Pulmonary tuberculosis was extremely rare among workers in the anthracite mines. On the other hand, miners' asthma and other diseases of the respiratory system were prevalent. This phenomenon points to the necessity of more intensive study of the factors involved in the apparent immunity of the anthracite miners to tuberculosis. The diseases and conditions recorded among members of coal miners' families do not differ essentially from those found in previous sickness surveys.

I would conclude that serious sickness is no more prevalent among miners and their families than among families previously studied in other industrial communities of the United States. Accidents play a great part in incapacitating coal miners, and statistics show that the percentage of accidents in coal mines is greater than in many other industries and occupations.

Taken all in all, the occupation of coal mining is as healthy as the average industry or calling, the accident hazard is no greater than in many industries and the remuneration for the work compares favorably with the most lucrative of occupations.

Scope of Miner's Employment—Contributory Negligence.—Although an employer is not liable for injury to an employee while the latter has stepped aside from his line of employment, thereby exposing him to a danger which the employer could not have contemplated, the fact that a miner temporarily passed from his working place to a crosscut to await clearing away of smoke in his place of work cannot be deemed to be a departure beyond the scope of his employment; nor can the fact that he went into the crosscut to take a drink of water, or to advise a fellow employee of the placing of a can of powder, or to test a fuse.

The employer must anticipate the employee's acts in stepping aside from the place of his actual work in such circumstances. One employed to load holes and attach fuses for blasting acts within the scope of his employment in testing the fuses, since that is for the mutual benefit of the employer and the employee.

When an employer asserts that the direct cause of a worker's injury was the latter's own carelessness, he has the burden of proving that fact by the preponderance of the evidence. (*Colorado Supreme Court, Micheli vs. Rapson Coal Mining Co., 164 Pacific Reporter, 311.*)

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Coal at $40 Per Ton

HOW MUCH coal do you think you could sell a railroad fuel agent at $40 per ton f.o.b. your mine? "Not much!", you'll answer. And yet that is the estimated cost to one system for the fuel it bought in the wild scramble for coal during part of the recent strike period. Just how this cost came to be is the moral of our tale.

As all of us now know, even including the worthy ex-members of the Federal Railroad Administration's purchase section, the failure of the railways to buy and stock coal early last year was a big mistake. But without recrimination as to who was to blame let's see the consequences to one road.

This system had no coal in stock when the threat of a miners' strike became serious; worse than this, it could not get any surplus above its daily needs, for every one else was grabbing all that came their way. This line, therefore, for most of the strike period lived from hand to mouth, never quite sure from which point its next week's fuel was to come, in some cases even in doubt whether it would come at all. It was thankful for most anything that "was black and looked like coal"; and it got just that kind of stuff.

And the results—. No trains on time; many firemen and enginemen quit because the coal was impossibly bad; and over-time had to be paid for those who stayed on the job. Freight trains were cut down in size and even then they could only limp along because the best of enginemen could not get results with the fuel supplied. And anyone knows what a limping freight train does to the rest of the traffic on a busy division. Only a week of this thing and you can see the chaos wrought in the traffic of this road, how junctions with other lines became choked with freight and how everyone in the organization became disgusted with his job. You can see the *real* cost mounting to the aforesaid $40, even though the coal man got only his "government price."

When you talk with the railroad-fuel agents about their next year's stock, just ask them what they think of this case. Perhaps it will help persuade them to buy and stock a bit more coal than at first planned. Don't try to make us prove a $40 cost to them, for maybe the fuel agent with whom we talked was a bit too pessimistic when he told his story. But even a quarter of that is bad enough to be convincing to your man. He knows that the best coal he can buy is the cheapest for his road no matter what the price. Show him how to get it now and why he won't be sure of it if he waits till next November. Just remind him, too, that when the snow flies next fall he'll not have the U. S. Fuel Administration authority to divert his coal for him, nor any "government price" to help him either. Storage is insurance; the man who does not keep a supply of coal on hand for the winter is as foolish as the man who fails to take out an insurance policy against the possibilities of accident, disease, fire or lightning.

Stabilizing Effect of "Ship-by-Truck" Movement

IN NO PERIOD of the year is the coal trade more stagnant than in the spring. Usually it is a time of no orders and many cars. Summer is little better. What is wanted in the spring and summer is not more transportation but more orders. Why talk therefore of shipping by truck in that period of the year? Just because during those seasons, as in autumn, good roads are admirably suited for travel, and coal can therefore be shipped in many cases more cheaply by truck than by railroad.

Where the railroad track extends from the tipple of the producer to the plant of the manufacturer, and the latter has an elevator or a trestle to take care of the coal as it arrives, there is much to be said on behalf of the railroad, whenever the cost of shipping by truck is greater than the freight rate, which is the case where the distance is long and roads bad; but when the person receiving the coal does not have a railroad siding, the coal, if to be transported by the railroad, must be unloaded and perhaps stored, loaded from storage into a motor truck or horse wagon and hauled perhaps some miles and put onto the recipient's storage pile.

Clearly in many cases it would be cheaper to provide for but one form of transportation—carriage by truck. The greater flexibility of this unit as compared with the railroad is readily apparent. The seller is not held down to his own line of railroad, he is not obliged to follow where his own or some other railroad has gone. Within limits he is free to place his coal where he will. He can make the price *right*, because there is only one handling to pay for, there is no yard service, no demurrage, no pilfering of coal.

The possession of a motor-truck, of the right type of course, and a truck- or wagon-loading-chute, which practically all mines possess, will give him a chance—provided he has a few good roads to important towns—to keep his mines working when others are closed. The business will be in a degree seasonal—best suited to the summer. It will balance the railroad activity which is greatest in the winter. It will be obtained solely on the merit of the contention that with a good truck, good roads and good weather, coal can be transferred from the tipple to the bin or storage ground of the purchaser more cheaply than with the help of the railroad company. "From mine to cellar" may be the slogan of coming coal companies, at least during the favorable months of the year.

Shortage of Houses Disturbs Coal Market

LAST YEAR the shortage of houses caused many sales of metropolitan real estate. When a property was sold over the head of a tenant, he tried to secure a home by buying another house. Upon securing it, he promptly turned out the tenant. In consequence, dwellings were changing hands with great rapidity.

The man who expects to sell a property does not fill his cellar with coal. He knows, or thinks he does, that he can sell his property for the same amount whether the cellar is stocked with fuel or is swept bare. Many landlords and most tenants avoided buying coal, for they did not know just how long they would own or occupy the building in question.

This had a bad effect on the trade in coal early last year and may have some important influence on buying this year. Many people are purchasing houses and expecting to hold them just long enough to raise the rents. After that is done they will sell the house for a price much above the purchase rate. This practice is greatly retarding coal storage.

As the tenant is wholly at the mercy of the landlord, the latter can easily impose on the former, refusing early in the year to heat the building any longer. If the tenant complains, he is politely evicted. That the landlord is going to renovate the house, is the reason given. There are laws and fines for landlords who fail to supply the heat which is specifically or impliedly promised. But if the officials of the Health Department step within the doors and, after examination, decide to summon, or even upbraid the landlord, he suddenly declares it is necessary to have the house vacated that necessary repairs may be effected. As soon as the tenants have vacated, he looks for other tenants who will pay a higher rent and who are docile enough not to trouble the Health Department. Only the other day a man was refused a lease till he had passed the scrutiny of a two-month occupancy and had shown himself willing to be satisfied with almost any treatment.

This situation will result in quite a saving in the consumption of coal. It may result in a general custom of keeping houses during winter as frigid as those in Great Britain. The cry of "Save Fuel" during the war was hardly as competent to reduce consumption of coal as is the present economic situation.

Against this conclusion must be placed the fact that apartment houses are not in general being built. Two-family houses are more customary. Undoubtedly the apartment house, with its large heating unit and its greater depth and height, should be more economical in the use of fuel per occupant, but on the other hand in two-family houses the owner is usually one of the occupants, and he stokes the furnace with a more watchful eye than does the janitor in a series of apartments.

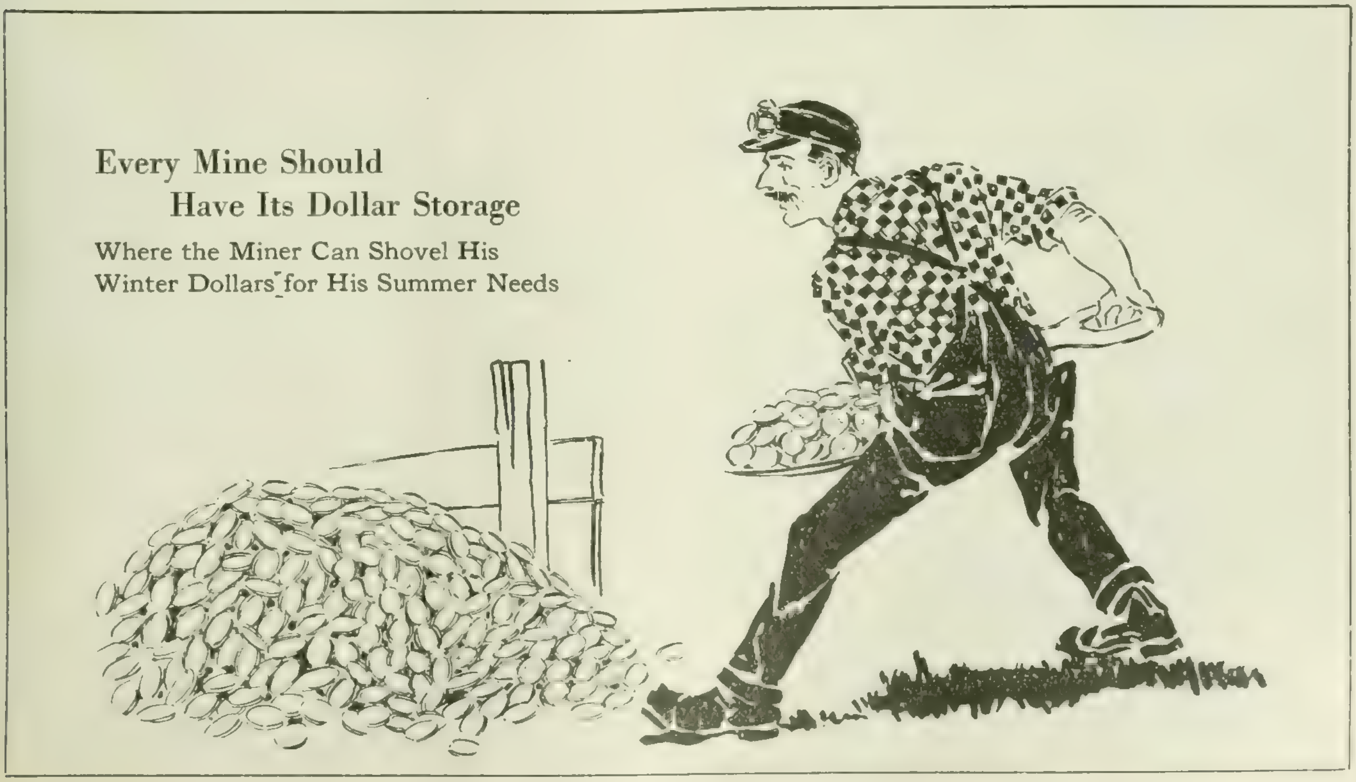
Certain it is that the uncertainty as to the duration of real estate holdings will delay summer purchases of coal. The effect of the new-found independence of the formerly unfortunate landlord is not quite clear. He will save coal but may, by his profiteering, indirectly cause the construction of many well-appearing but hard-to-heat two-family houses, which will add to the fuel bill of the nation. The anthracite year of 1920-1921 may be looked to with interest. Will it start haltingly and will it show itself as a whole less active than the years preceding it?

Troubles of Our Own Making

ALL the labor troubles of the coal industry that the country is now facing have arisen from the fact that when the mine workers were well and truly beaten in December of last year, A. Mitchell Palmer proposed an armistice, and the Bituminous Coal Commission was formed. If it had not been for the parlor-car conference—that "secret agreement clandestinely arrived at"—peace would reign today in the coal industry, the anthracite operators having nothing to do but grant the same advance as was conceded to the bituminous mine workers.

But Mr. Palmer, so bold before, became weak in the presence of assured victory. He had a good argument before the courts, but would it advantage him at the polls? Did he have at that time a premonition that he was going to be a candidate for President?

Another mistake was the failure to make clear just what authority the Bituminous Coal Commission was to wield. Proof of course is impossible but does it not seem certain that it was planned that the award should bind the operators while merely making a suggestion as far as the mine worker was concerned? Certain it is that no effort is being made to coerce the mine worker into acceptance, Washington seeming to be afraid to declare itself satisfied that the verdict of the majority of the commission is correct.


Every Mine Should
Have Its Dollar Storage
Where the Miner Can Shovel His
Winter Dollars for His Summer Needs

DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

Dead-End in Trolley Haulage

Letter No. 1—From the reading of the inquiry of "Assistant Foreman," regarding the proper distance of the dead-end of a trolley line from the face of a heading, I would assume that he has reference to the use of gathering locomotives.

In my experience in mines, I have frequently found the trolley line carried up to the last crosscut in a heading. It would not be good practice to carry the wire further than that point and it would certainly be unnecessary, as the cable, wound on the reel on the locomotive, will reach a distance of 300 ft., or more than double the distance that a heading would ever be driven beyond the last crosscut, unless it is for the purpose of prospecting the seam. Ordinarily, a heading will not be advanced more than 50 or 60 ft., though the Bituminous Mine Law gives the maximum distance allowable as 35 yd. beyond the last open crosscut.

The point that must be borne in mind, in this connection, is the expense and annoyance of cutting the trolley wire into short lengths and splicing them, whenever it is necessary to extend the trolley line. The more splices that are made in a trolley wire, the greater the risk of a break occurring and causing a possibly fatal accident.

If the mine is generating gas, I would much prefer keeping the dead-end of the trolley line as far back from the face of the heading as convenient, and depend on the length of the cable reeled on the locomotive for hauling the cars from the face of the heading. A 300-ft. length of trolley wire can be put up more perfectly when it becomes necessary to extend the line; and this will give better satisfaction than when the extension is made in shorter lengths, all of which goes to make for efficiency and economy in mine haulage. SAMUEL MCKAY.

Burgettstown, Pa.

Letter No. 2—Referring to the question of how far the dead-end of a trolley wire should be located from the face of a heading, in mine haulage, allow me to say that, as a mine official, it has been my practice to consider this problem much as I would that of ventilation.

Section 64 of the West Virginia mining laws plainly states that the mine foreman "shall not permit any room to be opened in advance of the ventilating current." In my opinion, this is a good rule to apply to the extension of a trolley wire in a heading. The West Virginia law makes no mention of how far a trolley wire may be carried in approaching the face of a heading.

However, the mining law of Ohio states (Sec. 947) as follows: "No trolley wire shall be extended into or maintained in any room while being used as a working place; no trolley or feedwire shall be extended into any entry beyond the outside corner of the last breakthrough." It will be seen that this statement, in the Ohio law, supports my practice in regard to the dead-end of a trolley line. DICK.

Oak Hill, W. Va.

Supporting Mine Roof

Letter No. 4—The question of adopting suitable means of saving timber, which is of growing importance throughout the Pittsburgh district, will soon be of equal importance in all mining districts. Before considering other means of supporting the roof than by the common method of timbering, it would seem best to draw attention to the need of adopting a systematic method of timbering that is designed to meet the particular conditions in each mine.

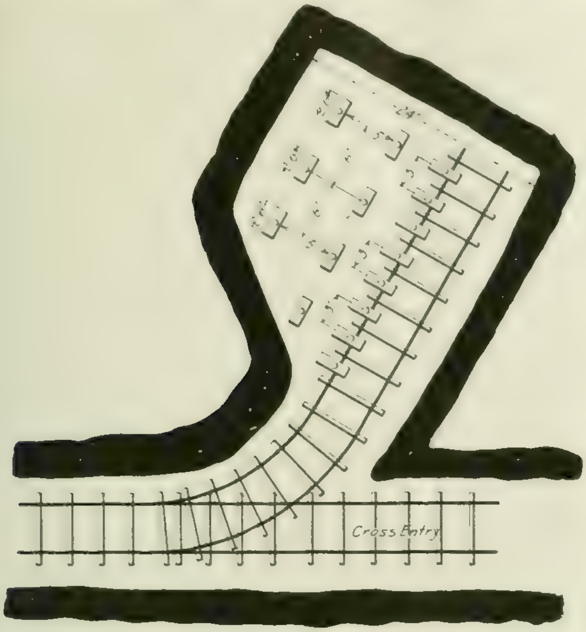
While I am a firm believer in systematic timbering, let me say that there is no hard-and-fast rule that will apply to every mine. For that reason, the question of timbering the working places must be left to the judgment and experience of the mine officials in charge. Such a system must be used as will best meet the conditions of roof, floor and coal, in the seam mined. These conditions are constantly changing with the varying character of both roof and floor. They are not constant, even in the same mine; and must be carefully watched to determine what changes, if any, should be made in the style of timbering in use.

RULES THAT APPLY TO EVERY MINE

There are some general rules that will apply to every mine and district; such are the following: 1. Rules and regulations regarding timbering must be enforced and strictly obeyed. 2. The distance apart and the manner and time of setting the posts in working places must be clearly specified. 3. A plentiful supply of timber of the right size and length must be kept on hand, in each working place. 4. The timbering, in each place, must be regularly inspected by the foreman or his assistant, in order to see that the rules regarding timbering are obeyed. 5. There must be no haphazard methods employed where posts are set in the most convenient place, because the miner is allowed to follow his own inclinations and permitted to use his own judgment. 6. The setting of a post must never be left until the roof is plainly loose and unsafe. Such a practice entails an avoidable risk. Delay in posting and lack of judgment are the cause of many accidents.

Turning, now, to the question of steel timbering, the use of steel girders and posts has proven a most effective means of supporting the roof on roads and entries. For this purpose, different shapes and sizes of steel are used for posts and girders. These consist of I-beams and channel bars, either single or combined. Some special form of chair is generally employed where the girder rests on the head of the post. These steel sets are cut to the right length and properly fitted together at the shop where they are manufactured, and are ready to be placed in position when sent into the mine.

When steel timbering is used in the rooms, heavy cap-pieces of wood are placed on top of the posts and against the roof to give better support to the latter. In the accompanying figure, I have illustrated the plan of setting steel posts with wood caps, in a room turned off an entry. As shown in the figure, a row of posts is set at the side of the track, these posts being spaced 3 ft. apart and surmounted with cap-pieces 3 ft. long, which project well over the rail. The caps are 4 in. wide and 3 in. thick. It is frequently necessary to set two or three rows of posts in the gob, to support the roof while the room is being driven up to the limit. These caps are 30 in. long and have the same width and thickness as those at the roadside. The cap-pieces in the gob are set at right angles to those along the road and, as shown in the figure, the posts can be spaced 6 ft. apart and 5 ft. between the rows, where the room is driven a clear width of 8 yd.



STEEL TIMBERING IN A ROOM

Rolled-steel posts of the girder pattern are used for propping the longwall face in a few mines in England, and have given satisfactory results. Cast-iron props were extensively used at the large collieries of the Stavely Co., Derbyshire, England, and at a few other mines; but these have not given satisfaction, as they break without warning, under certain pressure. On the other hand, rolled-steel props will bend under the pressure of the overlying strata and can be taken out, straightened and used again. The steel posts set in rooms are taken out when the rooms are abandoned, and these drawn posts are used over and over again, in driving other places.

William Dickinson, Sr.

Oak Hill, W. Va.

Tamping Dynamite

Letter No. 3—In his letter, *Coal Age*, Jan., 29, p. 244, Gaston F. Libiez does not agree with the answer given to the question, "Is it necessary to tamp holes charged with dynamite?" The answer referred to appeared in *Coal Age*, Dec. 25, p. 941. It stated that it is not necessary to tamp such a charge, owing to the fact that the detonation of the dynamite is instantaneous and the force of the explosion is radiated equally in all directions from the charge.

In regard to this question, I wish to say, that my experience of more than 30 years as a miner, in the handling of dynamite, has been that the untamped hole gave the same results as the one tamped. I have worked with miners who persisted in tamping their dynamite holes hard, hammering and pounding the stemming down on the charge. I have also observed that these heavily tamped holes gave no better results than those not tamped so hard. I find that, as a general thing, a wad of paper pushed in on the charge to hold it in place gives as good results as hard tamping.

Mr. Libiez says, "The full tamping of a dynamite charge should be recommended if only for the purpose of stopping the practice of miners who use a short fuse, light and shove it into the hole and then run like the devil to get out of the way." Allow me to say, I do not approve of the use of the short fuse, as practiced by some miners; but, while I regard it as more or less dangerous, I do not think it is any more so than the heavy tamping of dynamite charges.

I recall one instance where a miner persisted in tamping his dynamite charges so hard that other miners did not like to be in his place while he was tamping. He was warned time and again of the danger of the practice and told it was unnecessary; but he would not be convinced of that fact. One day miners working next to him heard him pounding the tamping in on a dynamite charge, which exploded, killing him instantly.

Mr. Libiez thinks it a pity that practical miners will use so little judgment in using the short fuse. To me it seems equally as much a pity that practical miners will not learn that it is not only dangerous but unnecessary to tamp dynamite charges hard.

John Rose,

Dayton, Tenn. Former District Mine Inspector.

Letter No. 4—Referring to the question of the need of tamping a charge of dynamite, the discussion of which grew out of the reply to an examination question that was answered in *Coal Age*, Vol. 16, p. 941, my opinion is that the tamping of dynamite is advisable, although it cannot be said that it is absolutely necessary; because, as stated in the reply to the question, the detonation of the charge is instantaneous and the force is distributed equally in all directions.

It is well known that an explosion of a charge of any explosive acts in the direction of the line of least resistance. In my experience, I have had some large boulders to break and have always found that the work was performed more safely, economically and efficiently, by drilling a hole toward the center of the rock and inserting from a half- to one entire stick of dynamite; instead of placing from eight to ten sticks of the explosive on top of the rock, as is sometimes done in order to save the work of drilling. The smaller charge, located in the heart of the boulder, will do more work than the greater charge placed on top of the rock; because the force of the latter reacts only against the air, which offers small resistance.

Permissible Powders Should Be Tamped

Now, the permissible powders that are being so much used in mining resemble dynamite but are considerably weaker. In their use it is necessary to tamp the hole if good work is expected. It is my belief that all holes should be tamped full to the top or mouth of the hole, with incombustible material, which will make the charge do far better and safer work than when no tamping is placed in the hole.

The writer of Letter No. 1, *Coal Age*, Jan. 29, p. 244, speaks of the practice of miners of using a short fuse, lighting and shoving it back into the hole and then running to safety. I have seen men cut an 18-in. length of fuse, put a cap on the end of it, light the fuse, shove the primer into the hole and run. It is such practices that keep the accident list increasing. It is a careless and reckless manner of shooting.

The most efficient and safest way of firing either dynamite or permissible powder, in blasting coal in mines, is to employ competent shotfirers, who should use nothing but electric caps and batteries for firing. The work should be done after the men have gone.

Johnstown, Pa. SAK.

Effect of Wire Gauze on Flame

Letter No. 2—Referring to the interesting letter of R. Z. Virgin, assistant professor of mining, Carnegie Institute of Technology, Pittsburgh, Pa., which appeared in *Coal Age*, Feb. 12, p. 324, the author prefaces his remarks with the statement that "the effect of the wire gauze. . . is a question that always creates much interest in the minds of young men who are studying the science of mining." Let me suggest that the same question is interesting, also, to older and more experienced men, which is my apology for commenting on the letter mentioned.

Professor Virgin will pardon me in saying that, reading carefully, he will observe that the question he quotes, as being one "often asked in mining examinations," calls for the conditions under which flame will pass through the gauze of a safety lamp; and, in his explanation, the professor gives but one condition that will allow the passage of flame, namely, the heating of the gauze to a temperature approaching the ignition point of the gas, which he states is 1212 deg. F. The question quoted appears in *Coal Age*, Dec. 11, p. 902, where the reply given by the editor enumerates four or five conditions under which flame will pass through the gauze of a safety lamp.

In this connection, I recall an interesting experiment performed by M. Marsaut, a few years ago, in France. The experiment is a simple one designed to show that flame will pass through the mesh of the gauze of a safety lamp, owing to an explosion within the lamp and when the gauze is perfectly cool. In this experiment, an inverted belljar was filled with pure gas (methane) and a safety lamp raised quickly into the gas filling the jar. The fresh air contained in the combustion chamber of the lamp now forms a highly explosive mixture with the gas entering the lamp and an explosion follows that forces the flame through the gauze.[1]

The Marsaut experiment has not received the attention that it deserves, although its author explains that the result was "due to the cannon effect set up by the explosion within the lamp, the force of which, being confined within the chimney, can only escape at a high velocity through the mesh of the gauze and cause the failure of the lamp."

Conditions in Mining Practice That May Cause a Lamp to Pass Flame

Again, the Prussian Safety Lamp Commission proved that a Clanny gauze with a smoke cap was more dangerous than one without the smoke cap, owing to the top of the gauze chimney becoming more clogged with smoke particles, which are liable to transmit the flame through the mesh. Likewise, a lamp exposed to a dust-laden atmosphere may pass flame at a very low velocity, owing to the accumulation of the fine dust on the mesh of the gauze.

A mixture of 4½ per cent of gas in the air, when dust is present, has been found to pass flame, at a velocity of only 6 ft. per sec., in the short space of 10 sec. This occurred in a Davy lamp, but it is probable that the same is true of a Clanny lamp. It cannot be claimed that experiments performed in the laboratory, showing lamp failures, do not prove like results in ordinary coal-mining practice, since there are on record a number of actual failures of safety lamps when in use in the mines.

Experimental vs. Practical Test of Lamps

My observation leads me to conclude that a lamp is more liable to fail when in actual use in the mine than when subjected to an experimental test in the laboratory. A lamp that was known to have failed in the mine did not pass flame when subjected to a later test, under a similar velocity, in the testing chamber of the laboratory. The cause for this was probably due to the presence of dust in the mine air and its absence in the test made in the laboratory.

I am drawing attention to these facts relating to the passage of flame through the mesh of a safety lamp to show that there are numerous conditions other than the heating of the gauze that will cause the failure of the lamp when in use. M. Marsaut was so convinced of the danger attached to a single-gauze lamp that he added a second superimposed gauze, and even a third gauze, for increased protection in a highly gaseous mine. The double and triple gauzes are the characteristic features of the Marsaut safety lamp.

It would seem that the subject of safety lamps has not received as much official attention from the Federal Bureau of Mines as we could expect. However, when the Miners' Lamp Committee of the British Home Office makes its report, these matters may be shown to have more than an academic importance. Let us hope that such will be the case.

James Ashworth,
Consulting Mining Engineer.

Livingstone, Alberta, Canada.

Promotion of Ambitious Workers

Letter No. 10—The subject of promotion of workers is one that appeals to all classes, but more particularly to the young coal miner who is ambitious and anxious to get away with a good start in life. In the discussion of the subject in *Coal Age*, it is interesting to note the many viewpoints expressed. These varying views are educational in a way, as they give us an insight into the difficulties many young men experience when trying to better their condition; and the narration of these should assist mine managers to gain a broader understanding of the merits of promotion for their workers.

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[1] [illegible] for gas, attention has fre- [illegible] the fact that the moment [illegible] a flaming lamp [illegible] chamber of the lamp, in this case, is filled with the gas and the entrance of fresh air, [illegible] a highly explosive mixture within, which is liable to explode and force the flame through the gauze. This illustrates the same idea as that brought out [illegible]

Turning the matter over in my mind, it appears to me that the difficulty of the situation is the natural shortage of responsible positions and vacancies. As compared with the number of aspirants for these positions, the number of places available to them is relatively small. This aspect of the case, however, is not as serious as it was a few years ago; because of the higher wages now paid for general labor, which gives men less incentive to strive for higher positions.

In Filling Vacancies, the Qualifications and Fitness of Each Applicant Should Be Considered

It is a difficult matter, at times, to fill a vacancy without causing disappointment to someone. However, in order to maintain an efficient organization and encourage a spirit of mutual co-operation among the employees, it is necessary that every applicant for the position should be fully considered. Family connections or influence of any kind should not control the selection of the man for the place. On no account, should an outsider be chosen to fill one of the minor vacancies underground. Such positions should be open only to the men working in the mine, and the choice should be determined by the qualification and fitness of the several applicants.

In a mine where these conditions do not prevail, however, I would advise the ambitious young man to seek employment in another field where his capabilities will receive just recognition. There is always a demand for capable men, and the experience gained by working under varying conditions in different mines will always be an asset that will prove valuable to the man, in his future career.

True merit has always had its reward. If the ambitious worker will only realize this and keep pegging away, fully determined to gain recognition, success will assuredly come to him. Competition is so keen that no coal company can afford to hold a man in a responsible position who is not thoroughly efficient. For that reason, every worker must stand on his own feet, knowing that his rise or fall will depend on the results of his work.

Successful Management Recognizes the Human Element in the Treatment of Men

The mine manager's ability, today, is not measured by his knowledge of mining alone; he must be a man who understands that running a coal mine is no one-man's job, and that his own success or failure is governed to a large extent by the work of his subordinates. The human element must be considered and fully understood. Unless there is a measure of co-operation between the mine manager and his subordinates, and between these subordinates and the other employees, it is impossible to get efficiency. When all has been said and done efficiency is simply having the right man in the right place.

Let me say, here, that it is not good policy for any company to appoint an outsider to an official position if the said position can be filled by promoting some ambitious employee. The mere fact that the ability of one man has been recognized and rewarded will give others encouragement to study and prepare themselves for future promotions. In every such case, the organization is strengthened and improved. In order to get results, under present-day conditions, the mine manager must have his entire force, in and around the mine, working in one direction; and, to accomplish this, he must take a personal interest in every employee, from the trapperboy up, and assist in every way possible those who are anxious to improve their position in the mine.

Importance of Rewarding Ability and Push When Observed in a Subordinate

The competent mine manager is never afraid of the ability or push of any of his subordinates; and where it can be proved that the mine foreman actually discharges a subordinate who shows initiative, the company should lose no time in filling his place by giving it to the subordinate. The same rule applies to the subordinate's dealings with the men who are working under his charge.

Where a man is capable he is never afraid of losing his position. The position should, without exception, seek the man and, invariably, the capable man can get his price. To attain this enviable position, however, means many years of hard, conscientious work and study, and strict attention to duty. Loyalty to one's company is also a big factor. The path to success is open to every man who has the grit to smile at disappointments and rise above them. The man must have faith in himself; no man is a failure, until he decides so himself. The young man who relies on his family connection or influence for advancement is going to meet with many disappointments. Let me advise him here to get some well-defined object in view, and go after it fully determined in his own mind that he is going to reach his objective, and he most assuredly will.

J. H. McMillan, Supt.,
Jasper Park Collieries, Ltd.
Pocahontas, Alberta, Canada.

[This letter will close the discussion, "Promotion of Ambitious Workers."—Editor.]

Lawful Examination of a Mine

Letter No. 12—I have been greatly interested in the discussion running in *Coal Age*, regarding the lawful examination of a mine. For the past nine years, I have worked under the ruling contained in the mining laws of Ohio and believe that there is no better system in use anywhere, in any coal-mining state. At the present time, the mining of coal, in Ohio, is regulated and controlled by the Industrial Commission, who are responsible for the enforcement of the state mining laws.

Under the heading, "Competent Person or Persons Shall Be Designated as Fireboss," Sec. 925 of the mining laws of Ohio, reads as follows:

"The owner, lessee or agent of a mine generating firedamp so as to be detected by a safety lamp shall designate a competent person or persons as fireboss or firebosses, who shall make a thorough examination of each working place in the mine every morning with a standard safety lamp, not more than three hours prior to the appointed time for employees to enter the mine. As evidence of such examination, the fireboss shall mark with chalk upon the face of the coal, or in some conspicuous place, his initials and date of the month upon which the examination was made. If there is any standing gas discovered, he must leave a danger signal across every entrance to such place."

My opinion is that the requirements of this section far exceed those of any system of mining laws that will permit a fireboss to enter a mine and start his examination from six to eight hours before the time appointed for the men to enter for work. Mention has been made of the mining laws of Illinois, which permit the fireboss to start his examination of the mine "within eight hours preceding the time the dayshift goes on duty." In my judgment, such a law should be revised, and the sooner it is done the better.

MINE FOREMEN AND MEN MUST RESPECT AND OBEY THE INSTRUCTIONS OF A FIREBOSS

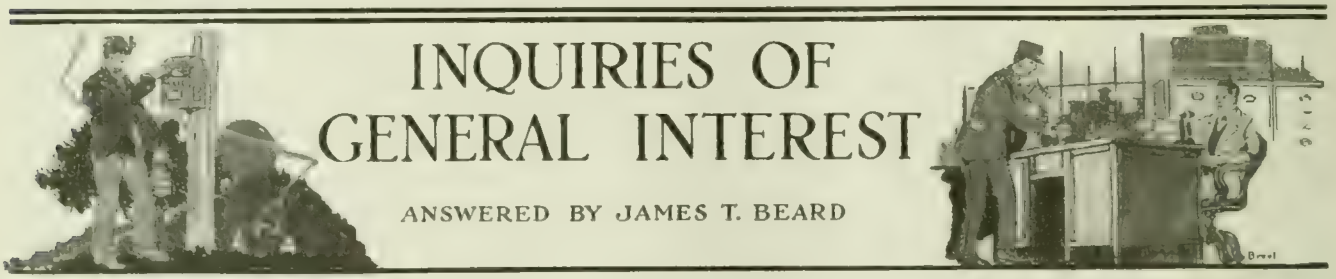
Another important feature in the work of firebossing is the carrying out of the orders of the fireboss. When the examination has been completed and the fireboss has entered his report in the book kept for that purpose, and has informed the mine foreman of the conditions in the mine or section of the mine he has examined, he should have the full assurance that his suggestions are respected and his orders are carried out and obeyed. It must be admitted that numerous accidents have resulted, in different states, owing to some persons having been dilatory in not performing their duties, or where the orders given by the fireboss have not been obeyed. This is a matter that calls for the earnest consideration of mine officials.

I can fully endorse what is said by "Ben," of Thomas, W. Va., in his letter, *Coal Age*, Feb. 26, p. 415. He states, "Each section should be of such size that an assistant foreman could have complete supervision of its working places in each shift"; and adds, "At a large mine all section foremen should meet two hours before starting time, enter the mine at the same time, and again gather on the outside to compare notes of their examinations, before permitting the men to enter the mine." While this system would require more mine examiners and increase the expense, I fully believe that, if required by law, it would have the effect of reducing the number of accidents, especially where bad conditions exist.

JAMES H. TAYLOR.

Poston, Ohio.

[This letter will close the discussion, "Lawful Examination of a Mine."—EDITOR.]



INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD

Short-Circuiting or Obstructing Air in Fan Ventilation

A short time ago the question came up, at one of our mine foremen's meetings, regarding the effect produced on the water gage and the speed of the fan by either short-circuiting the air current or obstructing its flow in the airway. This question was referred to *Coal Age*, at the time, and the reply given stated that the short-circuiting of the air cut out the mine resistance and reduced the water gage, but the air volume was largely increased, assuming the power on the air remained constant. On the other hand, obstructing the airway *increased* the resistance and the water gage and *decreased* the volume of air passing.

In response to an inquiry sent to the manufacturers of the fan, a bulletin was received bearing on the point in question. Inasmuch as some of the statements in this bulletin appear to be at variance with the generally accepted theory as set forth in textbooks, I desire to make a few quotations from this bulletin, hoping for a thorough discussion of the matter. One statement reads as follows:

> [illegible] understanding, among certain [illegible] of a fan under certain conditions. For instance, some men keep a watchful eye on the water gage, in the hope that they will detect falls in their airways. This practice comes from their belief that as soon as the airways become clogged, the water gage goes up. But this is not true [illegible] normal capacity, and at a constant speed, produces a constant pressure, and to look for falls in the airways with the fan running at normal capacity is misleading.

Again, the bulletin states:

> To illustrate: Let us suppose a fan of given dimensions to be running at a certain speed and producing, say, 3 in. water gage in the fan drift. Now, if the fan drift leading to the mine is closed off, any increase of water gage will show that the intake or discharge area of the fan is too small. This condition is described by saying that the fan is working above its normal capacity and is therefore mechanically inefficient. If the intake and discharge areas of a fan are properly proportioned to its other dimensions, or when a fan is not working above its normal capacity, the same speed of fan will produce the same water-gage reading in the fan drift whether or not the air is passing.
>
> Again, if the air current is short-circuited when the fan is working up to its normal capacity, so that the circulation does not pass through the mine but is discharged from the fan drift into the atmosphere, a larger volume of air will pass through the fan and, as a result, a greater portion of the depression due to the fan's action, will be absorbed within inself. The reading of the water gage will then be lower than when tne air current is circulating through the mine, the speed of the fan being the same in each case. Notice, however, that if the fan is not running up to its normal capacity when the air is short-circuited, no appreciable effect will be observed in the reading of the water gage, until enough air is short-circuited to bring the fan up to its normal capacity.

After a discussion of the statements just quoted, it was decided to experiment, for ourselves, on the fan in question. Accordingly, the first day that the mine was idle, the mine foreman, electrician, two assistant foremen and myself started for the fanhouse. The assistant foremen were sent to the bottom of the shaft, while we took readings of the speed of the fan and the water gage and quantity of air produced, in the fan drift.

It should be stated, here, that there were three roads leading to the bottom of the shaft. The men had already blocked up two of these roads with brattice cloth; but there was, no doubt, air leaking through these stoppings, as they were by no means tight. The results were as follows:

	Speed of Fan r.p.m.	Quantity of Air c.f.p.m.	Water Gage in.
Normal working	147	56,000	1.2
Two roads blocked............	147	46,000	1.4
Opening 25 sq. ft..............	148	21,750	1.5
Airway closed	150		1.6
Air short-circuited............	145	....	0.6

These results appear to show that when the air-course was obstructed the water gage was increased and the air volume diminshed. The fan running normally at a speed of 147 r.p.m. produced 56,000 cu.ft. per min., against a water gage of 1.2 in. Blocking off two of the roads reduced the air volume to 46,000 cu.ft. per min. and increased the water gage to 1.4 in., the speed of the fan remaining practically the same.

Now, when the opening in the third airway was reduced to 25 sq.ft., the air volume was reduced to 21,750 cu.ft. per min., and the water gage increased to 1.5 in., while the speed of the fan was increased to 148 r.p.m. Finally, when the last airway was closed as completely as possible so as to cut off the air, the water gage rose to 1.6 in. and the speed of the fan increased to 150 r.p.m. The leakage of air through the improvised stoppings could not be measused in the fan drift.

In the last test, all of the airways were open and the air short-circuited, by opening the doors at the foot of the shaft. The result was a large increase of air volume, for which no satisfactory measurement was obtained. The water gage dropped to 0.6 in. and the speed of the fan decreased to 145 r.p.m. This is in exact accordance with the theory that has often been stated in *Coal Age*, but it appears to be at variance with the statement I have quoted from the bulletin of the manufacturer of the fan.

May I ask if *Coal Age*, or its readers, can throw some further light on this interesting subject and explain what is meant by "normal capacity of a fan." This should lead to an interesting discussion.

McIntyre, Pa. THOMAS HOGARTH.

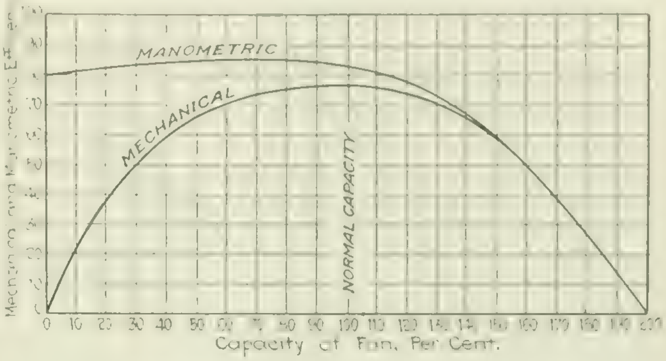
The results obtained in the experiments performed by this correspondent agree with the claim often made in *Coal Age*, that when the air current produced by a centrifugal fan is short-circuited at the foot of the shaft, the water gage drops and the air volume is greatly increased. The passage of this larger quantity of air through the fan causes an increased resistance and a larger proportion of the power is absorbed within the fan itself, which leaves a less power available for turning the fan and causes it to run slower.

On the other hand, any obstruction in the air-course, as a considerable fall of roof or otherwise, increases the resistance in the mine and the water gage rises accordingly. In this case, the air volume is reduced, less power is absorbed within the fan and a larger amount of power is thus available for turning the fan, which then runs faster.

Referring to the statements quoted from the bulletin, it appears that reference is there made to a particular type of stepped, multiblade fan, whose water gage and air volume are rated on a certain so-called "normal capacity." It would seem that this normal capacity is an arbitrary rating, depending on the speed of the fan that will give a maximum mechanical efficiency, according to the size of its intake and discharge openings.

Judging by the statement quoted from the bulletin, the claim appears to be made that where these openings are properly proportioned to the other dimensions of the fan, the water gage is a function of the speed, regardless of whether the fan is circulating any air or not. This statement does not accord with our practice in fan design, which has been to regard the water gage as a function of the mine resistance. To eliminate the resistance against which a fan must operate is to eliminate the water gage in the fan drift.

However, it is quite possible that the type of fan referred to in this inquiry does not conform to the principles that govern a fan whose dimensions are proportioned in accordance with and dependent on the mine potential or resisting power of the mine, as determined by the ratio of the area of passage in the mine, to the cube root of the rubbing surface of the airways, or the ratio of the quantity of air in circulation to the cube root of the power on the air. The two methods of computation are so radically different that there is no comparison to be made between them. The author of the bulletin, in explanation, writes as follows:

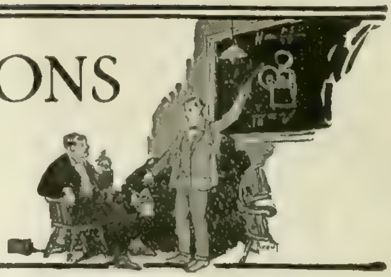


> I term 100 per cent as the normal capacity of the fan; that is, the fan will work efficiently 20 per cent above and below this point. If the airways are entirely closed off, of course no air will be passing and the efficiency of the fan will be zero; but a certain static pressure will be produced in the drift.
>
> Now, if the drift is opened up so that, say, 30 or 40 per cent of the normal capacity of the fan can pass, the water gage will rise a little; but this is scarcely worth while taking into consideration. In fact, the average mine man would not detect it on his water gage reading. If we keep on opening up the mine, until sufficient air is passed to bring the fan up to its normal capacity, the water gage will be about the same as when the mine is entirely closed off.
>
> Beyond this point, however, if we keep on lessening the mine resistance, by short-circuiting the air, naturally part of the depression produced by the tips of the blades will be consumed in drawing the air through the fan itself, which causes a fall of the water gage in the mine drift. This will continue, until the mine is thrown wide open and the static gage is reduced to zero, as is also the efficiency.

According to the bulletin, in the former case, the fan would be working above its normal capacity and, in the latter case, it would be working below its normal capacity. The same author presents a diagram representing the characteristic curves of a stepped, multiblade fan, which we have reproduced here for a better understanding of the author's meaning, in the quotations from the bulletin mentioned. The diagram shows that, at normal capacity, the fan has a mechanical efficiency of 77 per cent and a manometric efficiency of 83 per cent. The question is worthy of thoughtful discussion that it is hoped will reveal some new principles in fan ventilation.

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD



Indiana Firebosses' Examination Held at Indianapolis

(Selected Questions)

Ques.—(a) Give a full description of a safety lamp. (b) What is its essential characteristic? (c) In what condition and under what circumstances may a safety lamp be unsafe?

Ans.—(a) A mine safety lamp consists of an oil vessel of brass, aluminum or steel, surmounted by a glass cylinder, forming the combustion chamber of the lamp, above which is a wire-gauze chimney that permits the escape of the hot air and gases formed in the lamp, but prevents the passage of flame through the mesh of the gauze, by reason of the cooling effect of the wires of the gauze. In the Davy lamp, the glass cylinder is omitted and the wire-gauze chimney is attached directly to the oil vessel. A small rod or "pricker" runs up through the oil vessel for use in raising or lowering the wick. Practically all other types of safety lamps, like the Clanny, have a glass cylinder surrounding the flame.

(b) The essential characteristic of all safety lamps is the isolation of the flame by wire gauze, which protects all openings to the lamp.

(c) A safety lamp is unsafe when any part is defective; the lamp improperly assembled or carelessly handled; the gauze dirty or allowed to become heated by too long exposure to gas; or the lamp exposed to a strong air current or blast of air. A safety lamp should never be entrusted to an incompetent person.

Ques.—(a) Describe in full your whole procedure in the inspection of a gaseous mine. (b) What unsafe conditions would you observe other than the presence of firedamp?

Ans.—(a) Before entering the mine, inspect and prepare the safety lamp for use. Observe that the ventilator is working properly and note the reading of the water gage as indicating a normal condition of the circulation underground. Then, having entered the mine, proceed to the bottom of the downcast shaft or the main intake air-course and observe that the usual volume of air is passing into the mine.

Beginning at the intake end of the section of the mine to be examined, follow the air current while inspecting each working place, travelingroad or airway. Examine each place for gas and other dangers that may be present. Write the date at the face of each place examined, as evidence of your presence, and observe what timber is on hand and coal loaded.

When the examination is completed, on returning to the shaft bottom, enter in the book kept for that purpose a full report of the examination, stating what dangers, if any, have been found and where located. Date and sign the report, after which remove from the board the checks of those men whose places contain any danger. This must be done before permitting the men to enter the mine. The checks taken from the board are given to the mine foreman, who is informed of the conditions as they exist in the mine.

(b) Besides making the usual examination for gas, the fireboss should carefully inspect the roof and working face to detect any bad top or loose coal that may be dangerous, and observe if any timbers have been discharged by a shot the previous night.

Ques.—(a) Give the essential requirements for a well ventilated mine. (b) Why is it necessary to take measurements of air at certain intervals throughout the mine?

Ans.—(a) The volume of air in circulation must be sufficient to comply with the requirements of the state mining law and as much more as may be necessary to dilute and sweep away the gases generated in the mine and make it safe for work. The air current must be conducted so as to sweep each working face and all void places and falls, so as to prevent the accumulation of gas. To do this will require air-tight stoppings, doors and air bridges and the building of brattices wherever this is necessary to carry the air forward to the face or make it sweep the falls.

(b) Air measurements taken at different points on the air-courses and throughout the mine serve to show where air is leaking through poorly built stoppings, doors, etc. These measurements also show the proper distribution of the air between the several sections or districts of the mine.

Ques.—(a) What elements determine the ventilating pressure in a mine? (b) What determines the resistance? (c) How is the resistance measured?

Ans.—(a) The ventilating pressure (pa) is the total pressure producing the circulation and is determined by the resisting power of the mine. The ventilating pressure is equal to the unit pressure (lb. per sq.ft.) multiplied by the area of the airway, in square feet.

(b) The resistance of a mine or airway is determined by the extent of its rubbing surface and the velocity of the air current, which, in turn, depends on the power producing the circulation.

(c) The resistance is measured by observing the reading of the water gage in the fan drift. This reading, in inches, is multiplied by 5.2 and that product by the sectional area of the fan drift, in square feet.

Ques.—What is a booster fan? Do you consider a booster fan practicable? Give reason.

Ans.—A booster fan, in mine ventilation, is a small secondary fan, installed at some point in the mine where the circulation of air is deficient. Its purpose is to assist the work of the main fan on the surface.

A booster fan is only practicable as affording a means of reducing the leakage of air through poor stoppings, in a section of a mine that is about finished, and where it is cheaper to install a booster than to repair the stoppings, which will be needed but a short time.

Freight Cars Are More Widely Scattered Than Ever

Car Service Commission Invested with Plenary Powers in Efforts To Secure Return of Cars of Special Type

RAILROAD freight cars have fallen into worse need of repair and are more widely scattered than at any time since Jan., 1918, when the railroads came under Federal control, according to an article appearing in the current issue of *American Railroads*, the official organ of the Association of Railway Executives.

Regarding the efforts being made by the Commission on Car Service of the American Railroad Association to reassemble scattered rolling stock the article states:

"The Commission on Car Service, acting under an agreement signed by the various railroads to abide by and enforce the car service and per diem rules and authorizing the Commission on Car Service to act as its agent in all car service matters, is making an effort to secure the return of special types of cars as expeditiously as is practicable in view of all the conditions, but in order to meet emergencies it is invested with plenary power to suspend or permit departures from the rules requiring the return of cars to the home roads and to transfer cars from one railroad or territory to another when necessary to meet traffic conditions.

"It is also authorized to exempt when necessary cars of any type from the provisions of the rules and to provide other regulations under which such cars shall be handled and it is directed to co-operate with the Interstate Commerce Commission in all car service matters.

"Normally, approximately 50 per cent of the freight cars are away from home, but usually the bulk of them are on the lines of direct connections which are likely to use them for a return load. At the beginning of Federal control, according to the recent annual report of the Division of Operation of the Railroad Administration, 44 per cent of the freight cars were on home lines. On January 1, 1919, the figure stood at 26.6 per cent.

"Special attempts were made in the early part of 1919 to relocate cars more in accordance with ownership, with the idea of getting the cars to the home road so that extensive repairs and betterments might be completed, and also in part because of the prospective return of the railroads to private management.

"By July 1, 1919, 31.7 per cent of the cars were on home lines, but at the present time the number of cars on home lines has again declined to about the same point as January 1, 1919, or approximately half of what may be considered the normal condition. The other 75 per cent of the cars are scattered throughout all parts of the country.

"Exact information as to the present condition of the equipment is not available because the roads have not seen many of their own cars for a long time, and the entire subject is a matter of dispute between the railroad companies and the Railroad Administration, which was obligated by its contracts as well as by the Federal Control Act to return the property of the railroads in the condition in which it was taken over or to pay for any deficiency.

"During January of this year out of 2,453,227 freight cars on the lines of the railroads under Federal control 6.6 per cent were reported as unserviceable, as compared with 5.8 per cent during January, 1919, and 5.4 per cent in January, 1918, according to the reports of the operating statistics section of the Railroad Administration. These figures did not include 19,300 cars set aside and classified by the Railroad Administration as condemned cars, which it would not repair, but held out of service until the owning companies should agree to their dismantling."

Railroads Call Meeting To Arrange To Continue Soft-Coal Pool

Lines Using the Ports of Baltimore, Philadelphia and New York Contemplate Voluntary Plan of Control

AS President Wilson's proclamation requiring all bituminous coal for transshipment to be consigned to the pools of the Tidewater coal exchanges at Atlantic ports will expire April 30, the various railroads transporting bituminous to the ports of Baltimore, Philadelphia and New York have called a meeting of interested shippers and carriers to be held in the Bellevue-Stratford Hotel, Philadelphia, at 2 p.m. Wednesday, March 31.

Consideration will be given at this meeting to the question of continuing by voluntary action the handling of bituminous coal for transshipment through the several pools after April 30. As this is of great importance to shippers and receivers as well as the railroads, a large attendance of the various interests involved is expected.

The Wholesale Coal Trade Association of New York, Inc., sent the following notice to its members calling attention to the proposed meeting: "Pursuant to the following resolution adopted at a meeting of the principal Tidewater bituminous coal railroads using the Ports of Baltimore, Philadelphia and New York, a meeting of shippers and transshippers of bituminous coal through these ports and of the railroads serving them is hereby called for Wednesday, March 31, at 2 p.m., at the Bellevue-Stratford Hotel, Philadelphia, Pa.

" 'Whereas, by the withdrawal from the Tidewater Coal Exchange after April 30, 1920, of the railroads serving Hampton Roads, it is necessary to consider the result as to the Tidewater Coal Exchange at the Northern Ports:

" 'Resolved: That Tidewater and originating bituminous railroads serving the ports of Baltimore, Philadelphia and New York, believe that an effort should be made to continue the pooling of Tidewater bituminous coal.

" 'While these railroads are averse to continuing the sole financial support of the exchange, as at present, they are willing to bear a fair share of the cost of operating it, if it can be continued with assurances of sufficient tonnage.

" 'To this end a meeting of Tidewater bituminous coal shippers and transshippers using the ports of Baltimore, Philadelphia and New York and of the railroads serving those ports and originating the coal, should be called at the earliest practicable moment to consider what arrangements can be made between the railroads and the shippers and transshippers, for the continuance of pooling.' "

Railroads Ordering Much Equipment with Return to Corporate Owners

Inquiries Indicate More Extensive Orders Are About To Be Placed—Huge Terminal Projects Are Expected Soon—Steel Work Delayed by Car Shortage—Prices Holding Many Orders Back

INQUIRIES forecasting extensive purchases of equipment are making their appearance with the return of the railroads to their corporate owners. A flood of orders was expected with the relinquishment of federal control, but this expectation has not yet been realized. The volume of orders for equipment has been delayed by the following factors:

1. Expectation of a drop in iron and steel prices. It is the opinion throughout the country that the prices now holding have reached their peak and will take a final downward turn shortly. In fact, a few orders have been placed recently in the steel trade in which it was stipulated that the price should be that quoted at the time of delivery.
2. Decision as to freight increase shortly to be handed down by the Interstate Commerce Commission.
3. Extension of credit for the purpose of purchasing new equipment. It is believed this extension of credit will be somewhat increased by the decision handed down recently by the Supreme Court to the effect that the properties of carriers are to be valued at present prices.
4. Present wage situation and scarcity of labor. The present wage is to be maintained for six months longer by act of Congress, but the scarcity of labor is expected to be relieved by a reduction of wages in other quarters.

The withdrawal of the dissolution suit against the U. S. Steel Corporation has not been a market factor. While exports of iron and steel showed an increase in February in the face of unfavorable rate exchanges so far this month the situation has reversed. In fact, European business is almost at a standstill.

Car Shortage Is an Important Factor

Production is now at the highest rate it has been in a year and the prospects for a further increase are good. Of the finished products, sheets are the scarcest.

In the Pittsburgh district one of the greatest factors operating right now is the shortage of cars—the car supply being about 40 per cent of normal. This acts directly on the pig iron output, as the deliveries of coal to the blast furnaces are away below normal.

Although the making of extensive purchases of railroad equipment is being held up, necessary purchases have been made or are in way of being negotiated. Since the first of the year about 1,200 locomotives have been bought or are being negotiated for at the present time. Contracts for 25,000 cars are expected at an early date.

There are three great terminal projects, one already under process of construction and construction on the others is expected to start soon. Of these, the Chicago Union Station program, which has been under way for some time, will involve an outlay in construction costs alone of some $20,000,000, and the purchase of 17,000 tons of fabricated steel for the main structure.

The Markham freight yard of the Illinois Central, which is now under construction, is a $4,000,000 improvement and is regarded as a prime need of the business world. Electrification of the Illinois Central lines in Chicago and the construction of new passenger and freight station facilities involving $80,000,000 is under way. This expenditure will, however, be spread over a period of years—the completion of the electrification program having been set for some 20 years hence. Also the Cincinnati Southern R.R. has drawn up tentative plans for the construction of union terminals in Cincinnati, which they will shortly submit to the officials of other roads entering that city. This project, if carried through, calls for an initial expenditure of from twenty to thirty million dollars.

Large Orders for Freight Cars to Be Placed

The general opinion holds that upward of 100,000 freight cars will be ordered within the next month or two. The market for locomotives and passenger cars is expected to be proportionate. Among car purchases recently made are to be noted the following: Atchison, Topeka & Santa Fe, 2,500 refrigerator cars and 500 gondolas; the Erie, 1,000 box cars; Southern Pacific will construct 1,000 box cars; Canadian National Railways have ordered 1,000 box cars from this country and 1,000 from Canadian firms; Canadian Pacific has placed an order for 1,500 box cars with Canadian firms.

Among purchasers of locomotives are St. Paul, 100; Canadian National Railways, 55; Great Northern, 45; St. Louis Southwestern, 10; Santa Fe, 50; New York Central, 280.

Compared to the above are to be noted these prospective purchases: Illinois Central, 1,000 gondola cars; Misouri Pacific, 2,000 box cars; Elgin, Joliet & Eastern, 700 gondola cars; Seaboard Air Line, 2,000 fruit and vegetable cars; Canadian Pacific, 1,000 box cars; Midland Packing Co., 1,000 refrigerator cars; Missouri, Kansas & Texas, 40 passenger cars; Roger Ballast Car Co., 500 freight cars; Union Pacific, 65 passenger cars; American Refrigerator Transit Co., 2,028 refrigerator cars; Grank Trunk, 3,000 automobile cars and 2,000 flat cars; Rock Island lines, 325 freight cars and 75 cabooses; N. Y. Central lines, 15,500 freight cars and 261 passenger cars; Northern Pacific, 1,000 ballast cars.

The St. Louis, San Francisco and St. Louis Southern expect to be in the market for 1,000 box cars each; the Louisville & Nashville will construct 1,000 box cars; the Chicago, Burlington & Quincy is in the market for 4,000 freight cars and 40 passenger cars, and the Fruit Growers Express is in the market for 500 refrigerating cars. As for locomotives, the Chicago & Northwestern contemplate the purchase of a large number, the Illinois Central, 110; the Missouri Pacific, 5; Santa Fe, 25. The Pennsylvania R.R. has already let contracts for 186,000 tons of rails and the Big Four for 36,000 tons.

Union Said To Be Back of Armed Raid Against Guyan Region

Governor Cornwell Appoints Investigating Commission—Testimony Heard March 13

WHEN another hearing was held, on March 13, by the commission appointed by Governor Cornwell of West Virginia to probe conditions in the Guyan region and to investigate the attempted invasion of Logan County by armed miners last September, only four witnesses out of about forty summoned put in an appearance. Members of the commission are Major T. B. Davis, acting Adjutant General, and Colonel George S. Wallace.

The testimony of witnesses heard on March 13 tended to show that in many instances where organizers of the United Mine Workers had called meetings of the Kanawha locals these locals had called out the miners as a preliminary to a march on the Guyan field.

The first witness heard was W. H. Morris, superintendent of the Cabin Creek Consolidated Coal Co.'s mines at Kayford. He said on the stand he had had no previous notice of the men being called out but had asked Tarretta, president of the local union, why the men were ceasing work. Tarretta told him that the men were going to the Guyan Valley because women and children were being killed in that field. When Tarretta was asked the source of his information he named "Keeney and Mooney." Morris said he supposed Tarretta was speaking of C. F. Keeney, the president of the United Mine Workers of America in that district.

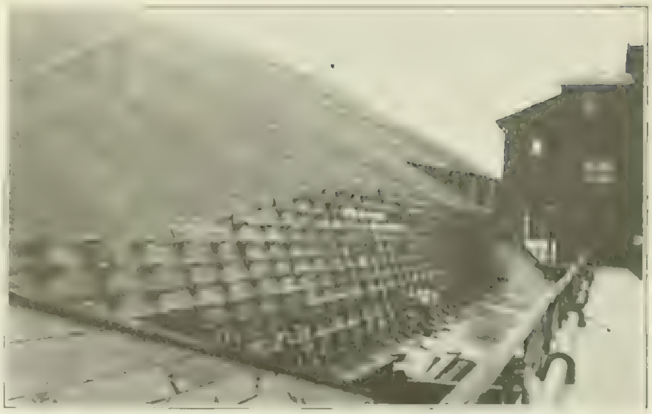
According to the testimony of H. H. O'Neal of St. Albans, superintendent of the Sharlow mine of the Sharlow Gas Coal Co., on Big Coal River, on the day prior to that on which he was officially notified that the miners proposed to drop their work, he had observed Charles Workman, connected with the headquarters of District 17, United Mine Workers, talking with the mine workers. Shortly afterward he was waited upon by a committee who notified him that the miners would not report for work.

Notice was given him by a committee that the miners were going to cease work for several days, according to the testimony of W. A. Otey of the Acme operations of the Cabin Creek Consolidated Coal Co. He added that following such notice the men actually quit work and that the mines were closed down for three days.

Bulkhead for Retaining Coal Piles

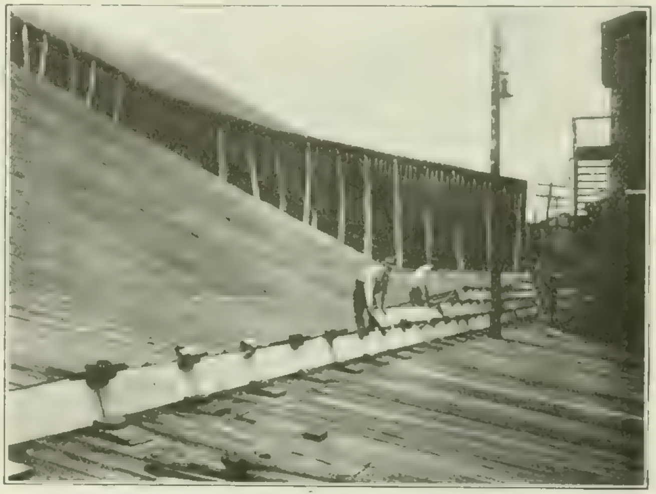
Bulkhead is Easily Constructed—Can Be Taken Down and Material May Be Used Over Again

A RATHER interesting revetment has been devised by the Philadelphia & Reading Coal & Iron Co., and is used at its storage yard near Schuylkill Haven, Pa. As will be seen from the accompanying illustrations the bulkhead is simple but strong. Only two men are required to construct it as no planks longer than 12 ft. are used and since these are only 2 in. thick the work of construction is easy. The planks are 10 in. wide and are set on a batter of 4 in. to the foot. The back braces themselves are 4-ft. long and are spaced on 3-ft. centers horizontally while vertically they are on 12-in. centers.


A BULKHEAD THAT IS PRACTICALLY FINISHED
This bulkhead 16 ft. high retains a bank of coal in one of the pockets at the Schuylkill Haven Storage Yard.

Bulkheads of this type are built as coal is filled in behind them, since it is necessary that the back supports should be firmly imbedded in the coal. As the coal rises a man with a shovel sees to it that the coal is packed tight underneath the back braces since otherwise when weight comes on the bulkhead these members will have a tendency to settle, causing bulges in the retaining wall.

As the coal fills in behind it the bulkhead is built up until it reaches the maximum height of 16 ft. In one of the illustrations it will be noted that the bulkhead has apparently reached its maximum height in the center and at one end, but at the other there is not as yet sufficient coal in place to allow the wall to be built higher.


BUILDING A BULKHEAD TO RETAIN COAL
Showing the simple method used to construct these light bulkheads. This work is done by two men.

It will be noted in the illustration in which the bulkhead is just being started that temporary braces are used to assist in keeping the face of the wall straight while in the figure showing the almost completed bulkhead, extra outside bracing at the bottom may be plainly seen.

One exceptionally advantageous feature of this bulkhead is that it can be taken down as easily as it is erected. The material may then be laid away and used over again. Except in placing the auxiliary braces no spikes or bolts are employed, the coal itself performing this function.

Is Canada Able To Fill Its Coal Needs Without Help from the United States?*

F. W. Gray Answers the Question with a Bold Affirmative—From Fort William, Westward, Canadian Rocky Mountain Coal Will Fill All Demands—Other Consuming Areas Can Be Supplied from Nova Scotia Mines if Canals Are Deepened To Accommodate Ocean-Going Vessels

"THE political division of North America, as it finally evolved from the conflict of races and the divergent search for an identical ideal by two branches of the English-speaking peoples, bore no considered relation to the balancing of the mineral resources of Canada and the United States; and, in so far as coal supply is concerned, the boundary line was fixed before the national importance of coal in peace and in war was realized, and in ignorance of the coal resources of what used to be known as a part of the Far West, and is now known as the Canadian provinces of Alberta and British Columbia. If no national issues had arisen, and North America had developed its resources as one nation, then in the East the coal fields of Nova Scotia would have supplied the Atlantic seaboard with bituminous coal; British Columbia and Alberta would have supplied the Pacific seaboard and the Northwestern States, and the central territories would be supplied entirely from the great central coal field of Pennsylvania and the adjoining coal-yielding states.

Argues that anthracite coal is a luxury and that Canada, like Europe, can do without it. Alberta alone has as much coal as the remainder of the western half of North America. Nova Scotia if adequately financed could mine twice as much coal as now and supply all Canada from its own mines to Lake Superior.

"This is the natural scheme of distribution. Under such circumstances, however, it is certain that the territory which is now included within our own borders would not have reached so advanced a development as is the case, as the independent impulse of our own nationality would have been absent in the North, and industry would have concentrated itself further south and nearer the great central coal field. Also, it may be surmised, the coal production of Nova Scotia would have been upon a much larger scale than it is, while Sydney, N. S., would have been of greater importance and Montreal of lesser importance than is the case today.

CANADA WOULD LIKE TO BE SELF-SUFFICING

"But the national issue did arise. Canada is a nation, so acclaimed and recognized in the councils of the world powers, and although the boundary line between ourselves and our good friends in the United States has certain disadvantages to ourselves, we must make the best of accomplished facts.

"Our unevenly distributed and deficient coal resources, and to a large extent also their backward state of development, are a consequence of this country's determination to be a nation within the British Empire. We have desired national independence, and have achieved it, and as our coal problem is an outcome and a concomitant of this desire and achievement, it becomes a principal duty of Canadians to work for the solution of our most pressing internal problem—the country's coal supply. North America is favored above the nations of Europe in having a supply of anthracite, a most desirable fuel, more especially for congested centers of population, because of its smokeless character and great heat value. Unfortunately, Canada has no anthracite, so far as is known, with the exception of some anthracitic metamorphosed coals of relatively small tonnage in the West. Therefore, if we use anthracite it must be imported.

"Large parts of Canada use bituminous coal and have never found it necessary to import anthracite. In many parts of Canada the burning of anthracite is not understood, and all grates and furnaces are adapted to the burning of bituminous coal. This being the case, and seeing that Europe gets along with bituminous coal, it can hardly be argued that anthracite is indispensable in those districts of Canada that can be supplied with bituminous coal from Canadian mines, and it follows that anthracite, under such circumstances, no matter how desirable, is a luxury.

"Assuming therefore that bituminous coal can entirely replace anthracite in Canada, we have only to consider over what extent the bituminous coals we have can be distributed, or how we can extend the zones of distribution of Nova Scotia and Western coal so that they may approach, and, if possible, meet.

PENNSYLVANIA SHOULD NOT CUT OUT ALBERTA

"So far as Canada west of Fort William is concerned, it surely can be equally well supplied with bituminous coal from the Western mines in Canada as with bituminous coal brought from Pennsylvania. Transportation distances do not enter into the question in the same grave manner as they affect Nova Scotia coal.

"West of the longitude of Lake Superior, there is as much bituminous coal in the province of Alberta alone as in the remainder of the western half of North America.

"Canada has not yet apprehended all the implications of the vast concentration of coal, and probably oil also, that exists in Alberta, and there is no compelling reason why the zone of distribution and use of Alberta bitumi-

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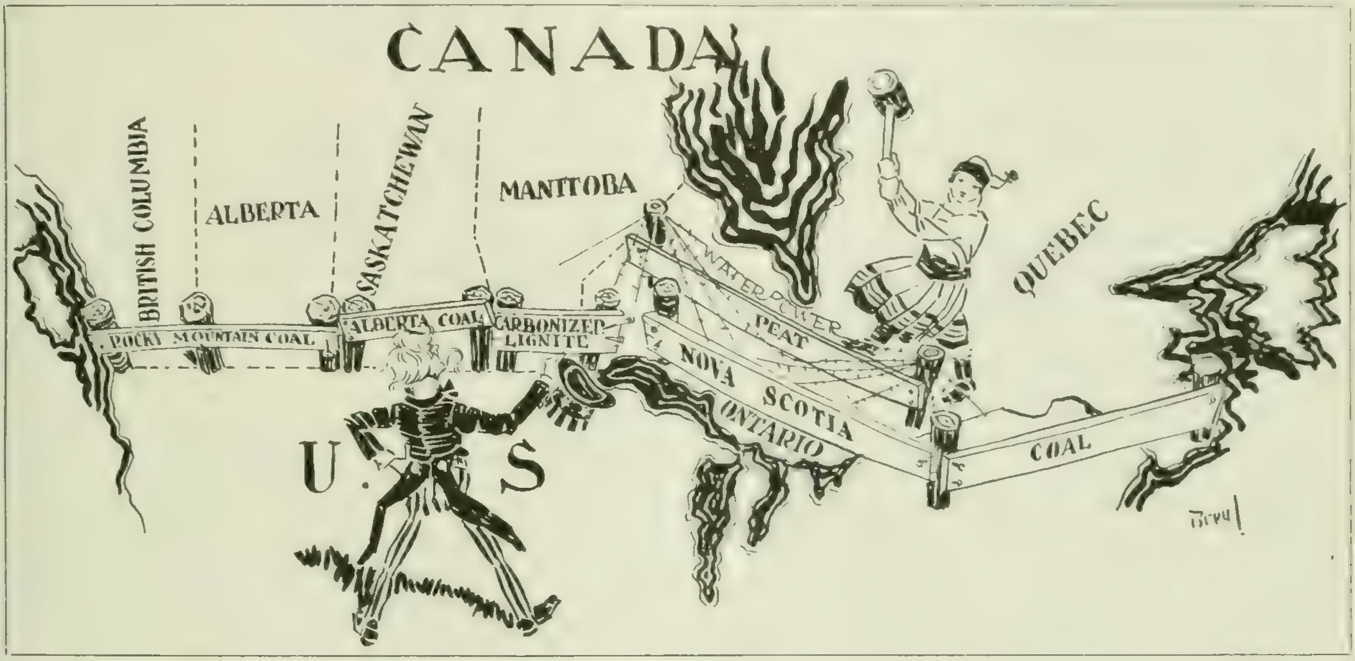
*Synopsis of an article read by F. W. Gray, editor of the *Canadian Mining Journal*, on March 6, 1920, before the Canadian Mining Institute and entitled "Coal Supply of Canada."

ous coal should not be as extended as that of Pennsylvania and West Virginia. West of Fort William, Canada is more than capable of providing itself with all possible requirements of fuel.

"There remains for our consideration the possible radius of distribution of coal of Nova Scotia, but first something should be said as to the extent of the maritime coal deposits and the costs of mining them. The coal fields of Nova Scotia, while they are not relatively large, forming as they do only one per cent of Canada's coal resources, have never been worked to full advantage because of divided interest and scattered operation.

"The consolidation of operation that followed the formation of the Dominion Coal Company was the salvation of the Sydney field, but, unfortunately, consolidation did not go far enough to insure the maximum cheapness of production that it only can make possible. Sporadic, unco-ordinated, haphazard, and in some instances unwise operation of the coal deposits of Nova Scotia, have conspired to prevent a healthy growth in the annual production of this province.



SURELY BY THIS THE CANADIANS SHOW THEMSELVES TO BE OUR BLOOD KIN

For They Exhibit the Same Readiness to Sell and Chariness to Buy That Is Ours in Generous Measure

One who, say in 1907, had looked forward to an annual coal production in Nova Scotia of ten million tons by 1920, could not have been regarded as unduly optimistic. Indeed, the objective of the Dominion Coal Company alone was at that time seven million tons annually, as those who refer to the late Mr. James Ross's remarks on this matter may confirm for themselves. The disappointingly small production of Nova Scotia during the past six years is chiefly a result of the war, and in that respect is a passing incident, but underlying, and altogether apart from the temporary effects of war, coal production in Nova Scotia has shown a recessive rather than an advancing tendency. What is the reason for this lack of vigor in the maritime coal industry?

"Without attempting to excuse the faults of operation that have hindered coal production in Nova Scotia, it may be answered that the non-progressive character of the industry is due to a general lack of encouragement on the part of the railways and large purchasing interests in Canada, and the failure of the Government in successive administrations to understand the paramount influence of coal supply on financial, military and naval security.

"For many years it was the policy of the Canadian railways to screw down the Nova Scotia coal operators to a minimum selling price, American competition being skilfully used to effect this. As an instance, it may be mentioned that Cape Breton coal was sold to the large railways in Canada delivered at Montreal at $2.40 per ton, a figure that was—when the costs were correctly calculated—below the cost of production. The American coal, against which the Cape Breton coal competed on a rigorous basis of monetary cost, was itself sold at prices below the cost of mining to the American operator, a fact that the statistics of the United States Fuel Administration have since abundantly demonstrated.

"Coal must always cost relatively more to mine in Nova Scotia than it does in the uniquely favored deposits of the United States, but a considerable part of the abnormally high mining costs in Nova Scotia at the present time is a result of too small a production of coal in relation to the capital invested in mine properties and transportation equipment. Nothing can so effectively lower the unit costs of production in Nova Scotia as an increase in the output of coal.

"The coal companies there possess equipment sufficient to handle from two to three million tons annually of additional coal so far as transportation and marketing facilities are concerned. Given a sufficient expenditure and the necessary lapse of time to open new collieries and extend the existing collieries, there is no reason why Nova Scotia cannot produce twice its present output of coal. Such a program, however, is possible only through the thorough-going consolidation of the operating coal companies, unification and concentration of direction, and very large capital expenditures on new mines and transportation equipment.

"Before investors can be induced to undertake the heavy commitments indicated there must be a change in the attitude of the public and the railways toward the coal trade. C. A. Magrath, the fuel controller, in his final report, suggested that the railway companies should give contracts for their coal supply for a term of years, at cost, plus a fair percentage of profit, provided the coal companies make the necessary expenditure to equip and maintain properties with all appliances to enable production to be carried on at a minimum of cost.

"There is much to be said for this suggestion. It should be obvious that if in times of plenty our Canadian railways choose to starve our domestic coal mines by buying coal in the United States, or by demanding that the domestic producers meet United States competition, even though that involve a profitless transaction or an actual loss to the Canadian producer, our coal trade must live a precarious life, and will always be unready to meet the national emergency which may at any moment arise through political, social or diplomatic occurrences, or by reason of physical hindrances.

"Canada cannot be run as a successful economic whole if we ignore the obligations of nationality and insist on buying goods in the cheapest market merely because they are cheap. That way lies loss of independence and national disintegration.

Nova Scotia's Undiscovered Coal Resources

"The apathy of public opinion, if not actual hostility toward the struggling coal trade of Nova Scotia is not the less effective because it is based on ignorance and is against the best interests of Canada, for not only has it discouraged the expansion of the known coal fields, but it has deterred the search for the hidden coal fields, the existence of which is much more than a presumption.

"It would be entirely incorrect if we were to assume that the known coal deposits of Nova Scotia comprise the whole of the coal resources of that province, and here again there is reason to complain of lack of interest on the part of our governments, for no part of Canada has been so neglected during the past thirty years in the matter of geological exploration and mapping as Nova Scotia.

"As a case in point, one would mention the Springhill coal field, which has an unknown but extremely probable southward extenson. The port of Parrsboro, which now serves the Springhill coal field, as known, is distant by water only some 90 miles from St. John, N. B., which place by the direct line of the Canadian Pacific Ry. is about 380 miles from Montreal. There is nothing insuperable in sending coal from this field to Montreal even by rail. Much longer hauls are made from the mines to the great cities in the United States.

"There is, however, no necessity to send coal by rail. It has in the past gone from Nova Scotia to Montreal by water at the rate of two million tons in the season of navigation, and could be sent in very much greater quantity by providing additional transportation equipment.

"The feasibility of sending coal by water from Nova Scotia to Montreal being already demonstrated, what can be done to cover the gap between Montreal and Fort William that is now entirely dependent upon United States coal? The cheapness of transportation from the United States central coal field to the Great Lakes and the adjoining territories arises from a combination of water transport and a preferred inland freight rate from the mines to the Great Lakes ports.

"The carriage of coal to Canada gives an outward load for the cars carrying iron ore from the Lake Superior ranges to Pittsburgh, which otherwise would make the outward journey in an empty condition. From such points as Ashtabula and Cleveland the transportation of coal to Canadian ports is cheaply effected by the water routes.

"Apparently the only way by which the radius of distribution of Nova Scotia coal can be greatly extended east of, say, the eastern extremity of Lake Ontario is by deepening the St. Lawrence channel so as to give access to ocean-going vessels to the Great Lakes.

"In such event Nova Scotia coal could compete on fairly even terms so far as cost of transportation is concerned with United States coal, as the all-water route from Nova Scotian ports to the point of unloading in a Great Lakes port would offset the preferred rail rate from the United States mines to the point of transshipment on the Great Lakes. This project is under investigation. So far, all the protests that have been made against the project are such as, if conversely applied, constitute arguments for its carrying out, so far as Canada is interested.

"It may be submitted that if the project is pronounced feasible it offers to Canada the opportunity to become thoroughly self-supplying and self-contained in bituminous coal supply. By affording to Nova Scotia a cheap water route for coal shipments, the coal miners there would be able to so enlarge outputs as to effectively reduce costs of production, and soft coal from Nova Scotia could be shipped far enough west to span the country and meet Canadian soft coal shipped from the western mines.

"The deepening of the St. Lawrence waterway is, however, not an immediate possibility, while the necessity to make Canada more independent in bituminous coal supply is indeed a most immediate urgency. What is feasible in the enlargement of distribution of Nova Scotia coal today? We can at least get back to the pre-war shipments to St. Lawrence ports of some two million tons annually.

Need to Widen Radius of Nova Scotia Coal

"Further, the same factors of increase in the cost of coal production have been at work in the United States also. There is also some encouragement in knowing that the Canadian people have to some extent awakened to the serious handicap we suffer from such entire dependence on the United States for coal, the danger of dislocation of our business, the threat of discomfort and physical danger that are always impending whenever interruptions to our coal supply occur. These new conditions suggest that an extension of the pre-war radius of distribution for Nova Scotia coal may be possible at the present time if energetic effort is made by the operators to recover and extend the St. Lawrence markets.

"The present moment offers an opportunity to the coal interests of Nova Scotia, and the transportation interests of Eastern Canada to work together to secure the future permanency of the coal trade of Nova Scotia, which, whether they appreciate it or not, is something on which the railways, the public and the government of Canada are equally interested with the coal operators and the mining population.

"The equipment of the Nova Scotia collieries is modern, and, apart from the duplication inseparable from divided interests, no grave criticism can be made of the technical or business management of the operating properties, but some changes will be necessary before the most efficient production is possible.

"In particular, the present system of single shifts will have to be replaced by multiple shifts. The present practice of working the collieries for only eight hours in each 24 hours, often for only five days a week, does not permit of full returns from the capital invested, or the extent of underground territory developed.

"With regard to bituminous coal supply we may conclude that the problem is not so much one of a source of supply in Canada as it is one of deficient and difficult transportation. Canada has sufficient bituminous coal for its own needs, but the country has never undertaken to become thoroughly self-supporting from a conviction that this was not only desirable, but actually essential to national independence. It cannot, therefore, be said that our capacity to be self-supporting in bituminous coal supply has even been tested.

CANADA IS LOSING ITS HOLD AS COAL PRODUCER

"Far from expanding our coal output we are not even holding our own, and every year's record of Canadian coal outputs is more disappointing than the one preceding. How is it that the worst examples of dishonored bond issues in Canada are connected with coal-mining enterprises, and that in at least two well-known instances the capital invested by Canadian and British interests has been lost, and reorganization has been effected by United States capital?

"While a good many reasons could no doubt be advanced in explanation, the lack of any well-defined policy to foster production in Canada, *because of its national importance*, will explain the ill fate of many well-intentioned and promising coal mining flotations on this side of the line.

"It may be necessary to explain that this presentation of the Canadian side of the coal problem is not made in any spirit of hostility toward the United States. On the contrary, the generous and wholehearted manner in which the U. S. Fuel Administration co-operated with the Fuel Controller of Canada in the desperate conditions of fuel shortage in 1917-1918 is gratefully remembered here.

"In this instance the United States shared its inadequate supplies of fuel with Canada in a manner worthy of all praise. The people of the United States, however, are the last people in the world to excuse a lack of enterprise in another people, and if they should criticise the backwardness of our fuel policy, it would be criticism well deserved."

Farrington Declares Insurgent Strikers Sought to Destroy Union

The insurrection of the southern Illinois miners in August, 1919, was a deliberate plan of the Socialist Labor party to wreck the organization of the Illinois United Mine Workers, according to a declaration made by Frank Farrington, Illinois president, in an address before the Twelfth District Convention at Springfield. He said: "Starting at a mass meeting held in Belleville, the trouble spread through the Springfield and Peoria district until 20,000 of our members were involved in a movement in positive defiance of every law and principle of our union.

"Some of the instigators of the trouble said it was a move to force the calling of a special district convention, while others asserted it was to force the operators to concede a new and improved wage agreement. Still others said it was to force the resignation of your district officials. As a matter of fact, it was an attempt deliberately planned by the Socialist Labor party to wreck our union.

"In the course of the rebellion local unions were looted of their funds and accredited leaders insulted, slandered and defied. Irresponsible committees rushed madly over the State, creating prejudice and dissension. Marching bands were sent out to mold destructive sentiment.

"If this union of ours is to survive we must have discipline in our ranks. Discipline is the very essence of unionism. Unionism does not mean individualism, where each shall have license to do as he will. Instead, it means that all shall be bound to act in unison. Where there is no law, there can be no unity, and where there is no discipline, there can be no law."

Some, in West Virginia, Expect General Coal Strike

Just how the majority report of the Bituminous Coal Commission appointed by the President will be received by the United Mine Workers in West Virginia has not so far become apparent, officials of the union refraining from making any comment on the majority decision.

Inasmuch as the union is insisting upon a substantial increase in wages and working conditions more favorable than those enjoyed by the men in any other industry and is insisting that nothing short of that will be acceptable, there is much speculation in West Virginia fields as to whether there will be another strike in case the unanimous decision of the Coal Commission, if indeed, there is one, should not be up to the expectations of the miners.

What leads some to believe that preparations have been made for another strike was the announcement made the latter part of January by John L. Lewis, president of the United Mine Workers, that it was the intention of his organization to unionize the five non-union fields in West Virginia, such fields having furnished the bulk of production during the November strike and having been the weak spot in the armor of the United Mine Workers.

Selling price of *Coal Age* will on and after April 1 be 20c. for domestic circulation. The foreign subscription rate will be $6 per year, or 25c. a copy.

President Wilson has removed the regulation of bituminous coal prices, to become effective April 1, and has transmitted the report of the majority of the Bituminous Coal Commission, notifying the mine workers and operators that this must be the basis on which the wage settlement must be made.

Is Price Regulation Any Longer of Legal Force?

Cushing Tells Wholesalers Progress Is Being Made in Meeting the Lever Act by Proof that It Is Unconstitutional. That Even If Still of Force It Must Be Enforced Reasonably—Legislation To Annul Act Is Being Promoted

ON WEDNESDAY, March 17, the New York Wholesale Coal Trade Association held a luncheon at the Whitehall Club, New York City, and discussed the various phases of the Lever Act. About 80 coal operators, sales agents and other trade representatives were present. C. Andrade, Jr., president of the association and treasurer of the Matlack Coal and Iron Corporation, presided and introduced George H. Cushing, of the American Wholesale Coal Trade Association, who gave an extended review of what had been done in reference to relieving the coal trade of the incubus which it carried as an outcome of the passing of the Lever Act during the war. Mr. Cushing said that with certain officials in Washington "nothing smells so bad as a wholesale dealer in coal."

Wholesalers, says Gibbs L. Baker, can sell safely for cost plus a profit without violating the Lever Act. Government had no right to refix old prices without inquiry. Coal is not on all fours with spiritous liquors. George H. Cushing states that the purchaser does not break the law when he pays more than Government prices.

He stated that when the matter of providing coal to concerns who were unable to obtain fuel supplies arose, he offered to give the time of the staff of the American Wholesale Coal Trade Association and to supply the necessary money to provide for a proper distribution of the coal output, but he soon found that the attitude of the Administration was so strongly against the wholesaler that it was impossible to obtain a hearing.

In fact, the average man engaged in a Washington bureau felt perfectly safe in turning a deaf ear to any proposition that was made to him because he knew that his chief was as busy as is a lawyer who is conducting 50 or 100 suits at one time and hence could not spare the time to give any outsider a hearing. Every bureaucratic chief was disposed to leave matters to his subordinate, because he was so terribly rushed he could not attend to the matters himself.

Another attitude he found prevalent was that the Railroad Administration handled all the coal that was produced in the country and, therefore, knew more about the coal business than the operator, the wholesaler or consumer, and for that reason was more competent than any other to handle problems relating to the coal industry.

He stated on the other hand, that his dealings with the Federal Reserve Board afforded him no little gratification. When he called on W. P. G. Harding, the Governor of that board, he anticipated that he would barely be granted a hearing, but he was surprised to note the extreme alacrity with which that official acted when the matter was introduced to him. Mr. Cushing declared to him that he could not expect the Federal Reserve Board to do anything in regard to the confiscation of coal by the railroads, despite the fact that they had not paid for the coal that they had confiscated. He could not give him any relief in regard to the coal that had been diverted and had not been paid for, because these were matters between the coal companies and the railroads and between the coal companies and the consumers. He could, however, take action to relieve the owners of coal from the great difficulties they were in by reason of the fact that the railroads had held coal on the tracks and so had tied up about $30,000,000 of the coal companies' money.

Mr. Harding called upon the banks to be extremely careful not to call any coal man's loan, in view of the fact that the situation of the coal men was extremely precarious, owing to the action of the Government in confiscating and diverting coal. He extended the rights of the banks to loan 25 per cent instead of 10 per cent of their reserves to coal companies, and thus further relieved the necessities which the occasion had created.

He said that from $40,000,000 to $50,000,000 was paid within three days to the coal companies, largely by reason of action that was taken by Mr. Harding. He alleged that there were two ways of overthrowing the Lever Act; one was by showing that it was unconstitutional, and the other was by obtaining legislation which would abrogate the Lever Act. The American Wholesale Coal Trade Association was endeavoring to do both.

First, with reference to the constitutional enactment of the Lever Act: The legislation was passed before the armistice, when the nation was engaged in war. The need for it passed with the signing of the armistice. Mr. Cushing said that the validity of the act terminated with the need for its enforcement. But even supposing that the state of war or peace did not bear in any way upon the question, it still remained true that the act called for reasonable prices. He declared that instead of it costing 15c. to market a ton of coal, the amount allowed, the expense involved amounted to between 18½c. and 20c., and this did not include any buying cost. Consequently the regulations of the Fuel Administration were really in violation of the Lever Act.

In reference to the political method of obtaining relief, he stated that a bill to repeal the Lever Act had been introduced by Representative U. Q. Tilson on behalf of the consumers of coal who found that the provisions of the law hindered rather than helped them. This bill, the Representative thought, would do much to wipe out the injustices from which the purchaser of coal suffered as a result of the arbitrary powers which the President possesses, or believes himself to possess. The bill had been referred to the proper committee and he expected that a similar bill would be introduced into the Senate.

Gibbs L. Baker, who is the attorney for the American Wholesale Coal Trade Association, in his remarks which followed declared that the Lever Law was unconstitutional, and that in any event its validity was largely destroyed by the fact that the prices set upon coal on Oct. 30 were fixed without any inquiry as to any changes in costs of materials or efficiency of labor, and, therefore, without due knowledge of the facts upon which a price could be based. It was not in accordance with the law that the Fuel Administration should place a price without due inquiry and then resign, leaving no opportunity to protest and no provision for investigation. He quoted in support of his viewpoint the opinion which former President William Howard Taft prepared for the Smokeless Coal Operators' Association.

Prohibition No Precedent For Coal Control

It is true, he said, that in the matter of spiritous liquors Justice Brandeis had declared that the President was still in possession of his war powers, regardless of the signing of the armistice, but alcoholic liquors have always been regarded as subject to police powers of governing bodies, and the right to buy and sell spiritous liquors has never been regarded as a property right but as one which is revocable at will on the part of duly constituted authorities. He declared that the members of the American Wholesale Coal Trade Association would be perfectly justified, legally and morally, in selling coal at the price it stood to them, plus a reasonable profit, and he advised them so to do. He believed that no court would hold them liable for such action.

Mr. Baker said it might be possible that the present control of the situation would cease to exist at midnight on April 30 if the railroads had by that time signed contracts for the next year's supply of fuel, otherwise it might again be extended by executive order.

Mr. Cushing in his further remarks stated that the American Wholesale Coal Trade Association would stand back of any member who took action on this account. He was not in favor of giving notice to the Attorney General that such action would be taken, because that would be tantamount to admitting that some might think that action of this kind was illegal.

One May Safely Buy Coal at Price Offered

Mr. Cushing remarked that there is nothing to prevent any man buying coal at any price at which he can secure it. There is nothing in the Lever Act to require a man to pay only the Government price. If the operator believes that he is justified in selling his coal above the price set by the Government, or is willing to take his risks with the Lever Act, that is his business and there is nothing to prevent a wholesaler from buying coal at the seller's price, for there is no fine or threat of imprisonment attached to such act. This is true whether the Lever Act is in force or invalid.

Charles S. Allen, secretary of the Wholesale Coal Trade Association of New York, who recently returned from several days' stay in Washington, told the members of the trade that the coal men had the support of United States Senators Calder and Wadsworth of New York State in their fight to have the law repealed and that he had spoken to several Congressmen, some of them from the Southern States, who also had expressed their approval of the efforts being made by the industry. He said that the support of many civic and other organizations had been sought to aid in the fight and that so far such support had been promised by more than 200 bodies located in various sections of the country. He also said he was in receipt of telephone messages from nearby Boards of Trade promising support and then he read extracts from several letters he had received in reply to a letter sent out by the local association asking help.

Mr. Allen said other means of aiding the fight were in contemplation and that the trade would be advised of them shortly.

A letter had been sent broadcast by the association, over the signatures of President Andrade and Secretary Allen asking the recipients that if they favor a discontinuance of governmental control of fuel, to write their Senators and Congressmen to vote for the repeal of the Lever Law. The letter reads:

"The war has ended and the emergency legislation growing out of the war also should end. Our citizens have submitted patriotically to the regulations of the Fuel Administration and lately to the Central Coal Committee, which is a branch of the Railroad Administration.

Excessive Control Makes Product Short

"Government control of the railroads is a demonstrated failure; and with equal certainty, government control of coal is a demonstrated failure. It is the direct cause of the present shortage and congestion in the handling and transport of coal. There is plenty of coal-mining facilities and labor but the administrative red tape now in vogue will not let the coal reach the consumer.

"The business of the coal trade is to supply the country adequately with coal. If left to itself, the coal trade will do this, as it did before the war. If you favor a discontinuance of governmental control of fuel, ask your Senators and Congressmen to repeal the Lever Law, and write us when you have done so."

The meeting ended without any action being taken; in fact no action was intended. Under date of March 18 a letter was sent out disclaiming any purpose on the part of the officials of the New York Wholesale Coal Association to advise the members as to the course they should take as regards the Lever Law and stating that they personally found themselves in disagreement with Mr. Cushing on many points.

Duty Concerning Highly Charged Electric Wires.—A coal mining company may be held responsible for death of a miner resulting from negligence of the company in permitting a cable heavily charged with electricity to become and remain uninsulated at a point exposing employees to danger.

A miner is not to be charged with contributory negligence for failure to disconnect an electric wire before working near it in the absence of a rule or prevailing custom requiring him to do so, unless he appreciates or should appreciate the danger under the circumstances of the particular case. (*Kentucky Court of Appeals, Kitchen vs. Hillside Coal Co., 194 Southwestern Reporter, 791.*)

Termination of Federal Control of Coal and Coke Industry Sought

Senator Frelinghuysen Introduces in Senate Bills Providing Seasonal Transportation Rates and Appointment of Commissioner with Advisory Powers—Confiscation of Coal by Railroads Prohibited

TERMINATION of the Federal control of the coal and coke industry, appointment of a Federal Coal Commissioner, and the designation of seasonable rates for the transportation of coal are being sought by Senator Frelinghuysen of New Jersey. Bills looking to the above ends, representing the conclusions of the subcommittee of the Committee on Interstate Commerce, which has conducted an extended inquiry as to the coal situation, have been introduced by Senator Frelinghuysen. In offering these bills to the Senate Mr. Frelinghuysen pointed out many of the conclusions of his committee.

The proposal as to the seasonable freight rate is that it be made compulsory for railroads to handle coal from April 1 to Aug. 31 in each year at 15 per cent less than the regular rate and that during the remainder of the year 15 per cent be added to the rate charged for the movement of coal.

The bill terminating Federal control of the coal industry also amends the act to regulate commerce so as to expressly prohibit any railroad to confiscate or divert any coal which may be in its possession solely for the purpose of transportation and which the owner has not voluntarily transferred to the railroad. The bill providing for the appointment of a Federal Coal Commissioner gives that official only advisory powers. Senator Frelinghuysen takes the stand that the Government has not taken proper interest in the coal industry and that no agency of the Government has been authorized to study and keep track of its progress.

The bill provides that the commissioner shall compile statistics and inform himself as to prices and cost and form a clearing house for the coal industry. The salary of the commissioner is fixed at $10,000. The bill also provides a $5,000 salary for a secretary to the commissioner. The commissioner is given ample powers to demand information, facts, and figures from all those concerned in the coal industry. Among the provisions of the bill are the following sections:

"Sec. 7. That the commissioner shall investigate, from time to time, the organization, management, and practices of dealers and operators, costs and profits in connection with the mining, sale, and distribution of coal, the terms contained in leases of coal mines, the prices demanded or received for coal, the distribution, storage, and sale of coal, and the methods and processes employed therein, the consumption of coal, and the transportation of coal in commerce, including the distribution of coal cars.

"Sec. 8. That the commissioner shall investigate, from time to time, the wages, working conditions, terms of employment, and the living expenses of miners and other workmen employed in mines from which coal is transported in commerce.

"Sec. 9. That the commissioner shall investigate, from time to time, methods and processes for the storage of coal, and conduct such experiments and researches as he may find advisable to determine the most efficient means for such storage.

"Sec. 10. That the commissioner shall file, analyze, and compile all data and information obtained under sections 7, 8, and 9, and shall keep such data and information revised currently and available for immediate reference. He shall publish from time to time, in such form as he deems proper, such portions of the data and information obtained thereunder, except trade secrets or names of customers, as he may deem advisable in the public interest.

Sec. 11. That the commissioner shall, on request, and to the extent that he deems proper in the public interest, place at the disposal of any private or public board, commission, or other group engaged in the arbitration, conciliation, or settlement of any labor dispute arising in any mine from which coal is shipped in commerce, all data and information in the files of his office relating to the matter in controversy. The commissioner shall cooperate with the Interstate Commerce Commission in promoting the proper distribution and most efficient use of coal cars in commerce. He shall also co-operate with dealers, consumers, and others to encourage the construction of facilities for the storage of coal.

Sec. 12. That the commissioner shall investigate the desirability and practicability of prescribing statutory standards for various kinds and grades of coal, and shall submit a report thereon to Congress before April 1, 1921, accompanied by such recommendations as he may deem proper.

Sec. 13. That the commissioner shall investigate the desirability and practicability of a statutory zoning system defining the distance from the mine within which coal therefrom may be transported in commerce, and shall submit a report thereon to Congress before April 1, 1921, accompanied by such recommendations as he may deem proper."

Fear That Operators Will Be Jailed If They Meet Miners in Collective Bargain

MUCH indignation is felt by the Pittsburgh coal operators at the decision in Washington that the findings of the Bituminous Coal Commission are to be regarded merely as a report and not as an award, the whole question to be threshed out in a conference between the mine workers and operators. With 125 men under indictment for just such a conference the operators feel little inclined to meet in another such session, even at the pleasure of the Washington administration, fearing that what they are begged to do today they may be jailed for doing tomorrow if fickle Washington does not happen to register its approval of the terms on which agreement is reached.

What did the conference do before but try to provide for just such a bargain as the majority of the Bituminous Coal Commission has recently awarded, or rather, as it seems, has merely suggested? Yet that provision, or suggestion—whichever it may be—of the majority is less than would satisfy the minority member of the commission, John P. White. It is said that the present indictment is being brought because of the wage discussion in the past conference. Whether that is so remains to be seen when the indictment is a matter of public knowledge.

But if it is indictable to try to make an agreement in accord with that advised by a majority on a Government commission and to raise wages 25 per cent, how much more indictable it would be to put oneself in an agreement with the minority member of that commission and raise wages 35 per cent! Consequently, when a meeting is held the operators must concede more than 25 per cent and look forward to incarceration or hold to 25 per cent and fail to make any headway.

They prefer to refuse to put their heads into the noose until they are assured by a lifting of the indictment that a conference will not be held to be in the nature of a conspiracy. With a few exceptions the names of the indicted are not known, but it is surmised that the list includes many prominent coal operators and in particular all the members of the scale committee. The operators would prefer to wait and let the mine workers get into a more amenable state of mind such as would make it possible to obtain from them an agreement to accept the rate of pay proposed by the majority of the Bituminous Coal Commission. It is believed that the mine workers have no disposition to go the length of striking on April 1, their present declarations being merely bluster.

Several Operators Arrested in Indianapolis for Conspiracy

Violation of the Lever Act Charged—Allegation Made That Indictment Is Brought on Ground That Joint Wage Conferences Are Illegal

AT LAST arrests have been made in connection with the inquiry of the Federal Grand Jury at Indianapolis into the alleged conspiracy to enhance the price of coal. Those arrested on March 20 were E. D. Logsdon, George A. Van Dyke, B. E. Neal and W. B. Tobin, all of Indianapolis, Ind., and William Zeller of Brazil in the same state. Mr. Logsdon and Mr. Zeller surrendered to the officers, while the others were served with capiases. It appears that Carl A. Fletcher, also of Indianapolis, surrendered to the U. S. Marshal on March 19. Each of the operators gave a bond for $10,000 and was released till May 4 pending arraignment on that date.

At the marshal's office the statement was made that capiases for the arrest of 51 Indiana men had been placed in the hands of the officers and that it was the intention to serve them as soon as possible. The capiases to be served on men in Illinois, Ohio and western Pennsylvania who are involved in the charges will be mailed to those States for service locally.

E. D. Logsdon, after his arrest, prophesied that as a result of the prosecution there would be a tie-up in the bituminous coal industry after April 1. In his statement he asserts that, according to information that the operators have received, the Government is making its prosecution on the ground that joint wage conferences are and have been illegal. This theory of the illegality of joint wage agreements is said to be the basis for a part, at least, of the charges against the coal operators and mine workers.

If the Government questions whether such conferences and pacts are legal and tries to convict the operators and mine workers for taking part in them, the former, at least, will be indisposed to try to enter into the conferences or sign the agreement, according to Mr. Logsdon. He declares that the Government is inconsistent, for President Wilson as late as March 19 urged that the operators and mine workers get together again and make a collective bargain, thus giving Government sanction to just that practice which the Government by its action appears to be trying to condemn in the courts.

The Federal authorities, it must be conceded, do not admit that the prosecution is based on any such ground and they declare that they will not divulge the details till all of the men accused have been arrested.

On March 22 the list of the indicted was increased by 20 more names: J. S. Riddle and Harold Henderson, attorneys for the United Mine Workers of America; Ed Stewart and William Mitch, president and vice-president of the Indiana or No. 11 District of the same organization; John Heslar, Robert Perry, John Little, F. McQuaid and Harry Lents, members of the Executive Board of District 11, and Will J. Freeman, Homer Talley, former president of the Indiana Bituminous Coal Operators' Association; George Watham, coal operator; M. L. Gould, J. C. Kolsem, Phil H. Penna, secretary of the Indiana Bituminous Coal Operators' Association; Hugh Shirkie, A. M. Ogle, David Ingle, Charles Fettinger and U. G. Hall.

Jabez Wooley, an Evansville coal operator, was arrested at that city at about the same time. As in the other cases the bond was set at $10,000 and was furnished in every instance. By noon March 23, the number under arrest had reached thirty-one, mostly of Terre Haute and Evansville.

Will Hold Over Convention Till Scale Committee of Mine Workers Has Met

Pending a final decision from the Bituminous Coal Commission, the annual convention of the miners of the Fifth Sub-District of Ohio will not be held. Tuesday, March 9, was the date originally set for the convention, but when it was apparent that the report of the coal commission would not be available by the time set for the convention, the convention was postponed, it evidently being the intention of the miners at their convention to pass upon the decision of the commission and to indicate whether its decision was satisfactory or not. President Ray of the sub-district has indicated that the sub-district convention will not be held until after the General Scale Committee of the mine workers meets at Washington.

All-Year-Round Work Demanded by Anthracite Miners

Steady Employment as Well as 60 Per Cent Wage Increase Sought in Wage Conference

AT THE conference of representatives of anthracite miners with a sub-committee of the operators at the Union League, the miners' demanded all-year-round work as one of the conditions of the new wage agreement the conference seeks to reach. No decision had been reached when the conference adjourned.

An increase of 60 per cent in pay and work throughout the year were declared by the miners to be the least concessions with which they would be content. The operators insisted that present conditions in the anthracite fields offer an opportunity for steady work, but the miners contended such conditions are only temporary, due to effects of the war.

Family budgets showing increased costs of living were presented by the miners in support of their demand for more pay. Philip Murray, international vice-president of the United Mine Workers, stated that the work of the conference was proceeding satisfactorily. He said the operators had offered no counter proposals.

The existing wage agreement expires April 1, but it is not anticipated there will be a strike called on that date, even if a new one has not been arrived at. The miners take the position, however, that any wage increase decided on after April 1 be made retroactive. To this the operators take exception, pointing out that they cannot make retroactive any increase in the price of coal made necessary by higher wages.

Anthracite Miners Quote Living Costs To Justify Wage Increase

Operators Say That Advances Granted Since 1915 Have More Than Kept Pace With Prices

THE second week of the Anthracite Wage Conference between the sub-committee of mine workers and operators going on at the Union League Club, New York City, was devoted almost entirely to a discussion of statistics dealing with the cost of living and other economic conditions.

International President John L. Lewis was absent in Washington all week and his place at the conferences was taken by Philip Murray, vice-president of the International Union. The sessions last week began on Tuesday and continued over Saturday, instead of adjourning on Friday, so that the members could return to their homes over Sunday.

At the session on March 16 the earnings of the miners and the demand for a 60 per cent wage increase were discussed. The operators, it was learned, made known their objections to wage increases at this time, declaring that the advances granted the workers since 1915 have more than kept pace with the high cost of living.

When the session finished on March 17 a statement was issued saying that the sub-committee had discussed the opportunities of anthracite mine workers for employment, their earning capacity and the increase in the cost of living.

As at the previous day's conference a mass of statistics was presented by both operators and miners, and it is said that the operators produced reports showing that the workers have been making a "living wage."

The longest statement issued during the present conferences was given out at the close of the session of March 18. It read:

"The production of coal under the present agreement both as to the total amount produced and the per capita production of the miners was taken up at today's meeting. Various arguments were advanced by both parties as to the bearing of the figures shown upon the demands of the mine workers. The representatives of the operators contended that the anthracite industry offers an opportunity for steady employment to the workers, while the miners' representatives argued that the present steady employment in the anthracite regions is largely due to the abnormal conditions arising out of the war.

"The mine workers presented figures showing increases in rent, coal and clothing from 1914 to 1920, also compilations of increases in the cost of living in the anthracite regions and compiled from family budgets secured from anthracite mine workers and their families. Both miners and operators have at their command large statistical data to fortify their debate."

Effort Being Made To Prevent a Strike

The session on March 19 was largely devoted to the presentation of additional data by the miners in support of their claims. During the week there were rumors that the conference was waiting for some word from Washington regarding the bituminous wage controversy. It is not expected that any definite action can be taken on any demand until the soft-coal situation is settled.

Every effort is being made to prevent a suspension of work by the mine workers. With this end in view it is said that the operators have asked the miners to continue to work after April 1 if an agreement cannot be reached previous to that time. In reply to this request, it is said, the miners stated that this might be possible, provided that whatever agreement might be reached would be made retroactive from April 1. It is believed the miners will hold out for this provision.

The scale committee of the union, appointed at the tri-district convention held in Wilkes-Barre, considered the request of the operators at a three-hour session on March 20 at the Continental Hotel. Further consideration of the request took place on March 23.

The action of the scale committee in postponing definite action on March 20 was later reported to the sub-committee at the Union League Club. After a brief session it was stated that the sub-committee had continued the consideration of the mass of figures presented by the miners covering the increase in the cost of living and its relation to the request of the miners for an increase in wages. The miners argued that the figures justified their claims for higher wages. Copies of all of the data submitted were read into the record and will be considered by the operators.

Philip Murray, international vice-president, who is attending the sessions of the sub-committee during the absence of President Lewis, has said that every effort will be made to reach an agreement before the expiration of the one now in force. "We have a contract to make and we are going to make it before the present agreement expires if it is possible," he has said.

It is believed that there would be quicker action by the sub-committee if the bituminous wage controversy was settled. President Lewis is now in Washington working on this situation. Notwithstanding all the time devoted to a discussion of the demands, it is said the miners are determined to make the strongest kind of a fight for the recognition of the union, which has always been refused by the operators.

The sub-committee devoted its session on Monday, March 22, to a consideration of the earnings of the mine workers. Figures were presented by the representatives of the miners showing the full time earnings of the various classes of labor in and about the mines during the past four years.

The sub-committee did not resume its conferences until the afternoon and after a two-hour session adjourned to the next day. It was thought likely that the Scale Committee of the miners would on Monday give further consideration to the proposal of the operators that the men remain at work after April 1 in the event that a new wage agreement is not agreed upon, but it was said at the Continental Hotel that no session was held and that further discussion of the proposal would not take place until the morning of Tuesday, March 23.

This session of the Scale Committee was considered the most important yet held by that body since the beginning of the present negotiations. It was understood that the officers of the union would advise the men to move slowly before framing their reply to the operators' proposal.

Seasonal Freight Rate Would Obviate Car Shortage

Senator Frelinghuysen's Bill, by Promoting Regularity of Movement, Would Eliminate Fall and Winter Rush

PROBLEMS that have long vexed the coal industry are promised a solution by the seasonal freight rate bill introduced by Senator Frelinghuysen. The measure reflects the ideas of Commissioner Clark of the Interstate Commerce Commission, Mr. Frelinghuysen said. Some of the beneficial results expected from the bill were summed up by the Senator from New Jersey as follows:

It would stabilize the price of coal. The capacity output of all the coal mines in the United States, assuming fairly constant operation, would far exceed the present consumption. The output of all these mines working, as at present, only intermittently during the spring and summer months, and working to capacity during the fall and winter months, is barely sufficient to supply the current needs and the greatly increased cold-weather demand for coal.

During the winter the demand so nearly equals the currently available supply that scarcity prices prevail. In addition to this, the actual cost of production per ton is unduly enhanced because the operator must, during the time his mine is closed down or working intermittently, keep together his organization and expend money for the upkeep and maintenance of the property, all of which must be added to the price of coal which he mines and sells during the rush season.

If the demand for coal were reasonably constant throughout the year, many of these costs based on holding plant, capital, and personnel idle for a large portion of the time would disappear, and the price of coal would more nearly represent only current costs of production plus a reasonable profit, leaving no opportunity for charging scarcity prices during the months when the greatest amount of coal is consumed.

Such legislation would obviate very largely the pressing necessity for more coal cars. The present supply of coal cars, while totally insufficient to handle the fall and winter rush under existing conditions, would be fairly adequate to carry all the coal desired by consumers if this equipment could be kept moving with greater regularity throughout the year, as would be the case if the advantage of lower summer and spring freight rates could be held out to induce consumers to receive coal shipments in advance of their winter needs. Under the present system thousands of coal cars lie idle during the spring and summer, while the whole available supply of coal cars is entirely insufficient to handle the fall and winter emergency.

Such legislation would remedy the present inadequacy of terminal facilities. The large amount of coal which must now be transported within a comparatively short time in each year tends to glut already overcrowded terminals. The increasing inability of existing terminal facilities to handle extraordinary seasonal demands without entailing serious delays and disproportionate terminal costs is one of the most glaring weaknesses in the present American railroad transportation system.

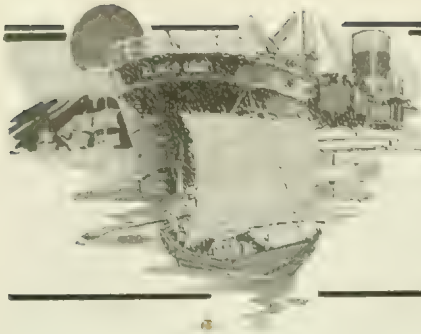
All Mines To Share Orders Equally

Seek Also To Have Insurgent Strikers of Belleville, Ill., Reinstated

A movement for the equal distribution of orders among all the soft-coal mines of the United States was inaugurated at a sub-district meeting of the United Mine Workers a few days ago in Belleville, Ill. James Mason, secretary-treasurer of the Belleville sub-district, was instructed to ask John P. White, miners' representative on the National Coal Commission, to induce the commission to incorporate in its decision on the miners' wage a provision that coal orders be distributed equally among the mines, to the end that a more even distribution of employment may be secured.

It was stated at the meeting that some mines work steadily while others operate only part time because the railroads concentrate their purchasing at a few large mines. It also was charged that these mines were favored by a larger delivery of coal cars. The allegation also was made that the southern Illinois miners were being deprived of employment because the railroads were purchasing largely from the non-union mines of Kentucky.

Reinstatement of Belleville miners who were discharged for activity in the insurgent strike at the Southern Coal Co.'s mines last summer, or an order to strike at those mines until the discharged men are reinstated, was demanded in a resolution adopted at a meeting of the Belleville sub-district of the Illinois United Mine Workers.



FOREIGN MARKETS AND EXPORT NEWS

Movement to Tide During January Largest in Five Years

Bituminous coal dumped at North Atlantic ports totalled 3,185,000 net tons during January, 1920, according to the U. S. Geological Survey. This was a large increase over November and December, when many mines normally shipping to tide were closed by the strike. In fact, the movement was the largest attained in any January during the last five years. The total tonnage dumped during the first ten months of the present coal year was 32,793,000 net tons. Compared with the preceding coal year (1918-1919) this was a decrease of 4,471,000 tons, or 12 per cent.

BITUMINOUS COAL SHIPPED TO TIDEWATER (Net Tons)

	Coal Year, 1919-20	Coal Year 1918-19
November	2,235,000	3,270,000
December	2,036,000	3,206,000
January	3,185,000	2,954,000
Coal year to Jan. 31	32,793,000	37,264,000

Coastwise shipments to New England during January amounted to 804,000 net tons. This was the largest tonnage reported since last September, and except for that month and for August, the largest since December, 1918. In comparison with January of last year it represented an increase of 83,000 tons, or 11.5 per cent. Cumulative tidewater shipments to New England from the beginning of the present coal year now amount to 7,424,000 tons, as compared with 13,329,000 tons during the corresponding period of the year 1918-19.

BITUMINOUS COAL SHIPPED TO NEW ENGLAND VIA TIDEWATER (Net Tons)

	Coal Year, 1919–20	Coal Year, 1918–19
November	703,000	1,162,000
December	674,000	876,000
January	804,000	721,000
Coal year to Jan. 31	7,424,000	13,329,000

Overseas exports from North Atlantic ports during the month were 896,084 net tons, which may be quite roughly distributed as follows:

New York	
Philadelphia	103,000
Baltimore	174,000
Hampton Roads	591,000
Charleston	29,000
Total	897,000

As compared with the 230,325 and 182,064 tons exported from these ports in November and December, respectively, this was a marked increase. It was, however, less than half the tonnage sent overseas in October, before the strike necessitated restricting exports.

Danzig Is Short of Housing Facilities and of Fuel

As in most other cities, there has been for some time a marked shortage of housing facilities in the city, which has been aggravated by the fact that many quarters suitable for dwellings have been rented as offices by new firms coming to the city, says *Commerce Reports*.

The authorities have endeavored to relieve the situation by converting barracks, officers' clubs and other buildings into dwelling houses. Two official boards, the Wohnungsamt (housing office) and the Mieteinigungsamt (office for settlement of questions pertaining to rentals), are charged with finding dwellings for the population and settling disputes and adjusting rentals between landlords and tenants. The powers of both boards are extensive.

The fuel shortage has constituted another serious problem for the Danzig authorities. In January, 1919, the tariffs for gas and electricity, which are both furnished by municipal plants, had to be materially increased. Fares collected by the company operating the street railway lines were raised in February. The services of the company had to be restricted in the course of the year.

As a further means of saving fuel restaurants and moving-picture theatres were ordered closed at 9 p. m., although they are now permitted to remain open until 11, provided they have their own lighting, for which benzol is widely used. With few exceptions, stores have to be closed at 4 o'clock.

Heavy Export Coal Traffic at Charleston, W. Va.

The *Charleston Gazette* states that coal that is moving through Charleston is probably better known to people in towns along the Southern Ry. than to people of Charleston. For some time long coal trains have been hauled into the Charleston yards, just above the city boundary, and many more are on the schedules.

A Spartanburg man who had observed these long coal trains cross Main street in his town, said that it looked as if all the coal in the world was moving down to the seaboard. He said that people in that section were wondering what became of the coal after it reached Charleston.

For months, the movement of export coal through Charleston has been steadily growing, the several companies expanding their business. A considerable quantity has been sold to the Paris-Lyon-Mediterranean Railroad in France, this being transported in the railroad's own steamships. Other vessels have also carried coal from Charleston to European ports. Several cargoes have been taken to Boston.

Coupled with a heavy freight business generally, this movement of coal has added considerably to the burdens of the office of the division superintendent, Clifton P. King, but the matter of arrangements for storage tracks has been handled without a snarl. Mr. King is widely known as an expert in solving problems growing out of heavy traffic and Charleston has had its freight moved over the Southern Ry. as promptly as possible in all the circumstances.

While it has been reported that the Southern Ry. has been considering the construction of another unit at its coal terminal on the Cooper River, near the Country Club, nothing official has been announced and it is said that nothing will be said about the matter for some time. When the terminal was built, it was designed so that additional units could be installed if the expansion of the business warranted.

Czech Industries Retarded by Coal Shortage

A partial shutdown of Czecho-Slovakia's industries is threatened because of the scarcity of coal. The demand for Czech products is so great that the coal requirements of industries exceed pre-war requirements. The situation is complicated by falling off in supply due to the difficulties of working the mines and the treaty with Austria requiring them to give up a large part of their supply.

Anthracite coal production last year was 10,000,000 tons, which is nearly 4,000,000 tons below the normal. The output of bituminous in the same period was 16,500,000 tons as compared with 23,000,000 tons before the war. Of this supply 1,000,000 tons of anthracite and 3,500,000 tons of bituminous were surrendered to Austria, leaving only 56 per cent of the former and 67 per cent of the latter coal available for domestic consumption. The Government has carefully apportioned the supply to the various needs of the country.

Coal Output in Nova Scotia Is Not Up to Average

The production of coal in Nova Scotia for the last three months of 1919, Consul Charles M. Freeman, Halifax, Nova Scotia, Canada, states, was hardly up to the other months of the year. The output for the period was over 1,000,000 tons, an average of about 11,000 tons daily. There is practically no reserve stock on hand; all the surplus production from the coal fields of Cape Breton has been taken by steamships calling for bunker, except a quantity sold to the Netherlands Government.

No new mines have been developed, although the Dominion Coal Co. has in view the opening of new collieries during the coming year. Labor conditions have curtailed production.

Price of British Bunker Coal Continues To Be High

The following cablegram has been received from Consul General Robert P. Skinner, London, regarding the price of bunker coal and the movement to advance the outward freight rates:

Bunker coal at the port of London is selling at 155s. per ton. Coal for British industrial works is selling at the controlled price of 40s. per ton, and equivalent quality bunker coal at 140s. per ton. Since last May the price of bunkers has risen by 100s. per ton, while ordinary cargo freight rates are practically unchanged. There is a movement in progress to advance outward freight rates from the United Kingdom by 50 per cent if bunker prices cannot be lowered.

Coal Conservation Regulations in Force in Denmark

So serious has the coal situation in Denmark become that the government has found it necessary to formulate stringent regulations of the hours of business. Even the temperature that may be maintained in houses is prescribed. For instance, no private house is permitted a temperature in excess of 53 deg. F.

Restaurants must close at 10:30 each night, street car service ceases at midnight. All theatres and moving picture shows open at 6:30 and all stores and offices must close on four days of each week at 5 o'clock. Copenhagen, being far north, has very short days during the winter months. The population must get up in the dark, even if they rise at 10, and dusk begins to gather at 3 in the afternoon. Consequently laws governing early closing make life very dreary.

South Wales Collieries Agree to Fixed Maximum Prices

The South Wales collieries have agreed to a fixed price for bunkers—large, £4, small £3 per ton, to be effective April 1. The new prices will apply on all shipping, home and foreign. It is expected that other ports will meet this cut.

COAL AND COKE NEWS

Scranton, Pa.

Spectacular Mine-Cave Developments —Engineers Investigate Oxford Working—Mayor Connell and Police Assist

West Scranton was a storm center during the second week of March in regard to the mine-cave agitation which has been such a prominent issue in Scranton and vicinity for the past few months. The city council of Scranton recently authorized the expenditure of $10,000, to investigate mining conditions under the municipality. Accordingly Mayor A. T. Connell appointed five engineers to inspect the Oxford mine of the Peoples Coal Co. James Smith, city mine-cave engineer, is chairman of the board of engineers; and Arthur W. Long, engineer of the Scranton Mine-Cave Commission, is to act as advisory head to the engineers and also to give assistance in the investigations of mine workings.

The area underlaid by the workings of the Oxford mine has been the scene of great disturbance for the past few months. The surface and the buildings on it have been seriously damaged; the gas mains have been broken, with the result that explosions occurring not only did considerable damage but further incensed those living in the vicinity. The Surface Protective Association of Scranton has been especially active in efforts to obtain relief from such conditions. In addition certain apparently incriminating information reached the city authorities and doubtless influenced Mayor Connell to order an examination of this particular mine. The mayor stated that he wanted an exhaustive, unbiased, unprejudiced and uninfluenced inspection made; he believes that when the inspection is completed, that the public will better know what steps to take to prevent further damage to surface and property and possibly to life and limb.

In pursuance of this plan the board of engineers entered the Oxford mine to verify certain information and to obtain a definite idea as to underground conditions in the West Scranton section. Here they met with forcible resistance, especially when they attempted to dig through a wall in the mine, behind which it was suspected mining operations were being carried on, despite an injunction of court. This section is underneath or near North Main Avenue. Mayor Connell himself was refused admittance to the Oxford mine on the first day of examination and a number of sensational incidents marked the attempts of the engineers to gather information in the workings.

Effect Entrance to Mine With Armed Force

On the following day Mayor Connell made another effort to enter the mine in company with 45 armed patrolmen. Not often in the history of the city has there been as much excitement around a mining operation, as when the mayor and patrolmen fought with officials and employees of the Peoples Coal Co. around the entrance to the mine. During the days following, sensational scenes attended the efforts of the engineers to gain admittance to the Oxford mines and to certain parts of the workings. Entrance was effected through old openings and by means of connections with an adjoining mine of the Delaware, Lackawanna & Western company.

Apparently the engineers have unearthed evidence which may have an important bearing on the situation affecting the West Scranton section. No official statement has been made by those having the inspection in hand, and several weeks may elapse before the examination is completed. Many physical difficulties are presented to those inspecting the workings and reports state that strangely enough the Peoples Coal Co. is placing many obstacles in the way of those examining the Oxford mine. Mayor Connell has issued a proclamation covering the situation in which he orders the Oxford mine closed and that no further mining of coal will be allowed; also that no persons will be allowed to enter the mine except fire bosses, pump runners and those of like occupation, whose presence is necessary to the safety of the mine, until examination has been completed.

The city of Scranton authorizes and will enforce this order. The matter of surface protection is to be brought to a head. It is claimed that the Davis law, enacted in 1913, has been violated. The matter will undoubtedly be carried to the courts, upon whom those directly interested seem to place reliance for a final decision.

Charleston, W. Va.

About All Chesapeake & Ohio Coal Cars Missing—Mine Supply Serious Problem—Confiscation of Kanawha Coal—New River Exports at Low Ebb

Time was being marked by many mines in this section of West Virginia during the second week of March while operations awaited cars which never came. Production was seriously retarded in fact by the inability of railroads to supply cars even approaching mine ratings. This scarcity of cars, therefore, made it impossible to make any gains in the output over previous weeks. In fact production was less than half of what it ought to have been and less than half of what it could have been had the car service been at all satisfactory.

No causes other than a shortage of cars operated to hold back production. Nearly a full production was possible at the beginning of the week, largely through a two-day car supply combined in one; then the output was lowered to 45 per cent and finally down to 35 per cent. During most of the week the supply was just about 45 per cent of requirements.

Months Before Car Shortage is Over

Although the Chesapeake & Ohio R.R has about 40,000 coal cars, most of such rolling stock is now in use on other roads and some of it in the far West. As a matter of fact fully 35,000 coal cars are missing from the home line with little prospect that they will be returned for several months to come; so that the Chesapeake & Ohio is confronted with quite a serious problem in endeavoring to supply its mines with cars. Of course under such conditions, it is useless to attempt to operate in many instances, and little hope is held out for anything better than a 50 per cent supply for some time to come.

Little progress has been made so far in this part of West Virginia in closing contracts for the new coal year; companies are far behind on contract deliveries for the present year, being not only utterly unable to supply the spot demand but also to furnish the coal which they are under obligations to deliver. It did not require embargoes to prevent coal shipped from reaching its destination. Confiscation accomplished the same purpose, and the widely advertised cessation of confiscation is described by producers as a myth; since coal consigned to tidewater points for export is being gobbled up, even after it is in the pools ready for cargo loading, and it is then handed over to the railroads and to New England utilities. Naturally then export shipments were reduced to the very minimum.

Continued control over the coal industry is not only exasperating coal men in West Virginia, but it is also arousing keen indignation, as operators feel that Government officials are openly discriminating against the industry. With the Government still maintaining its hold on the industry and with everything at sixes and sevens, few contracts are being made under present uncertain conditions.

Heavy Kanawha Production Loss

Less coal was produced in the Kanawha region between March 8 and 13 than during the first six days of the month, and the inability of the mines to secure cars was almost solely responsible for the heavy production loss sustained. At only one time during the week did loadings approach normal and that was on Monday when production was 28,000 tons; Coal River mines on the same day having a production of 15,000 tons. As soon as Monday's cars were loaded out, mines began marking time once again, the supply on Tuesday being only 44 per cent of allotment. There was a slight improvement on Wednesday, but on the day following there was only a 36 per cent supply.

Contrary to general expectations, much Kanawha coal was still being conficasted during the second weekly working period of the month. The mere fact that coal was being shipped under permit to tidewater, did not protect such coal from confiscation even after being dumped into the pools at tide.

New River Output 37 Per Cent

New River mines failed during the second week of the month to regain any of the ground lost in earlier weeks, suffering to an even greater extent than had been the case in the period between March 1 and 6; a scarcity of cars was the chief factor in holding production to a ridiculously low figure. In fact mines were not working more than half time during the week, and the car supply was, during five out of the six days, much under 50 per cent.

Production fluctuated between 35 and 45 per cent of potential capacity. Under the circumstances producers were finding it impossible to keep pace with the demand. Export shipments were at about as low a point as they had been for some time, confiscation of New River coal in transit, as well as at tidewater, having as much to do with that condition of affairs as anything else. It was stated at the end of the week, that smokeless producers would disregard Government prices and charge what was considered a fair market price for smokeless coal. There was nothing to mar the labor situation in the New River field during the second week of the month.

Bluefield, W. Va.

Mines Idle in Southern West Virginia—Virginian Ry. Places Big Car Order—Acute Pocahontas Car Shortage—Tug River Increases Output

The second week of March found the conditions much worse on the Norfolk & Western, from a transportation standpoint, than had been the case during the previous week; while on the other hand, mines on the Virginian had a supply slightly more liberal than during earlier weeks. Idleness was quite general throughout the extreme southern mining fields of the state during the greater part of the week. As a matter of fact the end of the week found the car supply almost at zero. For two days, or during one-third the weekly working period, there was not more than a 20 per cent supply of cars available for most mines on the Norfolk & Western. In the face of such discouraging transportation conditions, optimism had given way to pessimism as a hoped for improvement in the car supply had not materialized. It is extremely doubtful if the average mine in the southern part of the state was able to operate more than three out of the six days, and some of the smaller mines were affected to an even greater extent.

Under such conditions coal costs were mounting quite rapidly, since the overhead expense is going on just the same. Not only was the meager car supply, during the weekly period ended the thirteenth, embarrassing from a transportation and financial standpoint, but it was breeding much discontent among the miners, and was driving them away in great numbers, owing to the irregularity of work and the small amounts they were able to earn.

Another drawback to satisfactory coal movement was poor motive power, the movement of coal being extremely slow. However it was Government regulation of distribution and of prices, which was also seriously affecting the business of mining during the week ended the thirteenth, since coal was being confiscated in just as large a volume as ever, whether it was for export or not, so that there was virtually no coal at all being exported during this period. As a matter of fact on March 11, at all three tidewater terminals—Sewell's Point, Lambert's Point and Newport News—there was only 16,000 tons of coal available for export loading.

Until the Norfolk & Western succeeds in securing the return of more of its own equipment than it now has on hand, a continuance of the car shortage is expected. As the influenza and other factors which affected labor conditions, during a part of February, have been eradicated, the man power available in southern West Virginia is such as to make a large production possible, although during the first two weeks of March, inability to secure work was causing many miners to seek employment elsewhere.

Winding Gulf Works Three-Quarters Time

Slight gains were made in the output of the mines of the Winding Gulf field, during the week ended March 13, not through any improvement in the Chesapeake & Ohio car supply but largely through a more liberal distribution of cars on the part of the Virginian Ry. The supply of cars from the latter road was such as to enable mines to work about 4½ days during the week. On the other hand mines dependent upon the Chesapeake & Ohio for empties had to content themselves with about a half week's supply.

Operators in the Winding Gulf field have been advised that the Virginian Ry. has placed an order for 1,000 120-ton open-top cars for delivery during the present year. Proposed export shipments from the Winding Gulf field have fared the same as exports from other fields, not being treated as exports at all but as subject to Government interference and confiscation; so that coal from the Winding Gulf region actually exported during the second week of the month was quite small in volume.

Pocahontas Car Supply 50 Per Cent

Pocahontas production continued to suffer in the second week of March as it has since the first of the year, with losses outweighing the output and with a car shortage counting as the most serious source of this loss. As during the few preceeding weeks, the acute shortage of cars cost a production of more than 200,000 tons of coal; the supply of empties, taking the week as a whole, not being more than 50 per cent at the most. Hence, on an average, Pocahontas mines were idle about half of the week, and on the twelfth and thirteenth the quota distributed to various mines averaged just about one-fifth of requirements.

There was little sickness among miners but mine workers were becoming restless and were leaving the field because of the frequent idleness at operations. While priority regulations did not affect export shipments, confiscation did, and by the middle of the month export shipments of Pocahontas coal were few and far between.

A[illegible] seriously handicapped by inability to secure cars, mines in the Tug River field were not affected to as great an extent, during the week ended March 13, as other fields in southern West Virginia; therefore the output was increased [illegible] to 72,[illegible] net tons, the [illegible] reached in a period of [illegible].

With the contract season right upon them, Tug River producers are very much [illegible] contracts owing [illegible] of Government price control. Indeed, the plight of producers is [illegible] confronted with the necessity of either shutting down, or [illegible] to Government [illegible].

[illegible] that many smokeless operators will disregard Government [illegible] therefore possible [illegible] in the price of [illegible] within the next 30 or 60 days. [illegible] operators say [illegible]

ent price of coal as fixed by the Government. Owing to adherence to the rule of the American Car Association, that coal cars be returned empty to home lines, a more serious car shortage than now prevails is looked for in the Tug River and adjoining fields.

Huntington, W. Va.

Car Shortage Losses Far Exceed Output—Confiscation of Coal—Double Tracking of Guyan Branch Requested

There was a downward trend to production in the Logan field during the period ended March 13, production reaching little more than 150,000 tons, with car-shortage losses mounting skyward and far exceeding production. As a matter of fact the loss from transportation disabilities was well over 200,000, it being one of the worst weeks in recent months from a production standpoint; despite the fact that the car supply was better and the loadings larger on Monday (the eighth) than at any time in recent weeks, amounting on that day to 50,000 tons.

Less than half that amount of coal, or 22,300 tons, were produced on the ninth, there being a slight increase on the tenth however when the output was 25,700 tons. However on the eleventh, production had dwindled to one-third of normal, being only 19,850 tons. Logan mines wound up the week with an output of only 17,650 tons, weather conditions being highly unsatisfactory and operating to cut down both the production and movement of Logan coal.

Although confiscation of coal was assumed to have ceased with the passing of the railroads back to their former owners nevertheless Logan producers reported quite a large tonnage still being confiscated, part of it at tidewater. However, the volume so confiscated was far less than was the case when the railroads were under Government control.

Tidewater shipments, especially during the latter part of the week, were running unusually heavy, but so far as could be learned only a small proportion of the coal going to tide was being shipped overseas, not only because of export regulations but also because of the confiscation at tidewater. Western markets were drawing heavily on the Logan field for a coal supply, some of the product of the field also being consigned to southeastern markets.

Logan operators were represented by a delegation who attended a conference at New York (on the nineteenth) between directors and officials of the Chesapeake & Ohio and representatives of various Kentucky and West Virginia coal fields, at which time the double tracking of the Guyan Branch of the Chesapeake & Ohio (in addition to the double track already built) was requested, in order to take care of the additional tonnage from the Guyan field.

Fairmont, W. Va.

Meager Car Supply on Baltimore & Ohio—Other Roads Hard Put—The Reason—Late Lake Season Opening Welcome

While the Baltimore & Ohio R.R., operating in northern West Virginia, appeared to have more cars for the mines on its lines than other roads in the state, even the supply on that road during the second week of the month was, most of the time, below 50 per cent; so that it may be imagined how hard put mines on other roads were for open tops. In all fields, Monday brought a large quota of cars. However, that was the only day out of the six in which there was anything like a full day's work, for by the second day, even on the Baltimore & Ohio, the quota furnished had dropped to less than half; the West Virginia mines on the Monongahela R.R., were forced to be content with a 30 per cent supply. As a matter of fact that road distributed only 75 cars even on Monday.

Production, it is believed, reached the lowest level on the tenth in the Fairmont as well as in other northern West Virginia fields. In the Fairmont field, the Wednesday distribution was less than 500 cars. With no cars available, to speak of, it was not surprising to find 112 mines not in operation. While idleness was not so general Thursday, nearly 90 mines found it impossible to operate on that day. Other fields in the northern part of the state, as may be surmised, were not doing even as well as the Fairmont field, and consequently idleness was quite general.

One reason for a more plentiful supply on the Baltimore & Ohio was the fact that that road was not releasing as many cars to connections as were other lines. Furthermore in order to secure coal, the railroad had to deliver cars. While the supply was exceedingly poor even on the Baltimore & Ohio, it was somewhat better than had been observed while the road was under Government control, during recent months.

Western shipments were comparatively limited as compared with eastern consignments. Of such coal as was flowing westward, the bulk of it was being consigned to Michigan and Ohio points. Export shipments were extremely meager in volume during the week. A considerable tonnage of the northern West Virginia product was being used by the railroads. In fact, under a sort of quasi-agreement, about 20 per cent of the fuel produced during the second week of the month, was being furnished the Baltimore & Ohio and other railroads.

Lake Season Not to Open for a Month

Little preparation so far has been made by northern West Virginia operators to take care of any Lake business. In the first place it is generally believed that it will be fully 30 days before the Lakes are open to navigation. Although it is believed that little coal remains on hand from last year, and consequently that there will be a pressing demand when the Lake season is opened, yet the demand and the shortage in the East is such, that it will be necessary to equalize the supply and demand before being able to ship coal on a large scale to the Lakes, for next year's reserve stock.

Furthermore northern West Virginia operators rather welcome a late opening of the Lake season, since it is almost impossible to arrive at a proper basis for making contracts under present conditions, and consequently contract-making is far behind that of other years. A year ago producers were eager to find contract customers. Generally speaking, at the present time producers are waiting developments before making contracts.

Norton, Va.

No Let Up in Coal Confiscation—Output 60 Per Cent of Capacity

Despite repeated protests there is no abatement in the confiscation of coal produced at Virginia mines. At least such was the case during the second week of March when fully half the output of the mines was seized by the railroads, not in transit, nor at tidewater but at the mines, with entire disregard of the arrangements between producers and consumers.

This indiscriminate confiscation left very little coal available for commercial purposes, especially when it is taken into consideration that there was a production of only 114,000 tons, or 60 per cent of potential capacity. The other 40 per cent was lost entirely because of the inability of the mines to secure cars.

There was an output of 32,000 tons, in addition to the figures just given, for which there was no cars; but this 32,000 tons was used in making coke. Including the tonnage used in the manufacture of coke there was a total of 145,210 tons produced in the field. Spot coal was not available even in the smallest quantities, owing to the fact that the limited output, less the tonnage confiscated was not such as to enable producers to meet contract requirements.

Ashland, Ky.

Kentucky Mines Big Capacity Increase—Campaign for Improved Car Service—Ex-President Taft's Recent Opinion

Production was punctured to some extent during the week ended March 13 in the northeast Kentucky field, a ten per cent loss, as compared with the previous week's production, being sustained. In other words the output dropped to 124,940 tons, or 51 per cent of a potential capacity (246,000 tons), with the car shortage responsible for a loss of 116,505 tons or 47 per cent. In the same period of 1919 the output was 109,027 tons.

The car supply to the mines served by the Chesapeake & Ohio and its branches, during the week, afforded 56 per cent working time, or a little better than three days; while on the Louisville & Nashville a 46 per cent working time was permitted the mines, or a little better than 2½ days for the week. The production on Monday, March 8, was by far the largest one day's loading in the history of the field and had the car supply continued to the same extent during the week, the district would have loaded well in excess of 200,000 tons.

Large Development in Mine Capacity

A careful survey of the situation in the northeast Kentucky field, during the second week of the month, disclosed an increase of 57 per cent in the potential capacity of the mines since March, 1918. The increase separately by railroads was as follows: Chesapeake & Ohio mines, 53 per cent; Sandy Valley & Elkhorn mines, 22 per cent; Louisville & Nashville mines 38 per cent, Ashland Coal & Iron mines 5 per cent; marked gains were made in the other local districts, especially along the Long Fork, which was not opened for service two years ago. Quite limited improvement in railroad service was made during the period mentioned so that it is easily explained why the railroad service at this time falls far short of the demand placed upon it.

Increased development has also taken place along the other branches of the Chesapeake & Ohio although possibly not relatively so great. Furthermore, considerable contemplated new development has been retarded by the failure of the railroads to take care of their present business. It is safe to assume that had proper encouragement been given to new operations in the way of satisfactory car supply the productive capacity of the northeast field would easily have been doubled in two years. With the new development now under way it is expected that within a year the double mark will have been reached.

Aggressive Campaign for Improved Car Service

Northeast Kentucky operators, in cooperation with those from the other Chesapeake & Ohio districts have started an aggressive campaign for the improved service they feel they are entitled to; it is expected that the entire question will be aired before the Interstate Commerce Commission, if the Chesapeake & Ohio management does not show greater assurance, that they have the matter under consideration; furthermore that they will do everything in their power to improve conditions and at the earliest possible date.

A more liberal treatment of the mine ratings for the ensuing month has been granted by the Chesapeake & Ohio Allotment Commission, so that the new ratings for the northeast Kentucky district show an increase of approximately 10 per cent over the previous ratings. Nevertheless, many of the northeast Kentucky operators are still far from satisfied, and are pressing their claims energetically for additional increases, which they feel they are entitled to.

Former President Taft recently submitted his opinion before the smokeless operators meeting, during the second week of the month, wherein he held that the confiscation of coal by railroads was illegal and the enforement of price regulations under the Lever Act null and void. In consequence of this many operators in eastern Kentucky contemplate entering the markets with a view to securing the best price offered them for their production; so that it would not be surprising to see quite a general increase in prices within the next two months. The only alternative to price increases, many operators claim, is either a suspension of operations, or bankruptcy.

Birmingham, Ala.

Operators Refuse to Reinstate Miners —Umpire Sustains This Decision— Other Miner's Complaints Dismissed

Alabama coal companies, including the Pratt Consolidated Coal Co., Aetna, Liberty, Sloss-Sheffield Steel & Iron Co., Gulf States Steel Co. and the Corona Coal Co., won the first battle in this state in the complaints of miners who claimed that coal operators refused to reinstate them, in violation of the Garfield agreement, following the coal strike last November.

Judge E. H. Dryer, umpire between the coal operators and the miners in Alabama, ruled that the Garfield agreement did not provide that operators must reinstate men who voluntarily quit their jobs, either during a strike or at any other time, but only where union affiliation was the cause. The umpire held that the men had voluntarily given up their jobs in the coal strike, and the question of reinstatement was a matter of company policy on the part of the coal corporations.

Frank S. White, Jr., acting counsel for the United Mine Workers, declared himself unfamiliar with the contentions of the miners petitioning reinstatement, as he was substituting for his father, Frank S. White, Sr. who was ill. Following the ruling he announced that as the cases of 104 other miners petitioning reinstatement with nine other coal companies, set for hearing March 19, involved the same principle, that they should be dismissed. It was so ordered by Judge Dryer.

The following statement regarding the contentions of the miners was given out by Judge Dryer:

"Wyley Davis, Walter Chism and Will Chism complain that they are denied reinstatement by the Pratt Consolidated Coal Co. for service as employees at the Gamble mines. As members of the United Mine Workers they obeyed the general strike order, effective Nov. 1, 1919, and voluntarily quit the service of the employer. The strike ended, they claim to be entitled, as of right, to re-enter the service of the company, which refuses to re-employ.

Strike Illegal, Reinstatement Refused

"The umpire concurs in the public declaration made by the President, and in the opinion of United States District Judge Anderson, of Indiana, that the strike was illegal, and the question presented is, whether or not a member of the union who obeyed and participated, may now rightly demand to be placed in his former position without the consent, and against the wishes, of his former employer. The contention, in its essence, is that an employee may leave and return to the service as and when he pleases; and that this right exists even where the abandonment of the service was without just cause.

"Neither in law, nor in morals, may one escape individual responsibility for the consequences of his acts in obeying the orders of a union of which he is a member. What the union does, with his participation, is his act. If he leaves a service under the orders of the union, he leaves of his own volition. Having left, he cannot, as against his employer, claim any privilege or immunity he could not claim if he had not been a union man and had left the service of his own free will and accord. A union man cannot rightfully claim the benefits, and repudiate the burdens and responsibilities, of concerted action.

"No one would contend that a non-union man may leave a service, without good cause, and be entitled, as of right, to reinstatement against the consent of his former employer. A union man occupies no higher station.

Practical, Businesslike Ruling

"The prime object of the Garfield agreement is for increased production of coal. When a strike occurs, in order to continue operations, it is necessary to call in new men, and promote those remaining (who are competent) to places made vacant by those who have walked out. It would be unjust to discharge, or demote these men in order to restore the old men to their former positions whenever they may be pleased to return and demand reinstatement. No business could long survive a practice of that nature; and the true interest of the working man is not advanced by insistence upon it. The agreement, in terms, eleventh section, provides:

" 'The operator and his superintendent and his mine foreman shall be respected in the management of the mine and the direction of the working force. The authority to hire or discharge shall be vested in the mine superintendent or mine foreman.'

"It follows, that these applications for reinstatement should be denied. It is so ordered.

"It being admitted that the several complaints against Sloss-Sheffield Steel & Iron Co., Corona Coal Co., Aetna Coal Co., Liberty Coal Co., Birmingham Trussville Iron Co., Central Coal & Iron Co., Eureka Coal Co., Supreme Mining Co., Red Eagle Coal Co., and Rodney Coal Co. are of like character, and cannot under the ruling be sustained; they are, each, for the same reason, denied and dismissed."

The decision in this test case establishes an important precedent which should be invaluable in future similar disputes. The umpire in the Pennsylvania anthracite field performs a similar service, which dates from the time of appointment of the Conciliation Board.

Vancouver, Wash.

New Coal Field 80 Miles from Portland—Large Deposit of Fine Coal—Good for Coke and Power —Importance of District

Investigations are now under way, according to A. L. Haley, an engineer of Vancouver, Wash., which may result in the development of coal fields, heretofore dormant, within easy access of the Columbia River basin; this field, it is stated, would supply Portland and the ports of the Columbia River, with an unlimited quantity of cheap fuel and place them beyond the necessity of depending upon outside sources for their coal.

"Within the Columbia River basin, about 78 miles from Portland and Vancouver," said Mr. Haley, "there are available large deposits of coal suitable for ship's bunkers and fuel for industries.

"Southwestern Washington, 78 miles from Portland and Vancouver, has been known for a long time to have large areas of bituminous, sub-bituminous and lignite coal. Near Cinnabar, however, an extensive deposit of bituminous and sub-bituminous coal has been exposed; glacial action having eroded the lignite formation from the surface, bringing into view the earlier sandstones, and exposing seams of coal said to be equal to the best discovered anywhere in the West. The surface croppings had been the source of supply for different military posts in western Washington, for many years before the country became settled, and that the properties have been dormant so long a time, is due to the fact that there has been concerted effort on the part of the coal and transportation companies, to keep prices at as high levels as possible by discouraging development of new fields.

"Shipments of this coal sent to Connellsville, Pa., and made into coke, showed that the coke had a hard body, carried a heavy burden and stood fast driving in a blast furnace for the making of iron.

"A number of tests for byproducts made from shipments averaging about 30 per cent volatile matter, showed that it compared favorably with other coals produced in the United States in regard to yield of tar, oils, pitch, benzol, phenol, ammonia, creosote and gas. Tests made at Sacramento and San Francisco for steam purposes showed that it was of excellent quality for locomotives and steamships.

Big Coal Development Expected

"Development of the Pacific Coast has been much retarded by lack of good coal for steam purposes and for coke for smelting ores and manufacturing iron and steel. Most of the coke has been brought here from a distance. A number of attempts have been made to establish steel works in western Washington, but these projects had to depend upon imported coke, and failed. With the development of this large deposit of good coking coal, suitable for the manufacture of iron and steel, the future of the manufacturing industries of the Pacific Northwest is said to be assured.

"It is almost inconceivable the vast quantity of coal that exists upon a 1,200-acre property here. The U. S. Geological Survey Bulletin 424, on the valuation of coal lands, states that a bed of bituminous coal one acre in extent and one foot thick contains approximately 1,750 tons of coal. Under good conditions of mining (about 86 per cent recovery) it should yield over 1,500 net tons per acre. There is a total thickness of 146 ft. of coal on the property, and a yield of 1,500 tons to the acre-foot would make an acre yield of 219,000 tons, or a total of 260,829,000 tons underlying the 1,200 acres. Seam croppings on the east and west and development in the center indicate that the whole area is underlaid with coal of which about one-third is blocked out.

"It is believed that the eastern portion of Lewis County and upper Cowlitz Valley are destined soon to become one of the most important districts of Washington. Through this region, 75 miles east and west by 30 miles north and south, begining at Cinnabar and extending to the summit of the Cascades, with Carlton Pass and Nesqually River on the north and Cowlitz Pass and Cowlitz River on the south, there extends a ridge of mountains in which, it is said, nature has a vast storehouse of coal and iron ores.

"On Summit, Carlton, Muddy and Skull creeks, the extreme head tributaries of the Cowlitz River, are found the anthracite coal deposits. At the headwaters of the Tilton River, on Lightning or Devils' Mountain, is a large deposit of hematite ore

PENNSYLVANIA

Anthracite

Hazleton—The West Hazleton council is arranging to create a bureau of mines in that place, as authorized by the act of 1913. This bureau is empowered to send an engineer into underground workings at any time, and the company must furnish maps of all operations under the municipality. The object of this is that the city might get proper returns in taxes from coal mining.

The G. B. Markle Co., one of the largest independent anthracite operators, having an annual production of over 1,000,000 tons, will on and after April 1 will sell its coal direct to the trade. This company's well-known Jeddo and Highland Lehigh coals have been handled by the Lehigh Valley Coal Sales Co. for many years. Harry Hosford, who for many years has been connected with the Lehigh Valley Coal Co., will be the sales agent for the Markle company, with headquarters in New York. The official announcement issued by the G. B Markle Co. says: "On and after April 1, 1920, G. B. Markle Co. will sell direct to the trade its celebrated Jeddo and Highland Lehigh coals, as its sales arrangement with the Lehigh Valley Coal Sales Co. will expire March 31, 1920. We ask that your orders for shipment after April 1 be promptly submitted direct to us for our consideration, addressed to G. B. Markle Co., Jeddo, Pa. We cannot tell you at this time what the prices for our coal f.o b. mines will be in view of the fact that the wage contract with the anthracite mine workers expires March 31, 1920. Negotiations with the mine workers are now going on, and as soon as agreement is entered into, we will advise you our prices at the mines. We solicit your orders in advance, and any orders you may thus submit which are accepted by us will be contingent upon the acceptability to you of the prices we then name."

Bituminous

Pittsburgh—One hundred leading mining men of western Pennsylvania, including the examining boards for mine foremen and fire bosses of the various bituminous districts. met at the Seventh Avenue Hotel recently and discussed the questions which will be asked at the coming examination. The dates set for the examination are April 6 and 7 for the second-grade mine foremen, April 8 for the first-grade mine foremen and April 9 for the fire-boss tests.

Creighton—A property known as the Wainwright holdings consisting of 37 acres of coal lands was reported sold recently. The tract went to a manufacturing company which will erect modern buildings on it. The consideration was approximately $100,000. The property lies between the Pennsylvania Railroad and the Allegheny River in Allegheny County. The identity of the purchaser was not disclosed.

WEST VIRGINIA

Longacre—Fire on the night of March 8 did damage to the extent of $60,000 at the plant of the Kanawha and Hocking Coal Co. at this place in Fayette County. In the fire, the machine shop, store and office of the company were destroyed; records and accounts of the company in the office at the time of the fire going up in smoke. It was impossible to save any of the property destroyed, owing to the fact that the fire had gained such headway before being discovered. Increased gas pressure in a sleeping room above the store is generally ascribed as the cause of the fire.

Huntington—The Logan Operators' Association held its monthly meeting here on March 13. As illustrating conditions in the Logan field, figures were submitted to the members of the association, showing that wages had been advanced in the field about 125 per cent since 1914, yet since 1914 the cost of living had been advanced only 60 per cent. Other statistics submitted showed that the average working time for miners in the Logan field had been 97 hours for January and only 92 hours for February, a scarcity of cars during the two months having materially reduced the working time. The association [illegible] rates of 15 per cent for the Kentucky & West Virginia Power Co., whose application is now pending before the Public Service Com- [illegible] ity by the installation of a $2,000,000 plant.

Charleston—[illegible] of West Virginia [illegible] for two days during the second week of March, devoted their attention in the main to the question of further control of the coal industry, with particular reference to the re-establishment of the tidewater pool, the confirmation by the President of the powers delegated to the Director General of Railroads and to price control. A special committee was delegated to make a report as to the right of the Government to continue price-control regulations. The committed referred to submitted a report and as a part of that report the opinion of William Howard Taft, in which the latter held that the Railroad Administration is without legal authority to exercise control over the coal industry, and that there was no validity to orders issued under the Lever Act since October 30, 1919. A committee of the smokeless operators held a conference with the Attorney General and were informed by him that he would feel it necessary to prosecute if there were any infractions of the Lever Act. The committee appointed at the February meeting of the association, to take up with the Railroad Administration the question of securing payment for diverted and confiscated coal, made a report stating that considerable headway had been made in securing settlement for coal, about which there had been disputes, and that in the future more prompt payments might be expected.

Charleston—The properties of the Monte Coal Co., on Little Coal River, in the Kanawha district, changed hands on March 10, being purchased by the Buffalo-Thacker Coal Co., at a consideration of about $1,000,000. L. R. Feese, president of the Buffalo-Thacker Coal Co., with headquarters in Huntington, acting on behalf of his company, consummated the deal for the purchase of the Monte company, at Philadelphia. The Monte company operated three mines at Ottawa on Little Coal River, the three mines having in the aggregate a capacity of 30,000 tons a month. With the purchase of the Monte mines the Buffalo-Thacker Coal Co. will have a monthly capacity of 50,000 tons a month. Identified with the Monte company were: Paul Hurdy, J. M. Moore, Charles M. Gohen, B. J. Heiner, J. K. Oney, J. H. LeBlanc, H. O. Aleshire, Thomas W. Harvey, R. P. Aleshire and W. G. Lax.

ILLINOIS

Springfield—Many local mines in this district are being closed on account of car shortage. The situation is becoming more critical every day. The Auburn mine has been closed several days and the Riverton, Junction and Capitol mines were able to run only a few hours a day, while the Divernon, Sherman, Sangamon and Citizens' mines are also closed some days. The operators and miners both feel that this car shortage is growing more serious and that instead of relief, greater difficulties may be expected. The Great Lakes docks have estimated that they will need 30,000,000 tons of coal and the Eastern operators are confident of the fact that they will be able to supply more than 10,000,000 tons of this amount. The Western operators seem quite confident that they will not be able to make up the deficit.

Duquoin—Reports have been circulated of the purchase of the Wabash, Chester & Western R.R., which runs through Tamaroa, north of here, by Jessie Diamond, president of the Southern Gem Coal Co. The report certifies that Mr. Diamond at least has an option on the road for the sum of $500,000. This road has been changing hands quite frequently during the past four years and, in the event that the Southern Gem Coal Co. takes it over, it is practically assured of future operation, which up to this time has been difficult. The line passes through the heart of large acreages recently acquired by the Southern Gem and other large concerns, and, it is understood that, with numerous extensions and switches, the road would furnish sufficient means of transportation for the product of the many new mines which are under consideration. Drilling is now in progress in many locations by various companies, and as far as can be seen good results have been shown by such prospecting. The Wabash, Chester & Western connects with the Illinois Central R.R. at two different places, also with the Chicago, Burlington & Quincy, these two being the largest shippers from the Southern Illinois fields.

Several hundred acres of coal lands were recently deeded by the West Frankfort Coal Co. and others to the Southern Gem Coal Co., most of which is located in Elk Prairie, Bald Hill and McClellan townships. The total consideration of the deeds filed was $218,000. These new tracts will add to the already enormous holdings of the company.

One of the largest deals in the mining history of this section was recently consummated between the Peabody Coal Co. and the Franklin Coal & Coke Co., of Royalton, 18 miles southeast of here. The deal included the two mines owned and operated by the Franklin Coal & Coke Co., also the large store of the Franklin Supply Co., 8,000 acres of coal lands and over 100 houses in the town. The amount paid by the Peabody Coal Co. for this property was approximately $2,000,000.

The Rentchler Station mine located near Belleville, in Madison County, owned by the Enterprise Collieries Co., was recently sold to R. B. Clark, of Harrisburg, Ill., for $35,000. The mine is located on the Louisville & Nashville R.R. It is not definitely known just what corporation Mr. Clark represents, but it is thought that, owing to the fact that the Aluminum Ore Co. recently bought the Southern Traction property and is buying up other coal properties along its right-of-way, this purchase would give the controlling power of this mine also to the Aluminum Ore Co.

Announcement has been made of the purchase of the Taylor and Carbon mines near O'Fallon, north of here, by the Perry County Coal Co., of Pinckneyville. The former owners of the two mines were J. Edward Yoch and Jacob B. Yoch, of Belleville, going under the business name of the Mutual Coal & Mining Co. The deal was made for a consideration of $150,000.

The O'Gara mine No. 12 of the O'Gara Coal Co., located near Muddy, Saline County, has been closed down, and from appearances will be abandoned at once, as workmen are now busy removing all of the machinery both on the surface and below ground. The company intends to take out the remaining coal belonging to No. 12 through No. 1 shaft, which is about half a mile north. The air shaft is also being filled in to prevent the sinking in of land surrounding.

ALABAMA

Birmingham—It is reported that the Ricton Mine, of the Big Warrior Coal Co., has begun shipping coal. This operation is located near the Warrior River, in Walker County, and the output will be handled by barge. New houses have been provided for employees and other improvements made.

It is also announced that the Corona Coal Co. is constructing a modern bath house for its employees at its Coal Valley operation, near Cordova, Walker County.

About 600 acres of coal lands belonging to the Gaston estate, located in St. Clair County, has been sold to Watt T. Brown, of Ragland, Ala. Mr. Brown now owns approximately 7,000 acres of coal lands in that section which, it is understood, he will develop at a later date.

Personals

George A. Miller, formerly southwestern sales manager for the Peabody Coal Co., of St. Louis, is now holding the same position with this company at Sheridan, Wyoming.

J. R. Hudelson, general manager and treasurer for the Franklin County Coal & Coke Co., of Royalton, Ill., recently shot and killed himself. He was a prominent man in mining circles in that district.

T. O. Sloan, formerly head of the office force of the Peabody Coal Co., at West Frankfort, Ill., has been promoted to traveling auditor for the company and will have charge of this work at the various plants owned by the company in southern Illinois.

Fred G. Campbell, formerly chief clerk for the Peabody Coal Co., at Marion, Ill., has resigned to accept a better position in Wyoming, that of auditor of a big group of mines in that state. For some time he was also traveling auditor for the Peabody Coal Co.

A. B. McLaren, general superintendent of the chain of mines in southern Illinois, owned by the O'Gara Coal Co., of Chicago, has resigned, effective at once. This announcement was made together with the report of a serious operation which was recently performed upon the superintendent. His successor has not yet been named.

John J. Mulvehill has resigned as chief clerk to Frank R. Lyon, vice president of the Consolidation Coal Co. to become identified with the J. C. McKinley Coal, Oil and Gas Co., at Wheeling W. Va. For several years Mr. Mulvehill was secretary to Geo. T. Watson while the latter was vice president of the Consolidation company.

Arthur Evans, for several years chief clerk of the Jefferson & Clearfield Coal & Iron Co. at McIntyre, Pa., has been promoted to a similar position with the Rochester & Pittsburgh Coal & Iron Co., at Lucerne mines, near Homer City, Pa. The Lucerne plant is the largest in Indiana County.

Charles C. Werner, of Somerset, Pa., who has been the acting chief engineer of the Consolidation Coal Co. in the Maryland district, has resigned to accept an important post with the Penn Mary Coal Co., with headquarters at Reedsville, W. Va., the Penn Mary company being a subsidiary of the Bethlehem Steel Corporation.

Major Samuel D. Brady, of Fairmont, W. Va., has been elected a director in the Upper Potomac Coal Association, operators of mines in the upper Potomac field composing the association. The officers of the association are: T. M. Dodson, of Bethlehem, Pa., president, and Howard P. Bryden, of Cumberland, Md., executive secretary. Major Brady operates mines in the Fairmont field as well as in the upper Potomac, or Western Maryland field.

D. S. Hanley has announced his resignation as general manager of the Pacific Coast Coal Co., of New Castle, in Kings County, Wash. He leaves the service of the local company to become assistant to the president of the East Ohio Gas Co. at Cleveland, Ohio. Mr. Hanley has for many years been associated with Martin B. Daly, president of the concern to which he now goes, in fact, he came to the Pacific coast some years ago to manage Mr. Daly's coal property at Bayne; the property was in operation until the recent coal strike, at which time the machinery was taken out and the mine closed. It is said that the property will not be reopened until the operators and miners can agree on a basis permitting of running the plant at a profit. Mr. Hanley will be succeeded by Wyie Hemphill, assistant to the vice president of the Pacific Coast Coal Co.

Obituary

Morgan Llewellyn, died on Feb. 17, 1920. He was the active vice-president of the Walsh & Weidner Boiler Co., of Chattanooga, Tenn.

James J. Flannery, president of the Montour & Lake Erie Coal Co., and a prominent manufacturer, died at his home in Pittsburgh, Pa., on March 6. Mr. Flannery was also a member of the board of directors of the Wharton Steel Co. He is survived by his widow and nine children.

J. R. Hudelson, aged 40, general manager and treasurer of the Franklin County Coal & Coke Co., at Royalton, shot and killed himself. The sale of the Franklin County company properties to the Peabody Coal Co., of Chicago, is being negotiated, the consideration being $2,000,000. Mr. Hudelson was one of the influential business men in the mining circles of Franklin County. Worry over the sale of the property is believed to have caused him to take his life. A widow and one child survive.

Frank C. Smith, former president of the Reading Iron Co., and a prominent figure in the development of Reading as one of the centers of the iron industry, died on March 3, of a complication of diseases, at his home in Reading. He was 74 years of age. After an early training with the Philadelphia & Reading Ry. Co. and in Reading banking circles, Mr. Smith in 1873 entered the service of the Reading Iron Works as business manager, and remained as such until the organiation of the Reading Iron Co. in 1889, when he was made treasurer, and later vice president and general manager, under the presidency of the late George F. Baer, whom he succeeded in 1902. He was a director of the Penn-Mary Coal Co., and a number of other organizations.

Coming Meetings

National Coal Association will hold its annual meeting May 25, 26 and 27 at the Traymore Hotel, Atlantic City, N. J. Secretary, W. B. Reed, Commercial Bank Building, Washington, D. C.

The American Association of Engineers will hold its annual convention at the Planters Hotel, St. Louis, Mo., May 10 and 11. C. E. Drayer, secretary, Chicago, Ill.

National Foreign Trade Convention to be held in San Francisco, Cal., May 12, 13, 14 and 15.

Chicago Coal Merchants' Association will hold its annual meeting April 13, at Chicago, Ill. Secretary, A. H. Kendall, Chicago, Ill.

American Chemical Society will hold its annual meeting at St. Louis, Mo., April 13, 14, 15 and 16. Secretary, Dr. Charles L. Parsons, 1709 G. St., N. W., Washington, D. C.

National Retail Coal Merchants' Association will hold its annual meeting June 10, 11 and 12 at Detroit, Mich. Secretary-manager, Ellery Gordon, Philadelphia, Pa.

Kentucky Mining Institute will hold its annual meeting June 4 and 5 at Lexington, Ky. Secretary, C. W. Strickland, Huntington, W. Va.

American Society of Mechanical Engineers will hold its spring meeting May 24, 25, 26 and 27 at St. Louis, Mo. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

Chamber of Commerce of the United States of America will hold its eighth annual meeting April 26, 27, 28 and 29 at Atlantic City, N. J. Assistant Secretary, D. A. Skinner, Washington, D. C.

Industrial News

Kemmerer, Wyo.—The old Star coal mine, eight miles from this place, has been secured by Utah capitalists and soon will be in the producing class. The Star Coal Mining Co., capital stock $500,000, is to be organized to operate the property.

Beckley, W. Va.—A branch office has been opened in this place by the Fort Dearborn Coal & Export Co., of Chicago, the same company having offices in New York, Chicago, Cincinnati and Norfolk. M. B. Hoffman will be placed in charge of the Beckley office of the company.

Reading, Pa.—At the annual meeting of the Reading Iron Co., W. W. Williams, formerly general manager, was appointed vice president in charge of sales and operation, and J. M. Callen, former second vice president, was appointed vice president in charge of purchases and distribution of materials. Other officers re-elected are: L. E. Thomas, president; G. W. Delany, secretary; H. N. Yost, treasurer; R. J. Wenger, assistant treasurer.

Philadelphia, Pa.—Maderia, Hill & Co., a miner and shipper of anthracite and bituminous coal, with headquarters in this city, has acquired the property of the Rockhill Iron & Coal Co., in Huntingdon, Blair and Fulton counties. Included in the deal is control of the East Broad Top R.R. & Coal Co., operating a line 50 miles long and connecting with the Pennsylvania R.R. at Mt. Union. Six mines with an annual output of about 750,000 tons are involved, and it is said the annual capacity will be increased to 1,000,000 tons.

Charleston, W. Va.—Action has been taken by the directors of the Greenbrier & Eastern Ry. Co., looking toward the opening of about 120,000 acres of coal and timber land in Greenbrier County. The directors' of this road have reached a decision to initiate work in the near future in the road, which will be nearly nine miles in length, and which will be constructed from Rainelle, along Meadow Creek, penetrating the large area of coal lands owned by the Gauley Coal Land Co. Those active in promoting the building of the new road are John B. Laing, R. M. Bell, John Raine, J. Wade Bell, Agnew Morton and a number of others.

New York, N. Y.—Final argument in the tidewater demurrage complaint instituted by the Wholesale Coal Trade Association of New York, Inc., was heard recently by the Interstate Commerce Commission, at Washington. The arguments for the complaining association were made by Charles D. Drayton of counsel, and by Charles S. Allen, its secretary, and were listened to by the eight members of the commission. More than $1,250,000 in demurrage charges are involved in the suit, which is to recover alleged excessive charges incurred for the most part as a result of the various local harbor strikes, and pending the rendering of the final decision the association several months ago succeeded in having suspended the payment of charges aggregating about three-quarters of a million dollars. Commissioner McChord has already rendered a tentative report, and it was on this report that the entire commission heard oral argument last week. It is expected that the final decision will be handed down within sixty days.

Huntington, W. Va.—Directors of the Norfolk & Western R.R. at a recent meeting, indicated that they would be willing to construct a branch line from Lenora, on the Twelve Pole Branch of the road up Pigeon Creek in Mingo County. During the second week of the month, negotiations concluded at Huntington, which insure the early development of a virgin coal area, in which development fully $10,000,000 is involved. In the first place the railroad will make an outlay of $2,000,000 for the construction of a branch line if final approval is given the project for the extension, it now seems highly probable in view of the fact that a deal closed between March 8 and 13 between the United Thacker Coal & Land Co. (largely dominated by Kountze Brothers, bankers of New York) and a number of Huntington parties. Large areas of the Pigeon Creek territory were leased by the company named, to the following: H. H. Morris, president and general manager of the West Virginia Standard Coal Co. and the Kentucky-Elkhorn By-Products Co., 2,800 acres; A. B. Rawn, general manager of the Consolidated Collieries Company, 2,500 to 3,000 acres; Garner Fletcher, general manager of the Elkhorn Piney Coal Co., 11,750 acres. Companies will be formed at an early date to develop the land leased and such companies will vary in capitalization from $300,000 to $1,000,000. It is estimated that more than $5,000,000 will be expended within the next few years in the development of coal land in the Pigeon Creek territory.

Logan, W. Va.—Capitalized at $2,000,000, the Guyan Collieries Corporation has been organized for the purpose of purchasing and later developing 11,000 acres of coal land on the Guyan branch of the Chesapeake & Ohio; the tract to be purchased being located on the southwestern side of the Guyan River about 37 miles from Logan, near Gilbert. It is proposed to issue $1,000,000 in 8 per cent preferred stock and $1,000,000 in common stock. The company will have six workable seams available for development, such seams being the Cedar Grove, Alma, No. 2 Gas, War Eagle, Bens Creek and the Lower War Eagle. That portion of the 11,000 acres already reached by railroad is to be developed at once. By 1924 the new company hopes to have a production of 300,000 tons per year. The leading men in the new company are, W. P. Tams, of Tams, and J. B. Clifton, of Beckley. The former will direct the development work of the company. Besides Mr. Clifton and Mr. Tams, those interested in the new corporation are: J. H. Hatcher, W. H. McGinnis, of Beckley; G. E. Vaughan, of Lynchburg, Va. Officers of the company are W. P. Tams, president and general manager; J. B. Clifton, vice president.

Huntington, W. Va.—Fifty million dollars will be expended in opening mines and making improvements in the Big Sandy, Logan, Kanawha and New River fields, if provision is made by the Chesapeake & Ohio R.R. to handle the additional output, according to an announcement made here on March 13 by J. J. Ross, head of the Logan Operators Association, as the result of a conference of operators representing the fields named. Mr. Ross declares further growth of the coal industry in the territory reached by the Chesapeake & Ohio is entirely dependent upon transportation facilities furnished by that road, which are even now inadequate to take care of present tonnage. A committee was appointed at the meeting here on the thirteenth to hold a conference with directors of the Chesapeake & Ohio at New York on the nineteenth, at which time the directors will be asked to obtain from the Government a loan of from $30,000,000 to $50,000,000 for improvements, so that adequate provision may be made for handling 50,000,000 tons annually. Should the directors of the Chesapeake & Ohio decline to acquiesce in the requests for improvements the Interstate Commerce Commission will be asked to cause the railroad to provide the additional transportation facilities. It is desired to have the Chesapeake & Ohio install double track for a distance of 20 miles on the Guyan branch, and the road will also be asked to construct a third track from Barboursville, W. Va., to Russell, Ky. The opening of new mines on the Chesapeake & Ohio, during the last two years, with no increase in equipment, has only served to cut down the number of cars for each mine.

Louisville, Ky.—The Pittsburgh Coal & Coke Co., capitalized at $1,000,000, and the Pittsburgh Fuel Co., capitalized at $100,000 have been incorporated as Kentucky concerns and will take over local interest of the Pittsburgh Coal Co. The incorporators are Charles O'Connor, R. B. Hickman, M. W. Ades, George E. Bohmer, B. A. Leonard and others. They are all Louisville men. Negotiations for formation of the company and purchase of the Pittsburgh Coal Co.'s holdings have been in progress several weeks. The granting of a charter was delayed temporarily because of the similarity of names between the old and new companies.

A. J. Carroll, attorney for the incorporators, said permission to use a similar name had been granted by the Pittsburgh Coal Co. along with the "good will" transferred with the property.

MARKET DEPARTMENT

Weekly Review

Slight Improvement in Car Supply—Much Interest Is Shown in Results of Bituminous Commission—Export Business Continues Under Permit System—Floods Interfere with Anthracite Production

UNDER private operation the railroads are already showing a better car distribution. Where it had required from ten days to two weeks to bring cars of coal from mine to tide under Government operation, the time has been reduced to from three to four days in many instances. Empties from the Eastern territory, especially in New England, have been returned in increasing volume, as the railroads are making every effort to return cars to their respective home lines. It is asserted that operators will be satisfied with the number of cars supplied to the mines during April and May. However, a well-informed operator is of the opinion that the shortage of cars next October will be greater than at any previous date.

The President's action on the report of the Wage Commission is being especially awaited by operators over the entire country, both anthracite and bituminous. The feeling that price restrictions should be removed or some other workable plan adopted other than now existing is spreading more and more. Just what will result from Senator Frelinghuysen's bill before the Senate, in which he suggests a Fuel Controller for the whole country to be paid by the Government, is hard to predict.

Few operators feel inclined to obligate themselves to ship until after May 1 or May 15 and some have decided to suspend operations entirely until they may secure the right to sell their product with profit. Although much is heard of price violations the Government has not as yet interfered.

A good business continues at tide, especially in the bunkering trade, and there seems to be quite a liberal offering of tonnage for this business. Under the permit system, the export business also continues, though moderately, as it is easier to secure permits than it is to obtain bottoms for loading, thus causing great annoyance.

In New England the old-line companies are at last beginning to make quotations for lump gas coal to be delivered during the coming coal year, the price being from $3.85 to $4.25. Up to this time they have hesitated to quote a price owing to the prevailing uncertainty as to legislation and labor troubles.

Owing to the wage parleys, the outcome of which will inevitably be that the consumer will have to pay higher prices for coal, the retailers are in an unsatisfactory position. They have not been soliciting business for summer fillings, as had been their custom, for they are not in a position to quote a definite price. To make matters worse, consumers of domestic sizes are fully alive to the possibilities of the situation and in consequence are growing quite anxious. As a result, inquiries to the retailers are being made by the hundreds.

Much to the disgust of both operator and wholesaler, floods have been prevalent during the past week in the anthracite region and many of the collieries were forced to shut down, thus curtailing production considerably.

Coke production in the Connellsville region has varied not more than a few thousands of tons from week to week since the first of the year and practically the entire output is moving out on contract.

WEEKLY PRODUCTION

The weekly report on the production of bituminous coal, anthracite, and beehive coke, compiled by the Geological Survey, Department of the Interior, March 20, 1920, states that complete returns from the coal-originating roads indicate that production of soft coal during the first week of March was smaller than at first reported, amounting to only 10,009,000 net tons. The output during the following week (March 7-13) is estimated at 10,125,000 tons. This was a slight recovery over the preceding week and brought production up to almost exactly the level of the last week of February.

The daily average during the first half of March was 1,752,000 tons. During January and February it had been 1,766,000 tons. The decrease was due in part to the severe blizzard which moved from the Great Plains to the Atlantic Coast during the latter part of the first week of March and the beginning of the second. The cumulative production during the first 62 working days of the past four years has been

	Production first 62 working days
1917	111,343,000
1918	108,690,000
1919	[illegible]
1920	108,750,000

The tonnage so far produced in 1920 exceeds 1918 and 1919, but is 2,593,000 tons behind 1917.

The mines of the country lost on the average 2.1 per cent of full time because of labor shortage.

Rail shipments of beehive coke declined slightly during the week ended March 13. Reports received from 26 carriers originating approximately 97 per cent of the total tonnage shipped by rail indicate a production of 409,000 net tons, a decrease of 3,000 tons, or 0.7 per cent, when compared with the preceding week. The decrease occurred in the Middle and Southern Appalachian regions. The production of Pennsylvania and Ohio, on the contrary, was slightly larger, rising from 313,000 tons during the preceding week, to 315,000 tons; and from the Connellsville region a somewhat greater increase was reported. Production for that region is reported by the Connellsville *Courier* at 211,170 tons, an increase of 2.5 per cent over the week of March 6.

An active demand continues for beehive coke caused to a large extent by scarcity of coal at byproduct ovens. Production is restricted by a shortage of coke cars. The cumulative production since the beginning of the year now amounts to 4,529,000 tons, a decrease when compared with the corresponding period in 1919 amounting to 590,000 tons, or 11.5 per cent

Atlantic Seaboard

BOSTON

Car supply light, much interest in contracts. High grades hard to cover. Little coal available at piers. Hampton Roads shippers suffer from car shortage. Pressure strong for domestic sizes. Buckwheats less in demand.

Bituminous—Congestion on the New England roads has now been pretty well cleared up, although there are still hundreds of cars on sidings waiting for power to move them. Through the gateways movement continues to improve. The intervening roads, notably the New York Central, are also gradually clearing up their lines and receipts here are enough greater to help the current situation very materially. The milder weather has also had its effect and there is much less anxiety than was the case a fortnight ago.

For the most part the railroads have ceased grabbing coal in transit and so far as we are aware coal shipped the first two weeks in March is coming through practically without interruption. Shipments the past week, however, have shown a distinct falling off. Two bridges on one of the main arteries of the New York Central near the region were swept away by floods and this has so seriously held up the return of empties that car supply for the whole week has been very light.

Water damage has caused a large number of mines in Central Pennsylvania to suspend operations, and this together with car shortage has meant a heavy loss in tonnage. Large producers have had their mines idle for two and three days at a time and this certainly is not encouraging for New England industrial plants that are going to be in need of fuel during April.

Empties from this territory, however, are being sent back in increasing volume and cars should be in much better supply by the end of the month. The railroads are also making every effort to return the cars to their home lines, and operatives feel that this will have a tendency to increase the supply during April and May.

There is still much interest in contracts. Several large buyers find it difficult to arrange for supply, especially of the better grades. In some cases they have been able to cover but 10 to 20 per cent of expected requirements. They now feel they should have bought more actively a month ago when coal was being more generally offered. At that time it was not so difficult to buy fair coals at very close to present Government price, but today it is unusual to get an offer of less than $3.75 or $4 per net ton at the mines, plus wage increases, etc.

The trade is anxiously awaiting the President's action on the report of the Wage Commission. The feeling grows that price restrictions should be removed, or some more workable plan devised than that now in effect. Few operators will be inclined to obligate themselves to ship beyond May 1 or May 15 under the present price regulations: in fact there is a very general feeling that they will suspend operations altogether, if they cannot in some way secure something like the present authorized price for export and bunker trade.

In consequence, buyers here find it more and more difficult to get contracts, even though they undertake to pay a competitive price for use if and when restrictions are withdrawn. Moreover, the Pennsylvania shippers are anxious lest they lose any present foothold in the export market. Coal from Hampton Roads has distinctly the advantage in the offshore cargo business and it will be necessary for those who ship from Philadelphia or New York to keep themselves as strongly represented as possible.

One of the largest factors is actively canvassing for low-volatile coal of recognized quality and this shows the extent to which the Pennsylvania operators are following this more lucrative trade. Under the circumstances, it is easy to see that New England will not get much of this coal unless it bids a competitive figure.

At the New York and Philadelphia piers only small tonnages are available. These are either on contract or held for export. Of spot coal there is a great scarcity. At the same time it is a matter of comment in the trade that relatively so few premiums are exacted, even though premiums are against the regulations. Much is heard of price violations all-rail. Should these continue it almost seems as if the Government would have to take cognizance.

At Hampton Roads the situation has changed rapidly for the worse. Car supply on all three roads has been light, and the number of bottoms waiting has steadily increased. At Newport News on March 15 there were 168,000 tons of boats waiting, with but 25 per cent of the coal on hand. Heavy demurrage has accrued the past week and at this writing there is no prospect of better car supply. Most of the delay has been borne by steamers chartered for overseas; coastwise boats have not suffered to the same extent.

So far, the Hampton Roads agencies have made no moves on contracts. The authorized price is much too low and until authority is given for an advance in keeping with the export price, offerings of Pocahontas and New River in this market will be relatively small.

Anthracite—Demand continues urgent for all the domestic sizes. Retail dealers are not only short on supply, but they are much impressed with the advantage of getting forward coal under present circular. There are rumors of advanced barge freights, effective April 1, if not before, and there is also a feeling that railroad freights will also be marked up before many weeks have elapsed. Consumers are putting in their orders for refills to a greater extent than in any of the recent years and there is every indication that trade will be very brisk, at least until prices are lifted in the spring.

The steam sizes are somewhat less in demand than earlier in the month. Some contracts have been made at last year's price, plus the wage increase, the amount of which is to be figured later. Other shippers are disinclined to make prices on any basis until the present wage conference reaches a conclusion. While the movement into New England the past thirty days has been heavier than at any time since 1918, yet the aggregate tonnage has been much smaller than during the spring months of that year.

NEW YORK

No let up in demand. Floods in the mining regions curtail production. Bituminous operators move slowly in making contracts. Car supply poor. Longshoremen's strike injures bunkering. Railroads continue to confiscate coal.

Anthracite—Instead of the usual lull in the anthracite market which usually precedes April 1 the demand this month remains strong and heavy. Usually dealers and consumers take the month of March to clean out their bins in anticipation of the spring reduction of 50c. per ton on domestic coal prices, but that situation is absent this year. Instead both dealers and consumers are not anticipating any lower prices on April 1 and are willing to refill their bins.

Contrary to custom, the public appears to be little concerned in the negotiations now in progress in this city between the mine owners and their employees and which will undoubtedly mean an advance in wages to the workers and higher prices for the consumers. This unconcern may be due to the little publicity given the conferences by the daily newspapers. Heretofore during these conferences there has been much said about the probability of the suspension of mining and the lack of coal. This year, however, there has been very little of this kind of publicity, and as a result there is not that rush for coal that usually occurs.

However, shippers have no trouble to get rid of their tonnage, whether it be domestic or the smaller sizes. The heavy storms of the past few weeks did considerable damage to many of the mines in lower Luzerne and parts of Schuylkill counties, with the result that production and shipments were considerably curtailed. It was reported that some of the smaller mines had suffered greatly because of the thawing of the heavy snows along the mountain sides.

There has been no relaxation in the demand for the larger sizes and where one shipper might be easy with one or another of the coals his neighbor might be short of those sizes. Stove coal appears to be on a par with egg so far as shortness goes. Chestnut and pea are easier but there is no surplus.

The steam coals are higher because of the cut in receipts due to the floods in the mining regions. There is not that supply of barley that was present a week back, and shippers have little trouble in getting rid of the better grades at company circular or slight advances. Buckwheat and rice are in good demand, the former being mixed with bituminous by consumers in many instances. Quotations vary according to grades and in some cases the urgency of the occasion.

Current quotations for company coal per gross ton at mine and f.o.b., tidewater, at the lower ports are as follows:

	Mine	Tidewater
Broken	$5 95	$7 80
Egg	6 35	8 20
Stove	6 60	8 45
Chestnut	6 70	8 55
Pea	5 30	7 05
Buckwheat	3.40	5.15
Rice	2.75	4 50
Barley	2.25	4 00
Boiler	2 50	4 25

Quotations for domestic coals at the upper ports are generaly 5c. higher on account of the difference in freight rates.

Bituminous—The market here waited all week for some word from Washington regarding the acceptance or rejection of the Bituminous Wage Commission's report. Late on Friday newspaper dispatches stated that President Wilson expects the operators and miners to work out their contracts for the new coal year on the basis of the majority report.

Operators and shippers are moving carefully in making contracts for the next year's supply of coal and are particular to specify that the price after the end of government control is subject to change after the Wage Commission's report has been accepted. The repeal of those sections of the Lever Law relating to the coal industry will, the trade believes, do more to stabilize the industry than anything else at this time.

The failure of the car supply to improve has not helped the local situation. There is a lack of free coals and spot buyers have little success. The bunker business has received another setback because of a longshoremen's strike which affected principally the coastwise vessels. More than [illegible] workers were reported out along the Atlantic Coast tying up many ships. However, because of the slow shipments dealers in these coals did not complain of an oversupply.

Railroads continue to confiscate considerable coal and frequent complaints are made by shippers because of this. Considerable dissatisfaction is also caused by the long wait for payment.

Many operators are refusing orders for shipments, especially if intended for tidewater, they preferring to ship to line points. There is a brisk demand for coal for export but as heretofore bottoms are scarce.

The government price still holds good for quotations for free coals but there is none to be had here, practically all the available coal being taken for bunkering purposes where the selling price is $1.35 above the $2.95 mine price. Government prices prevail on all coal not shipped on contract. They are as follows:

	Mine-Run.	Prepared.	Slack
Central Pennsylvania	$2.95	$2.95	$2.95
Western Pennsylvania	2.35	2.60	2.35
Fairmont (Gas)	2.50	2.75	2.25
George's Creek, Upper Cumberland and Piedmont Fields	2.75	[illegible]	[illegible]

PHILADELPHIA

Anthracite market tightens up. Floods in the region cut down production. Little stove and nut arrive. Pea coal in strong demand. Consumer anxious for spring prices. No wage decision yet. Steam sizes scarce, especially buckwheat. Premiums offered on all sizes.

Anthracite—There has been a decided tightening up in anthracite. With April fast approaching and no definite understanding with the miners, there seems to be a scramble on to get as much coal on hand as possible. Whereas a few weeks ago many of the smaller companies were glad to take orders for sizes from pea down to and including barley, the situation has changed to the extent that there is really no coal offering at all.

With the situation as it is it is not surprising that the market has tightened up, although there are few who really believe that the miners will cease work. However, this is such an uncertain proposition that no one is taking a chance.

To complicate matters the mines have been almost drowned out for the past week and one of the big companies alone had thirty collieries idle on three successive days, with not less than ten down for the entire week. Some independent operations have been closed for even longer periods, particularly washeries. The offices of the shippers began to assume the appearance of war times, with the retail men on hand in numbers to urge more deliveries.

With the exception of pea coal the local retailers have the most meager supply of coal on hand and even this size is in extremely strong demand. There is no question now that pea has come into its own again. Many consumers whose supply of the larger sizes has run out need no urging to take pea, especially since the milder weather enables them to burn this size with little trouble. There is hardly a shipper in the city who is not anxious to get more pea and is actually urging his shippers to let it come out as fast as possible. As it is the market must depend entirely upon fresh-mined coal, as there is no tonnage of this size in the storage yards at all. With the scarcity of all sizes of coal the premiums on family sizes in many instances have run up well upon the standard 75 per cent of the leading independents. To be sure, these increases are being asked mostly by the brokerage houses, but they have little difficulty in getting their prices. It is also believed that much of the high-priced coal is going into New England, as the call from there is particularly strong.

Due to the wage parley with the miners the retailers are in an unsatisfactory position, as all of them have been accustomed at this time of the year to begin soliciting business for summer filling. Now they are afraid to go after this trade, as they are not in position to quote a price. To make it worse the consumers are fully alive to the possibilities of the situation and are making inquiries by the hundreds as to when they can have their cellars filled.

Many of such inquirers are under the impression that all they need do is to give their order to the dealer and that will insure them the present price. It is quite a shock to most of them when the retail man is compelled to advise that he cannot take any orders at a price. Of course a few of the dealers will make deliveries, if they can get coal, to the best of their trade who are worthy of credit, with the understanding that the price is to be based upon whatever retail price will be established following the announcement of prices by the shippers after the wage settlement.

There is the strongest kind of activity in the steam trade. For new customers to get buckwheat is almost out of the question, except that there is a limited amount of tonnage offering by some shippers at premium prices. If any proof were needed of the boom in steam sizes it would be in the fact that individual producers will not take any new business on the smaller steam sizes, rice and barley. These two latter sizes have been selling off price for the past six to eight weeks, but have now decidedly tightened.

It would seem that most of this tonnage is going to tide, where the report has it that neat premiums are being offered. The big companies have heavy tonnages of both these sizes in their storage yards, but they are working on the piles as heavily as their equipment will permit. Due to the heavy floods in the rivers throughout the anthracite region practically all of the river washeries are out of commission and this has taken quite a little tonnage of steam coal out of the market

Bituminous—There is not the least easing off in the demand for coal and all consumers are eager to get hold of tonnage. Unfortunately there has been no increase of fuel to the local industries this past week and a great many plants are simply running from day to day with the hope that they will soon be able to accumulate some kind of surplus.

Of course, the chief explanation of the shortage continues to be car supply, but the fact that the New England railroads are once more in position to take good shipments, diverts much tonnage from this territory. Shipments to that point seem to be increasing and this also ties up a considerable number of cars, as since boat freights got to such a high point the all-rail shipments have been growing.

Naturally with the coming of softer weather both shipper and consumer had been hoping for increased production, but so far, despite milder weather, all the circumstances have been against real relief. The consumer is growing more anxious each day and they are fearful of the outcome of the wage dispute, especially since it was learned late in the week that the President had favored the report of the majority on the commission, as against the minority or miners' representative.

One thing is certain, and that is should the miners decide to stop work the country would face the worst condition in its history, as the amount of coal above ground at this time is the lowest for years. So it can easily be seen why the consumers are particularly anxious to get ahead. Even the utility plants hereabouts who have been accustomed for the past few years to carry stocks enough for three and four months are down to a 40 to 60-day basis.

There is still a certain amount of contract activity in the trade, but the tenders by the shippers are only being made to the cream of their trade, and seem to be more of an effort on their part to keep their good trade in line rather than to fix upon a price. To be sure, they are quoting prices from $3.50 to $3.75, but all figures are subject to whatever wage scale is agreed upon with the miners. Up to that time coal is simply to be shipped at the prevailing Government price. With the situation inclined to grow somewhat tense, there is more of a tendency on the part of the consumer to consider contract offers, yet on the other hand there has also been something of an easing up in the efforts of the producer to talk contract.

An odd part of the present situation is the fact that many concerns are apparently able to get quite a plentitude of coal, while other equally strong consumers are riding on the edge of a short supply. Some consumers in the latter class are inclined to become bitter in the criticism of this condition and intimate that the Government figures are not being lived up to.

Whether this is true or not it is a known fact that the shippers are becoming of the opinion that the law controlling prices will [illegible] might be [illegible] claiming [illegible] their convictions and getting a better price for their coal. Some local consumers, in this connection, have received letters from shippers calling upon them to use their influence in having the Lever act repealed.

There has [illegible] increase in the number of confiscations by the railroads of fuel in transit. This has been another bone of contention between the consumer and the [illegible] While the former does not deny the necessity for such acts, the claim is made that the fuels officials should use at least a little judgment in their seizures.

A case has been cited where a plant had only two days' supply on hand, but had two cars in transit within a day's run of the plant, but before they arrived they were taken for motive fuel. The obvious thing to do in such an instance would be to ascertain the condition of the plant whose fuel it was intended to take.

There continues to be good business at tide, especially in the bunker trade and there seems to be quite a liberal offering of tonnage for this business. The fact that bunker prices are hovering around $3.40@$3.60 accounts in a measure for this. As to export shipments, the embargo levied weeks ago is still on, but the permit system is still in vogue and a good many shippers seem able to secure permits. It would seem, if anything, it is easier to procure a permit than it is a bottom for loading.

BALTIMORE

Much coal sold above government price. Majority of handlers refuse to follow until question is legally settled. Car supply still short. Better time between mines and tide aids considerably. Decided demand begins for hard coal for next winter.

Bituminous—Inquiry around the trade in Baltimore brings little news of any government priced coal. On the other hand there are undoubtedly a number of sales of coal above the government price, from sources that have formally notified the government that they would so sell and in which cases no action has been taken to stop such sales, and from sources that are "just selling." This does not mean that anything like a majority of dealers here are selling coal above the maximum; the fact is that most of them are abiding strictly to schedule through the fact that they are not selling coal in the open market but are confining their efforts to deliveries on contracts, as the reduced car supply and movement from mines prevents their getting more than enough fuel to take care of this more profitable end of the business.

All are praying for the day when it will be legally correct to sell coal to best advantage in a competitive market. The car supply remains short and loadings much below normal. About a fifty per cent run was shown on the Baltimore & Ohio last week starting at 81 per cent and running down to 38 per cent. The daily loading high was on Tuesday, 3,768 cars but other days of the week merely ran between 1,940 cars a day to 2,089, the next high twenty-four hour loading.

Under private operation the railroads are already showing a much better delivery time, however, and the time of ten days or two weeks so recently experienced by the coal trade in getting a car from mines to tide has been cut to three and four days in many cases. An exceptional delivery was made last week in less than two days. The reserve at Curtis Bay grows steadily better, starting with less than 500 cars the first of he week and running up beween 500 and 600 at present, the daily run to the piers being between 200 and 350 cars, while dumpings for the most part do not exceed 150 cars a day because of stoppage of exporting and almost complete cutting off of foreign bunkering.

Anthracite—The trade is in a state of uncertainty as to spring prices—and with April only a few days away. It knows not whether there will be a spring reduction at all, whether the miners' demands will be granted in a way to seriously advance all prices, whether premiums will grow still greater on independent coal, or whether freight rates will be reduced in order to induce summer purchasing.

It is certain of one thing, however, and that is that coal is not going to be any lower than the present schedule; at least that is a moral certainty to observing dealers, as many of the public see the handwriting on the wall. Orders are not only still coming in for the end winter business (because it has grown quite cold again at times) but because consumers are asking that full deliveries for storage for next winter be made at once.

A number of dealers who have been fortunate enough to get through considerable coal are making considerable deliveries on orders for next winer consumption. Most of the dealers have already begun to weigh the situation carefully, and at present a near-spring spectacle of unusual kind is to be witnessed, namely apportioning of coal and delivery of but part of orders.

Much interest is centered on the outcome of the wage parley now in meeting at New York. No wage agreement is hardly expected until all of the grievances between both miner and operator have been threshed out. Just how long this will take none can tell.

Eastern-Inland

PITTSBURGH

Rumored evasions of price limits. High prices expected later.

Reports are being circulated more freely that the price restrictions on coal are being evaded, but if there are evasions they are practiced with considerable secrecy, there being no open transactions at above the set limits. There is no secrecy, however, about the fact that the operators are greatly annoyed that the price restrictions continue, as they see a shortage of coal and many buyers willing to pay high prices for coal.

Some references are being made to former President Taft's legal opinion, recently rendered, that confiscation of coal is not justified by the Lever act, but the awkward feature in using this opinion as an argument that the price fixing is illegal is that Mr. Taft's opinion has some reference to the question whether the country is at war, and when the wage dispute arose the operators took the position that the state of war still existed.

Some well-posted coal operators hold very strong views as to high values of coal in the coming spring and summer, and indeed for the remainder of the year. These operators point out that consumers have had such trying experiences in the past few months with coal shortage that they are certain not to forget them, and there is therefore expected a heavy demand for coal for stocking purposes, sufficient to maintain much higher prices than the present set figures.

It is commonly assumed that the wage settlement will involve either recommendation or tacit approval of higher prices, and the trade has no definite information as to the status of the wage award except that the President has been seeking to bring about a unanimous recommendation by the Robinson Commission.

The market is quotable practically nominal at Government limits, $2.10 for slack, $2.35 for mine-run and $2.60 for screened, per net ton at mine, Pittsburgh district, with 15c. brokerage allowed in addition in certain cases.

COLUMBUS

Higher temperatures in central Ohio have relieved the stress in the domestic trade. Steam business is active. Car shortage is still the bad feature.

The stress of the domestic trade has been relieved to a large degree by milder weather which has succeeded the cold wave of the early part of March. As a result, dealers have been able to secure some reserve stocks and are taking care of their customers in good shape. The relief is the most pronounced in Columbus and central Ohio points while the northern part of the state is still experiencing a shortage of domestic sizes.

With the coming of milder weather the natural gas pressure has been bettered, and that has aided in solving the problem. Retail prices are firm in every way, still governed by federal figures. The business is tending largely toward small orders to fill out the winter's requirements. Pocahontas is quite scarce, while certain West Virginia grades are coming in fairly well. Hocking and Pomerqy lump constitute the large part of the Columbus supply.

Steam business is active to the extreme and the milder weather has had very little effect on that department of the trade. Steam plants are buying actively not only for present needs but for future requirements. Some have been securing a small reserve to guard against emergencies. Rubber plants are perhaps the best buyers at present, although iron and steel concerns are good customers.

Public service corporations have caught up in their fuel supply and are looking forward by laying in a surplus. Railroads are still confiscating a large tonnage and that is hindering shipments to the usual line of commercial customers. Practically no contracting for the coming year has been done owing to the uncertainty of the wage scale.

Out of a production of about 40 per cent in the eastern Ohio field railroads are taking more than half of the tonnage produced and that situation is fraught with much evil. Some of the large users are still short of fuel despite strenuous efforts made to secure shipments.

In the Hocking Valley and Pomeroy fields the output has been about 50 per cent although the car supply is not becoming better but worse if any change is reported. Little hope for an improvement in the car supply is held out by railroad officials as cars are not being returned to their home lines very rapidly. On the other hand, many coal cars needing minor repairs are lying idle on the side tracks.

The Lake trade is becoming more and more a matter of concern as the time for the opening of the Lake season approaches. Because of the uncertainty in the wage situation, only a few Lake agreements have been made in Ohio territory. These agreements, as they do not approach the stability of contracts, provide for the sale of a certain tonnage, subject to all changes in the wage scale and mining conditions. The Lake season is expected to be unusually strong right from the start.

CINCINNATI

Dealers are having difficulties in getting fuel shipments from mines. Plan to lay their troubles before the reconstituted Coal Administration Committee. Interest is being displayed in urging on the consuming public early storage of coal.

All sizes and grades are in keen demand, with the supply meager. Many concerns are anxious to enter into contracts for their coal for the coming year, but while conditions are as unsettled as now they do not seem likely to meet with much co-operation on the part of the dealers. Considerable tonnage arrived in the terminal the first half of the week, but this was soon distributed among dealers and shipped to other points along the line for distribution.

Enough coal to supply the city for one day came down the river last week. This did not last long as it soon found its way to its hungry industrial consumers. The general opinion is that coal will cost enough more next year to cover an increase to the miners and probably to give a good rate increase to the railroads.

Never in the history of the coal trade, dealers unanimously agree, have conditions been worse than during the past week. A procession of fuel beggars passed through the coal offices the entire week, pleading in some instances for a single car to take care of their patrons. The car supply has shown little improvement, being a little less than 50 per cent. While embargoes were not in evidence, yet there was still much confiscation of coal, though in more limited quantities than had been the case during most of last month.

Although government prices still prevail there are hints and rumors floating about the market that some operators are selling above the fixed price. Domestic trade is strong although the edge of the market is now off. Retail stocks are low and every effort is being made to replenish them. In many instances retailers in certain localities were entirely out of fuel and some suffering resulted.

From present indications the situation in this district is approaching famine although not apparent in the city and surrounding territory immediately contiguous. Many industrial concerns are yelling for fuel to keep their plants in operation. The railroads still continue to confiscate and divert, thus putting the operators and dealers to more discomfort.

Southern

LOUISVILLE

Mild weather and late season result in quiet demand for domestic coal. Production still about 60 per cent normal.

Starting March 15, spring weather descended on Louisville and vicinity, after several weeks of raw weather. This has resulted in demand falling off rapidly with the retail trade, which reports dull business. There is a good demand for car lot coal for industrial use, and a fair demand from local steam plants.

Production at the eastern Kentucky mines continues on an average of three full working days, due to car shortage, although on some railroads the percentage is better, and in western Kentucky shipping is better over the Illinois Central lines.

Many contracts between retailers and producers for block coal at $4 a ton and up are now expiring, which means the closing out of profitable block business for the operator, and a return to Government price on practically all shipments, as very little block business is held that wasn't taken prior to October.

Some reports are coming in concerning operators charging over Government prices for coal. However, the operator apparently is now charging more than Government prices, but is accepting premiums or bonuses for immediate delivery. It is held that some big industrial consumers in the North are freely offering the Government, plus a premium of 25c or more a ton to secure placement.

One jobber was complaining over this condition, stating that when trying to buy coal he found cases where operators were getting a premium on the side, and not willing to sell on any other basis. He charged that this prevented the jobber from buying such coal, where he desired to live up to regulations. It seems that the plan is a secret one, under which the producer bills out at the regular Government price, but receives a separate service payment which doesn't show on the invoice.

A number of coal men report that they have heard of such methods, and there isn't any longer a real secret concerning the plan within the trade circles. While this may be open defiance or defiance under cover of regulation, it is something that can't be helped much longer.

It is held that many operators are sitting still in the boat, and awaiting the outcome of the efforts of the National Association to set aside coal price control. Unless such efforts bear fruit, indications are that there will be open defiance of control, which will carry test cases to the higher courts for decision.

BIRMINGHAM

Car supply at mines shows improvement over last week. Heavy rains flood number of mines and delay movement of coal by washouts. Requirements of the trade far in excess of present output, the market showing great strength in all grades.

There was a marked improvement in the number of cars supplied the mines the past week over the previous one, and consequently production improved to some extent, as did also movement of fuel from the district. However, exceedingly heavy rains fell during the first few days of the present week, and a number of mines were flooded and production suffered considerably on this account. These rains also interfered with traffic by causing washouts and other damages to roadbeds. The car supply was probably 75 per cent of the requirements at the mines.

The trade is experiencing the most active demand that has developed since the strike, Nov. 1 last year, all grades being sought. Almost every coal-consuming interest is short on stock and the mines and distributors are being swamped with orders and urgent pleas for shipments. The railroads are still confiscating some coal, the Southern reducing its order 25 per cent for the current week. Other lines are taking over fuel only as occasion arises—where it is essential to do so—consequently the movement to consignees is more satisfactory than heretofore. Sales are practically confined to spot trade, as the present unsettled conditions bearing on the coal industry generally are not conducive to contract-making. The supply is far from being adequate to meet the needs of the trade for either domestic or steam fuel.

Lake Region

TORONTO

Supplies coming forward more freely. Dealers busy. Consumers anxious to lay in stocks. Bituminous supplies much below demand.

Coal has latterly been coming forward more freely, owing to the improvement in transportation conditions, and some of the yards have fair stocks of anthracite on hand. Large consumers are generally desirous of laying in stocks early for fear or shortage, and business is active, though more or less still hampered by labor shortage.

Supplies of bituminous are far below the demand and many industrial plants only getting enough for temporary requirements. Much anxiety is felt over the prospective shortage in case the threatened strike of bituminous coal miners takes place.

Quotations for short tons are as follows:

Retail—	
Anthracite, egg, stove, nut and grate	$13.50
Pea	12.00
Bituminous steam	11.00
Slack	10.00
Domestic lump	12.00
Cannel	13.00
Wholesale f.o.b. cars at destination—	
Three-quarter lump	9.00
Slack	8.00

CLEVELAND

Demand in general has receded. Shipments have increased 100 per cent. Domestic demand has fallen off. Prices of all grades except Pocahontas show a rising tendency.

Bituminous—With demand shrinking because of the milder weather, and mine and railroad operations increased because of it, approximately 60 per cent of the demand is now being met at Cleveland. Not only are all industries getting an adequate supply for their spot requirements, but some slight stocking also has been made possible. The 40 per cent of demand that remains unfilled is largely for stocking. In fact, No. 8 operators have seen their way clear to begin dumping for the lake trade at Toledo. The leading utility in Cleveland now has about a week's supply ahead which contrasts with a two-day "rubber" recently. Steam-coal users are unanimous in seeking to stock, and it will be months before there is any surplus upon the market.

Operators are desirous of contracting, and so are consumers, but the uncertainty as to prices is proving a barrier. Regular customers have spoken for their supply and verbal assurances have been given by operators. The trade is waiting for some large interest to cut its way through the wilderness; then the rest will follow suit. Three dollars for No. 8 mine-run and slack —an increase of 65c over government prices—still represents the general price idea here.

Meanwhile, prices are slowly but surely mounting. No. 8 Pittsburgh below $7 for domestic delivery is almost unobtainable, and some domestic bituminous is commanding as high as $7.50. Every item on the steam coal list has been advanced. No. 8 slack now holds at $6.00@6.25, an advance of about 25c, while No. 8 mine-run is quoted at $6.45@6.60, or an increase of 15c. All dealers report prices firming up.

Anthracite and Pocahontas—With the advent of milder weather receipts of both grades have increased, while demand is falling off, with the result that almost all dealers have a slight surplus. Dealers have more anthracite than Pocahontas, although the latter is coming through in fair shape. Dealers look for big buying this spring and summer on the part of domestic consumers. The minimum on shoveled-lump Pocahontas continues at $9 and on mine-run at $8. Stove anthracite is up 10c a ton, to $12.50.

Lake Trade—The first bituminous-coal cargo of the season has been loaded at Toledo. The Pittsburgh Steamship Co., which has the largest Great Lakes coal and ore fleet, has ordered its engineers to its boats April 5. This means a start not earlier than April 20, and prospect of any coal reaching the head of the lakes before May 1 is slight. Iron-ore carrying rates have been fixed at 20 per cent over 1919, equivalent to restoring the 1918 rates. This forecasts what will be done to coal rates.

Prices of coal per ton delivered by retail dealers in Cleveland, are:

Anthracite—Egg, $12.20@12.40; chestnut, $12.50@12.70; grate, $12.20@12.40; and stove, $12.50.

Pocahontas—Shoveled lump, $9.00@9.25, and mine-run, $8.00@8.25.

Domestic bituminous—West Virginia splint, $8.30; No. 8 Pittsburgh, $7.00@7.50; Massillon lump, $7.40@7.65; Cannel lump, $11.00; and Coshocton lump, $7.35.

Steam coal—No. 6 slack—$6.00@6.25; No. 8 slack, $6.00@6.25; Younghiogheny slack, $5.40@5.75; No. 8¾, $6.60@6.85; No. 6 mine-run, $6.35@6.60; No. 8 mine-run, $6.45@6.60.

DETROIT

Scarcity of bituminous coal supply continues to menace consumers of steam and domestic stock. Little anthracite moving.

Bituminous—With very little bituminous coal arriving in Detroit the situation continues to arouse anxiety among consumers of steam and domestic coal as well as among the jobbers and wholesalers. Owing to the insufficient receipts the demand from all classes of consumers continues urgent and is inadequately supplied.

Jobbers say that there is no free coal on tracks in or around Detroit and that shipments are sold before their arrival, while the confiscation and diversion of shipments by the railroads reduce the supply to an extent that threatens to force a number of large industrial establishments to discontinue operation.

The continued confiscation of shipments is made more troublesome because of the curtailment of supply due to inability of the railroads to supply sufficient cars or motive power to enable the mines to maintain continuous production at anything like normal capacity. With many mines reporting car supply of 50 per cent or less, the confiscation of a large part of the coal consigned to Detroit creates a shortage of dangerous proportions.

A few days ago the Detroit Board of Commerce arranged a conference with representatives of similar organizations from other towns of the state. At this gathering a report was made of the unsatisfactory progress attained in negotiations through the board's fuel commissioner with Federal officials in Washington. After reviewing the situation in Detroit and other Michigan cities the conference decided to send a committee of business men to Washington. Their prominence would assure that they be accorded respectful consideration.

Anthracite Though very little anthracite is now being brought in this city the rising temperature this week strengthens the belief that household consumers will not suffer hardship. In some of the retail yards the supply of anthracite is already reported exhausted.

Lake Trade—While the movement of coal from the docks at the head of the Lake indicates there will be an unusually active early demand for Lake coal, the condition of car shortage and urgent demand for coal in lower lake markets is likely to prevent a heavy volume of shipments at the opening of navigation.

Middle West

MIDWEST REVIEW

Spot coal is even more difficult to get today than it was last week, and for that matter, since the war. On all sides it is heard that coal is scarcer and harder to get than at any time before in the history of the industry, except during extraordinary periods such as strikes, etc.

Buyers of large quantities of steam coal who in past years, at this season, have been besieged by aggressive coal salesmen, say they haven't had a visit from a representative of a coal firm since last October. Contracts are to be had for the asking on almost any kind of coal. Furthermore, those desiring contracts are willing to buy their coal at the present Government prices, with the understanding that the Government price will be adjusted on a basis satisfactory to the operators, as soon as Government restrictions are removed.

Government restrictions on the coal industry are growing more irksome day by day, and a number of associations, both wholesalers and operators, are taking steps to have the Lever Act repealed, in so far as it influences the coal industry. For instance, one association has instructed all of its members to request their trade to get in touch with their representatives at Washington, demanding of them that something be done. It appears that the best legal brains to be had in the country all think the Lever Act is unconstitutional and that the Government has no right to hinder the natural course of development of the coal trade. An example, is Mr. William H. Taft's coming out in favor of the Pocahontas operators versus the Fuel Administration, as well as th case being handled by Rush Butler, for the Maynard Coal Co. versus the Federal Trade Commission.

The coal trade in the Middle West was very interested to see, in the daily papers, Mr. Frelinghuysen's plan for the solution of the coal problem. Mr. Frelinghuysen thinks there ought to be a permanent coal board, at Washington, with powers to regulate prices, and he further thinks freight rates ought to be reduced 15 per cent, during summer months, to give the public an incentive to buy coal early. We presume he also plans to have the Government regulators of the industry reduce the price of coal during the summer months so as to give the public an additional reason for buying their coal early.

[illegible] to find out so far [illegible] domestic coals, or both steam and domestic coals. Representa- [illegible] in the [illegible] Mr. Frelinghuysen's [illegible] Government supervision of the industry, and the trade feels that Government supervision has already been tried, both in peace and war, and [illegible]

[illegible] issued instructions to their traffic depart- [illegible]

other than the Pennsylvania, except when absolutely impossible. It is rumored pretty freely that the railroads are confiscating coal in order to accumulate a surplus storage, so substantial that they will be in a position to dicker with the operators for a long time and hence beat down prices before they are ready to contract. Whether or not this rumor is true, we cannot say, but we can say it is receiving wide circulation, and it is pretty generally believed.

The all important car situation remains practically unchanged. One or two roads have shown some improvement, but not enough to make any real difference in the situation. Operators have given up all hope of any immediate betterment, as they believe the only way help will arrive will be through building a very large number of new cars, and spending a great deal of money repairing old and worn-out equipment.

CHICAGO

Retail trade has a fairly substantial supply of coal on hand. Not as worried over the immediate situation as they were a few weeks ago. They are still anxious to buy. Buyers of steam coal are not so well fixed, as but few manufacturing plants have a substantial supply of fuel on hand.

It is rumored that Franklin County operators will come out with their spring and summer circular within a few days. It is predicted that a basic price will be fixed for Franklin County domestic coals, and that this price will automatically increase from ten to fifteen cents each month, until fall. If the Franklin County operators establish this plan, it is sure to be followed by other operators and associations, which will no doubt go far toward stabilizing the industry by giving dealers an incentive to stock up during the summer months.

The situation on Eastern coals does not appear to have improved any during the past month. There is some New River and Pocahontas coal from West Virginia moving forward and some domestic coal from southeastern Kentucky, but nowhere near enough to begin to take care of the demand. What little West Virginia coal comes out here is moving on old contracts which were entered into last spring or early summer. Those of the retail trade who buy Eastern coal, and generally buy it on contract, are having great difficulty in getting their usual West Virginia connections to name a contract price. In fact, Eastern operators are none too anxious to take on business, even entered on a basis of price current at time of shipment.

ST. LOUIS

Conditions easing just a trifle but at a critical point in view of rumors over probable strike. Car shortage continues and a good demand for everything produced.

The local situation is somewhat uncertain right now, and the car shortage in all fields continues with a slight improvement. Slight improvement is caused by the easing up in the demand, the pressure for coal not being as great now as it has been. Demand, however, exceeds the supply in all fields.

In the Standard field the car supply still shows a trifle better than two days a week. The railroad tonnage still continues heavy The Mt. Olive field conditions show some improvement principally because the railroad tonnage is heavy for the Northwest.

There is an undercurrent of dissatisfaction among the miners . They are not satisfied with the recommendations of the mining commission. They seem to think that thirty per cent increase should be the minimum, with a six-hour and five-day a week working clause. Unless something definite is worked out by April 1 the miners in these fields will refuse to go to work from indications.

There is a good supply of this coal at the present time for the St. Louis market but it is not moving out of town in quantities to meet the demand. A good tonnage of the steam sizes is moving north.

In the Carterville field of Williamson and Franklin Counties there has been a slight improvement that will continue from now on, but the railroads are still hard pressed for fuel, and until this situation is relieved cars will be short and the tonnage small.

On domestic sizes there is a call for spring business that has exceeded the wildest anticipations of any operator in this field. Some of the mines are already sold up for the coming summer.

The miners in this field show less dissatisfaction than in the other fields. In the Duquoin field the Illinois Central shows [illegible] improvement the past week with but slightly less than three days' car supply. This promises to improve gradually

In St. Louis proper very little anthracite is coming in and practically nothing promises for the future, and the same applies to eastern smokeless, while the outlook is not good for Arkansas. Prices are the same and are as follows:

	Williamson County Coal	Mt. Olive	Standard
Lump, Egg and Nut	$2.55@$2.70	$2.55@$2.70	$2.55@$2.70
Mine run	2.35@ 2.50	2.35@ 2.50	2.35@ 2.50
Screenings	2.05@ 2.20	2.05@ 2.20	2.05@ 2.20

Williamson County rate $1.10, Mt. Olive and Standard rate 95c.

MILWAUKEE

Scarcity of coal causing hardship. Anthracite sold in small lots only. Lake ice conditions hamper supply by carferry. Prices unchanged.

Harsh spring winds, equally as conducive to fuel consumption as real wintry weather, keep the coal situation at Milwaukee tense and unsatisfactory. Some dealers are refusing orders, and coke companies will not promise deliveries within a week after orders have been filed. Long lines of trucks and carts gather at the coal docks daily, awaiting their turn to receive a driblet of fuel, only ton and half-ton lots being the limit, according to circumstances.

These small lots in many cases go to consumers who contracted in advance for a full supply. Relief from the present situation is not expected before the middle of April, when it is expected that coal cargoes will begin to arrive. Ice conditions hamper car-ferry traffic and reduces the coal supply through that source.

At present there is practically no hard coal in Milwaukee, but little coke, and very little soft coal. Rail congestion and coal confiscation by the government are blamed for the unusual stringency. Prices continue unchanged. There are repeated suggestions of an advance on April 1.

Coke

CONNELLSVILLE

Coke production in the Connellsville region has varied from week to week no more than a few thousand tons since the first of the year, and practically the entire output seems to be going out on contract.

Some of the so-called "contracts" are of course merely arrangements whereby the coke is to be shipped and billed at the Government limits so long as they exist. Afterward the price would be subject to negotiation, with a recourse to cancellation if a price understanding could not be reached. Naturally this leaves little if any free coke, while some furnaces are not receiving as heavy contract shipments as they need and would buy in the open market if opportunity were afforded. There are fewer rumors than formerly of the Government regulations being evaded. Certainly there are no regular market sales at above the set limits.

Some prominent operators have still more pronounced views than formerly along the line that coke will be strong and high priced during the remainder of the year, or after Government regulation is withdrawn, and that withdrawal may occur upon the final submission of the Robinson award in the bituminous wage matter. Last week the commission stopped work, two commissioners holding one view and the other another, the President having since been endeavoring to bring the parties together for a unanimous finding.

It is held in the quarters referred to that there will be a heavy demand for coal by reason of consumers, so greatly inconvenienced in the past few months, building up large stocks, thus affecting the supply of coal for coking, also that blast furnaces will be disposed to stock large quantities of coke. There are other observers, however, who expect overproduction of coke as soon as good transportation conditions come They say that while the blast furnace industry might use 10 or 15 per cent more coke than they have been getting, the byproduct and beehive coke industries could produce at least 25 per cent more coke, given adequate supplies of coke.

The coke market is very quiet and Government prices, while quotable as the market are largely nominal, as follows: Furnace, $6; foundry, $7; crushed, over ¾-in., $7.30, per net ton at ovens. The *Courier* reports production in the Connellsville and Lower Connellsville region in the week ended March 13 at [illegible] tons, an increase of 6,184 tons

COAL AGE

Volume 17 New York, April 1, 1920 Number 14

Government Control Is Removed

By R. Dawson Hall

PRESIDENT Wilson is to be congratulated on having ended Government control of coal with all its many inefficiencies. He was beginning to see that if it were not removed, it would be wrested from him by Congressional or Court action. The last few weeks of the Railroad Administration showed an orgy of absolutism and a complete collapse, such as will long convince us of the dangers of bureaucracy.

"Two heads are better than one" and "In a multitude of counselors there is wisdom," but the wiseacres of recent years have planned to concentrate power in a few bureaucratic heads, which, nevertheless, they have chosen without using the best of judgment. These bureau heads, to the great detriment of industry, have frequently held up everything till they could make their investigations and arrive at their decisions.

When Washington was urging councils or soviets of workmen to control other people's business, it was introducing absolutism in its own. No one received a hearing. It was thought that all business men were necessarily without a spark of patriotism and unimbued with common sense, whereas it was felt that workingmen were of so noble an impulse and so high an intellectuality that they could safely be trusted to manage a business in which they had made no investment and in which they had but little interest of any kind. All that the workman jeopardizes by inconsiderate voting in a works council is the permanence of his job, and most of them can readily leave and go somewhere else where an equally good job can be obtained. So they really have no permanent interest to conserve.

Still industrial democracy rightly makes an appeal to human nature. And it not only appeals, it sometimes succeeds. There are some workmen who have a large degree of industrial consciousness and fit well into a "works council," many who would have such a consciousness if left to themselves and some who have not and so mislead the others. Unfortunately just of late there has been little disposition to call producers into councils of this sort when considering the nation's affairs.

Little groups of theorizers have been allowed to handle matters as seemed best to them. Snap judgments have been the general order. Dr. Garfield, who during the war was willing to submit to advice, came out like a jack-in-the-box on Oct. 30 of last year, delivered his decision relative to prices and then resigned. The operators would have liked to have had a "works council" with Dr. Garfield, but he was gone, but in the meanwhile he bound the coal industry beyond protest.

It has been a principle of Mr. Wilson that the workman should always have the right to present grievances and drive a collective bargain but these operators were deprived of the opportunity to protest singly or collectively to anyone and were forbidden to meet in a "works council" to discuss their compensation.

Control is now removed. Matters should soon adjust themselves. Let us hope that neither the project of Frelinghuysen to create a new controller, nor the scheme of Calder to give the power to the Federal Trade Commission, will find any backers.

Coal Shortage Threatens Industrial Crisis in Germany

Decreased Production Creates Grave Menace—Only Careful Retrenchment Will Enable Industries To Continue—Apprehension Is Felt Lest There Be a Shutdown of Bavarian Blast Furnaces

WITH reference to the coal conditions now prevailing in Germany the Bavarian National Coal Depot is authority for the statement that the country is in the midst of a crisis which is chiefly due to the lack of coal, and that the seriousness of the hour demands that wide publicity be given to the true facts of the situation, John Q. Wood reports from Munich.

Before the war Germany's coal production was 200,000,000 tons annually, but in the last few years the yearly output has diminished to 100,000,000 tons. As the requirements of industry and trade are about 85,000,000 tons per year, any further derangement of supply would be critical. Constant level has been maintained during the last few months.

According to the above-cited authority, while Germany produced in peace times 200,000,000 tons of coal annually, the production in the last few years has diminished to 100,000,000 tons. The requirements of the country, on the other hand, on a basis of the requirements for the year 1913, making allowance for a smaller Germany and the obligatory delivery of coal to the Entente, amounts to about 140,000,000 tons.

Of the actual annual supply of coal 20,000,000 tons are required for the Entente, 10,000,000 tons for the requirements of the mines themselves, 18,000,000 tons for transportation purposes, 3,000,000 tons for the food and provision industry, and 23,000,000 tons for household use and for gas, water, and electric works. Deducting this minimum from the supply there remains only 26,000,000 tons annually for the use of industries and trade.

Supply from Ruhr District Is Diminishing

The requirements of industry and trade, reckoned according to the consumption in 1913, amount to 85,000,000 tons, so that already in the year 1918 there was a deficiency of 59,000,000 tons. It would be possible with great retrenchment to maintain activities of German industry with the present coal supply. Any derangement in this supply, however, must lead to a crisis.

Since December, 1919, the coal supply from the Ruhr district has been constantly diminishing, first owing to the low water and then to the high water of the Rhine, which almost completely tied up Rhine navigation. At the same time, due to the railway strike in Elberfeld and Essen and to the still continued passive resistance, the railway deliveries have been extraordinarily hindered.

Owing to the inadequate transportation facilities, the supply from Silesia for several months has been devoted almost exclusively to moderate deliveries to gas works and the most essential industries. The supply is also in part still tied up owing to the railway strike in Upper Silesia. The supply of coal from Saxony and middle Germany in itself is not large; fortunately, however, it has in the past few months been maintained at a constant level.

Already in December the supply of coal from Bohemia, owing to transport difficulties and the Christmas holidays, diminished to about half the usual quantity, and the situation has been further aggravated on account of high water, which flooded the most important districts (for Bavaria) of the Falkenau and Brüx territories and thereby affected such mines as formerly supplied coal to Bavaria. Moreover, on account of the strike in the Ostrau-Mahrisch district, Bohemia has been obliged to furnish coal to Mahren and German Austria, so that the greater part of its output is required for home consumption. As a result of these conditions the export to Bavaria from Bohemia has diminished about one-half.

In Upper Bavaria—as in all other coal-mining districts—the output in the first half of January was still suffering from the after effects of the numerous holidays. Also, because of unfortunate accidents and owing to the change of explosives due to the issuance of new blasting regulations, the output has diminished somewhat. Besides, coal must now be supplied to the State railway in order to maintain the necessary provision and coal transportation facilities.

In Upper Pfalz the coal mines have been materially affected by the heavy rainfall and high water, especially in Schwandorf, through the giving way of a dam; the supply in consequence fell off to less than half, and the briquet factories were closed for several weeks. In Schwarzenfeld the supply was affected by a strike, and at Stockholm there has been only about 50 per cent of the normal output.

As a result of all these circumstances, the supplies of coal required by the State railways have been entirely insufficient, as the suspension of freight and passenger traffic has abundantly shown. The gas and electric works are continually face to face with a shutdown and operate only from hand to mouth as regards their supply of coal. Particularly is this true in the cities of Munich, Nuremberg and Augsburg.

Industry all along the line is in the direst want. Especially grave is the threatened closing down of the Bavarian blast furnaces in Amberg and Rosenberg, on which the entire iron industry of Bavaria depends. The introduction of cement, especially required for repairing water-power installations, is almost impossible.

Distributing Pulverized Coal to Small Plants*

Using Pulverized Coal From a Central Plant Is Getting To Be Common Practice In West —Pulverized Sub-Bituminous Coal Must Be Kept Dry and Air So Far As Possible Excluded If The Fuel Is To Be Handled Safely

By B. J. Cross†
Washington, D. C.

WITH the increasing use of pulverized coal as a fuel and with the extension of its field of application, problems connected with its transportation and storage are becoming more important. The preparation of this fuel, especially high-moisture sub-bituminous coals and lignites, for use in pulverized form is an involved and expensive process, and, in general, is economically possible only for plants of large capacity.

As far as combustion itself is concerned, there are advantages and economies of pulverized fuel apply, of course, to small as well as to large installations, so that a central plant for preparing and delivering pulverized coal would evidently supply a need and make this fuel available to small-scale operations.

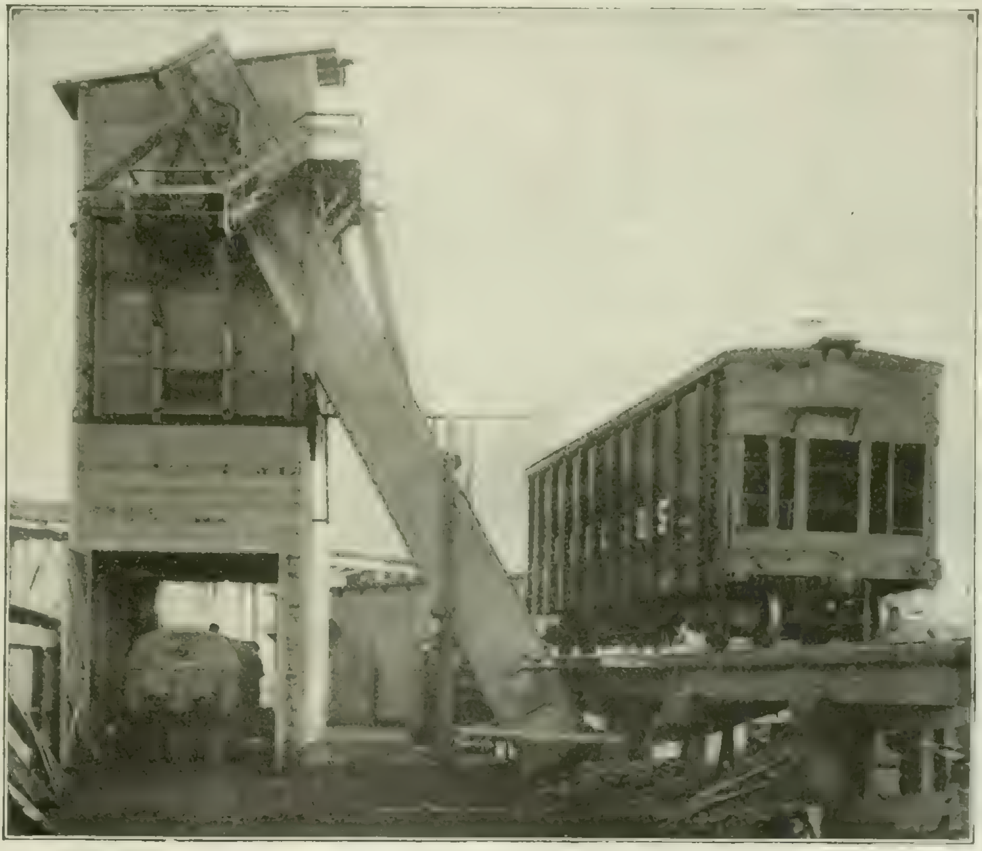
The Pacific Coast Coal Co., of Washington, has established such a central station near Seattle, which has been in operation for over two years. In the belief that it may be of value to those interested in this subject, the following brief description has been made from data generously furnished by this company. Acknowledgement is also made to George N. Calkins, manager of the powdered coal department, and Ralph Galt of the Fuller Engineering Co., for their courteous assistance and co-operation.

The pulverizing plant, which is situated near Renton, about 15 miles south of Seattle, consists of two 15-ton rotary driers (hourly capacity) and two 5-ton pulverizing mills. The large drier capacity is necessary because of the extremely wet coals sometimes used, running as high as 25 per cent of moisture. The pulverized coal is brought by rail to the central distributing bin at Seattle and from there delivered to the consumers' plants by motor trucks of special design.

FIG. 1

Powdered-Coal Car Elevator, Bin and Auto Truck

Pulverized fuel is here dumped, elevated, stored and finally spouted into the truck for delivery to the consumer with little if any exposure to the air and consequently no chance for the powder to either heat or blow away.



The railroad car for hauling the coal from the pulverizing plant to the central bin at Seattle is shown in cross-section in Fig. 2 both in its original form and as later remodeled. The body of the car is of wood lined with asbestos board except for the hopper bottom, which is lined with sheet iron. The car has a capacity of 30 tons when completely filled.

The intake openings at the top of the car and the discharge openings at the bottom are made with special castings and can be tightly closed. The density of the pulverized coal varies considerably with the degree of settling. An average figure is 40 lb. per cubic foot. This car, in its present form, is giving satisfactory service, and others, to be added as the traffic demands, will be of the same design but of all-steel construction.

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*Published by permission of the Director of the Bureau of Mines.

†Assistant Physical Chemist, Bureau of Mines.

The dry pulverized coal flows quite readily and with the proper devices is easily handled. After being ground the coal is drawn from the pulverizers by means of screw feeders and carried by two horizontal spiral conveyors a distance of 60 ft. to a point over the railroad car, into which the coal is discharged through large canvas tubes.

The conveyors are inclosed and their operation can be made entirely dustless. At Seattle, the car discharges into an inclined continuous bucket elevator and the coal is carried to the top of a storage bin, from which the delivery truck is filled by gravity as later described.

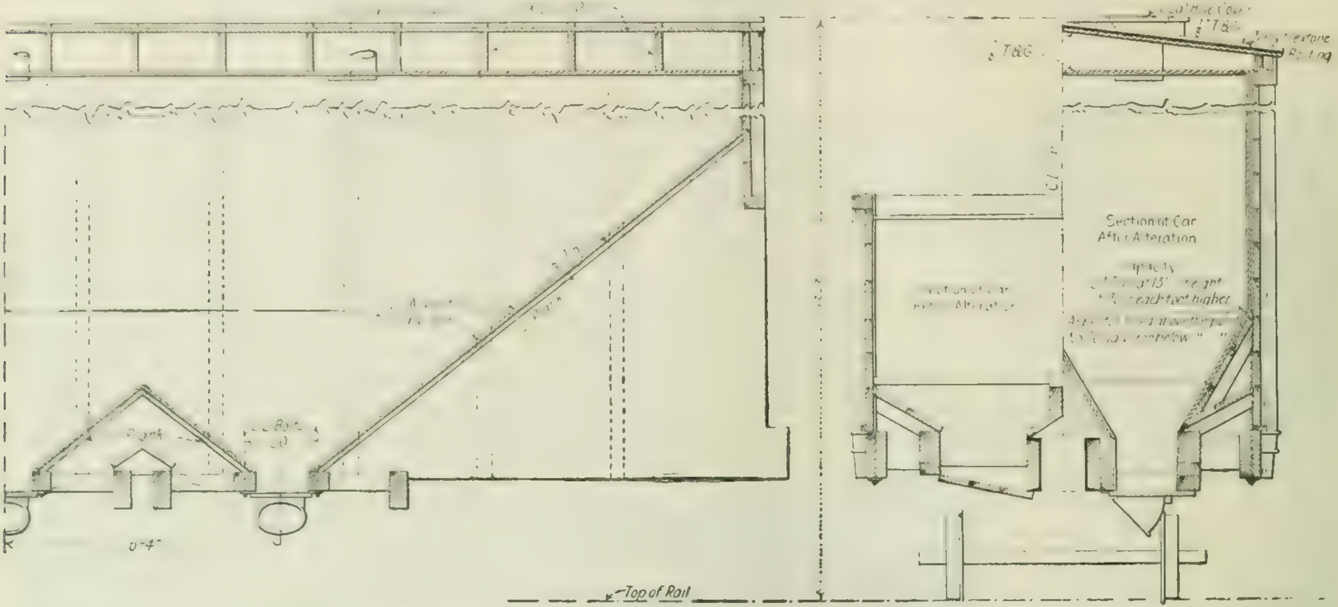


FIG. 2. LONGITUDINAL AND TRANSVERSE SECTIONS OF THE COAL CAR
This car as first built was unsatisfactory. After being redesigned, however, it now satisfactorily serves the purpose for which it was intended.

FIG. 3. FEEDING APPARATUS UNDER CONSUMER'S BIN
[illegible] screw conveyor and de[illegible] leading to the furnace

The motor truck used in delivering the pulverized coal to the consumers' plants presents some novel and interesting features. This truck is of an original design and was built in the company's own shops. Fig. 4 is a sketch of the truck body in position for discharging into a bin or bunker. The small pipe (*A*) makes an air connection between the top of the bin and the top of the truck tank. This greatly facilitates dumping and renders the operation entirely dustless, since the air displaced from the bin by the coal enters the emptying tank.

In filling the truck the tank body is tilted in the same position as shown for discharging. The 45-deg. elbow at the top of the tank then makes a tight connection with a spout from the bin. In Fig. 3 the truck is shown under the bin, but not in position for filling. The intake and discharge openings of the truck are closed by tight-fitting ratchet gates. Two trucks of this type are now in use.

The main storage reservoir of the system is in the stockpiles of untreated coal. Just enough of the pulverized product is held in storage at the various bins to insure an uninterrupted supply to the customers in the event of breakdowns at the plant or delays in

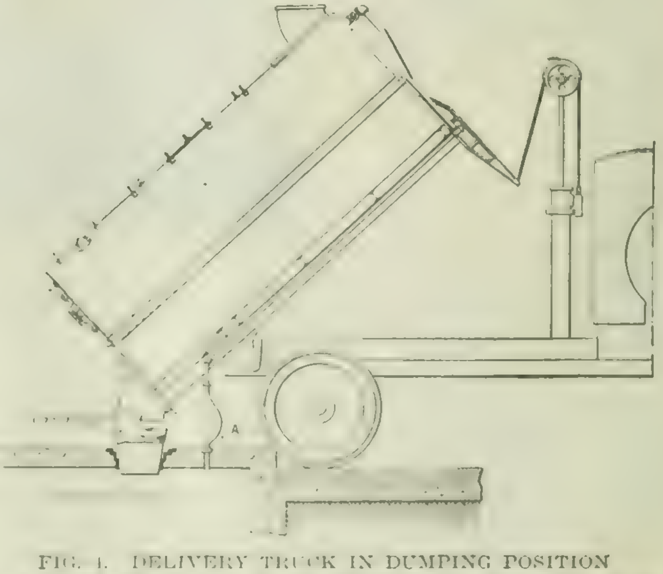


FIG. 4. DELIVERY TRUCK IN DUMPING POSITION
A canvas sheath and the air pipe "A" are details that have done much to make the delivery of pulverized fuel to the consumer's bin easy and successful.

transit. No pulverized coal is stored at the plant. The ground material is delivered directly from the pulverizers to the car.

The central distributing bin at Seattle has a capacity of 80 tons, and on an average 60 tons are held in reserve at this point. The bins at the consuming plants are all of the same type. They are built either of steel or concrete, and hold from 10 to 25 tons. These bins are usually kept full and the coal is probably in storage here longer than at any other point in the system.

Sub-bituminous coal is employed and this readily absorbs moisture from the atmosphere. Ordinarily this variety of coal from this region is quite susceptible to heating and spontaneous combustion when stored in the open.

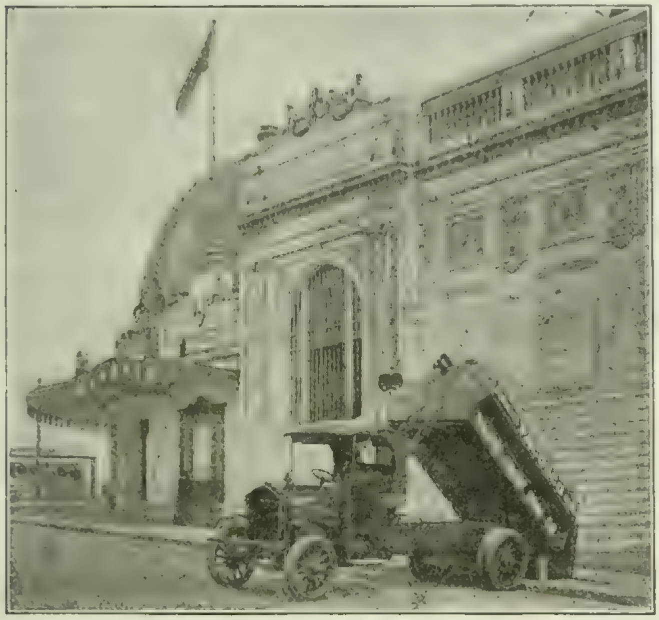


FIG. 5. DELIVERING FUEL TO A HEATING PLANT

The truck is in the same position as shown in Fig. 4 and the powdered coal is flowing to the consumer's bunker under the sidewalk.

All of the handling and conveying machinery employed in the various operations here described is inclosed and in every way designed to prevent exposing the dry pulverized coal to the atmosphere. The storage bins are as far as possible made airtight in order to prevent circulation or the renewal of the inclosed air.

It is worthy of note, even as a coincidence, that the only three occasions of serious heating of the powdered coal in bins occurred when the material had accidently been wetted. In spite of any conclusive evidence, the idea exists that in ordinary storage, moisture is a factor tending to foster the heating of coal piles. The experience here gained in the storage of powdered coal tends to substantiate this belief. As long as the coal is kept quite dry, no heating occurs.

Validity of Corporate Transfer.—Where a mining company conveyed practically all of its property to another company, leaving nothing which could be subjected to liability for death of a person through negligence of the first company, it became necessary for the second company, in order to avoid a setting aside of the transfer as being fraudulent, to prove that the transfer was made in good faith, and for a valuable consideration. (*Alabama Supreme Court, Setzer vs. Burnwell Coal Co., 83 Southern Reporter, 139.*)

Coal Resources in Arizona

By Paul Cloke
Tucson, Ariz.

DEVELOPMENT of Arizona's coal resources has been a matter of but passing interest hitherto, since it was overshadowed by the tremendous output of the state's metal mines. There are at least three places in the state, however, where coal occurs in large quantities, and when the Gallup fields of New Mexico commence to give out and there is a local demand for power for manufacturing and for agricultural purposes there is bound to be activity toward the development of these deposits.

The great possibility offered by these deposits would seem to come from erecting power plants at the mines from which energy could be transmitted by high tension lines to other parts of the state for various purposes, including artifical regrigeration. Some energy might also be used to recover nitrogen from the air right at the plant.

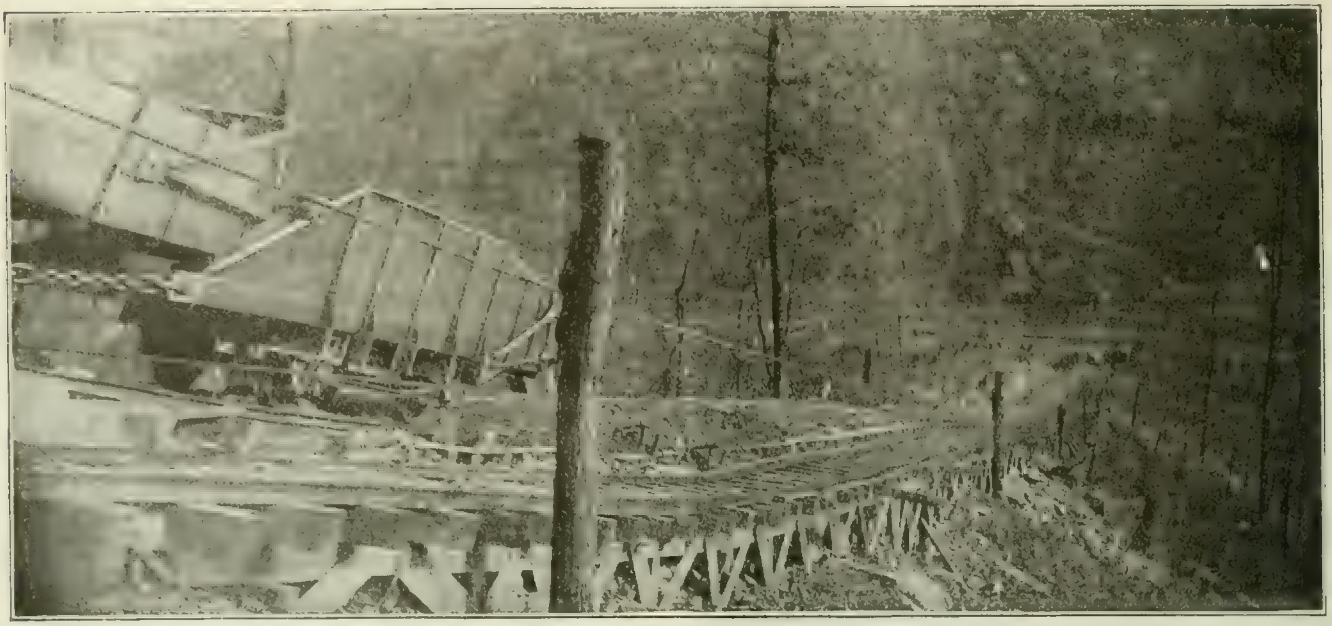
The Black Mesa coal field lies in and around Black Mesa in the Hopi and Navajo Indian Reservations in Coconine, Navajo and Apache Counties of Arizona. At present the field is difficult of access. The Santa Fe Railroad lies 70 to 90 miles south. As the name implies, the coal field lies almost wholly on a mesa which is the most conspicuous feature of the topography of the region. Its general altitude runs from 6,000 ft. at the south to 8,000 ft. at the north and from 500 ft. to 2,000 ft. above the general level. This coal belongs to the sub-bituminous class, a high ash being its chief drawback. The available tonnage is estimated at 14,000,000,000 short tons. It is thought that this is a low estimate. This coal is as good as or better than that of Gallup mines.

The Pinedale coal field is in two beds from 10 to 15 ft. apart, the upper reaching a maximum thickness of 12 ft., the lower 3 ft. The upper is a dirty deposit while the lower is a fairly clean sub-bituminous fuel.

The Deer River coal field lies on the south side of the Gila River just east of Dudleyville, at the junction of the San Pedro and Gila Rivers. It is about 85 miles northeast of Tucson. The eastern end is accessible from San Carlos through Hawk Canyon. The coal field is located near the center of the great copper-producing region of the state.

The field extends 10 to 12 miles in an east-west direction and it is known to have a breadth of 4 miles in Deer Creek basin. The coal is also found in Ash Creek basin so it is possible that the bed will extend to the limestone outcrop west of Saddle Mountain. Coal beds are also reported in Hawk Canyon. The coal runs about 2 ft. in thickness and the total tonnage is estimated at 30,000,000 short tons. The coal is, generally speaking, of two qualities.

The first is hard block coal adaptable for transportation for commercial use and for coke making. The second is a soft coal badly crushed and is of little use for marketing although it offers possibilities for manufacture of gas and for use in a power plant at the mine. The fact that these fields occur on Indian reservations interjects a point of difficulty, but efforts are being made by prominent engineers of Arizona, among whom is Dean G. M. Butler, Director of the Arizona Bureau of Mines, to have appropriate legislation enacted so that these mines may be developed.



Lowering Splint Coal Down a Mountain with Minimum Breakage

Degradation Is Avoided by Causing the Coal To Slide from the Car into a Tube, from the Tube into a Monitor, from the Monitor into Another Tube and from Thence to a Conveyor

By Josiah Keely
Kayford, W. Va.

At OLD ACME the splint coal was one of the first coals on Cabin Creek, W. Va., to attract the attention of buyers of high-grade domestic fuel. For many years the coal was produced on a making basis, and the miners became proficient in making a large percentage of lump. As other operations were developed in this bed it became their aim to equal the reputation of Acme. To this end loading booms, Marcus equipment, and shakers were introduced, but still there was too much small material—too great a proportion of slack to lump.

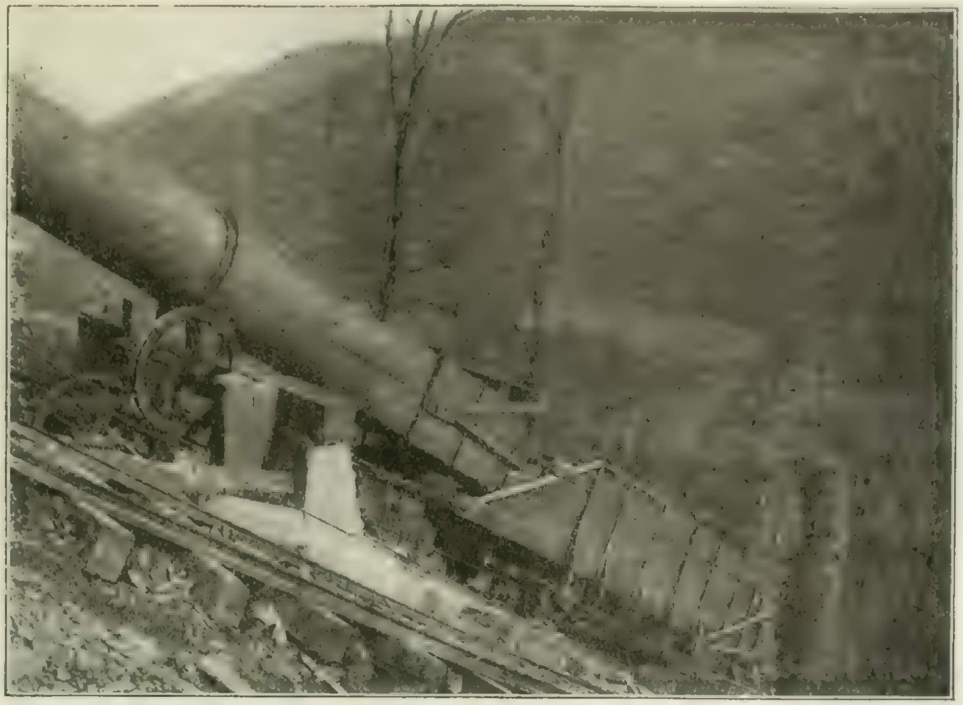
If it was attempted to use bins for storage, even in moderate quantities, the breakage became excessive. The result was that any delay in dropping in cars on the lump track caused a similar delay all the way to the mine partings. As the Acme bed is from 1,100 to 1,700 ft. from the tipple, various plans have been devised for transporting the coal down the long planes and into the railroad cars without undue breakage and in such a manner as to keep the mine haulage in operation in spite of delays at the tipple; also to keep the tipple going while there is a delay in the mine or on the plane.

One of the earliest attempts at solving this problem was made a dozen years ago on Paint Creek, which runs parallel to Cabin Creek and where some of the same beds are worked. An operator from the anthracite fields of Pennsylvania attempted to use the method employed for lowering anthracite down steep grades by means of a chute. An open trough about 1,500 ft. long, 16 ft. wide and 6 ft. deep was lined with sheet iron from top to bottom, and filled the entire distance between headhouse and tipple. The pitch of the chute was not uniform but followed the contour of the mountain. Also, I believe, there were one or two changes in direction. Anyway, the idea was to fill this big trough up and then draw off the coal from the bottom as it was filled from the top.

It seems that even the angle of repose of the coal had not been taken too carefully into consideration, for part of the chute must have been on not over a 25-deg. slope. Anyway, I am told that when this chute was filled it took weeks to dig it out. The coal came down at terrific speed in the steep places and kept on going over the lesser grades. It filled the chute all right; but it refused to move as a whole when drawn off from the bottom.

When this scheme failed it was attempted to put in checks and doors and let the coal slide dump by dump from top to bottom. After a fashion, considerable coal was run in this way, but it came like a bombardment of the tipple; sometimes the larger lumps left the chute and flew clear over this building. The degradation was frightful, but the lumps that survived defied any further breakage and might have been sold under the caption, "Indestructible Iron-clad Splint." The company went into the hands of a receiver.

Tubes and chutes have been used under favorable circumstances for the softer gas coals, but it seems that operators generally have avoided long chutes for



Monitor Receiving Its Load

As the monitor is pulled up under the lower end of the storage tube the gate on the tube end is lifted permitting the coal to flow into the monitor until it is full. Lowering the monitor shuts the gate and stops the flow.

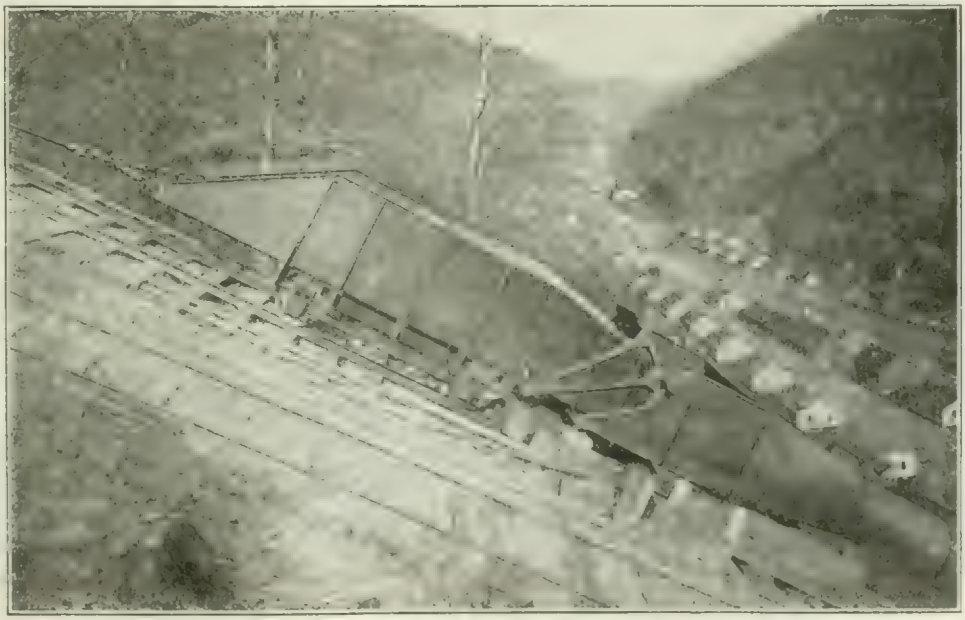
splint. Some monitors are employed but the usual method of handling splint coal is by running the mine cars, from two to four to a trip, directly from the mine down the plane to a tipple landing. It is true that a few have ventured to install long conveyors of the disc type, but it is doubtful if the up keep of these will stay within low limits.

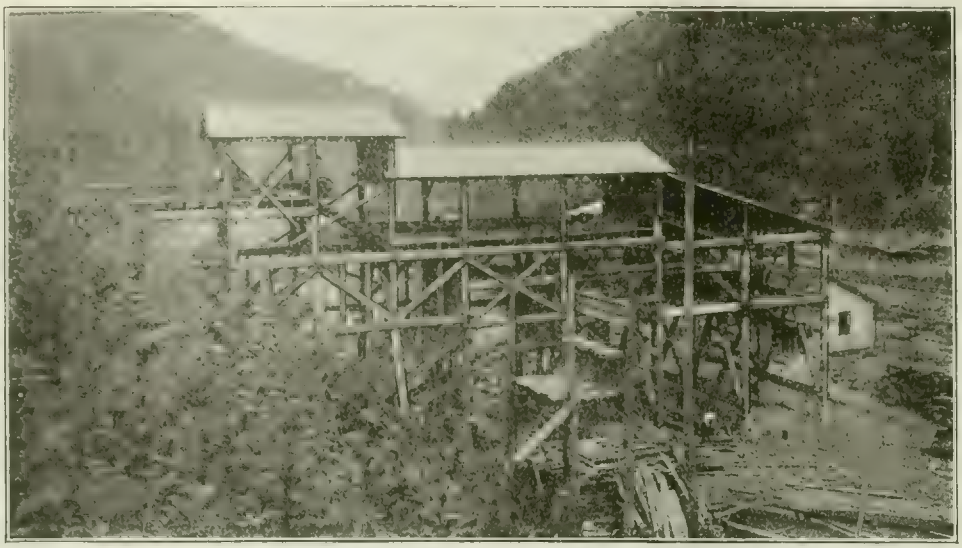
Running mine cars over a plane is not only hard on the cars but every car has to be inspected and kept in perfect repair for each trip. It is almost impossible to prevent some runaways, and unless the coal is carefully cribbed much is lost on the plane. Furthermore the landing at the tipple requires a longer and more substantial building. Finally, broken trips running away have, on reaching the tipple, been the cause of an appalling number of serious accidents.

The usual type of monitor is filled from a bin, the coal falling several feet into the top of the monitor. This, added to the breakage in the head-house bin and that caused from discharging into the tipple bin, makes an excessive deterioration before the coal is screened. However, there are so many considerations in favor of monitor transportation that careful attention may well be directed toward eliminating the attendant breakage. It was with this in mind that the rather novel equipment of Acme 2 was designed. It was desired to maintain the reputation of Old Acme for good lump coal and at the same time increase the capacity, reduce the cost,

Monitor Discharging Its Load

At the lower extremity of its travel the end of the monitor enters the upper end of the lower storage tube. This opens the monitor gate and allows the contents to discharge into the tube.





Tipple Frame and Machinery in Place

This picture was taken during the time that the equipment was being installed. The conveyor and transformers can be plainly seen.

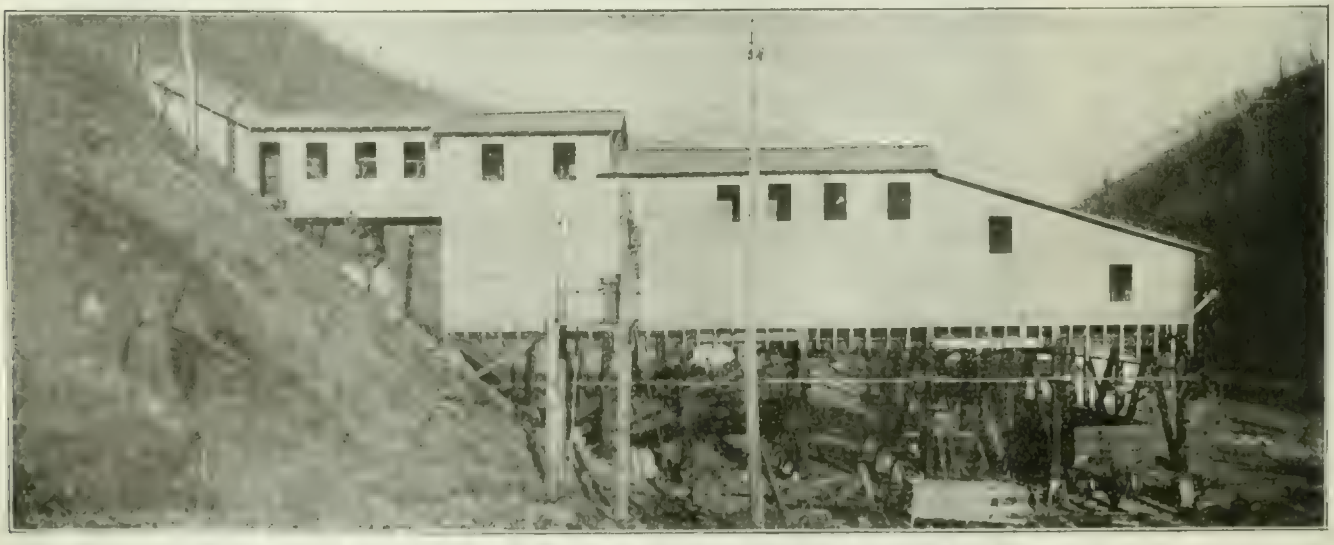
and eliminate the danger of cars running away onto the tipple. About everyone on the job had a hand in making suggestions which W. W. Venable of the Kanawha Manufacturing Co. has attempted to incorporate in his designs for this equipment.

First, an attempt is made to have the coal slide from point to point at all successive stages from top to bottom, instead of falling into bins and pouring into and out of monitors. Thirty-three degrees was chosen as the angle at which this coal would move from rest, and the equipment is a combination of monitors, steel tubes and conveyors. The monitors are especially designed, and shuttle between two 36-in. steel tubes, a receiving tube 104 ft. long and a discharge tube 220 ft. long. The short conveyor simply feeds the coal onto shaker screens from the lower tube.

Starting from the mine, the coal is loaded into 2-ton cars and weighed on a Fairbank scale with a Streeter-Amet automatic weighing device, after which it passes over a Phillips cross-over dump. Instead of dumping into a bin, the coal runs out of the car into the receiving tube, which is installed at the same pitch as the car bottom in position of dumping. The first dump rushes down the tube with considerable velocity and a good deal of breakage against the hooded door at the lower end results. However, the next dump cushions against the coal already in place and makes a fairly easy landing.

Each dump that rushes down the tube is spread out by friction so that there is a "tail" of coal in front and a similar tail behind. In other words, the tube is filled quite loosely and with much less breakage than a bin would be, because there is just enough momentum to the strung-out coal to bunch it up together at landing, making the tube full but not packing it. It is contemplated to not empty this tube until the end of the day, but to operate at all times with at least several dumps in the tube. It holds about 30 tons. A bin to hold 30 tons would have to be twice as large, unless coal were dumped with a fall of 10 or 15 feet.

Next, the monitor instead of having an opening in the top is open ended like a cartridge. It is rectangular in cross section and the upper end is designed on such a slope as to raise the hooded door of the receiving tube, taking its load automatically. As it opens this door it is on the same slope as the tube. The whole



TIPPLE COMPLETED, WITH FIRST RAILROAD CAR AWAITING ITS LOAD

Tipple is designed so as to reduce breakage. A large slack bin is provided, but the capacity of the tubes is relied on to furnish the storage. They hold about 100 tons.

bulk of coal in the tube simply moves downward and with enough thrust to entirely fill the monitor, with the exception of that part occupied by the end of the tube which projects into it. As the monitor withdraws the hooded door drops, cutting off the coal, not suddenly but allowing enough to come through to finish the monitor load by the time it is clear of the tube.

It is 700 ft. on a 25-deg. slope to the receiving end of the lower tube. The monitor, with 10 tons of coal, descends, operating the ordinary drum rigging until it reaches the 220-ft. tube, which is used instead of the ordinary receiving bin. The upper end of this tube is designed to receive the lower end of the monitor, which slides into it on an angle of 33 deg., the sides of the tube being constructed on such a slope as to raise the door of the monitor. The discharge of the coal is, of course, reciprocal with the receiving of the coal into the other monitor at the top.

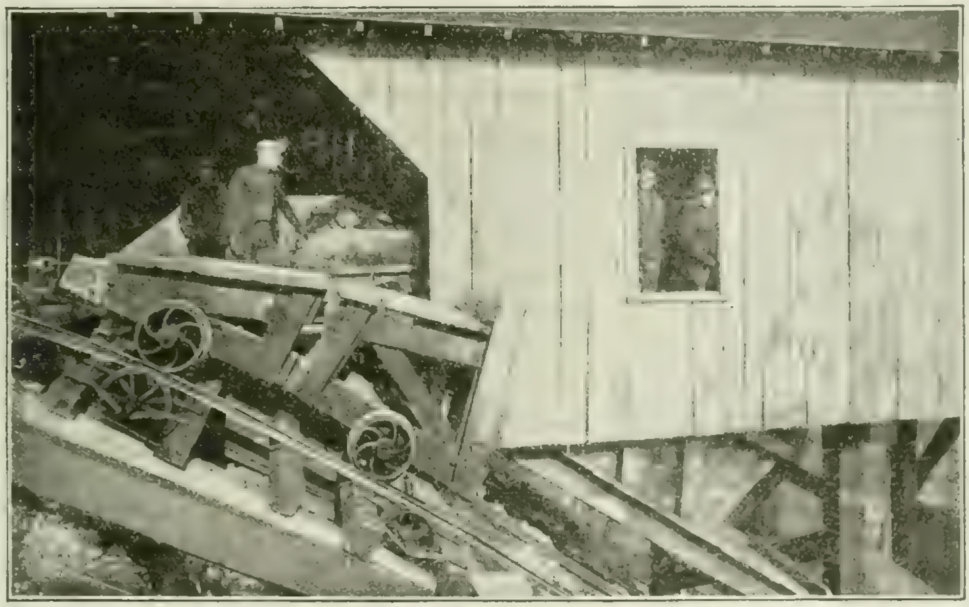
The first monitor full rushes down the tube and against its hooded end with appreciable breakage, but after this the succeeding dumps cushion on account of the coal being spread out up the tube. Each dump leaves a "tail" instead of presenting a solid bank for the next monitor load to break against. Although after the first dump there is less breakage than in a bin, still the intention is to operate with the tube well filled. It holds about 70 tons.

When the conveyor starts, the coal feeds from the tube at the rate of 2,000 tons per day, or, in fact, at about any rate desired. Thus the coal *slides* from the car into the upper tube, *slides* from this tube into the monitor, *slides* from the monitor into lower tube, and *slides* down this as the conveyor takes it away from the discharge opening.

Of course, in the whole design advantage has been taken of the contour of the ground. It just happens that the last 220 ft. of the plane is the steep portion, making the tube practical. It just happens that the grade between tubes is approximately uniform so that there are no knuckles to make sheaves and rollers necessary.

It happens, also, that running a tube over the Coal River railroad cut at this place saves a double monitor trestle. And also the cut makes a safety ditch which will effectually prevent any runaways from ever coming into the tipple. With heavy 10-ton monitors coming clear down to a tipple there will inevitably be a time when one of them will run away and smash things up. In this connection, it might be well to call attention to the fact that the first joint of the receiving tube is telescoped so that a heavy bump against it will not be communicated along the whole tube to the conveyor or tear the tube from its foundations. It is hardly necessary to explain that both monitors do not land at exactly the same point, there being four or five inches difference to take care of the four rails which are all brought in together from a frog, but with no latches to bother with.

Probably the most serious objection to the installation is the precaution that must be taken in freezing weather. This was, of course, considered when designing the equipment. The tubes should not be left full over night in cold weather, and too long a delay during the day might cause a stoppage, but as far south as this, the advantages in other respects outweigh the chances of these occasional delays in cold weather.



Dumphouse at the Top of the Plane

Mine cars are here discharged to the upper end of the upper storage tube. A jointed material skip is shown in the foreground.

In the present installation the tipple is equipped with a large slack bin emptied by a conveyor in order to get all the capacity, but there is 100 tons of storage carried in the tubes without breakage and which could not otherwise be provided for.

It would appear, to sum up the advantages: (1) That this is a cheap installation, (2) that it can be cheaply operated, (3) that breakage has been reduced, (4) that by shortening the monitor run 300 ft. the capacity of output is much increased, (5) that the danger to tipple and men from the runaway trips is practically eliminated, (6) that there is a maximum of storage in a minimum of space, (7) that by confining the monitor run to that part of the plane that is of uniform grade the number of sheaves and rollers is reduced and a correspondingly longer life given the ropes, which have been shortened 300 ft. by reason of the installation of the tubes, (8) that the monitor fills automatically and cannot be run over, wasting coal on the plane.

What Should Be Done To Provide a 300-Day Working Year*

Summer Storage of Coal Has Been Urged as a Stabilizer of the Industry—Of all Consumers of Fuel, the Railroads Are the Most Readily Able to Store Their Winter's Requirements

By Edwin Ludlow
New York City

At the recent meeting of the American Institute of Mining and Metallurgical Engineers, the open forum on the subject of the stabilization of the bituminous coal industry that was called by Mr. Hoover brought out a large number of able papers, and a full discussion of the problems involved. The criticisms of the bituminous industry were:

That it was overdeveloped with a possible output nearly 50 per cent in excess of the present requirements; that during the summer there were plenty of cars and no orders, and during the winter there were plenty of orders but no cars; that the mines were not properly developed from an engineering standpoint, and that the recovery of the coal varies from 50 to 95 per cent; that this industry, employing over 600,000 men, could, if running full time, release 100,000 men for other work; that the studies made by the engineers of the Fuel Administration showed that the cost of production increased with a loss of time and that with a 50 per cent operation the increase in cost was about 40 per cent.

There is much truth in all of these criticisms but the remedies suggested were all met by objections and no clearly-defined policy was formulated at the meeting. This was left for a committee to be appointed by Mr. Hoover consisting of the 15 members of the coal and coke committee of the Institute with 15 others not necessarily connected with the Institute but whose assistance would be of value in formulating a definite plan for the stabilization of the bituminous industry.

Twice Domestic Consumption Could Be Produced

It is true that with full running time the mines could produce nearly a billion tons per annum as against a domestic consumption of 500 million. It is not possible, however, to change immediately from half time to full time and any improvement will be gradual. In the meantime every year shows an exhaustion of some mines and the demand increases at the rate of 20 million tons per annum.

The criticism that a large proportion of the tonnage of bituminous coal is not produced under the direct control of engineers is perfectly true. The history of a majority of bituminous mines, especially of a large number of small ones that go to make up the aggregate tonnage of the country, is that some successful sales agent who has been selling coal on a commission for other mines feels the necessity of having an operation of his own to stabilize his own business and arranges either by the formation of a company or through his own capital to purchase or open up such an operation. He then appoints a good practical man to take charge.

In the majority of cases this means the appointing of a superintendent who has been a foreman at some other mine. He is not an engineer, and as he is expected to mine coal at the least possible cost, he works the mine on that basis, taking out the best portion of the bed and leaving coal for a roof when it is cheaper to do so than take it down and set timber. He usually works without definite plan. The engineers who go into such a mine are simply surveyors who record what work has been done and are not employed to project the future workings.

Profits Have Lain in Sales, Not Production

The selling end of the bituminous business has been the money-making end, and the majority of mining companies are only adjuncts of a sales company. The exceptions to this are, of course, the mines opened up by the United States Steel Corporation and other steel companies for the purpose of mining coal for their own coke ovens. The large landowning companies have also done much good work in the way of conservation by employing engineers and insisting that the leases shall be worked in conformity with the instructions of these men and the workings planned out ahead. The recovery in all fields worked in this way with definite plans and laid out by engineers runs from 90 to 95 per cent, while the other class of mines obtain from 50 to 75 per cent extraction.

The anthracite industry is much better stabilized than the bituminous, due to three reasons: First, the railroads operating in that field recognize the importance from the standpoint of their own revenue of maintaining full working time at the mines. As a consequence car shortage is almost unknown, while this is the cause of the greatest loss of time in the bituminous field.

Second, the companies give a summer discount to encourage stocking, amounting to 50c. per ton in April and which is taken up at the rate of 10c. per month until September when the full circular price is charged until the next April.

Lower-Priced Coals Are Stored

Third, storage is provided by the large companies to take care of such sizes as are not in demand during certain periods. This storage had to be added to the price reduction in order to make that effective and is used largely for the lower-priced steam sizes that find their maximum demand in winter for steam-heating plants in the cities.

The domestic sizes are now readily absorbed at nearly all times of the year, but until these storage plants were built the spring reduction in price did not show any great results in increasing the working time during the summer. The fact that anthracite can be stored without danger of fire and with only a small loss from degradation makes stocking it a much simpler problem than the similar treatment of bituminous.

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*Paper presented before the New York section of the American Institute of Mining and Metallurgical Engineers, March 3, 1920, entitled "Stabilization of the Bituminous-Coal Industry."

The unionization of the coal mines has made labor unnecessarily costly through the unions refusing to allow any man to fill two positions even when it was perfectly possible for him to do so without overwork. This has caused a 25 per cent increase in the number of men with no corresponding increase in tonnage. The union also frowns upon individual effort and openly advocates that all must hold themselves down to what the average man can do, and is continually preventing any rules being enforced calling for a full day's work.

Labor unionization has greatly and unnecessarily increased mining costs. Nationalization of mines is favored by the miners because they believe that there is no bottom to Uncle Sam's pocketbook and that the Government could produce coal and sell it below cost indefinitely. To force nationalization they make excessive demands.

Claims were made that the strike of last November was due to the short working time of the mines. This was not the reason as the strike was called in accordance with an agreement made in England a year ago by which coal miners of all countries were to demand the nationalization of the mines and in order to obtain it they were to ask a 60 per cent increase, a 6-hr. day and a 5-day week.

The English miners have not obtained nationalization of the industry, but have secured a shorter working day. The result has been so disastrous to the British industry that the men will probably never get any further demands. The Nov. 1 strike was called at the beginning of winter, in violation of contracts, with the expectation that the mines would be taken over by the Government. That short working time was not the reason for the strike is shown by the demand of the anthracite miners, who have never suffered from short time, that they shall be granted a 60 per cent increase, a 6-hr. day and a 5-day week when their contract expires on April 1.

The statistics show that each increase given the miners in the last few years has reduced the tonnage per man-day and if the anthracite miners receive any part of their demand there will not be enough anthracite mined to supply the requirements of the country.

I talked with a district president of the miners in the anthracite region and asked why they wanted Government ownership of the mines when they knew that Government operation of the railroads had been a failure. He said, "Yes, that's true, but look at the high wages and short hours the men get. That's what we want. We know that the mines could not pay their overhead and sell the coal mined in the shorter hours at a price that the public would stand for, so we want the Government to take the mines and sell the coal at any price it pleases, and if it is at a loss the United States Treasury can stand it."

A study of the various addresses made at the recent meeting indicates that the greatest difficulty in the coal industry is a lack of co-operation between the bituminous mines and the railroads. The railroads use 155,000,000 tons or 28 per cent of the entire output of bituminous coal in this country. The curves as shown in Mr. Smith's paper indicate that their heavy demands for coal are in the winter at a time when output is most difficult to produce, and when the demand from the domestic trade is at its maximum. The public utilities, electric lines, etc., consume 33,000,000 tons or 6 per cent and have their maximum demand in winter.

The domestic consumption naturally shows the greatest fluctuations in its demand curve, dropping from 10,000,000 tons for the month of January, to 2,500,000 tons for July and August and going up again to 9,500,000 tons in December. This total tonnage, however, is only 67,000,000 or 12½ per cent of the entire output. The coke ovens absorb 85,000,000 tons or 15 per cent of the output, but their low period is December, January and February, forming a potent factor tending toward equalization.

The other consumers shown by Mr. Smith's paper all have variable curves with a larger consumption in summer than in winter.

Prof. Stoek's paper showed that it was entirely possible to store bituminous coal without danger of fire if the storing is done properly. The safest storage of all is under water as that is not only fireproof but also prevents any loss of volatile matter and deterioration in the coal, while storage can be continued an unlimited time. It would not be practicable for the domestic consumer to do any large amount of storing as his facilities would not be such as to enable him to do it in a proper manner He would always have the danger of spontaneous combustion and the degradation which would be unavoidable. The amount that he would have to store would not warrant him in going to any appreciable expense in preparing a proper storage.

RAILROADS COULD RENDER MOST ASSISTANCE

The electric utilities could and should store to a much larger extent than they do, but the ones who could help the whole bituminous trade by co-operating with it and storing during the summer a three month's supply which could be drawn upon during the winter months, would be the railroads. They could do more toward stabilizing the industry than anyone else, and no other industry could so well afford to store coal as the railroads since they have at their terminals sufficient ground on which this coal could be put down and they have in their equipment the locomotive cranes necessary to pick it up when it is needed. Thus the only capital expense required would be the proper preparation of the ground on which the coal is to be stored so as to avoid the danger of picking up the surface when recovering the fuel.

The railroads could better afford to do this than anyone else for the reason that it would enable them to have their equipment free to handle their domestic trade in the winter and their freight trains would not be loaded down with coal for their own consumption or that of other railroads during the period of most difficult operation, when the demand for coal is the greatest.

Suggestions were made that freight rates should be adjusted, giving low rates in summer in order to encourage stocking. This would not be necessary if the railroads themselves would do the stocking. The mines also should be willing to assist in this stocking movement by agreeing in their contracts that coal delivered to a railroad or to any other industry in excess of the average monthly requirement should be at a sufficiently lower price to pay for the stocking.

Such contracts are now in existence with the electric companies by which in providing for, say 120,000 tons per annum, the mining company has the right to double the monthly average in any month or ship 20,000 tons in a month, but that excess over the average monthly requirement of 10,000 tons would carry a discount of 5, 10 or 15c., as may be agreed upon. With this sort of contract the mining company could fill the full contract in six months if it desired and the electric company would have to take it.

An objection to a reduction in rates is that it is a complication that would work an injustice on the railroads in their shipments to the Lakes, where a great proportion of the summer tonnage goes and which cannot be forwarded to its final destination excepting during that season. And the same would also be true of tidewater shipments which are usually heavier in summer than they are in winter. It would only take about 50,000,000 tons extra shipped during the summer months to practically stabilize the industry. This the railroads with a consumption of 155,000,000 tons could easily absorb.

The objection to the dealers storing the coal is the cost of such storage to them. They have to pay for the freight as well as the coal. They have to stand the loss in degradation and the danger of fire, and all of these losses would have to be added to the price to the retail consumer so that the public would have to bear the entire cost of this storage. It would also give an opportunity to the dealer who had these storage yards to charge an exorbitant profit when coal was scarce under the claim that he would have to have such an amount in order to absorb his storage charges.

The stabilization of the bituminous industry must cover the question of the price to the consumer as well as the operation of the mines. Attempts to store by the wholesale and retail dealer would not accomplish the desired result even if a seasonal freight rate was allowed.

Transportation in this country is in a serious condition. The railroads have just come back to their original owners after three years of government control, depleted as to cars and rolling stock and with their roadbeds in worse condition than when they were turned over to the government, with wages up at so high a figure that the majority of the roads are not able to earn the guarantee that the government gave them based on the three years' earnings before they were taken over.

It is going to take billions of dollars to rehabilitate the carriers. Unless they can show an earning capacity it will be extremely difficult for them to borrow the money with which to do this. We have to face, therefore, a utilization to the best advantage of the rolling stock and equipment that the railroads have at the present time and this can only be arranged by eliminating as far as possible the haulage of coal for railroad purposes during the winter months.

The congestion of population in the cities and the large increase in manufacturing industries, with a continually increasing cost of obtaining sufficient freight terminals in these cities, make the problem of future operation one from which we will have to learn a lesson from Europe and utilize to a larger extent the waterways of this country. This is already being done in the Pittsburgh district, where the Monongahela River is now becoming the great carrier of coal from the mines to the byproduct ovens and manufacturing plants of Pittsburgh.

To utilize this river to its maximum, the mines are being connected underground by haulage roads extending back as much as 11 miles so that coal may be hauled to a river loading point. Furthermore, the river is being kept open all winter by ice breakers to prevent any interruption of a steady movement of coal to the by-product ovens.

The Kanawha and Ohio Rivers have always been gateways for the outlet of coal and this movement would be greatly stimulated if the public utilities would locate their plants near the river and make provision for sufficient storage so that they could obtain the bulk of their supplies by water.

In the anthracite field the greatest development in that direction would be the making of slackwater navigation from Trenton to Easton, permitting the barges that now carry coal to Sound ports as well as those for the Southern ports to be loaded at Easton, Pa., which is at the junction of the Delaware and Lehigh rivers and is reached by nearly all the anthracite roads. This would mean a short haul from the mines to the loading docks and would avoid the congestion of the crowded New York Bay terminals, where nearly all of the coal, not only for New York but for the waterfront of New England, is now loaded.

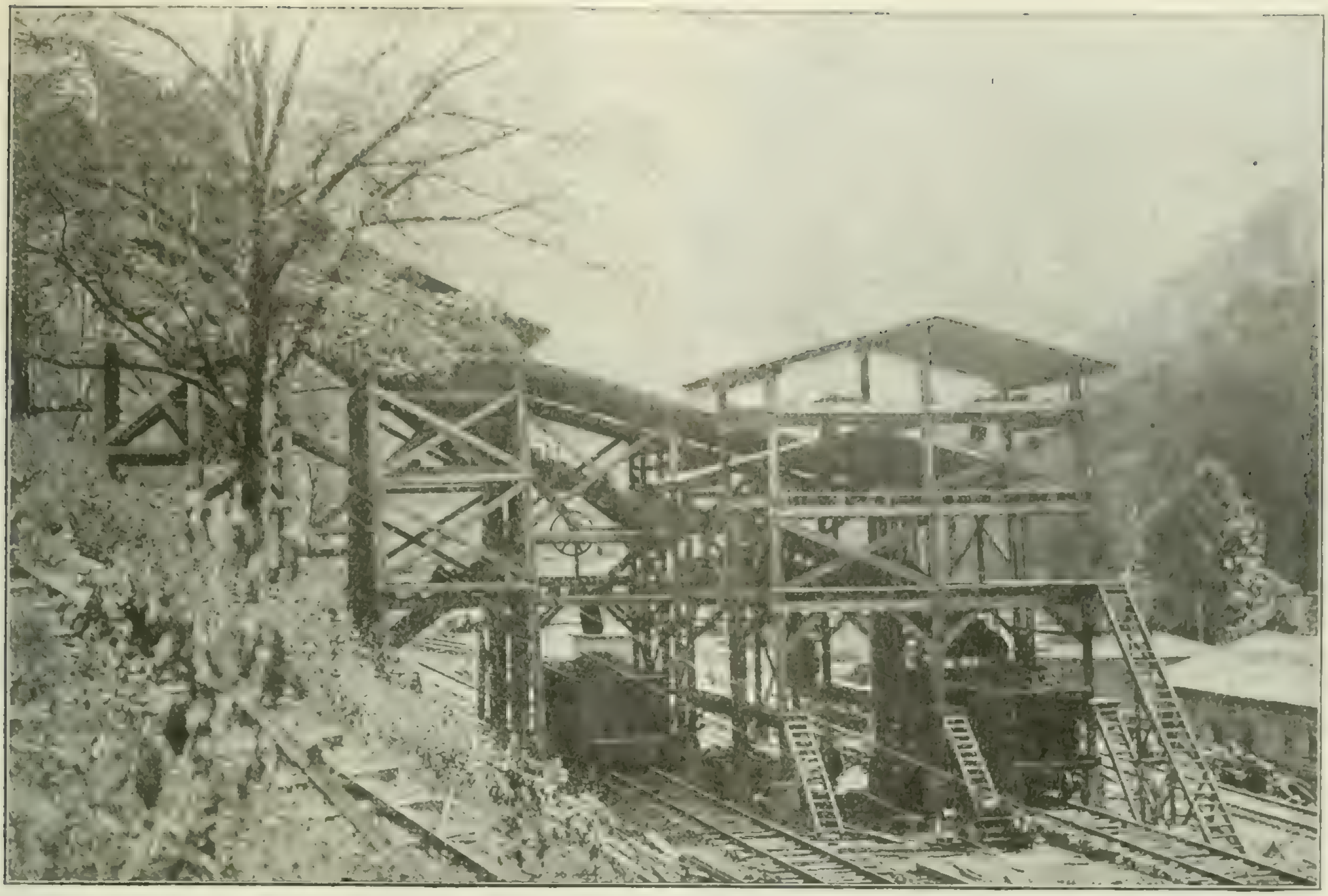
We are faced at this time with what is almost a coal famine and yet the mines are not working an average of three days a week. The coal that is being shipped in those three days is to a large extent being confiscated by the railroads. During the last five days of government operation at Newport News all the coal was confiscated irrespective of its destination and cars were even taken away from a vessel that was partly loaded and at the dock.

Provision should be made in the new regulations of the railroads, prohibiting this confiscation, and making the railroad that does confiscate, responsible not only for the price at which this coal was billed to the consumer but responsible for damages to the party to whom it was consigned, providing the non-receipt of this coal produced a loss in production or a shutdown of his plant.

As long as it is easy for the railroads to supply themselves through confiscation with the fuel that they need they will not take the trouble or go to the expense of buying sufficient stock to tide them over, and now that the railroads have gone back to individual ownership we should see that the bad practices instituted under government control are not allowed to continue.

We are faced with a fuel famine, yet the mines work only about three days per week—and much of what coal is shipped has been commandeered by the carriers. Bad practices instituted during Government control should not be indefinitely continued under private ownership. Confiscation by carload should be prohibited.

The stabilization of the bituminous-coal industry can not be accomplished without co-operation of the railroads and the railroads cannot obtain their full returns without utilizing to the fullest extent the cars and motive power they now possess. Now is the psychological time for the two parties to come together and formulate a plan to that end.



A Small but Efficient Tipple

Arrangement of Tipple and Machinery Is Such That Ready Access May Be Had to All Machinery—Three Sizes in Addition to Run-of-Mine Are Secured—Simplicity Is the Keynote of Entire Installation

By William Brasack
Fairmont, W. Va.

THE Birch Fork Coal Co. recently opened a new operation called the Birch Fork mine. This is located at Birchton in Raleigh County, W. Va., on the Coal River branch of the Chesapeake & Ohio R.R. The coal bed worked is the Dorothy Seam, which at this point has an average thickness of 6 ft. The coal is fairly hard and dry, is a good domestic fuel and well suited for steam purposes.

The mine is a drift operation located well toward the top of the mountain, while the tipple is placed in the valley. This arrangement called for a monitor plane about 1,800 ft. long. The coal is dumped at the top into a bin of about 500 tons capacity and loaded through undercut gates into monitors which lower it down the hill and discharge it into another bin of 25 tons capacity at the tipple.

The tipple equipment has a capacity of 200 tons per hour and is housed in a substantially designed wooden structure. One of the accompanying illustrations shows the tipple after the machinery was erected and while the first railroad car was being loaded, but before the siding and windows were put in place.

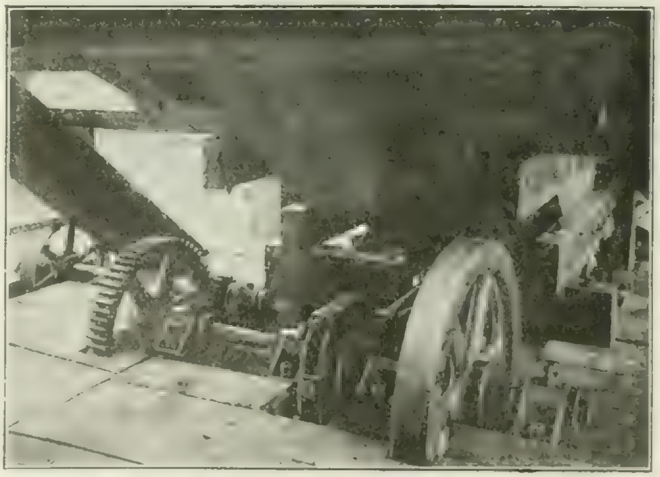


FIG. 1 MECHANISM OPERATING RECIPROCATING FEEDER
A flywheel on the main shaft assures a smooth oscillatory motion to the feeder plate.

An oscillating feeder operating under the tipple bin delivers the coal uniformly to the shaking screens. This feeder is driven from a 5-hp. squirrel-cage motor through one belt and one gear reduction and runs at 75 complete oscillations per minute. The oscillating plate is driven from an adjustable eccentric while a flywheel

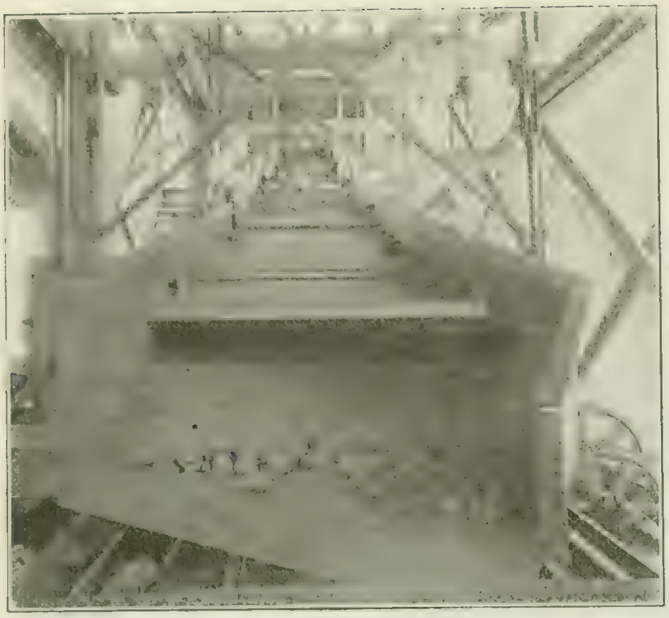


FIG. 2. LOOKING UP THE SHAKING SCREEN
These screens are built in two sections the oscillations of which are almost directly opposed, so that vibration is greatly reduced.

insures steady motion. This type of feeder produces a practically even feed and leaves a cushion of coal about 12 in. deep on the feeder plate which protects it when a monitor load is dumped into the empty bin.

The shaker screens are made in two sections, closely balanced, and are of the continuous bottom and gate type. They separate the coal into three sizes, slack, egg and lump. These can be mixed through a suitable setting of gates. Fig. 2 shows the shaking screens set for run-of-mine coal. The screens are suspended by adjustable hanger rods from overhead supports, the hanger rods being well braced sideways in order to avoid wabbling. A special bevel discharge lip deflects the lumps when going to the picking table and prevents them from being struck on the return stroke of the screen. The lower screen is provided with a veil plate for making run-of-mine. This is bolted to the screen, and when not in use can be lifted bodily out of place by a system of hooks and counterweights, thus avoiding unnecessary weight upon the shaking screen.

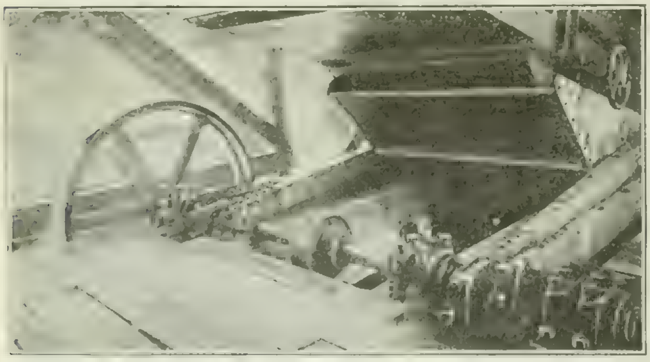


FIG. 3. THE SCREEN-ACTUATING SHAFT
In order to reduce friction and the speed of surface rubbing, cranks have been here substituted in place of the usual eccentrics.

The screens are driven at 100 strokes per minute through wooden connecting rods with suitable bearing heads from a crankshaft on which a heavy flywheel is fastened. The crankpins on account of their slow surface speed avoid the excessive heating sometimes encountered with large eccentrics. The crankshaft is driven from a 15-hp. slip-ring motor through an endless belt provided with a tension idler. This forms an elastic connection between the armature and crankshaft.

Another novel feature is the Fairmont patent spring connection between the two sections of the shaker screens. These springs are shown in Fig. 5. They are alternately compressed and expanded and store part of the energy of the screens during the retardation period, giving it up again during the acceleration period. The effect is a saving of power and an absence of shocks and vibrations on the driving mechanism and the tipple structure. Tests taken recently show that these screens consume only 6.7 horsepower.

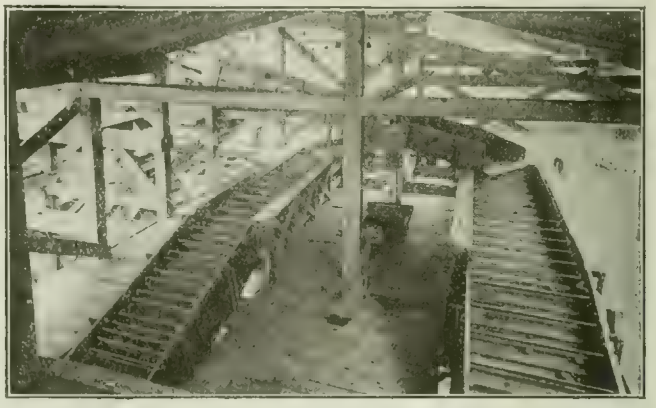


FIG. 4. PICKING TABLES FOR THE LARGER SIZES
These are of the traveling-apron type and terminate in hinged loading booms that may be raised or lowered to suit loading conditions.

Slack is discharged over a chute into car on the slack track, while egg and lump coal are discharged onto picking tables with hinged loading boom extensions. The picking tables consist of apron conveyors with

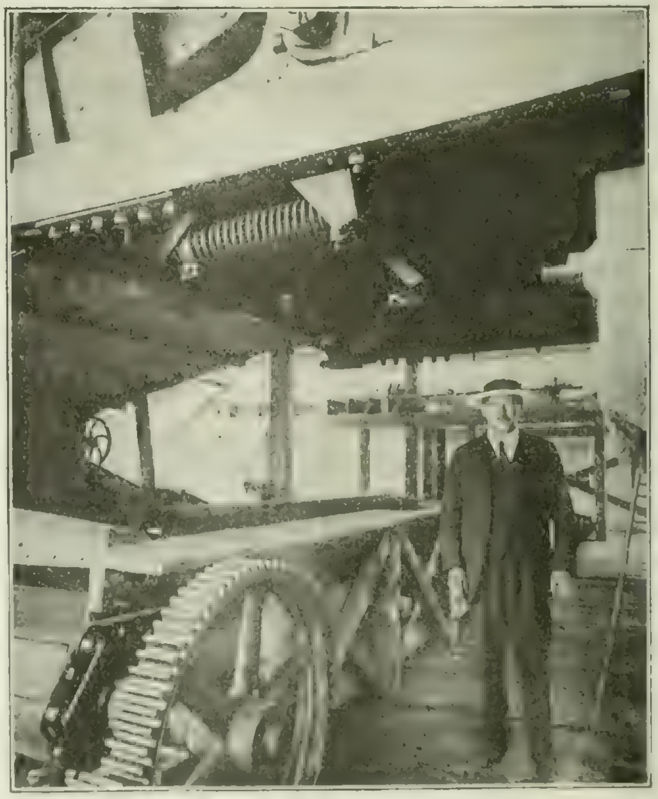


FIG. 5. BALANCE SPRINGS ON THE SHAKING SCREENS
Heavy spiral springs join the two sections of the screen; these alternately absorb and give up energy thus equalizing the load on the driving device and rendering operation much smoother.

S-shaped carrying pans attached to steel thimble roller chain running at a speed of 40 ft. per minute. The table for lump is 5 ft. wide while that for egg is 4 ft. wide. Both picking tables are driven from a single 10-hp. squirrel-cage motor through three gear reductions. The first or motor gears are cut and a bakelite noiseless pinion is used. The egg table may be disconnected by a special wide-angle jaw clutch which may be operated while the machinery is running.

The loading boom hoists are self-locking in any position and each one is independently driven through a bevel friction and a common belt drive from a 7½-hp. squirrel-cage motor. (The gear guards have been removed in the accompanying illustration in order to show the mechanism.) The friction drives are operated through hand lines which are carried to the trimmers' platform. The loading booms are partially counterbalanced.

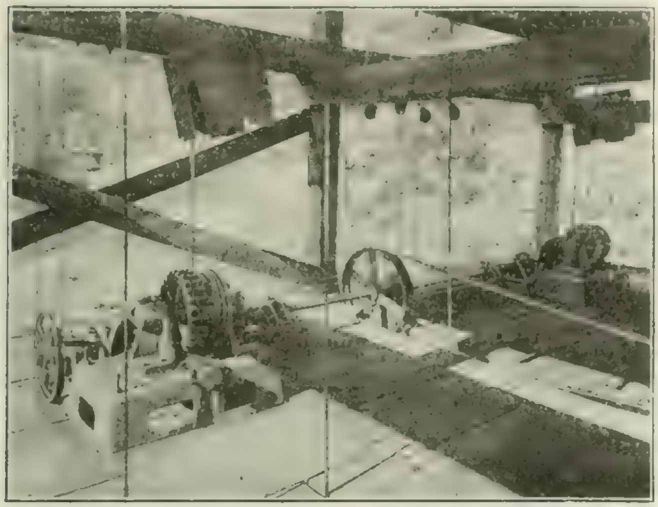


FIG. 6. BOOM-HOIST JACKS
These devices are belt driven and self-locking. They are controlled from the trimmer's platform above the loading tracks.

This tipple was designed and the mechanical equipment built and erected by the Fairmont Mining Machinery Co. of Fairmont, W. Va. The designers' aim was to produce a simple and yet effective and modern equipment with all the latest improvements and perfections. Special pains were taken to make all machinery easily accessible, and one may inspect all parts and walk around the tipple without bumping his head or being forced to climb over chutes and shafts, as is the case in some of the older structures designed for coal preparation.

Automatic Caging Device

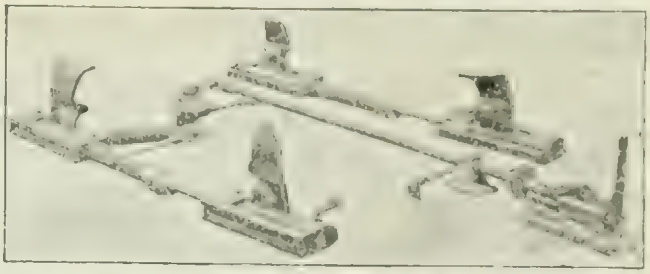
A Mechanism That in Most Cases Replaces Two Men

An AUTOMATIC stop, lock and release caging device is being manufactured by the G. M. J. Manufacturing Co. of Pittsburgh, Pa. This apparatus is intended for use on self-dumping cage platforms, and supplants the two men at the shaft bottom employed for caging the cars. The new device is primarily a labor saver and by reason of its dependable mechanical action is much speedier in its operation than the methods commonly followed in caging cars.

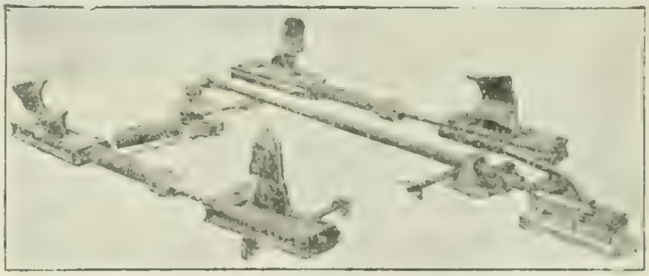
Built entirely of steel, the apparatus consists principally of four horns and the operating mechanism; the whole being mounted on the cage platform, which is set on a 5 per cent grade. The track utilized in holding the empty cars at the shaft bottom should be, of course, on a like grade. Assurance is given by this construction that the cars will automatically release and cage themselves by gravity.

For purposes of illustration, the device assumes on a downcoming cage the position shown in Fig. 1. The operating lever is in a vertical position and the tread of the front and rear wheels of the car fits snugly against the horns, holding the car steady on the cage. When the cage has reached the shaft bottom a loaded car is ready to press against the operating lever with its bumper.

This lever is actuated easily and is depressed, as shown in Fig. 2. This action is transmitted to the operating mechanism, which forces the horns on the discharge end of the cage outward and away from the rails. The obstruction to the wheels of the empty car having been removed, it proceeds on its way by gravity. As soon as the rear bumper of the loaded car has passed over the operating lever it is returned to the vertical position by recall springs. The horns are returned to position over the rails and arrest the progress of the incoming car.



HORNS ON THIS DEVICE OPERATE ALTERNATELY
This device will feed cars to the cage, one at a time, as long as the trip being fed lasts



OPERATING LEVER THROWN
The horns are now set in the opposite position from that shown above.

The pair of horns at the entering end of the cage are operated entirely by pressure from the wheels of the incoming loaded car and assume a vertical position as soon as these wheels have passed through them.

Lessee's Liability for Coal Royalties. — Under a coal mining lease binding the lessee to pay specified minimum royalties in certain years, regardless of whether sufficient coal was mined in those years to justify the payment, he became liable for such royalties by continuing to assert rights under the lease until after the royalties had accrued; although no coal was mined, he retained the lease for speculative purposes. (*Iowa Supreme Court, Saylor Park Land Co. vs. Glenwood Coal Co., 162 Northwestern Reporter, 203.*)

An Oddity in Washhouses

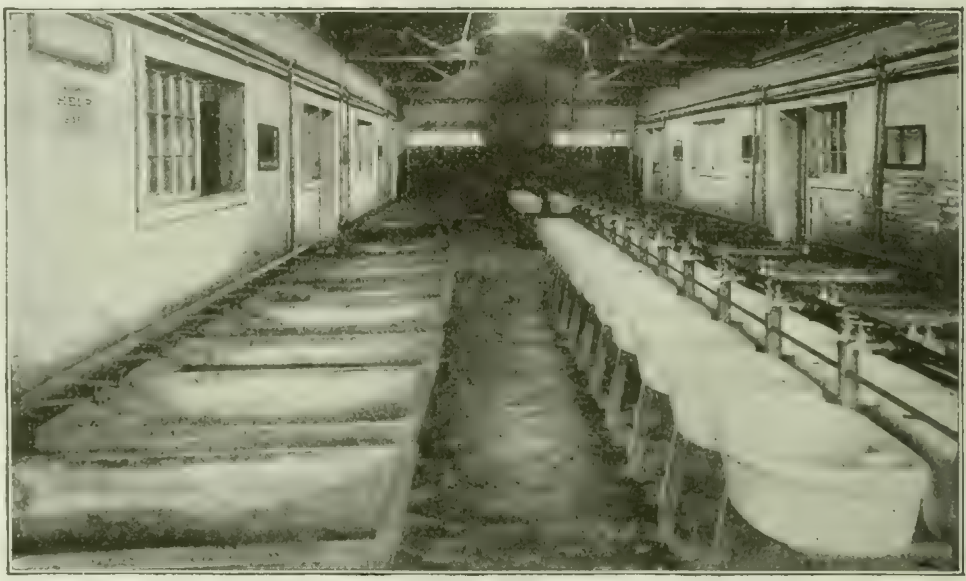
Miners and Laoorers Prefer Tubs to Showers—Tubs of Concrete Can Be Made Which Are Serviceable and Yet Can Be Inexpensively Built and Installed

AT MINE 4 of the Kingston Coal Co., Kingston, Pa., a washhouse of rather odd design has been constructed. The exterior of this building is of attractive design, as is shown in the accompanying illustration. When the washhouse was first built it consisted of only the central bay and was only one-half of its present total length. The first enlargement consisted in extending this building to its present depth. The demands upon the washhouse soon exceeded its capacity and it was doubled in size by the addition of the bay on the right. For only a short time did this building meet the requirements and it was necessary to add the third bay shown on the left. At present the washhouse is filled almost to its capacity and it probably will not be long before it will be necessary to make further enlargements.

EXTERIOR VIEW OF WASHHOUSE AT KINGSTON, PA.
This building has been enlarged three times to accommodate the demands of the men. The original washhouse was the front half of the middle bay.

The building is of brick with steel trusses supporting the roof. Interior walls and roof are unfinished but are painted as often as necessary with white enamel, keeping the interior light and clean. All of the floors are of concrete, which is easily washed and taken care of.

The central part of the building is used as the washroom proper and possesses some unusual features, the most important of which is the use of tubs instead of showers.



Interior of Washhouse Showing Washroom

The unusual feature of this washhouse is the use of the bath tubs instead of showers. A group of men on entering will almost always use the tubs in preference to the showers.

Bathtubs, thirty-six in number, are provided, but for those who prefer this method of bathing, six showers are installed at one end of the room. These bathtubs and showers together with the wash basins are well shown in one of the illustrations.

Miners and laborers at this operation seem to prefer the bathtub to the shower. While I was in the washhouse about twenty-five men used the bath tubs, while not one used the showers, showing a rather strong preference for the tubs.

When the company decided to use tubs it found the price of a good enamelled article prohibitive and since it was believed that the men would prefer the tubs it strongly desired to secure them. After careful investigation and trial it was found that a satisfactory tub could be made of concrete at a small cost, and all tubs for this purpose are now thus constructed.

Down the center of the washroom extends a line of thirty-six wash basins. As can be seen in the illustration, these rest on a bench made of iron while the water-supply line is between them. Hot and cold water is furnished for the showers, bathtubs and wash basins.

On each side of the washroom there are two locker rooms each containing 240 lockers, making a total of 480 in all. These lockers are built of steel, are double decked and well ventilated.

Plenty of heat is furnished the men so that there is little danger of their catching cold while cleaning up after a day's work in the mines. This heat is furnished by radiators on each side of the room. The foul air is carried away through the ventilators in the roof.

Light is furnished by the ventilators as well as by large windows on all sides of the building. At night the building is lighted by electricity. Twenty-four-hour attendance is arranged for, a man being in charge of the building all the time. Every morning and evening the building is thoroughly cleaned to remove all dirt carried in by the miners when coming from their work.

INTERIOR OF WASHHOUSE, SHOWING LOCKER ROOM
There are two of these locker rooms, one on each side of the washroom, each having a capacity of 240 lockers.

By law every mining company is required to furnish a washhouse. This could be easily and cheaply done, but the Kingston Coal Co. was not satisfied with barely living up to the letter of the statute but went further and studied out what its employees desired and built the washhouse accordingly. Its ideas concerning the preferences of the men seem to have been vindicated as about 90 per cent of the mine workers prefer the tubs to the showers and three enlargements have been made to the original washhouse for the accommodation of the men who desire to use the building. There is no law compelling the men to use the washhouse as there is for the company to furnish one. So from that fact the demand for accommodation indicates the satisfaction of the men in their building.

Large Possibilities in the Coking of Our Coal

BY R. S. MCBRIDE
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McGraw-Hill Co., Inc., Washington, D. C.

COKE production in 1919, as announced recently by the United States Geological Survey, shows the tremendous possibilities of the United States in that direction. Twelve per cent of our entire coal output last year was coked, and it is of great interest to note what may have been obtained from this coal, though figures on the output of byproducts have not yet been announced.

We are told that, roughly, twenty-five million tons of byproduct coke and nearly twenty million tons of beehive coke were made last year in this country. If we assume that the same percentage yield of coke from the coal was obtained last year as during previous years this means that about thirty-five million tons of coal were used in the byproduct process and thirty-one million in beehive ovens.

This is the first time that we have had a larger tonnage of coal used and coke produced by the byproduct process than in beehive ovens, and nationally we can congratulate ourselves on this evidence of real progress. The exact figures show the total byproduct coke production increased from 46 per cent in 1918 to 56 per cent in 1919.

It has been estimated, however, that only about 70 per cent of the possible byproduct-oven capacity was utilized in coke production last year. That the percentage was low is, of course, chargeable to the coal and steel strikes, which greatly added to the usual interruptions and other causes of low-capacity operation. It is rather interesting to see just what it would have meant if the byproduct ovens could have operated at full capacity. If this had been possible the coal consumption for the year in this process would have been fully fifty million tons, and the coke production over thirty-five million tons, or 80 per cent of the total coke produced and used last year.

Of course no one believes that 100 per cent capacity will ever be obtained in any such industrial process, but 85 to 87 per cent has been demonstrated as entirely feasible and even 90 to 92 per cent has been attained in certain plants or for certain periods throughout the whole country. If 90 per cent capacity had been attained forty-five million tons of coal would have produced about thirty-two million tons of byproduct coke, or over 70 per cent of the actual production for the past year.

If we make the assumption that the byproduct output per ton of coal will be the same as in previous years, we obtain for the various byproducts the results that are indicated in the following tabulation:

COKE OVEN BYPRODUCTS IN 1919*

	Assumed yield per ton of coal	Total yield	Assumed value	Total estimated value
Ammonium sulphate	18 lb	315,000 tons	5c. per lb	$31,500,000
Light oils (crude)	2.4 gal	84,000,000 gal	15c. per gal	12,500,000
Equivalent toluol	———	12,000,000 gal	———	———
Equivalent benzol	———	42,000,000 gal	———	———
Tar	7 gal	245,000,000 gal	3c. per gal	7,350,000
Surplus gas	5 M	175 billion cu. ft	12c. per M	21,000,000

*Estimated from known coke production assuming recovery in all plants to give the same yields as known for previous years.

These products, together with the metallurgical coke, were worth, at the plants where they were produced, something in excess of $300,000,000.

It is specially interesting to note that of the sixty-six million tons of coal used in making coke last year, nearly a million tons could have been saved had it been possible to utilize the byproduct process to 90 per cent capacity instead of only 70 per cent, and have the beehive operation correspondingly curtailed. Naturally, geographical distribution of the ovens and various company connections make any such change as this rather unlikely, but the great economic significance of such change cannot be safely ignored by anyone concerned in the coal business. It is only a question how long such an economic waste as the loss of a million tons of coal and the still greater loss due to the failure to recover byproducts from fifteen million tons of coal which might just as well have been coked in byproduct as in beehive ovens, will be allowed to continue without a radical change in practice.

Brief of Majority Report of Bituminous Coal Commission on Wages

Increase in Wage 27 Per Cent—Contract Begins April 1, 1920, and Expires March 31, 1922 —Miners Get 24c. More Per Ton—Adult Day Men Receive $1 More Per Day— Yardage and Dead-work Is Advanced 20 Per Cent—Eight-Hour Day at Working Place

IT MAY be well to make a prefatory note to the effect that the majority report of the Bituminous Coal Commission on mine workers' wages makes no decision on the question of prices. Its decision may be summarized as follows:

(1) Unless otherwise ordered the terms and conditions of the Washington Agreement of 1917 continue. (2) The 14 per cent increase in wages fixed by the Fuel Administration is eliminated on March 31 and replaced by this award (which is on a 27 per cent basis). (3) The agreements drafted under this award are to take effect April 1, 1920, and continue until March 31, 1922 (in other words, the miners do not get their demand for termination of contracts in the fall). (4) The prices for mining mine-run coal, pick and machine, are advanced 24c. (5) All day labor and monthly men are advanced a dollar a day, except trappers and other boys, who are advanced 53c. a day. (6) All rates for yardage, deadwork and room turning are advanced 20 per cent. (7) The fulfillment of all joint and district agreements is to be guaranteed by the officers of the international organization. In the discussion of this particular award the commission stated:

AGREEMENTS MUST BE BINDING ON BOTH SIDES

"We recognize that joint agreements resulting from conferences should be carried out fully and frankly by both parties, and that every proper assurance to this end should be given, since it is obvious that all attempts at amicable settlements of controversies will now and forever be futile unless the principle is once and for all established that agreements entered between employers and employees are binding upon both parties and are not to be considered as mere scraps of paper. For that reason we believe that the fulfillment of joint agreements, entered into in any given district, should also be guaranteed by the national officers of the United Mine Workers of America, and that it should be the duty of the officers of the national organization, as well as that of the officers of the district, to see that all such agreements are carried out both in letter and in spirit."

(8) The six-hour day and the five-day week are not granted; the eight-hour day is retained. In the discussion of this award the report states:

"We have gone fully into the mine workers' demand for a six-hour day and a five-day week, equivalent to a reduction of working hours from 48 to 30 per week. In considering this demand we were influenced in arriving at our decision by the fact that steady work on the part of all workers is urgently required by the entire world during the period of reconstruction and reorganization, when the enormous destruction and disorganization wrought by the World War in all countries and affecting all industries must be counteracted by unusual industry and perseverance. To make any restriction affecting the output would be an economic crime.

REDUCTION OF HOURS WOULD CURTAIL OUTPUT

"It is claimed by the miners, on the basis of experience after previous reductions of hours of labor and of the effects of reduction of hours in other countries, that curtailment of working time would not reduce the output in anything like a corresponding proportion. It is our view that arguments based on the effects of a reduction from 10 to 8 hours can hardly apply to a reduction from 8 to 6 hours, or from 8 to 7 hours. Production in countries where there has been a reduction in hours is less than before the hours were reduced. We feel that our responsibility to the nation will not permit us to make an award that would curtail appreciably the productivity of the workers in a basic industry.

"Each coal company endeavors to have enough men on its rolls to carry it over the peak of the rush season; the operators want coal mined while there is a demand, each company realizing that if it is unable to satisfy its customers they will turn to other producers and the sale will be permanently lost. A labor supply sufficient for the needs of the rush season is excessive during the rest of the year, part-time employment results and the nation will ultimately have to pay in its fuel bills the cost of maintaining this larger army of only partially employed workers.

"We are convinced that a reduction in hours of labor would only make a bad situation worse, that the miners' demand on this point is clearly uneconomic, and that no grant it would be detrimental to their own interests.

CONSTRUCTIVE PROPOSALS MADE IN THE REPORT

"Another result that would flow from a reduction in hours, with the wages that it is proposed should be paid, would be to increase the number of men who would seek employment at the mines on account of the shorter hours and the full pay, and this in turn would result later in further demands for the shortening of hours in order to give employment to the men who would thus be added to an industry that is already overmanned. We cannot, in view of our responsibilities, agree to a demand that would lead to such disastrous results. At the same time we hope to accomplish something in the direction of the stabilization of the industry by means of constructive proposals discussed elsewhere in this report.

"While we are in full sympathy with the miners in their aspiration for a fuller life, we cannot help but feel that eight hours a day is not too much to work under present circumstances.

"The contention that the extra hazardous nature of the mining industry makes it desirable to reduce the risks run by the miners by reducing the time during which they are exposed to this risk is inconsistent with the claim that the miners wish to work the same number of hours per year as they are working now, provided the hours are more evenly distributed through the year, for if they work as many hours they will be exposed to the same risks.

"We also have considered the fact that contractual hours of labor apply only to day workers, and that more than 60 per cent of the miners work on a tonnage basis. To reduce the number of earning hours during the year, particularly when one of the chief complaints of the miners is that they do not have sufficient hours of work and consequently cannot earn adequate wages, would clearly not be consistent with the commission's conception of its duty. Therefore, our conclusion is that, under all the conditions, the eight-hour day should be maintained."

(9) The practice of car pushing stands, but with recommendations for careful consideration of ways and means for the introduction of ameliorating practices. (10) Rules are set up under which new machinery can be introduced in the mines and thoroughly tested. (11) A commission is set up for the Central Competitive field to handle questions of differentials in rate and certain other matters. (12) If the recommendations of the President's Industrial Conference are adopted in regard to industrial tribunals and boards of inquiry, this machinery is to be put into use in the coal industry. Otherwise a special board is to be set up.

Federal Agencies Advised To Store Coal

(13) Explosives are to be furnished miners at cost, cost to include handling and insurance. (14) House coal is to be furnished to the miners at the tipple at the price they were paying on Oct. 31, 1919, plus the average percentage allowed as an increase on the wage scale; i.e., 27 per cent—the miners to pay for delivery at cost. (15) Charges for blacksmithing are not to exceed three-quarters of one per cent of the miners' earnings. (16) Special boards are to be set up for the Kanawha, Paint Creek and Cabin Creek fields; for District 12, Ill., including Assumption and Decatur, Ill.; also for the State of Washington, each commission to handle specific local conditions.

The report also recommends:

That an executive order be issued instructing departments and Federal agencies to buy and store their winter's supply of coal before July 1 of each year, and that the Council of National Defense assume the duty of obtaining the support of the general public for coal storage.

That an executive memorandum be issued to the Interstate Commerce Commission to the end that the commission may aid in the solution of the transportation problems outlined, with particular attention to the question of seasonal freight rates, car supply and car distribution, as well as the problem of railway coal purchase for storage.

That the Governors of the various states be asked to issue executive orders to state institutions and departments for the purchase and storage of winter coal during the summer months. Also that state railway and public utility corporations use their influence with the various utility commissions to induce the purchase and storage of coal by those corporations, reflecting, if necessary, the cost of such storage in the rates.

That a copy of this report go to the railsroads, to the end that they may co-operate in regard to coal storage, car construction and distribution, and the reduction to a minimum of the practice of commandeering coal, and that a copy of this report be transmitted to the Federal Reserve Board, to the end that Federal Reserve Banks may favor as eligible for rediscount paper drawn against coal in storage.

Housing Conditions Should Be Improved

That the Interstate Commerce Commission, state railway and public utility commissions within their jurisdictions issue rules controlling car distribution among mines, to the end that no particular mine or mines may be permitted to obtain, through a practice of car assignment and car guarantees, preferential car service.

That the practice whereby purchasing agents of carriers can use company control over car supply to force down the price of railway fuel, be abolished. That operators avoid the use for railroads of coal whose properties make it more valuable for other purposes; that camp and housing conditions be improved.

That the good offices of the miners' international organization be exercised to maintain their expressed position favoring the introduction of labor saving devices and machinery, and that the making of advances on miners' pay be discouraged in every way, but, if made, that they be made without discount, either directly or indirectly.

The following statement is included in the report: "In submitting this report particular attention is called to the fact that herein every effort has been made for the protection of the public, not only for the period under which this protection can be guaranteed by the Executive under the powers granted him by the Lever Act, but it has been our effort to go into the underlying causes for high costs and to offer some remedy therefor; this, in order that in the future, when the government relaxes its control over prices, there may be a continuing force at work in the public interest.

"We believe it is obvious that unless some changes can be made toward the end of reducing costs in coal production and distribution no act of Congress, no order of the Executive nor any other regulation by constituted authority can in the end provide against the continuing high costs. It is for this reason that we believe that this industry should be placed upon the proper basis for more continuous and thus more economical production and distribution, with the result that the cost of coal to the people will be reduced."

The report also states:

Reducing Cost by Continuous Production

"We believe it is fair for us to report that in the neighborhood of 80 per cent of the total tonnage that has moved since Oct. 31, 1919, has moved under contracts which carried what is generally known as the standard wage clause, providing for an increase in cost to the purchaser equivalent to the increase in costs resulting from an increased wage scale. This statement was made in order that there may be no misunderstanding on the part of the public and the public rate making authorities."

The annual value of bituminous coal is $1,300,000,000. The labor cost is 57 per cent and totals $741,000,000.

Twenty-seven per cent of this amount is approximately $200,000,000, which is the additional sum that would be paid to the miners as a result of the award, above what they were receiving on Oct. 31, 1919. It must be borne in mind that the award is based on the status prior to the application of Dr. Garfield's 14 per cent. The 14 per cent itself involved a cost of over 104 millions, to which the present award adds approximately another 96 millions.

Wage advances granted to miners between 1913 and Oct. 31, 1919, averaged 43 per cent for tonnage workers and 76 per cent for day men. Wage advances to tonnage workers after this award will amount to 88 per cent since 1913, while the advances to day men will average 111 per cent. This difference is due to the fact that day men were relatively underpaid before the war. The 27 per cent increase was apportioned to the miners along the lines of the award.

Labor cost is 57 per cent of the value of bituminous produced annually, to which the 27 per cent wage advance must be added. The railroads, by moving coal in excess of needs in low movement months, could relieve car shortage. Public utilities should store sixty days' supply.

The coal industry is a part-time industry, the average number of idle days out of a possible 308 working days each year during the past thirty years being 93. In 1918, when the demand for coal was at the maximum, the principal cause for lost time was car shortage. This accounted for a total of 49 per cent of all time lost. In 1919, when the war demands had ceased, "no market" accounted for 50 per cent of the idle days.

The report states that for many years the railroads, and especially the coal carrying railroads, have depended on a practice of commandeering coal assigned to other customers. In some degree public utilities have counted on this form of priority. The railroads are consumers of about 30 per cent of the total coal production of the country. We have presented to certain of the executives of the larger systems a request that the railroads accept the principle that it is their duty to the public to move coal in the months that normally are months of low movement, to consumption terminals, such movements to be in excess of their then needs, thereby gradually accumulating a three months' supply before the winter, the railroads to come out at the end of the winter with possibly twenty or thirty days' supply on hand. This movement would be more economical than the movement in the winter, and, from the standpoint of the coal railroads at least, the lower cost of movement would to a great degree offset any cost of storage.

The acceptance of this principle by the railroad executive heads has been general. The Pennsylvania R.R. and the New York Central lines expressed their acceptance in an especially liberal spirit. The report states that this is a duty of the railroads and that some method should be devised under which they will provide such storage.

The report states that it is the commissioners' belief that the public utilities, too, have a duty to perform to the public and that they should not rely on any form of priority when the pressure comes in the winter, and to this end that they should be called upon to move and store coal in the summer months in excess of their needs, going into the winter months with sixty days' supply in storage. The commissioners feel that these two groups owe this as a duty, and that in both cases, if there is an increased cost, it will be recognized by the rate-making authorities. In the case of the public utilities it was in effect stated by a representative that he believed this plan or principle was sound.

The next largest group of coal consumers is the steel industry. The commissioners have presented the problem to certain of the heads of important steel concerns, including the United States Steel Corporation, and they express an intention of increasing storage of coal and movement of the same in the months of low movement along the lines of the plan here suggested. It is believed that the Federal Reserve Board and the several Federal Reserve Banks will favor considering as eligible for rediscount paper drawn against coal in storage.

In addition to these groups the report recommends strongly that all Government institutions—national, state, municipal and local—purchase, receive and store coal during the spring and summer months in anticipation of the winter's requirements.

The commissioners state as their belief that if the various groups mentioned carry out the plan of storing from two to three months' requirements, beginning the winter with this supply on hand, the result will be a decided stabilization of the coal industry, a considerable measure of relief to the carriers, and a general economic saving to the public and the nation, and, further, that the practice will result in the minimizing of the commandeering and confiscation of coal on the theory of priority. The commissioners also feel that unless some plan of this kind is adopted we are bound to have recurring conditions of coal shortage in the winter months, and that no need for such a situation exists.

The commission not only made its recommendations in regard to purchase and storage, but has taken up with railways and public utilities the questions involved. It has already received the written approval and promise of support of the New York Central and Pennsylvania lines, the endorsement of the Association of Public Utility Commissions of the United States, and it is believed that the Federal Reserve Board will co-operate by favoring the rediscount of paper drawn against coal in storage.

Button Strikes Still in Operation

At the Pine Hill Colliery, near Minersville, Pa., in the Southern anthracite coal field, a button strike was declared March 14 because two men working at that plant had not paid the last quarter's dues and lacked the button which, according to the union contention, is necessary if a man is to be allowed to work in the mines

Injury Caused by Defective Coupling Hook.—A coal operator may be held responsible for injury to an employee caused by uncoupling of cars, due to a defective condition of a coupling hook, if the defect had existed so long that the operator was guilty of negilgence in failing to discover and remedy the condition. (*U. S. Circuit Court of Appeals, Sixth Circuit; Elmore vs. Fentress Coal & Coke Co., 240 Federal Reporter, 328.*)

Disadvantages Urged Against Seasonal Rates Held To Be Untenable

Power Given Interstate Commerce Commission To Change Differential Where Necessary—Frelinghuysen Believes That Few Open Tops Are Likely To Be Purchased

THAT the disadvantages customarily urged against the feasibility of seasonal freight rates for the transportation of coal are untenable was asserted by Senator Frelinghuysen in presenting his measure to the Senate. While recounting the many advantages of such an arrangement Mr. Frelinghuysen directed his arguments to disproving the validity of ground for opposition. Some of his arguments in this connection are as follows:

No confusion, either for carriers or shippers, would result from changing the rate on coal twice every year. The proposed legislation prescribes that the carriers shall file their tariff rates on coal in the same manner as at present, and, instead of requiring them to alter these tariffs semi-annually, provides an automatic statutory differential below the tariff rate for one portion of the year and above the tariff rate for the remainder of the year, with discretion in the Interstate Commerce Commission to change the amount of the differential where it finds it neccessary.

SOME COAL WILL STILL BE MINED IN WINTER!

The revenues of the carriers would not be affected. A large amount of coal would still have to be mined and shipped in fall and winter to consumers who lacked the capital, credit, foresight, or storage accommodations to enable them to secure their supply during the warmer months. If the 30 per cent differential in favor of the months between April and August, inclusive, should prove an unnecessarily large inducement, so that too great a proportion of coal were shipped during this period, the Interstate Commerce Commission is authorized to change the percentage so as to balance the summer and winter shipments properly.

The transportation of coal in the spring and summer would not embarrass the railroads in handling other seasonal movements—for example, crops. In some localities cars carrying grain are loaded only in one direction, returning empty to the point of origin because of lack of shipments moving in that direction. If coal could be encouraged to move at the same time, this wasteful practice of hauling empty cars might be at least partially eliminated. Operating conditions during the clear weather of the spring and summer months are much more favorable, so that railroads can better withstand heavy demands for transportation at that period of the year than during the fall and winter months, when coal has heretofore moved in greatest volume. The cost to the railroads of transporting coal is also much less in warm weather, when locomotives can haul heavier trains, when they consume less fuel, and when fewer employees can handle more traffic.

The acquisition of more coal cars does not afford a practicable and complete remedy for existing difficulties. Under the transportation act recently approved the Interstate Commerce Commission is given the power to require carriers to provide themselves with sufficient cars. But most of the railroads have neither the money nor the credit with which to buy a supply of coal cars adequate for current needs under the present system of large seasonal shipments, so it would be useless for the commission to order them to purchase this equipment. On the other hand, most of the railroads which have enough money or credit to finance such purchases already possess an adequate number of coal cars to care for the needs of their own patrons, and they could not reasonably be required by the commission to purchase additional cars to take care of the traffic of other lines.

FEW OPEN-TOP CARS WILL BE PURCHASED

The transportation act also appropriates $300,000,000 as a revolving fund from which loans may be made to the railroads. In view of the fact, however, that this money will very likely be used only in small part for new equipment, and that of the portion which is spent for equipment much will go for new locomotives, refrigerator cars, and other types of urgently needed rolling stock, it is not probable that any considerable number of coal cars will be purchased out of this fund. It has been estimated that 100,000 new coal cars will be necessary to handle properly the usual seasonable demand. These alone would cost the entire amount of the appropriation mentioned above.

The same statute also provides for creating a general railroad contingent fund, made up of a portion of the excess earnings of prosperous railroads, out of which loans may be made to the railroads, and out of which the commission may purchase equipment and facilities to be leased to the railroads. This fund will, however, be wholly an expectancy for many months to come, and at least one more winter, with its heavy demand on the present totally inadequate coal-car supply, would elapse before any relief could be had from this quarter.

LIMIT TO ABILITY TO BUILD RAILROAD CARS

Even if funds were immediately available with which to purchase coal cars, and only coal cars were to be built, the car shops in the United States could not turn out sufficient cars between now and next fall to handle properly the coal shipments during the winter of 1920-21, assuming that the proposed legislation is not enacted in the meantime. Finally, even if this money were obtainable and cars would be turned out in sufficient quantity, the acquisition of cars which, under the present system of uniform freight rates on coal, would stand idle the greater part of the year would entail enormous depreciation and capital charges, all of which would have to be borne by the coal transported during the rush season.

It may be urged that the Interstate Commerce Act now contains ample provisions to permit the commission or the carriers to institute lower summer freight rates for coal. The conclusive answer to this contention is that during the many years that the same provisions have been law this practice has never been introduced. When the carriers have been asked to initiate such seasonal rates on coal, the request has usually been coupled with a demand that while rates might be lowered in summer, they should not be raised in the winter; and the carriers, facing a consequent depletion of their revenues, have declined to co-operate on this basis.

The shippers and consumers, motivated by their individual needs, have been by no means unanimous as to the amount of the difference in rates or the seasons in which lower or higher rates should prevail. In the very nature of the case, it is a subject for legislation, where Congress, representing all the people, may enact rules which will take into consideration the interests of all the people.

The Interstate Commerce Commission, while it might feel justified in approving schedules initiated by the carriers instituting such seasonal rates, could not make such percentages of difference in rates permanent. The carriers, pressed by coal operators or consumers, might at any time file new schedules abandoning or modifying these seasonal rates. General confusion would result.

It is understood that the commission does not believe that it possesses the power to require the establishment of such seasonal rates on coal. It has never attempted to exercise this power, and it is known that it does not contemplate doing so in the future in the absence of further legislation. The commission assumes that in prescribing rates and practices it is not empowered to initiate new systems of rate making designed principally to remedy general economic situations.

Even if the carriers, the shippers, and the commission could and did institute such seasonal rate schedules, their action in this matter would be the subject of interminable litigation. It would be contended that no power had been delegated to the commission to approve or initiate such seasonal rates, and the action of the commission in this connection would most likely be enjoined until the matter had been decided by the United States Supreme Court. The result would be that two or three winters might elapse before this urgently needed practice could be put into effect. Definite legislation, such as that proposed, will remedy the situation at once. In view of the fact that the courts have upheld similar differences in rates, based on no less cogent economic reasons—e. g., under the so-called long-and-short-haul clause—there should be no doubt as to the constitutionality of the measure proposed.

What Stabilizing the Coal Industry Will Save Mine Workers*

THE annual output of the coal industry is valued approximately at $1,300,000,000. It is estimated that by making the demand for coal spread evenly through the year, not less than 60 days can be added to the operating time of the mines. Sixty days represents about one-fifth of the total possible working days. Broadly speaking, such a saving would result in reducing the cost of the coal at the mines by one-fifth. At present the capital and labor engaged in the production of coal, while they must be maintained throughout the year, are employed only less than four-fifths of the working time.

A saving of one-fifth of the value of coal represents $260,000,000 or, allowing for the increased labor cost that will result from this award, $300,000,000. To this amount should be added the saving on the car equipment, which under present conditions needs to be sufficient to take care of the peak of the demand, while a large part of it remains idle during the period of slack demand. In addition to this, when the car equipment is utilized throughout the year, there will be a saving on the storage space required for the idle cars. While an accurate estimate of the saving under this head is not possible, the evidence shows that there are about 27,000,000 car days cost a year through car surplusage in the spring months, and it is a conservative estimate to place the loss at $100,000,000.

The aggregate saving that would result from the addition of 60 days to the operating time of bituminous coal mines is thus about $400,000,000 a year or one and one-fourth millions a day. This amount is twice as large as the increased labor cost resulting from the commission's award and more than four times as large as the amount added by the cost of the 14 per cent advance granted by Dr. Garfield.

Executive Order Proclaiming End of Coal-Price Restrictions

ON MARCH 19 the President of the United States issued the following order suspending price regulation under the Lever Act but continuing in force the rules relating to the operation of the Tidewater Coal Exchange:

"Pursuant to the authority vested in me by the Act of Congress of Aug. 10, 1917, entitled "An Act to provide further for the national security and defense by encouraging the production, conserving the supply, and controlling the distribution of food products and fuel," and other powers thereunto me authorized, I, Woodrow Wilson, President of the United States of America, do hereby order and direct that from and after 12:01 a.m., on the first day of April, 1920, the order issued by me on Oct. 30, 1919, restoring certain rules, regulations, orders and proclamations therein referred to, relative to the price of bituminous coal and other matters and things therein described, shall be suspended until further ordered, and that all other Executive Orders subsequent thereto issued by me, except the Executive Order of Feb. 25, 1920, relative to the Tidewater Coal Exchange, and all orders subsequent thereto issued by the U. S. Fuel Administrator, or any person acting pursuant to authority conferred upon him either by me or the United States Fuel Administrator, shall be suspended until otherwise ordered, on and after 12:01 a.m., April 1, 1920, it being the intent and purpose of this order to restore at 12:01 a.m., on April 1, 1920, the rules and regulations of the United States Fuel Administration to the status existing immediately prior to the aforesaid Executive Order of Oct. 30, 1919, but not in any wise to affect the validity of any act or thing done under any of said orders or regulations prior to 12:01 a.m., April 1, 1920, or the Executive Order of Feb. 25, 1920 relative to the Tidewater Coal Exchange."

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*A piece of publicity given to the public under the misleading head, "Estimate of Savings to the Nation as a Result of Stabilizing the Coal Industry."

Kendall Seeks To Annul President's Powers Under Lever Act

Declares That Prices Were Not Based Squarely on Production Costs, and That if Fair When Set, Could No Longer Be Fair After a 10c. Reduction and 14 Per Cent Wage Increase

CONTINUATION of Government prices on coal was denounced on the floor of the House, March 20, by Representative Kendall of Somerset County, Pennsylvania, who in the course of his remarks declared that "The bituminous operators were sandbagged further by Dr. Garfield when he advocated the increase of 14 per cent in the wages paid coal miners. Extracts from Mr. Kendall's remarks are as follows:

Under the recent delegations of Fuel-Administration authority loaded coal cars were kept idle on the railroad tracks, as many as 253,000 loads being kept standing, according to one statement. Coal has been kept at a uniform price while pig iron has increased in price from $33 to $41.50 per ton. Cost of supplies used in mining has risen 10 to 60 per cent.

"The prices fixed on coal at the mines by Dr. Garfield were in many cases most unjust and unfair. I have the honor to represent one of the largest bituminous coal districts in the United States. In my home county, Somerset County, Pa., Dr. Garfield fixed the price of bituminous coal at the mines at $2.95 per net ton; in Fayette County, immediately west of Somerset County, he fixed the price at $2.35 per net ton; in northern West Virginia, adjoining both Fayette and Somerset Counties, the price was fixed by Dr. Garfield at $2.50 per net ton; in western Maryland, also adjoining Fayette and Somerset Counties, the price was fixed at $2.75 per ton; and these prices are still in force today.

"No coal operator has ever been able to understand upon what legal or just basis Dr. Garfield fixed these highly discriminatory prices for my locality. The living expenses and the value of coal lands in Fayette County are higher than in the other localities mentioned, and yet Dr. Garfield in his wisdom saw fit to fix the prices in Fayette County 60c. per ton less than in Somerset County, notwithstanding that living expenses and the coal lands are much higher than in Somerset County.

"In northern West Virginia, where coal lands and living expenses are much lower than in Fayette County, he saw fit to pay the operators 15c. per ton more, and in western Maryland, where the living expenses are cheaper and the cost of coal lands one-fourth of what they are in Fayette County, Pa., he fixed the prices 40c. per ton higher than in Fayette County.

"The labor conditions in all these sections are practically the same, the distribution of cars is on the same basis, the cost of production is practically the same; therefore no coal operator can fathom where Dr. Garfield obtained the figures which justified him in establishing and fixing these plainly discriminatory prices for the operators in these four adjacent sections.

"The coal operator who has a mine in Somerset County pays the same mining rate, mines identically the same vein of coal, and has the same car supply as the man who operates a mine in Fayette County, but he receives 60c. per ton more for his coal than his neighbor in Fayette County. The same holds good of the man operating a mine in West Virginia or in western Maryland. Any intelligent man actuated by high principles of fairness and justice to the coal operators of the country can readily see that such a scale of prices is discriminatory and deserves the condemnation of all fair-minded people. There should be an immediate cancellation of this unjust, unwarranted, and illegal scale of prices.

"Dr. Garfield originally fixed the prices which should be paid to the operators of bituminous coal 10c. per ton higher than the prices just mentioned, but one day, without any notice, the coal operators discovered that a reduction had been made by Dr. Garfield of 10c. per ton on all bituminous coal. When he arrived at the prices he originally established he stated that he did so after consulting the figures prepared by the Federal Trade Commission as well as through conferences with a large number of coal producers throughout the country, and that, in his judgment, the prices arrived at were fair, just and equitable.

QUESTIONS JUSTIFICATION FOR 10C. CUT

"Therefore, after having arrived at these prices, I fail to understand what occurred to the mind of Dr. Garfield that would warrant or justify him in making a cut of 10c. per ton, when no other manufacturing concerns in the country had reduced their prices.

"As you are aware, the railroads, the steel trust, the oil refineries, the munitions plants are all large consumers of coal. None of these large industries had reduced the prices of its products, so that when Dr. Garfield deliberately reached his hand into the pockets of the coal operators throughout the country and took therefrom 10c. for every ton of coal produced and put it into the pockets of the railroads, the steel trust, the oil refiners, the powder trust and other large corporations, he committed an unwarranted act of unfairness and injustice.

"Dr. Garfield knew that the coal operators throughout the country were intensely patriotic and would submit to and carry out all orders issued by the Government—right or wrong—and of course the railroads and other large corporations extended their heartfelt thanks to Dr. Garfield for the munificent gift handed them in reducing the price of coal, of which they were large consumers, 10c. per ton, without even a request by them for such reduction.

"The bituminous operators were recently further sandbagged by Dr. Garfield at the time that he came to Washington to settle the coal strike by granting an increase in wages to all bituminous coal miners of 14 per cent—equivalent to an addition to the cost of production of 28c. per net ton.

"Dr. Garfield congratulated himself and the country that he had settled the coal strike without placing the burden of a single cent upon the consumers of bituminous coal by compelling the coal producers to absorb the increase of 28c. per ton, not caring whether by so doing he would drive the operator into bankruptcy or not. During the second visit which Dr. Garfield made to the coal producers he again injected his hand into their pockets—this time taking 28c. for every ton of coal mined, and turned this sum over to the railroads, the steel trust, the powder trust, and other large institutions—none of which had made any reduction in the price of its products, but, on the other hand, advanced prices from 75 to 85 per cent.

"So the bituminous operator today not only receives 38c. per ton less for his coal than the price which was fixed by Dr. Garfield during the war, which at that time he stated was fair, just and equitable, but he is also forced to pay an advance of from 75 to 85 per cent for the material he must buy for his mine, which adds another 10 to 20c. per ton to his cost of production.

FOREIGNER IS MADE A PREFERENTIAL BUYER

"Now, when Dr. Garfield originally set the prices on bituminous coal he either made them exorbitant or the price that the operator receives today is entirely inadequate and unfair, and relief should be granted him from this unwarranted price-fixing oppression, which ultimately means confiscation of his property.

"Another most unfair order issued by Dr. Garfield permits exporters of coal to pay $1.35 per ton more than domestic consumers are permitted to pay. This order permits foreign nations to come to this country and pay $1.35 more per ton for coal than Dr. Garfield permits our own manufacturers and consumers to pay. Therefore the foreigner is made a preferential buyer and is always able to purchase coal where in many cases it has been impossible for the American consumer and citizen to do so on account of price restrictions.

"Why Dr. Garfield should issue a preferential order, which naturally tends to take the coal out of our own country, where it is so badly needed, and supply the requirements of foreign nations, is more than the American people can understand. The shortage of coal in this country has always been largely due to the fact that many of the large producers are exporting their coal in order to secure $1.35 per ton more than they would receive if they sold it to our citizens. This order may be constitutional and legal, but as a citizen of the United States I do not hesitate to state that it is not American and should be severely denounced by all patriotic citizens having at heart the welfare and development of our nation.

"The coal committee recently appointed by the President to fix the wages of the bituminous coal miner made a report recommending an additional advance of 11 per cent. This will add another 22c. per ton to the production of bituminous coal. I have no doubt that under the power of the Lever Act the Fuel Administration will again see that this increase in wages to the miner will not be added to the cost of coal to the consumer, but will compel the producer again to absorb the increased cost.

CONDEMNS DIVERSION OF COAL BY GOVERNMENT

"The most pernicious, illegal, unwarranted and discriminatory usurpation of the power of the Lever Act since the signing of the armistice has been and is today the diversion of coal which was bought by the consumer engaged in legitimate business activities, employing large numbers of men, who is compelled to close down his plant because the Government took his coal and gave it to someone to whom it did not belong and who was not entitled to it.

"The assumption of arbitrary distribution and diversion was granted to the President whenever or wherever, in his judgment, it was necessary for the efficient prosecution of the war. No such necessity now exists. There is no prosecution of the war, and there should be no diversion of coal and no further interference with legitimate business on the part of the Government."

Representative Kendall then read a letter from G. W. Thompson, secretary to S. J. Harry Co., general contractors, of Shandaken, N. Y., who, in the sinking of a shaft, had lost $5,000 for lack of coal to continue work under their contract. On Jan. 26 two cars were shipped from Shapnack, Fayette Co., to S. J. Harry Co., at Grand Gorge, N. Y. One was confiscated by the Pennsylvania Railroad Co. at Altoona and the other cannot be located.

On Feb. 10 the company telegraphed Mr. Walls, of the U. S. Fuel Administration in Philadelphia, Pa., calling attention to the fact that the confiscation of the coal had laid 100 men idle. Up till noon of Feb. 18 no coal had been received, the men employed by the company were leaving, and the company was paying the board of such men as were left to induce them to remain at work.

Mr. Kendall read a letter from H. H. Lineaweaver, president H. H. Lineaweaver & Co., Inc., which stated:

"This [the need for the ending of Federal control] must be plain to you from the fact that when the Fuel Administrator, Dr. Harry A. Garfield, relinquished his position some time ago it was an admission on his part that the control of coal was no longer necessary, and there is now no head to the Fuel Administration, and no one to appeal to. We further believe that any law, such as the Lever Act, which suspends the Constitution of the United States, is illegal."

REGULATION IS STRANGLING THE COAL INDUSTRY

One from Jennings Coal & Coke Co. read as follows:

"The industry is being strangled to death; the miner is forced into idleness; factories are compelled to shut down or run on short time; the railroads are losing millions in freight rates; production, the very thing that is needed to bring down the cost of living, is being curtailed instead of increased, due to the lack of fuel, and the higher costs are passed on and saddled onto the public. If this act was doing anyone any good anywhere it might be cited as a justification, but there is none. Instead the far-reaching effect of its evil influence is beyond estimation. Home trade is ruined, our export trade is lost, and billions of dollars' damage is being done to the nation's one prime industry.

"The unwise schemes employed to handle the fuel situation during the coal strike resulted disastrously, to say the least. They confiscated, diverted and held loaded cars for from 60 to 90 days, until at the end they had over 253,000 loads on the track. Many of these are still standing. This has resulted in the greatest car famine that any industry has ever witnessed."

A letter from Uniontown ran:

"As we undestand it, our products—coal and coke—are the only products in which the Government has ruled on a fixed price, making that price the same as had been established during the war period. If the Government was fair and just in the action it took in regulating prices during the war, when it fixed prices on most all commodities, it certainly is inconsistent now, when it has removed price restriction on all other commodities except our own, and further ordered an advance of 14 per cent to be paid all labor.

"The price of basic pig iron was fixed at $33 in 1918; today it is $41.50, and the advance in price not only of iron and steel products but of all supplies that go into mine operations is 10 to 60 per cent over war prices.

"I inclose a clipping taken from the *Connellsville Courier* of March 11, which states that byproduct coke is being shipped into our competing territory at a price of $12.55 per ton, f.o.b. ovens. Can you explain to me why I, as an operator, should not receive the same price for a like commodity? The government price is $6."

President Wilson Approves Coal Commission's Report and Frees Coal Prices

ON MARCH 19 President Wilson transmitted the following letter to the operators' associations and the union officials:

"I am transmitting to you herewith a copy of the report and award of the Bituminous Coal Commission appointed to adjust matters in controversy between the bituminous coal miners and operators of the country.

"In accordance with instructions in my letter of appointment to the Commission and memoranda attached thereto and the agreements by mine workers and operators to abide by the report and award of the Commission, this report and award is the basis upon which the wage-schedule agreements between the mine workers and operators shall be made.

"Operators and miners should, therefore, make arrangements for convening the necessary joint conferences as soon as possible to make such changes in the terms, provisions and conditions, mining rates and wage schedules as are set forth in this report and award.

"It is essential to the public welfare that the agreements be concluded at the earliest date practicable so that the uncertainty as to fuel supply may be ended and that consumers may be able to make contracts for their coal supply and also that the recommendations contained in the report as to the storage of coal by consumers may be of service this year.

"I also inclose as information copy of minority report by one member of the Commission. This minority report concurs with the report of the Commission as to the wage for miners, though dissenting as to the wage for day workers, and in part concurs and in part dissents on other points. I regret that the members of the Commission were not unanimous on all points, as I had expressed the hope they would be, but the report of the majority is none the less the report of the Commission and binding as such.

"I take it that neither party will raise any question, and I am sure that no question can properly be raised, as to the binding character of the award, notwithstanding the fact that it is not unanimous. On Dec. 10, 1919, the miners, without qualification, agreed to submit all questions to a decision of a commission of three persons to be appointed by me, the report of such commission to be made the basis of a new wage agreement. This definite and unqualified acceptance did not in any way limit the power which any such commission is always understood to have, in the absence of agreement to the contrary, that it may reach a decision by majority vote. The acceptance of the operators was equally unqualified on this point. This condition was in no wise changed by my subsequent action on Dec. 19 in expressing a belief as to the desirability and importance of unanimous action.

"My appointment of the Commission indicated that the power to fix the price of coal would not be conferred upon the Commission except for its unanimous action and therefore it is clear that such power to fix coal prices should not be conferred on the Commission.

"I have carefully considered the question whether the war power of the Lever Act should be temporarily invoked by me—despite the absence of any action of the Commission so recommending—to continue temporarily the control of prices, and have concluded that it is not expedient for me to exercise any such price-fixing control, so that on and after April 1, 1920, no Government maximum prices will be enforced.

"There is at present no provision of law for fixing new coal prices for peace-time purposes, and unless and until some grave emergency shall arise, which in my judgment has a relation to the emergency purposes of the Lever Act, I would not feel justified in fixing coal prices with reference to future conditions of production.

"I am aware that at present, as a result of the shortage created by the coal strike, and of the consequent interference with transportation, and as a result also of the exceptionally unfavorable winter, the demand for coal continues active. I desire to impress upon the coal operators the extreme importance not only of their complying to the fullest extent with the laws against combinations in restraint of trade and against profiteering but also of their exerting themselves affirmatively to prevent exacting of unreasonable prices for coal. I am sure the public fully appreciates the desirability, where practicable, of leaving commercial transactions untrammeled, but at the same time I am satisfied the public will find ways to protect itself if such liberal policy shall appear to result in unreasonably high prices."

South Wales colliery owners are unable to carry out their contracts with their French, Italian and other foreign customers. Many owners of steamers are canceling their charters and sending their vessels away in ballast.

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An Opportunity for Profit

SHIPPING direct by truck promises a large opportunity to coal men who live on good highways near urban centers. The freight rate to these points may be small, say 70c. per ton. The cost of unloading and reloading into wagons or trucks may be about $1 per ton. Delivery may cost another dollar. The price of coal f.o.b. may be $3, making the total charge $5.70. Profit to the retailer may make the price $6.

With a direct-by-truck delivery it may be possible to deliver at a profit, charging only the cost of coal plus, say, $1.50 a ton, or $4.50, leaving a difference between delivery by rail and delivery by truck of $1.50 a ton. Some part of the $1.50 may be surrendered by the operator in order to encourage early buying and to pay costs and risks of storage, but even if all were surrendered to get business it would be profitable to make the surrender in order to make the coal purchaser come early to market and so keep the mines at work.

However, it is not likely that it will be necessary to make any surrender so large as $1.50, for the costs of storage to the recipient probably would not exceed 50 or 75c. per ton and might be negligible or, at any rate, not realized by the purchaser. But even if the surrender of 50c. to 75c. were necessary, from 75c. to $1 would be realized by the operator and the mine would be speeded up at a good profit.

With the 30 per cent seasonal differential in railroad rates provided in the Frelinghuysen bill, the saving derived from buying in the summer would be only 21c. on a 70c. freight bill and that would not pay for storage, but even if the storage did not cost anything, this would be a saving of only 21c. on $6, or less than 4 per cent. This would be such a small economy that storage would barely pay except as a measure of fuel insurance. A saving of 50 or 75c. would be more worth while, as it would amount to 8 to 13 per cent on the cost of the coal as delivered by rail through the retailer. Shipping by truck therefore gives great promise. It has the further advantage that with it there is not the same loss from stolen coal as is to be apprehended with rail-borne fuel.

Consequently, shipping by truck will encourage buying just where the rail differential is most ineffective. The towns near or in coal regions are usually the last to store their fuel. The United States public looks to the distant Northwest, Northeast and Canada to balance production, but with shipment by truck it may look with confidence to summer storing at consuming points near the mines.

Trucks have a large place at every mining operation, and it is certain that their use will become increasingly common. Many retailers' yards receive coal of varied quality. By buying direct of the producer the purchaser can be surer of the quality of his coal than when buying through a dealer.

If $663,000,000 is to be spent this year on good roads, in place of the $137,000,000 expended last year—and we are told that this is true—much shipping by truck will doubtless be necessary, for there will not be enough open-top cars to fill the immense demand for such equipment. The demand for open cars to fill the call for building material—sand, steel, lumber, paving and common brick, etc.—will make it, in a still further degree, difficult to meet the demands of the coal companies.

Now for the Foolish Figurers

AN INTERESTING statement under the head "What Stabilizing the Coal Industry Will Save Mine Workers" is printed on another page of this issue. As circulated it bore the misleading head, "Estimate of Savings to the Nation as a Result of Stabilizing of Coal Industry." It starts well with the statement that "The annual output of the coal industry," meaning doubtless the bituminous-coal mines, "is valued at $1,300,000,000." That was probably the value in 1919 if the average price received was the same as in 1918, when according to Dr. Garfield the sales realization was $2.61 per ton. What coal sold for in 1919, when figures above and below Government prices were paid, was still possibly approximately $2.61.

The statement goes on to say that by working five-fifths instead of four-fifths of the year the production would be increased a fifth. It represents the increased production as a saving to the nation. But will the profit fall to the public? According to the commission the mine workers get 57 per cent of the return. As their wages would be the same under steadier operation as under the past irregular work, the increased income to them would be 57 per cent of one-fifth of $1,300,000,000, or $148,200,000. Adding 27 per cent to that, the amount of the present award, the one-fifth would be raised by $40,000,000 roughly, making the increased return to the mine workers $188,200,000 per year.

In this the public would not share. Nor would the American people share in much of the 43 per cent of one-fifth of $1,300,000,000, or $111,800,000, for some of it must go to pay for royalties and to meet such selling costs as are based on the tonnage sold. A portion of the $111,800,000 would doubtless accrue to the public; how much, of course, it is hard to say.

As for what would become of the $100,000,000 assumed in the article as being the saving from steadier work on the railroads which haul the coal, it is equally hard to come to any certain conclusion. The Interstate Commerce Commission, in making its rates, may be only too ready to figure on savings resulting from steadier work. If, however, the probability of more regular operation is not allowed by the Interstate Commerce Commission to take part in the determination of freight rates, it will be easier for the railroads to earn their 5½ per cent dividend as well as the ½ per cent for equipment and development. Some will make more than 6 per cent and the excess will be divided between the railroad credit revolving fund and the railroad, the railroad using it as the law directs to guarantee against any losses in operation in future years. If the Interstate Commerce Commission makes its rates assuming steady work some, or even much, may go to the public, but if it does not the railroads will get it as dividends, improvements or increased credit.

But will steady work be achieved? The buying, it is true, may be better distributed over the year by reason of the better policy adopted by Government bureaus, railroads and banks. But the bituminous industry has in past years fallen into an unfortunate state which cannot be immediately rectified. There are altogether too many mines, and while there are not too many men per mine, there are too many men. A few years of progress in demand and production, without excessive development, and then the full value of distributed buying will be realized. In fact evenness of market will steady the fever of production and make the opening of mines tally well with the nation's distributed needs.

If the mines are going to work henceforth about as much one month as the next (of which, of course, we cannot be sure) then, if the total tonnage is not to increase, the mines will work irregularly all through the year and there will be the same degree of lost time as in the past. The mine worker will be helped, and so in a degree will be the operator, by the fact that the work is distributed, for the income will be regular and no longer spasmodic. Regular work will make it possible for both mine worker and operator to get along without so much invested capital as was needed though not always provided in the past. The mine operator and employer will gain also by the fact that from henceforth new and needless competitors, both for orders and for employment will be eliminated.

In the anthracite region the mine workers declare that they want the same wages as in the bituminous, despite the irregularity of work in the latter field. This shows that if bituminous mines are made regular in operation the mine workers will not consent to a wage reduction schemed so as to bring their annual wages to the same figure as they now are.

Hence we cannot look for the fulfillment of the forecast recently published in the New York *Evening Sun*, which we shall quote to show that the foolish figurers are hard at work. No reflection is intended against the reputable daily about to be quoted. It is in general an extremely fair paper. Its correspondent is merely voicing the opinions of Washington which are erroneously based on the piece of publicity around which this editorial is written and which is quoted by the correspondent at the close of his message. The statement which appeared under date of March 24, runs as follows:

"President Wilson, it was learned today, will soon sign an executive order directing all departments of the Federal Government to purchase and store up a three months supply of coal during May, June and July. State and county Governments and public-utility corporations will be urged to do likewise.

"The result will be, in the opinion of experts of the Bituminous Coal Commission, that the mines will be kept busy during the dull season, the frantic rush of work in the mines as winter comes on will be eliminated and there will be such a saving that the 27 per cent wage increase granted the miners by the commission will be absorbed and not passed on to the public."

Another danger is that the papers will say that as the miner gets only a 24c. per ton increase, the price of coal per ton should rise only 24c., overlooking all that multitudinous body of day workers and monthly workers whose wages are advanced $1 per day by the committee's award and forgetting also the loss which frequently results from the dirt which has to be removed from the coal, the increased costs of deadwork and yardage and other incidentals in the award that look harmless enough but are quite important.

John P. White appeals to this natural error of the public in his minority report when he notes that the retailer and operator increased prices more than the tonnage rate was increased to the miner.

The Right Use for Every Coal

FOR EVERY particular use there is a suitable product; for every particular product a right and seemly way of use. To be more specific, there is a right use for every coal and a right coal for every use. The experienced coal man knows this. He understands the importance of the proper coal selection and of the proper application of each type of coal. However, all too often he stops with the simple recognition of the fact and does not put his idea into practice.

More and more frequently these days we see evidence that large companies realize that they must sell service as well as commodity. One way in which this is accomplished is by advertising the characteristics and the limitations in use of the particular product which they wish to market. But in a great many lines much more than this is necessary. Expert judgment is needed and, especially in the case of fuels, each problem is a special case in itself. Many private companies under similar circumstances find it advantageous to afford their customers service facilities by sending experts who will advise them regarding their products. Everyone is familiar with announcements such as are made by electric-lamp manufacturers, makers of rubber belting, those who market chain-drive equipment, and many others. One large corporation doing national business says, for example, "If you will write to our nearest office in regard to ———, the matter will have the prompt attention of experienced engineers. This service is free for the asking. If you want better ———, this department can greatly assist you." This is not a new policy and from the increasing frequency with which it is observed, it is evident that the policy is one which is profitable.

Coal Age has already advocated this thought of selling service in the coal business and again we urge the idea. It is of greater importance every year that coal should be efficiently and effectively applied in our industries. The only way in which we can offset increasing costs for coal production is to teach the user how to make a smaller tonnage do the work which he desires to accomplish. If we achieve this ambition, the purchaser is able to pay for the higher cost and to reward the coal operator by a reasonable profit for services rendered. The industry does not suffer, therefore, through the increases of labor cost and the rising costs of material, as would otherwise be the case.

We urge, therefore, that steps be taken at once to educate the purchaser by expert advisers, who will go out and aid our large users of coal. The coal man's interest will be served by this effort most effectively. It is the coal man's job to accomplish this education. It is time that our producers and jobbing associations got busy on this problem.

DISCUSSION *by* READERS

EDITED BY JAMES T. BEARD

Authority of Shotfirers

Letter No. 4—The instance cited in the inquiry, *Coal Age*, Jan. 1, p. 26, where a mine committee assumed to dictate to a shotfirer regarding his authority for refusing to fire shots that had been charged in a manner of which he did not approve, is an example of how the employment of shotfirers has often operated to decrease the efficiency of the work.

There are mines where the conditions are such that the employment of shotfirers is certainly a long stride toward greater safety. But, where shotfirers must be employed, they should be men of such character that will insure freedom from any dictation by a mine committee. They must also be able to satisfy the state mine inspectors and required to pass an examination as difficult as any given mine foremen and firebosses. They should be employed as monthly men, which would give them more freedom, in the exercise of their authority, in the performance of their duties and the enforcement of the law.

In the instance referred to in this inquiry, the trouble arose regarding the charging of a hole with two or more cartridges. The practice of the miners was to open the ends of the cartridges where they came together, so as to insure the direct contact of the powder. The practice was dangerous, in the opinion of the fireboss, as the powder was apt to be scattered along the hole. I believe in bursting the first cartridge, after it has been pushed to the back of the hole. There certainly is danger of a charge having a double concussion when much paper intervenes between two cartridges. The paper may smolder for a time and a hangfire result, with the possibility of a blowout shot being caused. This is to be avoided because of the danger, aside from the loss in the efficiency of the work.

New Shotfirer's Law in Indiana

Only recently, I read a paragraph, in *Coal Age*, to the effect that the best way of avoiding the necessity of employing shotfirers was to give more time, thought and care to the proper ventilation of a mine, which I consider is good advice. In Indiana, a new shotfirer's law takes effect April 1, 1920. The law will require the employment of shotfirers, on and after that date, in all gaseous mines and wherever more than 2 lb. of powder is used in a charge. The law will affect practically every coal mine in the state.

It has always been my practice and desire to charge and fire my own shots, since there is a great loss in efficiency when shots are exploded out of their order, which may easily happen where shotfirers are employed. The matter costs me about 12c. a day, work or play. The mine where I work has never been known to give off gas, and my shots will average less than 2 lb. per charge. It is my hope that we will be exempt from the shotfirers' law, as it is less trouble for a miner to fire his own shots than to notify the shotfirer.

Moreover, shotfirers are exposed to greater danger than the miners, in the performance of their work, as they have no knowledge of how the holes are charged, and may mistake the proper order in which the shots should be fired. Again, a shotfirer proceeding to the next room, after lighting the shots in the room he is leaving, may be caught by a shot blowing through the pillar. Therefore, it is my belief, except in gassy mines, the employment of shotfirers is not a step in the direction of securing greater efficiency, as far as the production of coal is concerned.

We will never attain the highest efficiency, through the medium of state laws, until we realize the need of discriminating between mines that generate gas and others where no gas is generated. The law that takes effect April 1, in Indiana, I believe to be a good law for mines generating gas; but, in its present broad application, I fear that it will have the effect to decrease the efficiency of coal production. It is my opinion that the charge limit of 2 lb. per shot should have been at least 4 lb., which would have afforded a greater margin. Few, if any, miners use less than 2 lb. of powder per charge. W. H. LUXTON.

Linton, Ind.

Avoidable Degradation of Coal

Letter No. 3—The subject of this article would, I believe, be more clearly understood and it would have received closer attention if the title had read Avoidable Production of Inferior Coal, which is its real meaning. I know of one reader who passed over the letter of William Wesnedge, *Coal Age*, Feb. 26, p. 416; but when his attention was called to the same he read it and commented on its contents. In that letter Mr. Wesnedge seems to be emphatic on the point of possibly slowing up the quantity of coal produced and incidentally lowering the earning capacity of the men at the face, but does not suggest a remedy.

To begin, let me say what I have said before that a closer co-operation is needed between the men and the officials. My idea is that there should be sufficient assistants in any one mine that the men, especially those working at the face, might be visited often during the day, by competent officials and given all the help necessary to insure an efficient organization.

This plan would fall in line with that expressed by Richard Bowen Oct. 2, p. 586, who contends that "more attention should be given the miner who must be taught to use more judgment and skill in the performance of his work." It is too true that present day methods of many large corporations are inefficient in this respect. A large mine will seldom have sufficient foremen or assistants to properly look after the men employed, who are never visited oftener than once a day, and then so hurriedly that a miner hardly has time to bid the official the time of day.

For that reason, I feel that the advisability of visiting the men at the face as often as possible should always be taken into consideration. As has been truly stated, time and again, it is not always the poor, inexperienced miner that is injured; but just as often it is the man who is experienced in the mining of coal. Statistics frequently show where the experienced man "took a chance" and was caught. It is therefore, not only desirable but necessay to visit every working place where the men are at work.

Experienced Men Needed to Inspect the Work

An experienced man thoroughly acquainted with the handling of men and the different problems that arise at the face, should be employed in this capacity, and when the men know he is coming around so often they would not take the chance of doing the "wrong thing" but would invariably stick to safe and proper methods. By these means, I believe, miners would be taught the necessity of loading clean coal.

Some may recall that, for the lack of such a system, a large coal company in Pennsylvania, a few years ago, studied their production sheets for some time and made lengthy investigations before they determined conclusively the source of their trouble. It was found that the difficulty started at the face where the miners were gobbing their slack and loading the lump coal and slate. The reason was that scales were used and the miners paid on a basic agreement for the screened product.

Effect of the War on Coal Production

Now, to go back to the period leading up to the war, we find that the problem of getting out clean coal was studied from every view point possible, and companies vied with each other in the market. Consequently, generally speaking, the coal was clean. Why? Because the miners were given to understand that clean coal was all that would be accepted. Drastic rules were laid down and the men made to understand that they would be paid for clean coal only. Each man's production was inspected and he had no redress. There was nothing to be gained by curtailing his production. Only recently have statements been made that miners would be curtailed in their producing and earning power by the introduction of a clean-coal program; when, as a matter of fact, this basic agreement has always "been on the map."

When the war broke out, as the records will show, whatever came out of the mine was sold. The miners were quick to learn this fact and took advantage of it to gradually increase their producing power and earnings; but they overlooked the fact that the inferiority of the coal they mined was a crime. As a result, we find that, even to-day, miners have drifted so far from their former cleanliness that they find it difficult to return to their former ways.

The miners, however, are not alone to blame as the operators were neglectful also. True, the watchword then was "Coal, coal and more coal," till it seemed that anything black answered the call. Yes, there is much to be said on both sides, although in those trying times it was always literally understood that clean coal was the order of the day and must be respected. Today, these same men are paid on the same definite understanding based on their loading clean coal and they have no redress. It is also true that the production need not be diminished if the miner works the number of hours assigned for a day's work.

Miners Must Be Taught Judgment and Skill

To teach the miner to use more judgment and skill, which will increase their safety and efficiency, to my mind, is the one big factor. Surely a man with such knowledge will be able to systematize his work in a manner to benefit himself and all concerned. There is no more truth in the statement that a miner's interests depend on the quantity of his output, than to claim that the demand for increased tonnage defies the laws of safety. A miner who is efficient in all mining problems concerning his particular work will never lose in production.

When an experienced miner questions an official's right to teach him better ideas and methods of mining it is time for that miner to seek another occupation, or go into business for himself. I recall a recent instance where an experienced miner complained to the superintendent that the foreman was trying to tell him when and where to place a prop. He explained to the superintendent that he knew when and how to set a post and did not like the idea of taking orders from the foreman, as he felt he had had as much experience as the foreman. A little later, the miner admitted that he was wrong, when he was shown that the foreman was only complying with the laws of the state. That man is not an efficient miner who feels that he "knows it all."

In conclusion let me say that I am of the opinion that closer co-operation between the men and their employers will greatly strengthen and benefit this condition. Let them work together and adjust such differences as arise daily in the operation of the mine.

Thomas, W. Va. BEN.

Co-operation Among Mine Officials

Letter No. 5—Speaking of the co-operation that is needed among mine officials, it has occurred to me that this co-operation should be extended to include others than those directly in charge of the mines. For the past 40 years I have been employed in different capacities, in and around the mines, in several mining states.

We hear very much said regarding the need of conservation of coal and avoiding the disasters that occur so frequently in our mines. It would seem, however, that little has been attained along the line of preventing either the great loss of coal or the occurrence of these disasters.

To Regulate Methods and Systems of Mining

To my mind, our entire system of mining needs regulation in such a manner that it will be impossible to have the mines shot to pieces by a haphazard, hit-or-miss, or go-as-you-please method of mining. Kindly permit me to make one or two suggestions of a plan that I believe would develop more system in the planning of mines and their later operation.

My idea is that there should be appointed a state board of practical mining men and engineers, to work in connection with a similar federal board located at Washington. When a coal tract or lease is to be opened up by a company, their engineer should be required to run out the boundary lines of the property and prepare a map showing the acreage and the place where it is desired to open the mine. This should then be submitted to the state board.

PLANS INSPECTED BY STATE AND FEDERAL BOARDS

The engineer of the state board would be required to study the conditions and to draw a plan of mine, showing the direction and size of entries, width of crosscuts, breakthroughs, size of pillars, both entry and room pillars, width and length of room, distance between crosscuts and other data. The plan should show the ventilation of the mine and indicate all doors, stoppings, air bridges and brattices. The dimensions and capacity of the ventilating fan should also be indicated, the calculation being based on the future requirements for the development of a given acreage.

When the state engineers have finished their work, and it has been approved by the board, blueprints are sent to the federal board, at Washington, for their inspection and approval. This plan will enable any necessary changes to be made in the plan, before the same is put into execution in the mine. On approval, the federal board returns the plan to the state board; and it is then turned over to the company, with instructions to follow the blueprint in every detail. Should a mine inspector find that the foreman fails to do this, he should be authorized to notify the company to get another foreman.

In my opinion, this is the only sure and safe way of guarding life and property in the mining of coal. It will probably be a long time before such a plan or system will come into use; but I hope the suggestion will meet with general approval. It would have the effect of putting all mining operations on a systematic basis, the plan and operation being determined by skilled practical mining men; instead of, as at present, being open to the choice and inclination of men who often have no practical knowledge and skill of the work they undertake.

Such a plan would tend to eliminate disasters and conserve millions of tons of coal that are now lost beyond recovery. When going into a mine that I find is unsafe, I often wonder if we will ever get away from the conditions that surround coal mining, today.

Warrior, W. Va. J. A. RICHARDS, Supt.

Letter No. 6—If I understand rightly, the object of this discussion is to bring about greater efficiency in coal-mining operations, through more social relations whereby a better understanding will be established between employers and employees, on what may be termed "a brotherhood" in which men will have and take a deeper interest in each other's welfare. It is to be hoped that the discusion will reveal those conditions, local or otherwise, that exist in and about the mine and obstruct efficiency in operation.

One of the first and most important elements involved in such an undertaking is to establish a feeling of confidence and trust in both parties. This will depend very largely on the hearty co-operation and association of employers with their men, who must be knit together in a true bond of friendship and possess a kindly feeling toward each other that will create harmony. Every cause has its effects; and, in this case, the *cause* is the true friendship and harmony that should exist, and the *effect* will be a higher production efficiency throughout the organization. This will mean increased tonnage and a reduced cost of operation and production, as all will be on the alert to discover a leak and avoid friction and trouble.

The remarkable coal production during the war is an example of that loyalty, friendship and trust so necessary to the producing of results. The trust of employers in their men and the confidence of the men in their employers was not betrayed and results were produced, even in the face of labor shortage and other adverse conditions. The mine produced a greater tonnage, per man, which exceeded anything previously known.

KIND TREATMENT INSPIRES TRUST AND CONFIDENCE

May I ask, Why should not the same spirit of loyalty to the industry and trust in one's fellows exist, now that war is over and the work of reparation is in hand? It cannot be denied that mine officials are striving, by every means in their power, to increase the safety of the mines and produce a larger tonnage; but let it be remembered that a word of encouragement and a kindly act invite the trust and confidence of their men and avoid trouble and disaster.

It must be admitted that some officials are quick tempered, stubborn and exercise discipline in a wrong way. There are officials who have the bearing of an exalted being, with a divine right to govern and control, which is not the attitude of co-operation, as the latter involves association and close contact with their men.

By this means the official builds a firm foundation that will enable him to use discipline and authority, effectively, in a humane manner. Few will deny that officials of the exalted type are not adapted to the handling of men successfully. They are a natural hindrance to the future welfare of the operations in their charge.

UNDESIRABLE TYPE OF MINE SUPERINTENDENT

My meaning is that a mine official may be an efficient and well qualified man, in every other respect, owing to his experience, knowledge and skill in the mining of coal; yet, owing to an overbearing, self-asserting disposition, he is a miserable failure in the handling of men and is an undesirable man to place in charge of operations in the mine. My reference to such attitude on the part of a mine official is intended to show that the day is past when workers will stand for abusive methods. They are looking for and appreciate co-operation and kind humane treatment.

The present is an era of reconstruction and the successful official must have reconstructive ideas, which are necessary to produce a higher tonnage at a lower cost. The rapid development of our mines means increased danger, to meet which mine officials must have greater knowledge and skill requiring careful thought and study. They must develop progressive methods that will insure success; in other words, they must keep pace with progress and not stand still.

Now, let me urge that we all act the part of human beings; avoid being radical; use honest methods in all our dealings, believing that the time is not far distant when a reaction will take place in the readjustment that is sure to come. JOHN E. AMBROSE.

Fairmont, W. Va.

Working Kanawha River Coal

Letter No. 1—In answer to the inquiry of Arthur L. Sheldon, *Coal Age*, Feb. 26, p. 419, regarding the working of coal in the Kanawha River district, allow me to present the following general plan, as suggested by my own experience under similar conditions:

In the working of the coal in the three seams mentioned, I would advise sinking a shaft to the lowest seam and starting the work, in this seam, by driving the usual entries at the shaft bottom. Then, at a point 200 ft. from the bottom of the hoisting shaft and on the same side of the heading as the ventilating shaft, drive a place a distance of 180 ft., and, start an upraise or incline leading to the second seam.

This incline should have a pitch just sufficient that cars will run by gravitation from the top to the bottom. The width should be such as to permit the laying of double tracks. Build a sidetrack at the bottom of the incline and another at the top in the second seam. When this is done, drive straight ahead 100 ft., in the second seam, and connect with the ventilating shaft; or this connection can be driven at the time of sinking the ventilating shaft to the lowest seam.

In the development of the three seams, it is important to keep the working in the bottom seam slightly ahead of that in the second seam; also, the working face in the second seam should be kept slightly ahead of that in the top seam. I have seen this method worked successfully in a mine having three seams one above the other; also, the same method was followed in another mine where five overlying seams were worked at the same time. For the purpose of ventilation and for convenience in the handling of supplies and refuse, I would drive a slope from the surface to the top seam. This would also serve as an escapeway in case of accident.

Joseph Dover.

Stotesbury, W. Va.

Letter No. 2—Referring to the question of working three seams of coal in the Kanawha River bottom, let me suggest the plan of driving a slope to the first seam and erecting a rough temporary tipple, having an incline connecting with the mouth of the slope.

My plan would be to work out the coal from this upper seam first. If found advisable, I would double-shift the work in this seam, and when this development was well underway, I would select the best possible place to sink two shafts to the lower seam. As quickly as these shafts reach the second seam, entries should be driven, and work started in that seam, so that it will be kept in advance of work in the lower seam.

In the same manner, when the two shafts have been sunk to the lowest seam, entries should be started in that seam immediately under those driven in the seam above. My idea is to keep the development, in each overlying seam, well in advance of that in the seam next below. At the proper time, I would connect the workings in the top seam with the shaft and hoist the coal from that seam through the shaft, instead of hauling it out of the slope.

Permanent arrangements for loading the coal coming from the three seams can now be made at the top of the shaft, after which the temporary tipple can be removed, or it can be used for a slate dump, if desired. It may be that conditions will make it advisable to complete the extraction of the coal in the two overlying seams before starting to take out any coal in the lower seam. This, I think, will depend very largely on the question of finding gas in the lower seam.

W. J. Lyke,
Midway, Pa. Mine Foreman.

Barometer re Depth of Shaft

Letter No. 1—Kindly permit me to refer to the answer given to the second question in *Coal Age*, March 4, p. 458, where it stated "This is a question that cannot be answered with any degree of accuracy, except by the use of a logarithmic equation, and, for that reason, it should not be asked at a mine examination." The question reads as follows:

> The barometer at the top of a shaft is 30.2 in. and the temperature of the air, 64 deg. F. The depth of the shaft is 1,100 ft. and the thermometer at the shaft bottom reads 75 deg. F. Calculate the difference of pressure on the air between the top and bottom of the shaft, and the difference in the readings of the barometer at these two points.

It seems to me that the proper way to answer this question is to find the weight of a cubic foot of air, at the given temperature and barometric pressure, at the top of the shaft. Then calculate the increase of the barometric pressure due to the depth of the shaft, assuming this increase is 1 in. for each 900 ft. of depth. Then having found the barometric pressure at the bottom of the shaft, calculate the weight of a cubic foot of the air at that point, for the given temperature and for this pressure; and subtract the unit weight of air at the top of the shaft from that at the shaft bottom and multiply by the depth of the shaft.

According to my calculation, the weight of air at the top of the shaft is

$$\frac{1.3273 \times 30.2}{460 + 64} = 0.07650 \textit{ lb.}$$

Approximately, the decrease in barometric pressure, for a depth of 1,100 ft., is 1,100 ÷ 900 = 1.22 in., making the reading of the barometer at the bottom 31.42 in. The unit weight of air at the shaft bottom (temp. 75 deg. F.; bar. 31.42 in.) is then

$$\frac{1.3273 \times 31.42}{460 + 75} = 0.07795 \textit{ lb.}$$

The difference in pressure between the top and bottom of the shaft is therefore

1,100 (0.07795 — 0.07650 = say 1.6 *lb. per sq.ft.*

Freeburg, Ill. **Student.**

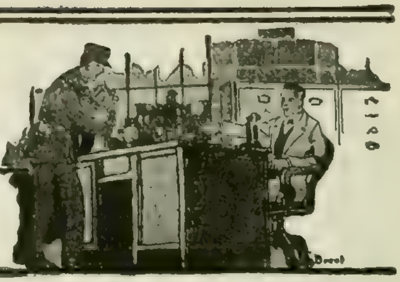
[The result obtained by this solution should show its falsity if nothing else. The difference in barometric reading between the top and bottom of the shaft, corresponding to this difference of pressure, would be 1.6 ÷ (144 × 0.49) = 0.0227 in., which is too small for practical consideration.

However, the last few lines, at the bottom of the first column, p. 458, should read as follows:

> That assumption would increase the pressure from 30.2 × 0.49 = 14.8 lb. per sq.in., at the top of the shaft, to 15.42 lb. per sq.in. at the bottom; and give a barometric reading, at that point, of 15.42 ÷ 0.49 = 31.4 in., making the increase of barometer 31.4 — 30.2 = 1.2 in.

The actual increase in barometric pressure is, as shown at the top of the next column, on the same page, 2.8 in. owing to the density of the air increasing with the depth of the shaft.—**Editor.**]

INQUIRIES OF GENERAL INTEREST



ANSWERED BY JAMES T. BEARD

Changing Pulley on Generator

We are operating a direct-current generator that is rated at 100 kw., 250 volts, 435 amp. at a speed of 200 r.p.m. The generator has a 10-in. pulley, which is belted to the driving pulley of the engine. The rating of the engine is not known, but it appears to be overloaded.

The question I want to ask is, How much would it lessen the load in horsepower on the engine if a 24-in. pulley is put on the generator, in place of the 10-in. pulley now in use, assuming that the engine can be run enough faster to drive the generator at 200 r.p.m.

Scranton, Pa. CONSTRUCTION BOSS

The change from a 10-in. pulley to a 24-in. pulley on the generator would reduce the load (tension) on the belt in the ratio 10: 24; but would require the speed of the engine to be increased in the ratio 24 : 10, which is very doubtful of accomplishment. Ordinarily, a plain, slide-valve engine is designed for a piston speed of, say 600 ft. per min.

If this engine is now running with a piston speed of only 250 ft. per min. the change from a 10-in. to a 24-in. pulley would enable it to run at a piston speed of 600 ft. per min. and give better service. There would result, however, no change in the power developed, as the increase in belt speed would exactly balance the decrease in the load (tension) on the belt.

The output of the generator when operated at full capacity is $(260 \times 435) \div 746 = 145+$ hp.; and assuming its efficiency as, say 90 per cent, the engine should develop $145 \div 0.90 =$ say 160 hp.

Carbon Dioxide and Oxygen Content in Mine Air

Referring to the reply given to the inquiry of "Mine Foreman," *Coal Age*, Feb. 26, p. 419, I would like to ask for further information regarding the carbon-dioxide content of mine air. The answer to the inquiry states that "the presence of the carbon dioxide causes a corresponding depletion of the oxygen in the atmosphere." Let me ask, Does the depletion of the oxygen in the mine air, of necessity, mean a corresponding increase in carbon dioxide?

For the purpose of illustration, let us take the following example: Assume that a section of a mine in which the air is generally good has become so bad that an oil lamp will not burn in that section. There is a current of air moving and the section contains no abandoned workings that would generate carbon dioxide. However, for the purposes of this inquiry, let us eliminate the probability of a gob fire and excessive powder smoke. Under these conditions, assuming that the failure of the lamps to burn is due to a depletion of the oxygen, does that mean a corresponding increase of carbon dioxide or oxygen?

Again, for the purpose of this discussion, let us assume that the carbon dioxide content, from natural causes, will not exceed 1 per cent and the oxygen content is 2 per cent below normal, giving an atmosphere containing oxygen 19 per cent and nitrogen 81 per cent, in round numbers. Then, should a further drop in oxygen of 1 per cent occur, would we have 18 per cent oxygen, 1 per cent carbon dioxide and 81 per cent nitrogen? And if another drop of 2 per cent in oxygen took place, would we have 16 per cent oxygen, 1 per cent carbon dioxide and 83 per cent nitrogen.

This atmosphere, or conditions approaching this state of affairs, would not be nearly as deceptive as one in which the depletion of oxygen was accompanied by a corresponding increase in carbon dioxide; because the combined lack of oxygen and increase of nitrogen in the air would make breathing difficult, while a corresponding increase in carbon dioxide would be generally fatal, owing to the toxic effect of the carbon dioxide.

It is my understanding that work in an atmosphere where there is an addition of carbon dioxide, with no other means of warning than a carbide light, would be many times more dangerous than work in an atmosphere in which the decrease in oxygen was accompanied only by a corresponding increase in nitrogen. The mere decrease in oxygen would cause a much more labored breathing and be ample warning that all was not well. But the same decrease in oxygen, when accompanied by a corresponding increase in carbon dioxide, owing to the toxic effect of this gas, would certainly work its havoc on a person. Kindly explain.

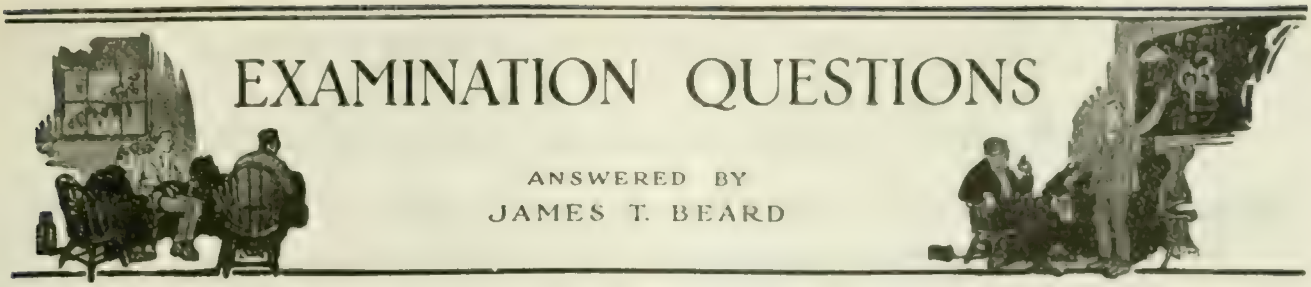
Portage, Pa. JEROME C. WHITE.

In answer to this inquiry, it is only necessary to state that the addition of carbon dioxide to air containing a normal percentage of oxygen (20.9 per cent) dilutes the air, which naturally decreases the percentage of both the oxygen and the nitrogen.

For example, assume 100 volumes of pure air consists of 20.9 volumes, oxygen; and 79.1 volumes, nitrogen. Then, suppose 10 volumes of carbon dioxide are added to this air, making 110 volumes of mixed oxygen, nitrogen and carbon dioxide. The mixture would then contain

Oxygen, $100(20.9 \div 110) = 19.00$ per cent,
Nitrogen, $100(79.1 \div 110) = 71.91$ per cent,
Carbon Dioxide, $100(10 \div 110) = 9.09$ per cent.

The oxygen content has been reduced, in this case, by the dilution of the air when the carbon dioxide was added. In other words, the oxygen content is depleted. The oxygen in mine air is often depleted, however, in other ways than by dilution caused by the generation of carbon dioxide or other gases. The oxygen is consumed by the various forms of combustion taking place in the mine. The depletion of the oxygen does not therefore, "of necessity mean a corresponding increase in carbon dioxide."



EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Indiana Firebosses' Examination, Held at Indianapolis

(*Selected Questions*)

Ques.—Explain the effect of barometric pressure in mines giving off methane (CH_4).

Ans.—A common belief prevails, to a considerable extent among mining men, that a fall of barometric pressure is accompanied with an increased outflow of gas from the coal and other natural strata; but proof is lacking to establish this claim. There is no doubt but that there is frequently observed a general increase in the percentage of gas in mine workings, following any considerable drop in barometric pressure. This increase of gas, however, is due to the expansion of the gas-charged air, accumulated in the abandoned workings and other void places in the mine, because the volume of air and gases varies inversely as the pressure.

The conditions under which occluded gases are held in the strata make it extremely doubtful if there is any increased emission of gas from the pores of the strata, owing to an observed decrease in barometric pressure. On the other hand, it is possible and quite probable that the flow of gas from pockets and crevices in the strata, which constitute feeders, is increased when the barometer falls.

Ques.—What difference, if any, is there in the quantity of air passing through two splits from a main aircourse, the first split being 4 x 9 ft., 4,000 ft. long, and the second split, 6 x 6 ft., 5,000 ft. long?

Ans.—Assuming equal pressures in these splits, the quantity of air passing in each split, in natural division, is proportional to the pressure potential for such split, which is expressed as follows:

$$X_p = a\sqrt{\frac{a}{lo}}$$

In this case, the sectional areas are equal, as $a = 4 \times 9 = 36$ sq.ft., and $6 \times 6 = 36$ sq.ft.; and the area can therefore be ignored in calculating the potential values for these splits. Also, the solution is much simplified by using the relative potential and calling the relative lengths of the airways 4 and 5, respectively; and the relative perimeters, 13 and 12, respectively, which gives for the relative potentials of the two splits, the following:

Split 4 *x* 9, 4,000 ft.; $X = \frac{1}{\sqrt{4 \times 13}} = \frac{1}{\sqrt{52}} = 0.1387$

Split 6 *x* 6, 5,000 ft.; $X = \frac{1}{\sqrt{5 \times 12}} = \frac{1}{\sqrt{60}} = 0.1291$

Since these values represent the natural division of the air between the two splits, they show that for every 13,870 cu.ft. of air passing in the first airway, there is 12,910 cu.ft. passing in the second airway.

Ques.—How much pure air must be circulated through an entry giving off 2,500 cu.ft. of methane (CH_4), per min., in order to render it nonexplosive?

Ans.—The lower explosive limit of pure methane is reached when the proportion of gas to air is 1:13. Hence, in this case, the volume of air required to render the gas nonexplosive must be somewhat greater than $13 \times 2,500 = 32,500$; or the quantity of air entering the mine should not be less than, say 33,000 cu.ft. per min. In actual practice, this volume should be much greater to insure safe working conditions.

Ques.—If, on inspecting a pair of entries, you observe two or three rooms having a trace of firedamp at the face, what would you do in order to warn the men working in these rooms?

Ans.—Much would depend on the conditions existing in the mine, the nature of the coal, amount of ventilation at the working face, and the experience of the men. In anthracite mines, it is quite common for men to continue to work in places generating gas in small quantities. In the mining of soft coal, however, more caution is needed; and, while a small trace of gas found at the working face may not be sufficient cause for withdrawing the men, care must be taken that the place is free from accumulations of dust and the men keep their lamps on the floor and at a sufficient distance from the face of the coal. However, it is not wise to take chances in this respect, and the safest course to pursue would be to provide the men with safety lamps or withdraw them from the place.

Ques.—What are the dangers to be watched for and guarded against, in a mine giving off large quantities of explosive gas?

Ans.—In a mine generating much gas, danger arises from the accumulation of the gas on pitches, in rise workings, and on falls, in pillar workings, or in cavities of the roof and other void places in the mine. Danger arises, also, from maintaining large standing areas in abandoned sections of the mine that are not thoroughly ventilated. There is also danger arising from the accumulation of fine coal and dust on the roads and in the working places. The operations of blasting must be carefully safeguarded by the use of permissible powders and the enforcing of strict regulations in reference to blasting coal and rock. It is generally safer to employ shotfirers to inspect, charge and fire all holes drilled by the miner, where the holes are found to be safe for shooting. No shots must be fired in a place, without first making a careful test for gas.

Ques.—What effect does the presence of coal dust have in a firedamp mixture?

Ans.—The presence of the dust lowers the explosive limit of the gas and renders the mixture more easily ignitable, besides increasing the force of an explosion should that occur. These effects are increased in proportion to the fineness of the dust and the inflammability of the coal forming the dust.

White Advocates Larger Concessions Than Soft-Coal Commission Recommends

Wants Day Men Conceded Further 35c., and Boys 22c. Per Day with Bank-to-Bank Time Reckoning—Urges Also Joint Agreements on Car Pushing and That Blacksmithing Be Provided at Cost

IN MAKING his minority report as member of the Bituminous Coal Commission, John P. White, former president of the United Mine Workers of America, may be quoted as follows:

The inability of the Bituminous Coal Commission to agree upon fundamental issues compels me to set forth my viewpoint clearly and briefly. I have in mind the duty and obligation I owe to you, the industry, and the country. My report and award embody this principle, with the expressed hope of enabling you to so determine and act that stability to the industry may accrue, justice and equity be established, and unrest displaced by contentment in such a full measure as to bring a long period of essential well-being to all.

The testimony and evidence submitted to your commission brought forth all the elements entering into the controversy between the coal operators and miners that caused the deplorable and disastrous condition that led to the creation of this commission. If this commission was to succeed in its work, a calm, dispassionate, judicial decision, unanimous in its findings, should have resulted. That this was not accomplished is, indeed, regrettable, which I deeply deplore.

War-Time Methods Applied to Wage Increases

I have carefully analyzed the majority report as a solution of the main and principal issues, with some of which I am in accord. To subscribe to their plan of reference of many major problems I cannot agree. To do so would only leave unsettled many of the clearly defined issues that have caused so much contention and controversy of long standing.

The majority in arriving at its conclusion was guided mainly by the theory of war-time methods in applying wage increases, namely, the increased cost of living. To this principle I cannot subscribe. The great outstanding fact developed by this commission's hearings in which every citizen is interested is the increased cost of coal.

From 1913 to Oct. 31, 1919, the mine workers' rate per ton increased 23c., the operators' receipts increased $1.41, and the retail dealers' receipts increased $2.10. The mine workers' pre-war earnings did not permit a subsistence wage. While the 24c. per ton increase on pick and machine mining recommended in the majority report will not reflect a reasonable standard of living in health and comfort into the lives of the mine workers, it will materially improve their condition, and in the interest of honorable compromise I assent thereto.

The following recommendation for the increase to day men provides the same percentage increase given tonnage men and follows a time-honored practice of the past. Reducing to a minimum the grave and disputed points that, in my judgement, must be adjudicated, I submit the following plan by which final and complete adjustment may be obtained and peace established in the industry:

Recommends Plan to Bring Peace to Industry

That the mining rates and wage schedules in effect on Oct. 31, 1919, in what is known as the Washington agreement applying to the Central Competitive field and the outlying districts, except as hereinafter provided, shall be subject to the following increases and conditions.

1. *Wage Increases to Pick and Machine Miners.*—That the mining prices for mining mine-run coal, pick and machine, shall be advanced 24c. per ton of 2,000 lb. In the block-coal field of Indiana and in other localities that are still on the screen-coal base, the usual methods of applying the tonnage rates shall continue. This also has its application to districts that have a joint understanding in applying wage increases to low coal.

2. *Wage Increases to Day Men.*—That all day labor and monthly men, except trappers and other boys, be advanced $1.35 per day, trappers and boys receiving less than men's wages to be advanced 75c. per day.

3. *Wage Increases Applying to Yardage, Dead Work, and Room Turning.*—That all yardage, dead work and room turning be advanced 20 per cent. Nothing shall prevent the representatives of the miners and operators in any district in joint conference from taking the flat equivalent of 20 per cent and applying it to yardage, dead work and room turning if by so doing they will make for uniformity and maintain the differentials. Failing, however, to agree to such application, then the 20 per cent shall be applied on the existing rates, effective Oct. 31, 1919.

Suggests Method to Adjust Differentials

4. *Central Competitive Field Differentials.*—The differentials existing in western Pennsylvania as between the thick- and thin-vein pick and machine mining, the 12c. machine differential in Indiana, and the 4c. differential in southern Illinois are disposed of in the following manner: The miners' international officials shall select two representatives and the officials of the Coal Operators' Association of the Central Competitive Field shall select two representatives and the Secretary of the U. S. Department of Labor shall select the fifth and disinterested member, and the selections herein enumerated shall constitute the tribunal for the purpose of determining the disposition of the equities involved in the claim of adjusting the foregoing differentials. This tribunal shall be selected and enter upon its duties not later than June 1, 1920, and its awards shall become effective the first day of the month following the determination and conclusion of its findings.

5. *Special Application for the Payment of Soapstone.*—Payment for handling soapstone directly overlying the No. 8 seam of eastern Ohio and the Pittsburgh district of Pennsylvania shall be subject to the increase provided herein; and that part of the stone up to and including the 12 in. is referred to the operators and miners of these two respective districts, and 2c. a ton is to be allowed, to be paid upon the ton, or converted to a yardage basis if desired. The principle of determining the flat rates for the payment of yardage and dead work may be applied in these two fields in fixing and establishing pay for the handling of soapstone.

6. *Western Kentucky Differentials.*—The differentials existing in what is known as the western Kentucky coal fields, involving day wage, pick and machine mining, shall be referred back to the joint conference of operators, and miners of that field for the purpose of mutual adjustment, and failing to agree, the matters in dispute shall be referred to a commission composed of two operators and two miners from that district, and the fifth and disinterested member shall be selected by the four so chosen. Failing to appoint, the Secretary of the U. S. Department of Labor shall make the appointment. Under no consideration shall the mines cease operation pending the investigation and findings of this commission.

OLD WORKING HOURS RETAINED UNTIL 1921

7. *Car Pushing.*—We refer this important matter back to the various district joint conferences to be worked out in accordance with mutual understanding, taking into consideration the conditions that obtain in each of the districts from which these complaints emanate.

8. *Eight-Hour Day.*—The present arrangement regarding the working hours of mine employees shall continue in effect until March 31, 1921. Beginning April 1, 1921, the maximum hours for employees shall not exceed eight hours underground per day and six days per week.

9. *Fulfillment of Award.*—The award becomes the base upon which all wage agreements shall be predicated. The specific awards set forth shall not be subject to negotiations, but shall apply automatically in such agreements or schedules of wages. Latitude to unify or to enter into mutual arrangements is authorized; provided, however, that specific awards and references as well as principles are adhered to and in all other respects the agreement as of Oct. 31, 1919, will be continued in effect and the application of this award shall be arranged mutually and without recourse to strikes or suspension of mining. This basic award substitutes and absorbs the 14 per cent average wage increase and becomes effective April 1, 1920, and will continue in effect until March 31, 1922.

The differential now existing between the thick and thin seams of western Pennsylvania was established years ago in order to compensate the operators for privately owned locks in the upper pools of the Monongahela River. The United States Government took over these locks with proper reimbursement to the owners.

The differential in Indiana of 2c. per ton on machine mining coal below the Danville (Ill.) basing point is of long standing. The pick rate is in accord with the Danville basing point. The southern Illinois differential of 4c. per ton was established mainly through freight rates and inadequate transportation facilities; this reason no longer exists. The western Kentucky differential, like southern Illinois in character, should receive the same consideration.

Each of the districts with these differentials has enjoyed the Government selling rate f.o.b. mine as has its competitors, which now continues to exist. Any change in these differentials to their proper base can under no circumstances add any to the cost or burden to the public or consumer. The majority report evades adjustment of these issues while this report definitely and finally points a way to a conclusion determined on the merits of these issues.

THINKS OPERATORS COULD ABSORB INCREASE

It is acknowledged in the majority report that 80 per cent of the increase of 14 per cent granted to the mine workers at the time of the establishment of the commission has already been carried on to the public through increase in prices by the operators.

If the 27 per cent increase is granted, as recommended by the majority report and concurred in by me, this would leave only 13 per cent which the operators would have to absorb. As Dr. Garfield stated originally that they were able to absorb an increase of 14 per cent, and this increase is acknowledged not to have been absorbed, it seems apparent that the additional 13 per cent now called for could be taken care of by the operators, assuming that Dr. Garfield was correct in his original statement.

The principles and suggestions embodied in this section of the majority report are commendable. In this connection attention should also be directed to some grave evils which still exist. Some coal companies still maintain what is known as the "closed camp." In these camps the companies dominate all the conditions of life of the people. On the slightest opposition of the miners to the living and working conditions offered, the coal companies are in a position to evict them from their houses and impose upon them almost any conditions they may desire, including discrimination against them on account of membership in the United Mine Workers or any other labor organization. These conditions are un-American—economically, socially, and politically—and cannot be too strongly condemned.

WANTS OLD PRICE OF POWDER MAINTAINED

The findings of the majority report would be acceptable with two additions which are of fundamental importance: (1) That the price to be charged for powder in the future shall under no conditions exceed the prices charged on Oct. 31, 1919; and (2) that detonators shall be furnished to the miners without charge.

As a substitute for this section of the majority report, I would suggest the following:

The price in effect on Oct. 31, 1919, for house coal furnished to the miners at the mines shall be increased by adding the labor cost only. No stipulation should be made as to the cost of delivery of coal to the miners' house for the reason that this provision may be abused by excessive charges.

The simplest and most direct method of handling this problem would be to substitute for the findings of the majority report a recommendation that "the charge for blacksmithing be made on a basis of actual cost." By sanctioning charges as of Oct. 31, 1919, many excessive charges would be perpetuated. In some instances miners are now arbitrarily charged for blacksmithing in machine mining.

The statement made in the majority report that car pushing is a natural condition of the industry is without foundation in fact. The joint report is contradictory. The first paragraph states that the complaint has no foundation, the second reciting that it has foundation. The Government itself in the central Pennsylvania field allowed miners during the war 5c. a ton for pushing cars. The majority report states there is not sufficient information on this subject to form a correct conclusion. The commission is, therefore, admittedly incompetent to pass upon the question. It should, therefore, be referred to the various joint conferences to be worked out through mutual understandings and agreements.

The price-fixing policy should be continued until June 1, when the operation of the laws of supply and demand will be such that it will no longer be necessary.

The majority report is objectionable in its recommendation relating to the Central Competitive Field, because it leaves unsettled those vital and all-important issues which have caused so much of the existing unrest and intensification.

The method provided by the joint report merely means a continuation of the conflict, as neither side, as experience has shown, will yield. This situation can only be effectively handled by the creation of such a commission as I have already in the beginning of my report recommended. The recommendations of the majority report as to northern Illinois are acceptable.

As a substitute for the recommendations of the majority report for the State of Washington I would recommend the following: The situation in the State of Washington, as presented by briefs and oral statements of the operators and miners, reveals one of the most unusual and complex problems submitted to this commission for its determination. The operators show by their briefs that in many of the commercial mines of the state, which produce the majority of the state's tonnage and sales realization, the price is below the production cost. They also show that foreign coal and fuel oil enter in a large degree into the future life of the coal industry in that state.

The miners in rebuttal attack the figures in the briefs of the operators, declaring the depreciation, depletion, and miscellaneous items of production cost are excessive and unwarranted.

In view of the vital issues involved and the lack of time and funds for this commission to make a survey and enable them to deal adequately with the problem, we recommend the following:

That the representatives of the miners and operators of the State of Washington, at the earliest possible moment, select one operator and one practical miner, the two selected to agree upon a disinterested mining engineer as the third member, and, failing to agree upon such a person, the Secretary of Labor shall make the appointment. This local commission shall make a survey of all the mines in the state to develop the facts underlying the whole problem as it applies to this industry in the State of Washington and at the earliest possible moment submit its report to the joint conference of operators and miners of that state. Pending this investigation the miners and operators shall jointly agree on what basis the mines will operate while the survey is being made. The expenses incurred by this commission shall be borne equally by the operators and the miners of the state.

I would also recommend the substitution for the section of the majority report entitled "Alabama, Tennessee, eastern Kentucky, and Maryland" of the following: The representatives of the miners from these states filed briefs citing the wages and conditions of employment, but, as the records show, none of the operators from these districts appeared before the commission, merely filing letters with the commission to the effect that they have no joint relations with the mine workers in their districts.

In each of these districts during the war wage increases were adopted and put into effect by the U. S. Fuel Administration and tribunals were set up for the adjustment of the usual complaints common to mining. These tribunals included a permanent umpire in each district, and the commission would recommend that the operators arrange to meet with representatives of the miners in those districts and to put into effect the award of this commission, and to adjust the differences that may prevail in the industry in their respective localities, to the end that industrial peace and tranquillity prevail.

The recommendations of the majority report as to "Kanawha, Point Creek, and Cabin Creek districts, in West Virginia," are acceptable.

At Last, List of 125 Indicted Is Made Public

FEDERAL officials revealed on March 27 the names of the persons indicted at Indianapolis for alleged violation of the Lever Act and the conspiracy sections of the Federal Criminal Code. The mine workers include John L. Lewis, the president of the United Mine Workers of America; William Green, secretary and treasurer, and Percy Tetlow, chief statistician.

Indiana seems to have an excessively large number of indicted, for there are 55 Indiana mine workers' representatives and operators under indictment. The operators include Thomas T. Brewster, of St. Louis, chairman of the operators' Scale Committee; Phil. H. Penna, of Terra Haute, spokesman for the operators in the Washington conferences; F. S. Peabody, of Chicago, head of the Coal Board in the early part of the war and later in control of explosives.

Illinois operators indicted include besides F. S. Peabody, Rice Miller, C. M. Moderwell, J. E. Rutledge, E. C. Searles, Thomas T. Brewster, George B. Harrington, John Connory, Walter S. Boyle, Theodore Keller, H. A. Huskey, H. C. Perry and J. W. Spencer. The Illinois union men indicted include Frank Farrington and Harry Fishwick.

Ohio is represented by Michael Gallagher, W. H. Haskins, E. G. Maurer, Joseph Pursglove, S. H. Robbins and G. C. Weitzell among the operators, and George Cecil, William Roy, G. R. Savage, John Sexton and William C. Thompson among the mine workers.

Western Pennsylvania operators indicted include W. K. Field, president of the Pittsburgh Coal Co., Pittsburgh, Pa.; James M. Armstrong, John A. Donaldson, William Henderson and James G. Patterson, while the union men include Thomas Hughes, Frank Leithold, Philip Murray, Robert Gibbons and John O'Leary.

Other indicted persons are Ponas Waffle, secretary of the Coal Trade Bureau, of Terre Haute, and R. W. Couffer, representative of the National Coal Association.

There are 18 counts in the indictment all alleging some form of conspiracy. One count sets out ten overt acts which are alleged violations of the Federal laws.

Anthracite Wage Conferees Agree To Make Settlement Operative from April 1

Miners Agree To Remain at Work Pending Settlement of Negotiations—Efforts To Establish Closed Shop and Check-Off Are Defeated.

IN THEIR efforts to negotiate a new working agreement to take the place of the one expiring at midnight, March 31, the sub-committee of operators' and miners' representatives put in a busy third week. Daily sessions were held at the Union League Club and although no announcement was made that any of the demands had been settled, the operators accepted the proposition of the miners that they remain at work after April 1, providing the new agreement would be made retroactive as of that date.

This proposition was believed to be the stumbling block in the early stages of the negotiations. The operators' representatives during the closing days of the previous week had proposed to the miners that they remain at work after the expiration of the present agreement pending the outcome of the negotiations. This proposal was considered by the Scale Committee of the miners when it was presented and again on the morning of March 23. After a session lasting more than four hours, during which there were some heated arguments, the resolution as presented to the operators later in the day was agreed upon.

Efforts were made by some members of the Scale Committee to amend the resolution to include the closed shop and check-off, the latter to become effective on April 1 regardless of when a new agreement should be signed. The district presidents and international vice-president argued against this amendment and it was finally defeated.

The resolution was presented to the sub-committees during the afternoon and after a brief discussion was taken under consideration by the operators' representatives, with a promise to have their reply ready at 8 p.m. on the evening of March 24. After a session lasting more than two hours on the evening of March 24 it was announced that the operators had agreed to make the award retroactive. The resolution as adopted read:

"Whereas, the negotiations now pending between the anthracite mine workers and operators may require additional time to reach a mutually satisfactory conclusion; and

"Whereas, it is to the public interest that the supply of coal be not diminished; therefore

"Be it Resolved, That *pending* conclusion of negotiations there shall be no cessation of work, and that by mutual consent the working conditions of the agreement of May 5, 1916, and the war allowances supplemental thereto, be continued during negotiations, and that whatever agreement is finally reached shall be retroactive to April 1, 1920."

At the conclusion of the session International Vice-President Murray predicted that the sub-committee would now get down to real business and thoroughly discuss each of the various demands. He believed that the work of the conference would now be speeded up.

The next morning, March 25, Mr. Murray and the three district presidents drew up a letter embodying the resolution adopted by the sub-committee, directing the mine workers to remain at work after the expiration of the present agreement and until a new agreement is reached.

A letter to the officers and members of Districts 1, 7 and 9, United Mine Workers of America, reads as follows:

"On March 18 the representatives of the anthracite operators submitted a proposition to your Scale Committee which provided for a continuance of work after April 1 pending negotiations, without any retroactive provision. Your committee refused to entertain the operators' proposal, and on March 23 a meeting of the full Scale Committee, consisting of the three district executive boards, three mine workers from each district and the international officers, was held to discuss and outline a policy to govern after April 1.

"After discussing the matter from every angle and with the advice and consent of our International officials the full Scale Committee authorized the sub-committee to provide an arrangement for the continuance of work after April 1 pending negotiations, with the understanding that whatever agreement is finally reached it should be retroactive to April 1. This action of the full Scale Committee has been agreed to by the operators, as evidenced by the adoption of the following resolution, which fully protects your interest while at work pending settlement."

(Here follows the resolution adopted by the sub-committee and which is printed above.)

The letter then continues:

"In view of the above facts you are officially notified to observe, as in the past, April 1 as a holiday by remaining away from work, but after that day work is to be resumed, pending negotiations, and in these negotiations it will be our aim to bring the matter to a conclusion as soon as possible.

"On account of the short period before April 1 this official circular will be published in the press and copies forwarded to the secretaries in order that our membership may be advised of the action.

"With the hope that we may be able to secure an agreement that will meet the requirements of the anthracite mine workers, we remain on behalf of the General Scale Committee:

"John T. Dempsey and John M. Mack, District 1.

"Thomas Kennedy and John Yourishin, District 7.

"C. J. Golden and James McAndrew, District 9 and

"Philip Murray, International vice-president."

The sessions on March 25 and 26 were taken up by a discussion of the wage demands of the miners, the operators presenting statistics showing the earnings of the men in the bituminous fields. It was predicted that with the return of John L. Lewis, the International President, to this city the sub-committee would work faster.

With the return of International President John L. Lewis from Washington it is expected that the sub-committee will get down to hard work. Mr. Lewis said his reports of the situation were optimistic and he felt confident that an agreement will be reached speedily.

He has been in Washington for the past two weeks in connection with the Bituminous Coal Commission's report and returned to New York on March 27 to make arrangements for the conferences between the bituminous operators and the miners' representatives at which a contract will be negotiated.

While no definite announcement has come from the sub-committee regarding the wage demands excepting the original demand of 60 per cent increase, the miners have said that while they will continue to press for the full increase demanded they will not accept less than 45.7 per cent. The men claim that they are entitled to 18.7 per cent more than the 27 per cent increase granted the bituminous mine workers by President Wilson's Commission.

The miners' leaders say that until recent years the anthracite mine workers received more pay than the men working in the bituminous mines but that this difference has not been maintained and they believe that now is the time to regain the loss. It has been declared that they must get the maximum figure in order to make their wages keep pace with the high cost of living and with the scale of wages received by the men in the bituminous fields.

The sessions on March 26 were devoted to a continuation of the offering of arguments and statistics by the operators in answer to the miners' arguments and statistics presented some days ago covering the comparison of time worked and earnings in the anthracite and bituminous-coal fields, after which the meeting adjourned.

A short session was held on Saturday, March 27, after which the sub-committee adjourned until 2 p.m., Tuesday, March 30. At its conclusion this statement was made: "The sub-committee of anthracite operators and mine workers met today. The time of the session was occupied by the operators in the presentation of statistics compiled by them in answer to the date heretofore submitted by the miners."

Operators Consider Byproducts of Award Especially Valuable

Settlement Believed to Constitute a Precedent That Will Reduce Wage Adjustment to Exact Science—White's Minority Report Considered Unfair and Misleading—Income of Bituminous Concerns Refutes Allegation of Enormous Profits

WITH the full text of the reports of the Bituminous Coal Commission before them, operators are now inclined to view the majority report with much more favor than they did when they were cognizant of only a few of the high points of the decision. The feeling that there is no justification for saddling the people with a new living cost running high into the millions is none the less strong, but the byproducts of the award are regarded as splendidly valuable.

Sight is not being lost of the fact that this award constitutes a precedent which is likely to be followed and which will ultimately reduce wage adjustments to an exact science. Many believe that the day is past when wages in the coal industry will be fixed by bargaining alone without careful attention to the necessity for developing all the facts

There is some fear on the part of the operators that the plan for a seasonal freight rate will not be as attractive in practice as it appears. It is certain that it will work to great advantage in some fields, but many operators think that certain districts will be affected adversely. There is a general feeling that a step of such importance should be taken only after its probable effects have been studied from all angles.

In some districts, for instance, the stimulation in the movement of the larger sizes will be such that it will make it extremely hard to take care of the screenings. In many localities the seasonal freight rate may well have an important bearing on the type of coal that will be used. Important readjustments will unquestionably be necessary, and the hope is expressed that the plan will not be put into effect too drastically until its operation is somewhat better understood.

One of the principal causes of satisfaction on the part of the operators is the evident fact that the majority members followed the Garfield principle in arriving at their conclusions as to wage. It is apparent that the majority of the commission made its calculation in exactly the same manner as did Dr. Garfield with the exception that it had much more complete data with which to work and had later figures on increases in the cost of living.

As indicated in John P. White's report, the living cost, on which the calculation was predicated, showed an increase of 97 per cent over that obtaining during the pre-war period. The important increase in the cost of living since the time of Dr. Garfield's calculation tends to refute the Attorney General's contention that the Administration's drive is holding prices on an even keel.

The minority report comes in for severe censure on the part of the operators. They state that it is a return by labor to its old methods of securing wage adjustments. It has been its habit to resort to oratory rather than to deal with facts. It is pointed out that Mr. White's statement is in large part not constructive but merely an argument against the majority report. Many instances are cited in which it is alleged that he has used unfair examples in an effort to substantiate his point. A conspicuous instance, to which operators point is the following statement of Mr. White: "From

1913 to Oct. 31, 1919, the mine workers' rate per ton increased 23c, the operators' receipts increased $1.41 and the retail dealers' receipts increased $2.10."

The unfairness of that statement is held to be obvious. Another example is when he cities average earnings in northern Illinois as being indicative of the general condition. The contention of the operators is that he should have mentioned that the northern Illinois district is not typical and should have pointed out that miners there earn important additions to their yearly income in occupations other than mining.

A source of great satisfaction to the operators is the tabulation of the net-income returns filed by bituminous coal-mining concerns. This tabulation effectively refutates the statements made by Messrs. McAdoo and Glass through which the public has been led to believe that coal operators in general have been making enormous profits. This tabulation shows that the average per cent of net income to invested capital was 9.72—a small return when the hazard of the investment is considered.

The decided conflict between the showing made by the Treasury Department's tabulation and the claims of Mr. White in his argument under the sub-heading of "Profits of Bituminous Coal Companies" is held to be striking. Mr. White's recourse to Senate Document 259 is pointed to as another glaring instance of unfairness. His reference to the 32 companies cited by the mine workers also is held to be unfair since they constitute only 32 companies out of 7,000 and include those engaged in the anthracite trade, in retail dealing and in the lumber and coke business.

That section of the majority report which deals with the six-hour day and five-day week is regarded as being of the greatest value in meeting an unsound tendency which might have had far-reaching effect had the majority been misled by the rather plausible argument that had been made in behalf of that proposal.

Hines Gives Out Text of Order Suspending Coal Diversion

THE full text of the order issued by the Director General of Railroads in regard to the diversion of coal is as follows:

"I, Walker D. Hines, Director General of Railroads, acting, with respect to control of the distribution of coal, under authority delegated to be by certain orders of the U. S. Fuel Administrator, dated Oct. 31, 1919, and Dec. 8, 1919, and by certain Executive Orders of the President of the United States dated Feb. 28, 1920, March 5, 1920, and March 19 1920, hereby order and direct as follows:

"That all rules, regulations, orders or directions issued by me or under authorization from me under and by virtue of the aforesaid delegation of authority to me shall be and until further notice shall remain suspended from and after 12:01 a.m., April 1, 1920; and especially a certain order made by me on March 5, 1920, establishing a certain preference or priority list and designating as my representatives certain Regional Coal Committees with power, within the limits and for the purposes therein specified, to make diversions of coal in the possession of railroads operating in the United States as common carriers."

Commenting on the order, the Director General states that "H. B. Spencer as chairman of the Central Coal Committee, today instructed all regional and district coal committees through which the control of the Director General over the distribution of coal has been exercised, to cease functioning as the Director General's representative at 12:01 a.m., April 1, 1920, and to give notice to all parties concerned that on and after 12:01 a.m., April 1, any and all orders issued by the committees will cease to have force or effect.

"The activities of these committees, which since March 5 have been charged with the duty of protecting the emergency fuel requirements of railroads, public utilities and other consumers in the first five classes of the Fuel Administrator's preference list, will be confined to carrying out the conclusion settlements for coal diverted prior to April 1.

"The committees have been advised that during the period remaining in which the Director General will exercise control over the distribution of coal, it is imperative that diversions shall be held at the absolute minimum necessary to meet current requirements of consumers in the first five classes and they have been instructed to exercise the greatest possible vigilance in seeing to it that no railroad, public utility or other consumer is permitted to build up a reserve supply of coal through diversions."

Brice Claggett, assistant to the Director General of Railroads, has been placed in charge of the work in connection with winding up matters relating to the distribution of coal by the Railroad Administration.

Southern Illinois Wants All Concessions It Struck To Obtain

Remembering that southern Illinois was the earliest, loudest and most disorderly in making a demand for the shorter day, the abbreviated week and increased pay, it is not to be wondered at that much dissatisfaction is being expressed by local leaders as well as by the men themselves in Franklin and Williamson, as well as other southern Illinois counties, over the majority report of the coal commission.

The men continue to fondly hope for that six-hour day and five-day week, along with the sixty per cent wage increase, and claim they will not be satisfied with anything less, and unless they get it there will be a general strike when the present contract expires in April.

Good Housing at Fair Prices

ONE of the leading dicta of the majority report of the Bituminous Coal Commission gives the operators, who have been renting good houses at less than fair rents, no little gratification.

"We therefore recommend that when houses are to be constructed by operators, houses of a modern type, with good sanitation, shall be built, the type of house to be based on the probable life of the mine; that rentals shall be based on the actual investment in houses and land; that the return should include no profit to the operator; and that the rentals should be only sufficient to maintain the structures in good condition, provide for the amortization of the investment cost and proper insurance, and return not to exceed 6 per cent on the invested capital while such sum is invested.

"Where the expected life of the operation exceeds 25 years the period of amortization shall be 25 years, but in no other event shall the amortization period be less than the expected life of the property."

New England Retailers Favor Price Control

One Dealer Declared That Now Price to Him Is Unregulated He Will No Longer Be Able to Make $3 a Ton as He Always Has Done—Retailers Opposed to Frelinghuysen's Federal Coal Commissioner and to His Freight Differential

RETAIL coal men from Greenwich, Conn., to Eastport, Maine, assembled in Springfield, Mass., March 24. Each year gives a new record of attendance and there are only a few now who are willing to withhold their support from this active organization. Springfield, Mass., is convenient to the greater number, but the Auditorium is better adapted to larger gatherings, and the association might well consider whether in future it would not be better to meet in a hall where speakers could more easily make themselves heard. The meeting was a success, however, in spite of some disadvantages; the discussions were well led, were interesting, and in the plans that were unfolded was much of great promise for the coming year.

With characteristic breadth of mind the retailers don't care who regulates the operator or how low his prices are placed, so long as no one constricts the sacred liberties of the retailer. In fact, the Lever Act and Dr. Garfield's attempt to use it for the purpose of compelling the operators to absorb wage increases do not seem subversive of the liberties of any one—in New England.

William A. Clark, Northampton, Mass., long the president of the association, opened the session on Wednesday by presenting Mayor Adams of Springfield, who made a cordial address of welcome. After routine business, the election of officers, etc., the convention settled down to coal discussion. Edward W. Parker of the Anthracite Bureau of Statistics had been announced to speak on "The Anthracite Question," but he was unable to be present. The prospect of hearing this paper was a great drawing card and real disappointment was expressed at Mr. Parker's absence.

URGES OPPOSITION TO FEDERAL COMMISSIONER

The meetings are purposely held near April 1 because of the great interest of coal men in the anthracite spring program, and to an unusual degree that was true of the convention just held. Ellery B. Gordon, secretary-manager of the national Retail Coal Merchants' Association, had a hard place to fill, for not only was he called upon to speak on his own topic, "National Matter," but it was also put up to him to cover Judge Parker's time as well. This he did most acceptably, giving the members a graphic account of legislation now pending in Washington.

Specifically, Mr. Gordon dwelt upon the three proposals of Senator Frelinghuysen's committee. The association received sympathetically Mr. Gordon's strictures on the first and third of these, the 15 per cent summer reduction in railroad rates as an incentive for purchasing coal early and the creation of a new Federal commissioner with inquisitorial powers. Coal men were urged to oppose vigorously both measures, and particularly the latter.

In Mr. Gordon's judgment the control sought would be altogether too high-handed and far-reaching and of a piece with legislation which provided for the Federal Trade Commission, the rulings of which are now being brought to question in the courts. As compared with the new plan the Lever Act, Mr. Gordon felt, was relatively harmless, for after all it applied only to the period of the war. Mr. Gordon emphasized the injury such overregulation would be certain to work in the trade. The second proposal, to draw the teeth of the Fuel Administration as now administered, was generally approved, although recognized as unnecessary in view of the recent Executive order. There was lively comment from the floor, and the outcome, a formal resolution, met with instant approval. For the interest of coal men in other sections we print the text:

"*Whereas*, we, members of the New England Coal Dealers' Association in convention assembled, recognize our responsibility of service to the coal purchasing public; and whereas for the period of the war we have done our duty, having rendered our service with the consciousness of bearing our part of the burden for the best interests of all, under government restictions that have been vexatious and costly, both to ourselves and to consumers; and whereas we have now arrived at a time when we feel that government supervision of our business is unnecessary and that continued supervision will prove costly both to the retail merchant and to those we serve, the public; and whereas the distribution of coal under government regulation has been a decided failure and the re-establishment of such regulation must work harm to all; and whereas the idea that there have existed in the coal business tremendous margins that have permitted extraordinary profit on the part of the retail coal merchant is not founded on fact, as has proven by government investigation; therefore, be it RESOLVED, that the New England Coal Dealers' Association do hereby protest against further government regulation of the retail coal industry and oppose absolutely the favorable report of Senate bill 4089 by the Senate Committee on Interstate Commerce, and that the secretary be directed to send copies of these resolutions to Senator Frelingbuysen, to all members of the Committee on Interstate Commerce, to the National Retail Coal Merchants' Association and to the New England Senators and Representatives in Congress and to every Chamber of Commerce in New England."

The President's announcement of unrestricted prices April 1 also came in for free comment. There was manifest a distinct sentiment favorable to the clamps staying on, but there was no vocal prophet present to point out just how steam coal would reach New England should the fixed price be continued and the operators be required either to meet all wage increases out of their own pockets or sell their coal abroad. It should be remembered that by far the greater number of New England retail dealers distribute only small tonnages of bituminous and do not realize in what volume it must be secured if our industries are to be kept in operation. One dealer in a small town was heard to say he had always been able to clear $3 a ton on soft coal, but if the lid was lifted he didn't see how it could be done hereafter!

Thursday forenoon there was a series of papers on such topics as "Degradation," "Cost of Doing Business," "Advertising in a Small Community," and "Application of Truck Costs." The general discussion disclosed bits of information that the members appreciated. A lot of note-taking was observed, and that is a good sign.

President Clark's formal address, after the municipal organ had shown its power and range, was a review of New England's peculiar situation with regard to anthracite since 1916. He complimented railroad management on the service during the worst succession of snow storms visited upon this region in many years, but his references to anthracite shippers in general were anything but complimentary. Save for the dull period in February and March of 1919, when, by the way, retailers could not be induced to order coal, Mr. Clark made it plain that for four years coal has sold itself. The chief complaint seemed to be "the indifference of the producing companies" to the needs of an area like New England, which easily absorbs 15 per cent of the entire output of anthracite. Mr. Clark doubtless meant that New England is willing to take 15 per cent of the output of egg, stove and chestnut, especially chestnut.

There was a further address on "The Experiences of a Retail Coal Merchant," this by Frank H. Beach of New York. The set program came to an end with a characteristically snappy speech by George H. Cushing. Needless to say, Mr. Cushing dilated upon the sins of the authorities, but his remarks were followed with the closest attention. Coal men came away in hearty agreement that Mr. Cushing knows coal and is rightly placed as director of the American Wholesale Coal Association.

The usual exhibit of coal-handling fixtures and supplies, always a feature of these meetings, was liberally patronized. The available space was disposed of months ago, and this speaks well for the growing effectiveness of the association.

Wednesday evening at the Hotel Kimball there were 560 seated for dinner. The entertainment was elaborate and was followed by dancing. There was some evidence that the great drouth was not so pervasive as some are led to think, and this fact should never be lost sight of in listing the attractions of a retail coal dealers' convention.

Many Labor Trials in New River

Ten Union Workers Charged with Perjury—Union Seeks Conviction of Nine Men—Government Aiming to Deport Murderer

TEN persons prominently connected with the United Mine Workers of American in District 29, which embraces the New River field of West Virginia, were indicted during the third week of March by a grand jury in the Intermediate Court of Raleigh County. The charge upon which the ten stand indicted is perjury in connection with the evidence given in the recent trial of Tony Stafford, who was found guilty the latter part of February of the charge of attempted murder for having tried to shoot up the Glen White plant of the E. E. White Coal Co. in November, 1917.

Those against whom indictments were returned were as follows: J. R. Gilmore, president of District 29, U. M. W.; Lawrence ("Peggy") Dwyer and Joe Patton, board members; John Gatherum, secretary of District 29; Marshall Price, colored organizer; G. F. Parsons, Socialist editor; Tony Stafford, J. E. Brooks, Lizzie MacMillen and John Keeney.

Indictments Brought Under "Red Men's Act"

The same grand jury which returned the indictments against these men also returned a number against certain mine workers under what is known as the "Red Men's Act" of West Virginia, the indictments for conspiracy growing out of the labor troubles occurring at Willis Branch in January, during which, it is alleged, members of the Willis Branch local of the United Mine Workers of America banded themselves together to prevent certain miners from working during a strike. In furtherance of this conspiracy, it is alleged, attacks were made on the night of Jan. 20 against Lee Kidd and Charles Treadway.

Under the name of the United Mine Workers of America, indictments for felonious assault have therefore been lodged against the following men: Frank Lafferty, Norman Maynor, Jesse Lilly, Walter Romine, Chas. Lafferty, Ezra Godbey, Nemiah Daniel, Elmer Collins, Demsey Vass. It is understood that indictments of a similar nature are to be returned by the Fayette county grand jury when it meets next week. Much property on the Fayette side of Willis Branch was destroyed during the trouble.

The hearing of deportation proceedings against Tony Stafford, which have been conducted at Beckley, W. Va., by Inspector of Immigration M. F. O'Brien, of Pittsburgh, came to rather an abrupt end, at least in so far as the inspector was concerned, March 18. Mr. O'Brien left on that date for Pittsburgh without making a report as to his findings in the proceedings, it being understood that his report will be filed with the chief inspector there.

Mine Workers Are Ejected from Court Room

No one appeared at the hearing for the government except Inspector O'Brien. At the beginning a large number of mine workers filled the court room, but before work was started the inspector ordered the room cleared except for the attorneys, the deputy marshals and Herman Pugh, of Huntington, a court reporter for the government.

At the conclusion of the testimony of several witnesses, Inspector O'Brien announced that the case was closed as far as the government was concerned. The defense is understood to have had about forty or fifty witnesses to be heard, but Inspector O'Brien is said to have informed the attorneys that if this was the case, and more than ten witnesses were to be called, the witnesses must submit their evidence in the form of affidavits to the office of the chief inspector in Pittsburgh.

West Virginia has now to contend with a number of troublesome characters. Fortunately it has good citizens who respect the peace, as for instance, the grand jury herein referred to and its competent Governor, John J. Cornwell.

McAdoo's Statements of Big Operating Profits Not Sustained

Figures from Internal Revenue Bureau Show That in 1918 the Group of Operators That Produced the Most Coal Were Those Who Made from 15 to 20 Per Cent Profit

FROM the Majority Report of the Bituminous Coal Commission is taken the table, charts and comment contained in this article. It reassuringly shows that the coal operators made satisfactory but not exorbitant profits from coal production during the closing year of the war.

"A table is shown herewith based on the returns made by coal operators to the Bureau of Internal Revenue for the year 1918. In this table are included returns from 1,551 operators, representing about one-third of the coal tonnage produced in 1918. We have the assurance of the U. S. Geological Survey that the relative figures would not be greatly different if all the operators were included in the returns. Of the 1,551 companies 337, or 22 per cent, reported net losses in 1918, and 168 companies, or 11 per cent, reported net incomes of less than 5 per cent on invested capital. Two charts illustrating this table are also presented.

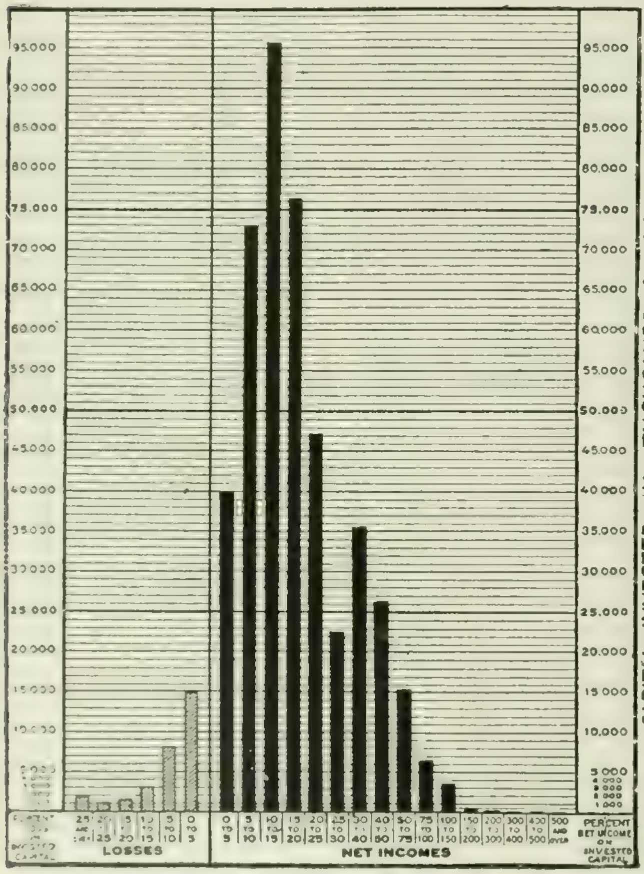


CHART 1. INVESTED CAPITAL OF GROUPS MAKING CERTAIN PERCENTAGES OF PROFIT

The group earning between 10 to 15 per cent had the largest amount of invested capital, slightly exceeding $95,000,000. The next important group from point of view of invested capital, that earning 15 to 20 per cent being followed closely by that earning 5 to 10 per cent.

"It is to be expected that companies which were not able to operate profitably in 1918, when the demand for coal was unlimited, will be unable to remain in business in normal times, and that many of the companies making net returns of only 5 per cent during that banner year will also decide to discontinue operations under competitive conditions.

"The two groups of companies reporting net losses and incomes of less than 5 per cent constitute about one-third of those for which returns are available, but represent only about one-seventh of the total invested capital and about one-ninth of the total tonnage. It is believed that the nation's coal requirements can ordinarily be met by the operation of those collieries alone which have advantages resulting in lower production costs and consequent larger returns on invested capital.

"The figures show that 36 per cent of the operators represented, having about 62 per cent of the total invested capital and producing about 48 per cent of the total tonnage, made net incomes of between 5 and 25 per cent on their investment, while other companies, still more fortunately situated, made even higher returns. The companies, however, that showed net incomes of over 25 per cent represent in the aggregate

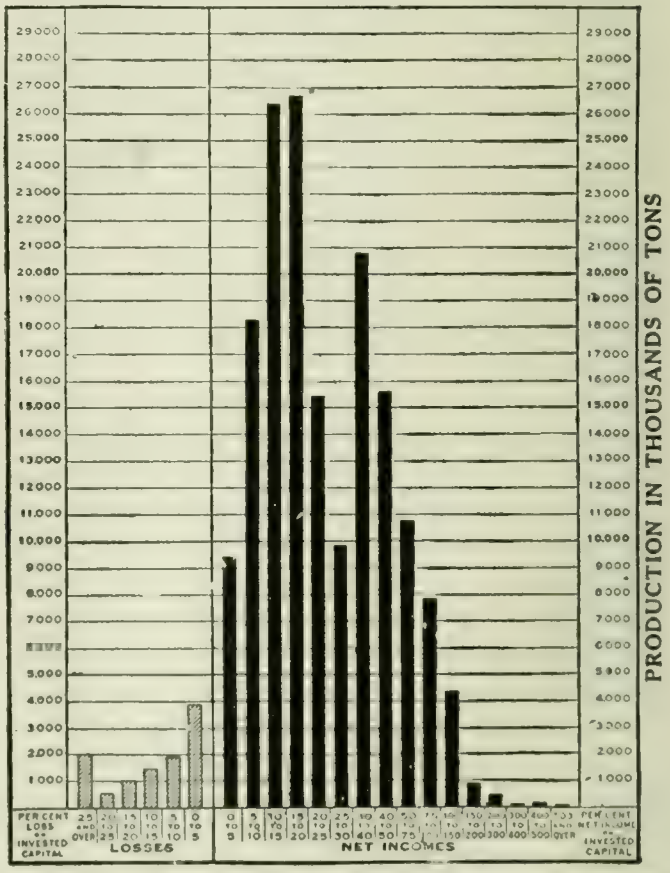


CHART 2. TONNAGE PRODUCED BY GROUPS MAKING CERTAIN PERCENTAGES OF PROFIT

The most productive group earned 15 to 20 per cent profit, the next lower group earned 5 to 10 per cent, the group below that 30 to 40 per cent and the fourth group 5 to 10 per cent.

NET INCOMES OF 1,551 BITUMINOUS COAL MINING CONCERNS FOR 1918

	Number	Capital Stock	Invested Capital	Net Income	Taxes: Income Tax	Taxes: War and Excess Profits Taxes	Taxes: Total Tax	Net Income, Tax Deducted	Average Per Cent of Net Income, Tax Not Deducted	Average Per Cent of Net Income, Tax Deducted	Tonnage
A Returns reporting income											
Net income per cent											
Less than 5	168	$28,582,464	$41,932,284	$897,407	$81,675	$1,49	83,167	$814,240	2.14	1.94	9,452,285
5 to 9.99	159	51,082,688	73,668,946	5,819,355	641,328	70,249	711,577	5,107,778	7.90	6.93	18,292,627
10 to 14.99	158	61,005,338	94,881,665	10,798,316	1,150,697	1,084,054	2,234,751	8,563,565	11.38	9.03	26,433,974
15 to 19.99	134	39,062,476	76,089,233	12,925,742	1,037,659	3,661,204	4,898,863	8,026,879	16.99	10.55	26,750,835
20 to 24.99	103	16,742,404	47,264,900	10,886,366	806,626	3,796,539	4,603,165	6,283,201	23.03	13.29	15,443,012
25 to 29.99	66	11,085,063	22,841,827	6,184,866	377,269	2,839,684	3,216,953	2,967,913	27.08	12.99	9,965,090
30 to 39.99	125	17,955,923	34,512,152	12,232,299	662,260	6,400,444	7,062,704	5,169,595	35.44	14.98	20,837,882
40 to 49.99	74	14,150,490	26,238,024	11,336,439	557,200	6,471,382	7,028,582	4,307,857	43.20	16.42	15,693,759
50 to 74.99	97	6,266,100	15,216,439	8,930,410	430,340	5,146,941	5,577,281	3,353,129	58.69	22.04	11,806,639
75 to 99.99	65	2,598,851	6,667,509	5,735,847	247,899	3,514,584	3,762,483	1,973,364	86.03	29.60	7,987,053
100 to 149.99	39	2,077,885	3,588,619	4,296,253	178,907	2,778,866	2,957,773	1,338,480	119.72	37.30	4,373,005
150 to 199.99	12	249,572	424,511	756,770	33,080	456,420	489,500	267,270	178.26	62.96	910,734
200 to 299.99	8	115,700	137,597	351,451	13,205	224,930	238,135	113,316	255.42	82.35	498,365
300 to 399.99	2	4,300	11,772	39,366	2,532	14,265	16,797	22,569	334.40	191.72	144,656
400 to 499.99	2	18,000	33,244	138,072	5,102	91,546	96,648	41,424	415.33	124.61	166,181
500 and over	2	5,300	11,824	125,248	7,389	59,669	67,058	58,190	1,059.27	492.13	137,254
Total reporting net income	1,214	251,002,554	443,520,546	91,454,207	6,233,168	36,812,269	43,045,437	48,408,770	20.62	10.91	168,893,351
B Returns reporting loss:											
Loss per cent											
Less than 5	106	9,593,808	14,468,873	*340,894					*2.36		3,901,970
5 to 9.99	58	3,935,362	5,129,012	*359,162					*7.00		1,991,389
10 to 14.99	32	3,146,905	3,034,632	*390,149					*12.86		1,488,947
15 to 19.99	29	1,471,750	1,602,321	*278,449					*17.38		1,001,002
20 to 24.99	20	1,105,860	1,267,789	*287,823					*22.70		606,234
25 and over	92	1,679,154	1,942,604	*963,255					*49.59		2,019,994
Total reporting loss	337	20,932,839	27,445,231	*2,619,732				*2,619,732	*9.55		11,009,536
Total A and B	1,551	271,935,393	470,965,777	88,834,475	6,233,168	36,812,269	43,045,437	45,789,038	18.86	9.72	179,902,887

* Loss.

From Majority Report of U. S. Bituminous Coal Commission of March 10, 1920.

less than one-fourth of the total investment and two-fifths of the tonnage, while the companies making returns of 100 per cent or more represent a total investment of only about $4,000,000 and a total tonnage of about six millions.

"The average returns of all the reporting companies were 18.86 per cent on the investment before payment of the income and excess profits taxes and 9.72 per cent after deducting the taxes. The companies reporting very high rates of return upon investment are all small concerns with investments of only a few thousand dollars, whose net income represents to a large extent the earnings of the owners for their own labor and management."

In chart 1 the capital invested by companies making, in the year 1918, 0 to 5 per cent, is plotted in a heavy black line, the invested capital of those losing from 0 to 5 per cent in a cross-hatched line. Similarly the invested capital of those making 5 to 10 per cent is plotted in a black line and the invested capital of those losing 5 to 10 per cent is plotted in a cross-hatched line. The invested capital of other groupings are similarly plotted.

In chart 2 instead of the capital invested the production is used for a basis of comparison.

Mines Bureau Would Have Miners Examined Periodically

PHYSICAL examinations at regular intervals are advocated for mine workers by the United States Bureau of Mines, and it adds that if such examinations should be applied to mine workers everyone should be similarly examined.

"Every miner and his family should keep in the best possible physical condition," declares the bureau. "A good miner always takes care to keep his working tools in excellent shape, in order that he may do effective work. He also carefully observes the danger signs that are seen at various places.

"In order to keep in good physical condition, every person should undergo a thorough physical examination at least once every year; better still, once every six months. This applies not only to the miner but to every member of his family as well. These periodical physical examinations should be made even if the person is apparently in good health. The physical examinations of young men by the draft boards showed that one of every three men examined was unfit for military service. The same condition of general health probably exists among the young women of the country.

"Many diseases begin without sufficient symptoms to attract attention. Tuberculosis, Bright's disease, and some diseases of the heart may progress for some time before the victim is aware of it. Thorough physical examination at regular intervals is the best means of detecting diseased conditions. Such periodic physical examinations show whether grown persons are in satisfactory physical trim, and also show the growth and the physical development of children.

"Early knowledge of a disease coming on enables the person affected to take the proper steps in the correction of diet, habits, or occupation to arrest the progress of the disease. Early treatment of tuberculosis affords a much better opportunity of checking the disease."

Government Will Buy Coal Early

In connection with the award of the Bituminous Coal Commission the President has requested each Federal department and other Government agencies to "purchase, transport, and store at the point of consumption before July 1 of each year, or if that is not practicable, as soon thereafter as may be feasible, an estimated three months' winter supply of coal."

Bituminous Mine Workers Will Not Strike April 2

Joint Meeting Held in New York City, March 29, Agrees Unanimously to Accept Majority Report of Commission—Men Ordered Not to Strike

On April 1 the bituminous mine workers will begin to reap the benefits of the 27 per cent increase in wages granted them by President Wilson's Bituminous Wage Commission and will remain at work pending the adoption of a new working agreement. This was decided upon at the meeting of the bituminous operators and mine workers' representatives on March 29 at the Waldorf-Astoria Hotel, when the first session of the conference took place that will put into effect the recommendations of the report of Messrs. Robinson and Peale of the Commission, to which John P. White, former International President of the United Mine Workers of America, the third member of the commission, made a minority report.

It was also decided at Monday's conference to refer the work of the conference to a sub-committee of eight miners and eight operators, which will work out the terms of the new agreement on the basis of the Commission's finding.

The miners' representatives, numbering about one hundred, held a meeting in the morning in Bryant Hall, at which John L. Lewis, international president of the miners' union, read the award, explaining it paragraph by paragraph to the miners.

So confident was he that a temporary agreement would be reached and that the men would remain at work after April 1 that he announced early in the afternoon that orders would be sent to all locals to continue work. It also was announced that efforts would be made to secure an increase for the day laborer of $1.25 per-day instead of $1.00 and it was intimated that efforts would be made to make the increase 31 per cent instead of 27 per cent as granted by the award.

The sub-committee that will draft the new working agreement is composed of the following:

For the mine workers: John L. Lewis, international president; Phillip Murray, international vice-president; William Green, international secretary-treasurer; John F. Moore and G. W. Savage for the Ohio district; Robert Gibbons and William Hargest, representing western Pennsylvania; Edward Stewart and William Mitch, representing Indiana, and Ben Williams and Richard McAllister, representing the Illinois miners.

For the operators: P. H. Penna and M. L. Gould for Indiana; C. E. Maurer and Michael Gallagher, for Ohio; E. C. Searle and Herman Perry for Illinois, and J. H. Donaldson and William Henderson for western Pennsylvania.

Upon the completion of the work of the sub-committee it will make its report to a general conference of miners and operators for a ratification of the new agreement. It was decided to meet again at 10 a. m. on the morning of March 30. Following the session President Lewis sent telegrams to all union officers and locals advising them of the action taken by the conference and instructing them to continue at work after April 1.

National Coal Association Shows That Miners Make Good Wages

Under the above caption there appeared in *Coal Age* of March 18, 1920, a series of three tables showing the earnings of miners in various fields and deductions made for smithing and explosives. The tables following are continuations of those above refered to and show mine workers' earnings in additional coal fields. Table I in this issue is a continuation of Table III in the issue of March 18 and Table III here presented is a continuation of Table II previously published.

It will be observed here, as in the previous issue, that the miners that worked reliably not only received greater remuneration per month but also bigger wages per day than those that worked with irregularity. In mining as elsewhere punctuality pays.

Table I. Earnings of Steady Miners

AS REPORTED BY THE OPERATORS OF BITUMINOUS COAL MINES IN VARIOUS FIELDS OF MEN WHO WORKED THE FULL NUMBER OF DAYS THE MINES LOADED COAL, AND ONE DAY LESS, IN THE TEN MONTHS, JANUARY TO OCTOBER, 1919

Occupation	Average Number of Men per Month Working Full Time and One Day Less.	Per Cent of Average Number of Men per Month in Occupation	Average Daily Earnings	Average Monthly Earnings	Average Days Worked per Month
Oklahoma Field					
Pick miners	15	30.61	7.91	97.70	12.36
Loaders	62	24.22	6.93	109.79	15.84
Machine men	15	21.74	8.28	131.04	15.83
Colorado Field					
Pick miners	404	31.64	7.14	152.25	21.33
Loaders	101	19.69	6.88	126.85	18.42
Machine men	27	25.96	9.65	214.44	22.22
Contract labor	6	10.17	4.65	92.39	19.86
Wyoming Field					
Pick miners	112	33.04	8.53	169.48	19.88
Loaders	72	30.90	6.87	139.88	20.35
Machine men	20	30.30	10.54	205.04	19.46
Machine men and loaders	2	10.53	10.94	173.40	15.85
Montana Field					
Pick miners	6	31.57	8.68	119.97	13.83
Loaders	13	32.50	7.73	120.01	15.53
Machine men	2	40.00	10.07	163.13	16.20
Washington Field					
Pick miners	173	37.86	8.13	161.41	19.85
Loaders	*a*	.....	5.48	131.50	24.00
Contract labor	108	27.34	8.55	174.92	20.45
Western Kentucky Field					
Pick miners	38	54.29	6.88	73.77	10.72
Loaders	407	46.62	5.37	61.11	11.38
Machine men	48	41.03	8.17	94.23	11.53
Contract labor	2	22.22	7.36	58.58	7.95
Fairmont Field, West Virginia					
Pick miners	178	27.94	6.98	118.96	17.05
Loaders	368	21.06	6.28	108.10	17.21
Machine men	96	29.63	7.88	140.06	17.77
Machine men and loaders	1	20.00	8.15	88.33	10.83
Kanawha Field					
Pick miners	16	14.95	6.14	111.86	18.21
Loaders	109	23.54	6.08	116.64	19.18
Machine men	29	50.88	7.55	154.74	20.49
Central Pennsylvania Field*					
Pick miners	155	15.18	6.78	94.14	13.88
Loaders	198	15.99	6.38	93.92	14.73
Machine men	43	14.05	7.45	105.51	14.17
Contract labor	1	6.25	4.14	98.67	23.83
Machine men and loaders	13	16.67	8.07	94.24	11.68
Central Pennsylvania Field†					
Pick Miners	743	34.02	6.37	117.10	18.38
Loaders	694	40.49	6.10	100.34	16.46
Machine men	84	28.18	5.67	103.12	18.19
Contract labor	9	16.67	4.43	101.80	22.96
Machine men and loaders	20	35.09	7.85	121.51	15.49

a Less than one

* As reported by 18 bituminous operators whose reports did not cover the full 10 months, January to October, 1919

† As reported by 36 bituminous operators whose reports covered the full 10 months, January to October 1919

Table II. † Earnings of Mine Labor Based on Occupation and Willingness To Work

AS REPORTED BY OPERATORS OF BITUMINOUS COAL MINES IN VARIOUS FIELDS DURING THE TEN MONTHS, JANUARY TO OCTOBER, 1919

The number of calendar days each mine loaded coal is taken as 100 per cent opportunity for labor to work. Table shows average earning of men in various fields per day per month working specified percentage of full opportunity. In some cases as noted in the last column of the table some men worked more days than the mine loaded coal into the railroad cars.

Occupations	Less than 25 per cent	25 to 49 per cent	50 to 74 per cent	75 to 100 per cent	More Days Than Mine
Average Daily Earnings					
Oklahoma Field					
Pick miners	6.71	6.79	6.87	7.69	7.80
Loaders	5.07	5.68	6.23	6.88	5.76
Machine men	6.82	6.17	6.67	7.43	6.07
Inside day labor	5.06	4.81	5.35	4.82	5.49
Outside day labor	4.70	4.77	5.15	4.76	5.61
Monthly men	.....	.....	4.08	4.37	3.69
Average Monthly Earnings					
Pick miners	19.47	35.19	87.58	137.27	162.59
Loaders	11.42	37.63	72.53	113.14	108.60
Machine men	11.81	44.65	80.50	128.97	125.97
Inside day labor	12.75	35.29	64.28	87.32	125.63
Outside day labor	11.05	32.04	65.79	85.33	137.22
Monthly men	...	...	56.13	69.38	104.59
Average Daily Earnings					
Colorado Field:					
Pick miners	5.47	6.09	6.49	7.02	7.88
Loaders	4.89	5.61	5.83	6.46	7.05
Machine men	6.55	7.17	7.35	9.24	7.67
Contract labor	6.00	5.57	5.58	4.98	5.21
Inside day labor	5.23	5.26	5.28	5.31	5.54
Outside day labor	4.80	4.84	4.69	4.81	5.12
Monthly men	5.79	5.75	6.12	5.92	5.23
Average Monthly Earnings					
Pick miners	15.60	51.22	93.96	145.61	164.70
Loaders	13.55	46.76	83.36	129.96	137.65
Machine men	16.14	60.94	104.70	198.2	177.84
Contract labor	21.27	48.73	69.89	101.11	133.59
Inside day labor	15.43	43.93	78.36	116.28	139.43
Outside day labor	15.27	40.33	66.55	106.45	131.74
Monthly men	22.00	59.20	87.25	146.84	152.77
Average Daily Earnings					
Wyoming Field					
Pick miners	6.77	7.76	7.94	8.27	10.24
Loaders	5.64	6.17	6.26	6.80	7.21
Machine men	9.22	11.52	11.81	10.52	10.17
Machine men and loaders	8.92	11.78	11.41	11.32	12.21
Inside day labor	5.52	5.58	5.65	5.63	5.67
Outside day labor	5.12	4.88	5.01	4.88	5.36
Monthly men	5.48	5.19	5.23	5.06	4.97
Average Monthly Earnings					
Pick miners	20.52	67.12	111.92	160.73	212.17
Loaders	16.86	54.09	88.58	138.04	132.65
Machine men	22.45	95.01	172.43	210.70	218.75
Machine men and loaders	29.00	95.65	151.00	196.09	212.33
Inside day labor	16.29	47.95	80.86	121.20	147.31
Outside day labor	14.97	40.78	71.60	104.26	146.19
Monthly men	14.80	46.00	93.73	119.70	149.32
Average Daily Earnings					
Montana Field:					
Pick miners	6.80	8.20	7.99	7.63	10.44
Loaders	6.11	6.97	7.13	7.89	7.74
Machine men	7.36	7.57	7.92	9.82	6.53
Inside day labor	5.92	5.80	5.82	5.78	6.06
Outside day labor	5.33	5.47	5.43	5.00	5.66
Monthly men				.....	4.47
Average Monthly Earnings					
Pick miners	17.00	48.45	95.52	112.12	251.19
Loaders	18.68	52.23	89.29	134.71	171.63
Machine men	17.17	53.00	95.00	155.35	170.22
Inside day labor	20.38	42.76	74.63	97.91	150.52
Outside day labor	13.74	38.96	66.00	84.92	145.57
Monthly men				..	131.75
Average Daily Earnings					
Washington Field:					
Pick miners	6.20	6.56	7.24	8.09	7.32
Loaders	.....	5.88		5.48	5.93
Inside day labor	5.52	5.62	5.49	5.48	5.83
Outside day labor	5.05	5.03	4.80	4.84	5.36
Contract labor	8.26	8.37	8.79	8.57	9.06
Monthly men	7.00	7.61	9.18	7.18	5.48
Average Monthly Earnings					
Pick miners	18.84	57.22	101.96	161.55	159.02
Loaders	.....	47.00	......	131.50	166.00
Inside day labor	18.10	51.41	80.51	113.62	149.71
Outside day labor	15.22	42.09	70.16	104.10	144.28
Contract labor	29.28	79.11	128.52	177.82	195.29
Monthly men	7.00	78.67	115.08	124.49	153.40
Average Daily Earnings					
Western Kentucky Field					
Pick miners	4.73	5.00	5.93	6.71	6.93
Loaders	4.22	4.60	4.61	5.21	5.37
Machine men	6.32	6.81	7.26	7.87	6.49
Inside day labor	4.28	4.12	4.08	4.23	4.35
Outside day labor	3.36	3.48	3.86	3.73	4.15
Contract labor	6.50	7.33	7.02	7.14	5.22
Monthly men	2.71	3.50	......	4.61	4.25
Average Monthly Earnings					
Western Kentucky Field					
Pick miners	11.09	34.20	57.95	74.65	103.18
Loaders	9.34	21.81	46.40	64.20	80.47
Machine men	12.76	36.40	85.57	97.60	99.59
Inside day labor	10.06	22.43	44.47	65.41	83.95
Outside day labor	6.98	17.46	37.48	53.71	89.60
Contract labor	19.50	26.40	55.00	61.33	93.40
Monthly men	3.80	35.00		119.50	121.95
Average Daily Earnings					
Fairmont Field, West Virginia:					
Pick miners	4.99	5.48	5.95	6.82	6.44
Loaders	4.57	5.22	5.72	6.11	5.63
Machine men	6.11	6.56	6.96	7.93	7.77
Inside day labor	4.67	4.69	4.82	4.83	4.95
Outside day labor	4.75	4.51	5.57	4.67	4.80
Monthly men	...	..	4.18	5.42	4.34
Machine men and loaders	5.25	7.56		8.13	7.72
Average Monthly Earnings					
Pick miners	12.70	40.35	79.64	120.14	106.37
Loaders	12.82	38.31	78.98	112.07	95.32
Machine men	17.59	46.11	91.51	152.50	150.28
Inside day labor	9.92	34.45	65.90	96.80	106.31
Outside day labor	13.00	32.35	63.44	98.62	113.91
Monthly men			55.57	127.42	120.42
Machine men and loaders	7.88	40.80		85.78	94.83
Average Daily Earnings					
Kanawha Field:					
Pick miners	5.04	5.38	5.68	5.86	6.95
Loaders	4.72	5.27	5.70	5.84	6.73
Machine men	5.09	4.76	5.83	7.17	5.47
Inside day labor	4.46	4.51	4.49	4.43	4.74
Outside day labor	4.07	4.26	4.35	4.61	4.54
Contract and gang labor	1.67	2.38	3.94	5.29	2.92
Monthly men		4.00	4.55	2.45	3.94
Average Monthly Earnings					
Pick miners	12.81	40.24	74.31	106.58	153.86
Loaders	13.29	38.29	76.94	111.80	124.83
Machine men	11.75	37.30	74.70	146.41	121.07
Inside day labor	10.88	34.40	62.06	89.47	101.03
Outside day labor	9.92	33.50	58.89	95.51	103.80
Contract and gang labor	4.00	19.00	46.00	74.00	79.93
Monthly men		28.00	70.50	49.00	112.67
Average Daily Earnings					
Central Pennsylvania Field*:					
Pick miners	5.35	5.69	6.27	6.72	6.46
Loaders	4.87	5.72	5.76	6.15	5.91
Machine men	5.60	6.16	6.67	7.11	6.37
Machine men and loaders	7.03	9.73	7.57	8.11	9.20
Contract labor	4.48	4.37	4.63	4.49	4.77
Inside day labor	4.86	5.19	5.18	5.30	5.35
Outside day labor	4.33	4.60	4.64	4.65	4.83
Monthly men	.....	4.21	5.58	6.57	4.58
Average Monthly Earnings					
Pick miners	13.25	35.88	82.85	104.97	117.71
Loaders	13.25	36.10	69.77	96.02	116.51
Machine men	13.06	42.77	79.65	106.79	117.50
Machine men and loaders	20.43	36.57	107.21	106.73	141.43
Contract labor	15.13	34.10	70.71	102.45	103.69
Inside day labor	11.72	37.54	66.72	98.77	110.69
Outside day labor	10.05	30.44	57.21	86.74	112.06
Monthly men		29.50	92.43	167.60	125.70
Average Daily Earnings					
Central Pennsylvania Field†:					
Pick miners	4.55	5.48	5.71	6.19	6.07
Loaders	5.18	5.51	5.87	6.04	6.32
Machine men	4.84	5.17	5.09	5.52	4.91
Machine men and loaders	5.49	6.86	7.46	8.05	6.28
Contract labor	4.43	4.48	4.50	4.47	4.57
Inside day labor	4.81	5.03	5.03	5.15	5.21
Outside day labor	4.34	4.45	4.44	4.48	4.78
Monthly men	4.02	5.15	3.76	4.70	4.13
Average Monthly Earnings					
Pick miners	12.58	41.34	82.40	117.28	123.11
Loaders	14.03	36.11	78.38	105.03	104.57
Machine men	12.22	38.61	64.98	100.72	101.80
Machine men and loaders	18.38	50.60	96.31	136.17	124.40
Contract labor	14.28	36.95	64.49	97.18	113.69
Inside day labor	12.11	39.25	68.43	101.88	119.54
Outside day labor	11.12	31.05	58.52	87.11	113.81
Monthly men	15.12	42.20	54.41	106.48	119 [illegible]

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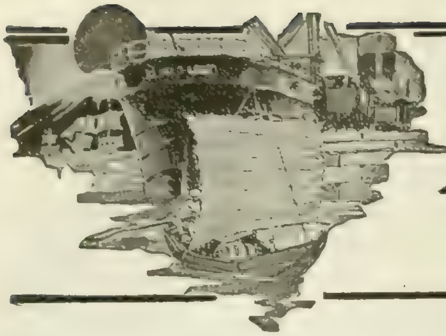
* As reported by 18 bituminous operators in this field, whose reports cover the full 10 months, January to October, 1919.

† As reported by 36 bituminous operators in this field, whose reports cover the full 10 months, January to October, 1919.



FOREIGN MARKETS AND EXPORT NEWS

Export Coal Chartering Is More Active

W. W. Battle & Co.'s coal trade freight report of March 15, 1920, states that export coal chartering was very much more active during the past week than in the recent past and numerous boats were chartered for many of the destinations named below at or about rates quoted.

These charters vary as to conditions, some of them being subject license; some, laydays to commence when vessel is in berth, some, laydays to commence 48 hours after vessel is ready at loading port, permit or no permit; and others, laydays to commence 96 hours after vessel is ready at loading port, permit or no permit. The more favorable conditions the shippers are willing to grant, the lower freight rate they can secure.

The Shipping Board has discontinued freight rates to European and South American ports, but is still quoting freight rates as mentioned below to West Indian ports. The quotations to other destinations are rates now current.

		Rate			Tons displaced
Stockholm	about	$22 50			800
Gothenborg	about	22.00			1000
Antwerp Rotterdam		19 50	19 75		1000
Hamburg		21.50	22 00		1000
French Atlantic exclud Rouen		19 50	20 00		800
Lisbon		18 00	19 00		1000
Cadiz-Bilbao		19 00	20 00		1000
Barcelona		21.50	22 00		1000
Algiers		21.50	22 00		800
Marseilles		21.00	22 50		1000
Genoa Leghorn		21 50	22 00		1000
Spezia Savona		21 50	22 00	—	1000
Piraeus	about	25 00			1000
Trieste Venice	about	27.00			
Pernambuco	about	15.50			500
Bahia	about	15.50			500
Rio	about	14.50			1000
Santos		15.00	16 00		600
Buenos Aires or La Plata or Montevideo		13.00/13.50		—	1000
Para	about	14 50		—	500
Rosario		15 50/16.50		—	750
Bahia Blanca	about	16 00		—	1000
To Nitrate Range	about	8 75			
Havana		7 50		—	600
Sagua or Cardenas		9 00		—	300
Cienfuegos		9 00		—	500
Caibarien		9 50		—	300
Guantanamo		9 50		—	300
[illegible]		9.00		—	400
Manzanillo		9 50		—	300
Baracoa		9 00		—	300
	free [illegible] and [illegible] free				
Kingston		9 50		—	400
St. Lucia		11.00		—	500
[illegible]		11 00		—	500
Santiago		8 50		—	500
[illegible]		9 00		—	400
[illegible]		11 00		—	500
[illegible]		10 50		—	500
	[illegible]				
[illegible]		13 00		—	400
[illegible]		16 00		—	500

[illegible] charter

Belgian Industries Show Remarkable Revival

An [illegible] recently by the Administration of Mines and the Labor Inspection Service of [illegible] of the unemployment and of the extent to which various Belgian [illegible] in December, 1919, indicate the remarkable industrial revival already commented upon by all recent visitors to Belgium, Trade Commissioner C. E. Herring, Brussels, reports. The effect of the general introduction of the eight-hour day and of the large amount of work necessary to restore plants and mechanical equipment in some industries is shown by the following figures:

In December, 1919, the coal mines produced 94 per cent of the 1913 output, although labor employed amounted to 104 per cent of the pre-war figure. Coking plants were producing 37 per cent of the pre-war output while employing 53 per cent of their 1913 personnel. Plants for making briquets for the railways and other industrial uses attained 98 per cent of the pre-war production, with an increase of 9 per cent over the pre-war labor force.

According to the finding of the Administration of Mines, 115 establishments, including coal mines, coke and metallurgical plants, and quarries of various kinds, gave war destruction as the chief reason for subnormal production. 80 plants specifying lack of transportation facilities, 52 lack of adequate coal, 49 labor shortage, 30 reduction of working day, 23 lack of raw materials other than fuel, and 33 (all quarries) lack of orders

Exports and Imports of Coal During January

In January of this year exports and imports of coal, as reported by the Department of Commerce, show marked changes in bituminous as compared with the same month of last year. Anthracite, however, shows less striking variations.

Exports of bituminous totalled 1,249,167 tons compared with 1,207,634 in 1919, while the amount of anthracite exported was 306,069 tons, over 62,000 tons less than during the first month of the preceding year. Total imports of bituminous were 110,258 tons, an increase of nearly 38,000 tons, while 7,404 tons of anthracite were imported, compared with 7,269 tons a year ago.

The figures in detail for January, 1919, as finally revised, are as follows:

EXPORTS (IN TONS)

	Jan 1919	Jan 1920
Coal:		
Anthracite	368,749	306,069
Bituminous	1,207,634	1,249,167
Exported to (in part)		
Canada	768,770	457,909
Cuba	103,639	99,620
Brazil	55,546	48,205
Uruguay	73,702	11,405
Argentina	43,484	145,455
Italy	11,303	128,502
Netherlands	38,442	112,846
Coke	67,526	58,026

IMPORTS

	Jan 1919	Jan 1920
Coal:		
Anthracite, tons	7,269	7,404
Bituminous, tons	72,784	110,258

Shipbuilding in Canada Shows 90 Per Cent Growth in Five Years

According to the Journal of Commerce, Canada's shipbuilding industry now employs about 25,000 men and approximately another 25,000 are engaged in the manufacture of marine equipment and supplies, Consul General John G. Foster, Ottawa, states. It is asserted by the same authority that the industry represents an investment of about $50,000,000 of capital, and that more than 90 per cent of this progress has been achieved within the last four or five years.

The Dominion Government has already appropriated about $70,000,000 for shipbuilding and some further appropriations are said to be under consideration. There is discussion of the expediency of giving out contracts for steel freighters and passenger ships for the National Merchant Marine, to be bonused on the basis of $10 per ton for all steel ships built in Canada that conform to certain standards of construction. The Government also has offered to aid wooden shipbuilding in British Columbia by loaning 75 per cent of the capital cost of vessels built there.

During the first three or four years of the war and up to May, 1918, contracts were given out by the Imperial Munitions Board for 42 steel steamships aggregating 207,800 tons dead weight and 46 wooden steamships aggregating 129,360 tons dead weight. All of these ships have been launched, completed and delivered to the British Government.

In March, 1918, the Dominion Minister of Marine inaugurated the Canadian National Merchant Marine. The first contract was given to the Canadian Vickers (Ltd.) for a 4,300 dead-weight steel freighter. Since then the Government has given out contracts for 58 ships of 343,100 tons, 23 of which have been launched and the greater part of the remainder completed and delivered. The Minister of Marine recently announced that the Government planned to build some combined passenger and freight boats of 15,000 tons gross. It is also stated that many of the leading Canadian shipyards have executed orders from France, Norway, Greece, Australia, Belgium, and other countries.

The Dominion Iron & Steel Co. has made arrangements for rolling ships' steel and for this purpose has erected a mill at Sydney, Nova Scotia. They have contracted to supply 50,000 tons of ships' steel annually for a period of five years. The plant will be in operation the early part of this year.

French Industries Are Crippled by Ruhr Crisis

French industries are suffering acutely because of the curtailment of coal supplies from the Ruhr district of Germany. The cessation of shipments from the Rhine Valley due to Spartacist activities, in fact, is literally starving France's manufactures.

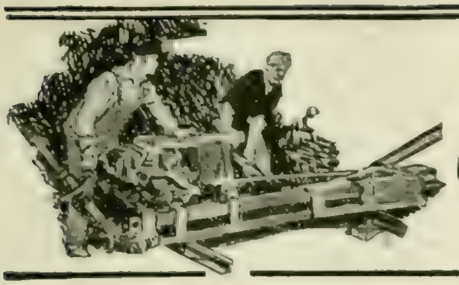
This disordered industrial situation seriously is understood to have impelled the Allies to agree to the proposal of the Ebert government that it be permitted to settle the problem in the Ruhr Valley with a German military force.

The French government would have preferred inter-Allied action in the occupied zone, while the British and the Italians favored granting permission for operations by the German army. The French gave way on this point in view of the acuteness of the fuel situation in France and the dependence of that country on supplies of coal from the Ruhr district.

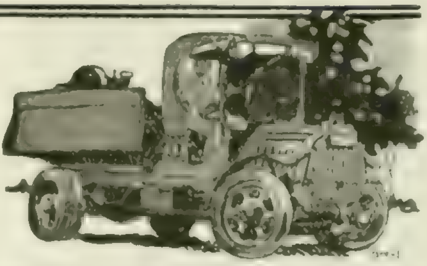
The annual coal requirement of France is 65,000,000 tons, and official figures place the amount that must come from the Ruhr district at 2,000,000 tons monthly. French coal production has decreased from the old figure of 40,000,000 tons to an average of about 18,000,000 tons yearly. By the terms of the Treaty of Versailles Germany is bound to cover the deficiency up to a total of 20,000,000 tons a year. She has never approached that rate of deliveries, however.

English coal, which has been received at the rate of 1,250,000 tons a month, now costs 450 francs a ton wholesale. Belgium is furnishing coal at the rate of 3,000,000 tons a year. With the German deliveries reduced to about 150,000 tons a month the fuel deficit of France is now about 25,000,000 tons.

The experiment of procuring coal from the United States was tried by France, but proved unsuccessful because of the high freight charges and the high rate of exchange. On the restoration of order in the Ruhr Valley, therefore, depends largely the continuation of the French industries. Without a continuous and growing supply of fuel from that source they will be greatly hampered.



COAL AND COKE NEWS



Scranton, Pa.

Governor Sproul at Mine-Cave Zone—Chief of Mines Also Takes a Hand—Tax on Coal to Settle Damages

Pennsylvania's chief executive and the Chief of the State Department of Mines were in Scranton in the early part of the third week of March, looking into the mine-cave situation. This support to Mayor Connell, for such it proved to be, judging from opinions expressed by the state officials, gave the matter more dignified tone. Governor William C. Sproul made a tour of the mine-cave zone in West Scranton and later attended a conference at which were present Mayor Connell of Scranton, Chief of Mines Button, local district mine inspectors and other interested parties. It is needless to say that any interest that Governor Sproul manifests in the mine-cave problem, will appeal strongly to those having in mind an early and definite solution of a menace of such long standing.

The sentiments expressed by the governor indorsing the action of the mayor in exercising the police power and the Davis law provisions, are heartening. The presence of the state Department of Mines is also encouraging, as it is claimed that mine laws have been violated in the case of the Oxford colliery. Furthermore, the matter is said to be beyond the province of district mine inspectors.

While on his tour of inspection, Governor Sproul gave frequent expression to his opinion about conditions in the Mine-cave area, stating that some remedial action must be taken at once. The governor is quoted as saying that "We have got to go through with the taxation proposition to solve this matter. I think it can be done now. The new constitution is being prepared and a greater tax can be put on coal."

How to Solve Mine-Cave Problem

Mayor Connell considers that the question of taxation on anthracite, through the proposed new state constitution, will ultimately solve the mine-cave peril; but such legislation will take too long to be put into effect, and something else must be done at once to apply to the emergency that exists. The mayor commented on former bills, which were drafted to care for mine-cave damages by taxation, and stated that they were bitterly opposed by the bituminous operators of the state, on account of the position such a handicap would place them in, when competing with the soft coal interests of other states. Mayor Connell's final plan, it is reported, includes a commission, appointed by the state, which shall distribute the fund that will come from the larger tax on coal, in event the taxation program goes through.

Chief Seward E. Button, of the Department of Mines, was in conference with the mine inspectors of the Scranton section and requested that special attention be given the Oxford mine, where conditions should be made safe. The inspectors were further instructed to ascertain all the facts at the Oxford and to make a complete report to the Department of Mines. In the event that mining laws are being violated, action will be taken by the state authorities having this matter in hand.

Progress is also expected to be made in settlement of the mine-cave question, when the coal corporation representatives meet the conference committee on mine-caves, which is scheduled to take place about the time this issue of *Coal Age* appears. It is said that the corporation representatives, who will meet in conference, will probably be the men who negotiated the present agreement. This has proved unsatisfactory and a broadening of the agreement is hoped for. During the last few months, the provisions of this agreement have been discussed at conferences, and submitted in their changed state to local operating heads of the mining corporations. The latter discussed the matter and again turned it over to the executives in New York. Representatives of these executive heads are now to meet with the Scranton conference committee to arrange an amicable settlement.

Charleston, W. Va.

Tonnage Declines — Dearth of Cars — Coal at Tidewater Confiscated—Kanawha Output 40 Per Cent—New River Coal Goes to Tide

Less coal was mined on the line of the Chesapeake & Ohio, in that part of the state around Charleston, during the weekly period ended March 20, than during the preceding week, the decline in the tonnage being due to a somewhat more pronounced scarcity of cars, making it plain that there was little to be hoped for from a transportation standpoint, even under private ownership, until more equipment is provided. In addition to the quite acute car shortage (in one field at least), a slide seriously retarded the shipping of coal, preventing at the same time the distribution of cars to the field affected.

On the entire Chesapeake & Ohio system, in fact, there seemed to be a dearth of cars, the shortage being apparent at the opening of the week, when only 132,000 tons were handled, the supply on Monday equaling about 70 per cent of requirements. With only 1,500 cars on the Chesapeake & Ohio for distribution to all its mines on Tuesday, or about a 43 per cent supply, the output dropped to about 77,000 tons.

It was on Wednesday, however, that production reached its minimum. The output on that day fell to 57,000 tons, the run of cars for all Chesapeake & Ohio mines being about 1,200. There was a slight increase on Thursday, another decrease on Friday, and Saturday's placement was only 40 per cent of allotment for the entire Chesapeake & Ohio system.

Actual movement of such tonnage as was produced was rather encouraging, except that slides were rather frequent and that, of course, held back traffic, especially that to the East. Much of the coal produced in this section was consigned to tidewater. A quite considerable tonnage in fact was being assembled at tidewater for export, yet despite the fact that boats were held for such coal, it was being confiscated and diverted in wholesale quantities under very aggravating circumstances to say the least. Indeed, operators saw little difference in the confiscation of coal, whether under private or Government control of the railroads.

Prices and Wages Hold up Contracts

In the negotiating of coal contracts for the new year in this part of West Virginia, producers found conditions such as to make it impossible for them to make any headway. So long as Governmental regulations concerning prices remained in effect, contract making was halted; although another factor in the contract situation has been the uncertainty as to just what may develop in regard to the wage question. At no time in the recent history of the coal industry of West Virginia had so few contracts been made as was the case when the new coal year was ushered in on April 1.

Price restrictions and a shortage of cars, as the coal year was brought to a close, were such as to make mining in this area of the state highly unprofitable, despite the fact that there was an unusually heavy demand. The prediction was being made that unless the situation, as it now stands, underwent some improvement soon, it would result in a serious curtailment of operations at many mines.

Grievances of Kanawha Field

Not so much Kanawha coal was mined in the week ended March 20 as was produced in the preceding week. The only factor responsible for the decrease was a growth in the car shortage. It had reached more serious dimensions at the very outset of the week, than usual. The best the mines were able to do on Monday was 26,000 tons having received only a 70 per cent car supply on that day. However, on Saturday the supply had slumped to 193 cars, or 26.9 per cent of allotment. The average quota of cars furnished Kanawha mines for the week, it is believed, was not much over 40 per cent.

The movement of Kanawha coal was free enough up to a certain point. In other words, embargoes interposed no barriers but confiscations and diversions served the same purpose, confiscation being most marked at tidewater piers, to which there was quite a large tonnage shipped. But confiscation at tide was rather ruthless, it was reported, and consequently shippers were inclined to believe that little coal was finding its way onto boats for foreign ports.

New River Export Coal not Exported

Operations in the New River field, during the third week of the month, were on a smaller scale than was observed in the preceding week, the complaint at all mines being a shortage of cars. It is questionable if mines were able, on an average, to work as much as three full days. Averaging the supply of equipment for the week, it hovered right around the 45 per cent mark.

Most of the product of the New River field was consigned to tidewater for the coastwise trade. Some of the product was being shipped for export. Not all of the export coal was exported, however. In common with the product of other fields it was being confiscated. Between such confiscation and continued price restrictions, New River producers were being reduced to rather straitened circumstances. That they proposed to fight continued Government control was evident on every hand. The perpetuation of such control had effectually brought the contract business for the new coal year to a standstill.

Bluefield, W. Va.

Removal of Government Price Control—Serious Norfolk & Western Problem—Tug River Loading Increases—Pocahontas Decreases

Just at a time when operators in the smokeless fields of West Virginia had about reached the limit of financial endurance, under Government prices, relief came in the removal of all restrictions concerning such prices, it having become apparent, through court action instituted during the third week of the month, that smokeless producers were becoming desperate. Quite a large factor in making it impossible to even produce coal at the price fixed by the Government was the car shortage and the resulting irregularity in operation, the shortage being at quite an acute stage in southern West Virginia during the third week of March.

Production losses were just about offsetting the output. In other words, mines in general were being operated to just about half of capacity, or three whole days during the weekly working period. To aggravate the car shortage somewhat, there were frequent interruptions to traffic, slides, derailments, and so on, preventing prompt movement of coal and also affecting the car supply to some extent.

Carriers were confronted with a serious transportation condition. Equipment belonging to the Norfolk & Western is still on other lines; as a matter of fact this road is seriously deficient in equipment. Under such circumstances this carrier has been forced to go the rounds in supplying various fields, giving one field an adequate supply one week, and supplying another field the next week.

Not only was the inability of southern West Virginia mines to work with any degree of regularity enhancing the cost of production, but it was also demoralizing the labor situation, since miners are earning scarcely enough to make both ends meet.

With the average company mining coal and receiving a price less than cost, financial conditions among the operators in the extreme southern part of the state (as the month drew to a close) were such that numerous suspensions of operations seemed imminent, unless some action was taken to relieve the situation. Operators were desperate, the new coal year was almost upon them and they were unable to complete new contracts. Consumers of smokeless coal were also suffering from such conditions.

Coal Shipped to Tide Diverted

To make matters still worse, most of the coal shipped to tidewater was not being allowed to be exported, but was being taken over by the Tidewater Coal Exchange and diverted; this caused further confusion and financial embarassment, owing to the delay usual in securing settlement for confiscated coal.

The Taft opinion has strengthened the determination of producers to go into the courts to secure relief, when the President revoked all orders governing the price of coal and removed the industry largely from Government control. Following the President's decision, the opinion was expressed that conditions would undergo rapid improvement and that there would possibly be a material increase in exports and an advance in prices sufficient to yield a fair return. However, much will depend upon what carriers are able to do in furnishing the necessary transportation facilities.

Pocahontas and Tug River Situation

Coal loading in the Tug River field during the week ended March 20, reached a total of 81,000 net tons, an excess of loading for any similar period since last December. However, conditions were much better in the Tug River than in adjoining fields. While there has been a steady decrease in production in the Pocahontas field since the first of the month, the contrary is true as to the Tug River field, where there has been a steady increase. The report from the Tug River field is that empties are becoming somewhat more plentiful on the Norfolk & Western. Word was received in the Tug River field on the twenty-third, advising that President Wilson had issued a proclamation suspending all price restrictions and orders respecting coal, except as to the Tidewater Coal Exchange, which controls export business and which will continue to function. For the first time in many months, Tug River operators begin to look ahead hopefully. The comment in this river region on the President's order was that though tardy it would create deep satisfaction.

A car shortage was still checking production to quite a material extent in the Winding Gulf region during the week ended the twentieth, although there had been a slight improvement at least as to the run of cars on the Virginian Ry. Mines on that road were able to work between four and five days during the week.

On the Chesapeake & Ohio, however, the supply was hardly equal to 50 per cent of requirements. The supply in the district as a whole, moreover, was such during the week that a strong committee of operators had been delegated to go to Washington with a view to seeing if a better car supply could not be obtained in the future, mines being seriously crippled in operation through the shortage of empties.

Huntington, W. Va.

Logan Output Lowest Since the Strike —No Cars—No Promise of Improvement at New York Conference

[illegible] last year have the [illegible] under more serious handicaps than they did in the week [illegible] during that period reaching the lowest point in many a month. Certainly at no time since the end of the strike has production been so [illegible] railroad [illegible]

[illegible] affected [illegible] coal-carrying [illegible] output was so slim [illegible] only 151,000 tons, there was a decrease of 12,000 tons.

As a matter of fact [illegible] during most of the week that loadings amounted to only 37 per cent of capacity. That meant a total production loss, of course, of 63 per cent, such losses heretofore having averaged from 50 to 55 per cent at the most. Because of the shortage of cars it is estimated that the loss from that source alone was in the neighborhood of 225,000 tons.

It became evident at the very outset of the week, when only 44,000 tons were loaded, that this period was to be one of small production. The worst fears of operators were realized by Wednesday, however, when with only 122 cars supplied the mines, production dropped to 6,100 tons or about a 12 per cent production.

Not all the coal which was shipped was finding its way to the original destination, to which it had been consigned, for a large tonnage was confiscated during the course of the week, principally after it had reached tidewater. In fact one case had come to light of a large company which had shipped 2,000 cars of coal to tidewater for export, even having vessels waiting for such coal. That made little difference, however, for the bulk of such coal was confiscated and diverted to the New England trade. So far it has not been established as to who will be called upon to pay the demurrage, arising from the fact that vessels were held awaiting the arrival of such coal at tide.

Because of the reasons just set forth, a very small portion of the Logan output shipped to tidewater was actually exported. Up until the twentieth of the month, scarcely any contracts had been entered into for the coming year, and owing to continued price control, Logan operators were finding it difficult to make ends meet.

With price control removed on the twenty-third, however, it is believed that conditions will be somewhat improved in the Guyan Valley. Although so far producers of that field have been able to secure no definite promises of any improvement in transportation facilities from the Chesapeake & Ohio, even though a conference was held with the directors of that road in New York on the eighteenth and nineteenth.

Fairmont, W. Va.

Little Work at the Mines—No Cars—Few New Contracts Made—Who Pays Demurrage in Export Tangle

Conditions in all northern West Virginia fields during the third week of March were more non-conducive to a large production than in earlier weeks of the month, lack of adequate transportation being the principal obstacle to a larger output; although other causes, to a limited extent, were also responsible for the decrease in production as compared with the previous week.

Taking the week by and large, aside from Monday and Tuesday, northern West Virginia mines were forced to accept a supply of empties which limited the output to about 35 per cent of potential capacity. The movement of empties on the Baltimore & Ohio was affected to some extent by a slide, curtailing operations at fourteen different mines, on Monday, the fifteenth.

By a peculiar coincidence, a derailment on the Monongahela Ry. on the same day, blocked coal traffic for virtually the entire day and prevented the distribution of empties to mines on that road to a large extent. The supply of empties on the Western Maryland, as well as on other roads, was greatly restricted throughout the week, so that curtailment of output, by reason of a scarcity of cars, was quite general throughout the entire northern part of the state.

The acute shortage of cars on the Monongahela R.R., throughout the week ended March 20, was generally attributed by operators to the failure of the Pennsylvania R.R. to turn over to the Monongahela the number of cars to which the latter road was entitled; while on the other hand, the Pittsburgh & Lake Erie was apparently furnishing the Monongahela road with an equitable proportion of cars. The Monongahela R.R. is owned jointly by the Pennsylvania and the Pittsburgh & Lake Erie railroads.

Efforts were made during the week, by northern West Virginia operators, to keep the Baltimore & Ohio supplied with fuel under a pro-rata arrangement, that road having found it difficult to secure enough fuel to meet all its needs. While it was possible, during the early part of the week, to furnish railroads a fairly large tonnage, the drop in the car supply during the last half of the weekly working period cut down the railroad tonnage quite materially.

Difficult for Railroads to Make Fuel Contracts

Railroads are now sending their representatives into the coal fields of northern West Virginia to place contracts for the new coal year; but the railroads are experiencing a good deal of difficulty in making contracts, owing to the treatment accorded the operators in previous years, and especially in view of the negligence of certain railroads in the matter of payment for coal diverted to them. However, producers realize that the railroads must have fuel, and are disposed to be fair but are in no hurry to tie up their output until the price situation is clarified.

Wholesale diversion of coal at tidewater intended for export, and for which boats were waiting, has thoroughly provoked northern West Virginia operators; it has raised an interesting question, as to who is going to pay the demurrage on the boats held for such coal. Most of the coal diverted was sent to New England, and operators were beginning to grow somewhat skeptical as to the necessity of sending so much coal to New England points.

Little tonnage from northern West Virginia points was being exported, because most of such export coal was being seized, and operators were not hopeful of a resumption of export business on a large scale until the yoke of Government regulation is thrown off. In that connection, northern West Virginia operators have adopted a resolution urging the repeal of the Lever act.

Norton, Va.

Serious Virginia Coal Confiscation—Operators Up in Arms—Hope to Increase Exports

The confiscation of coal in the Virginia fields, during the week ended March 20, was even more serious than it had been in previous weeks. Of the total amount of coal shipped, no less than 70 per cent was being confiscated, leaving only 30 per cent for commercial consumption, or approximately 38,220 tons. Those figures were based on the fact that there was a commercial mine production of only 127,400 tons during the week.

Through a car shortage alone in the same period the production of 44,000 tons was lost, that being a 27 per cent loss. In addition to the tonnage for which there were cars, 29,000 tons were mined for coke manufacture. Taking the field as a whole, the car supply did not equal more than 30 per cent of allotment.

Operators were up in arms over the confiscation of their output, for which they felt there was no justification; the operators also considered that the railroads were not within their legal right in taking such coal. Should confiscation continue, in view of the fact that the President has rescinded all regulations governing the price and distribution of coal, it is believed that those responsible for any further confiscation will be held to a strict legal accountability.

In view of the fact that the President holds that the emergency no longer exists, under which the Government or those representing it can appropriate coal and divert it, it is believed that export shipments from the Virginia fields will be materially increased, and that there will be no further delay in consummating contracts for the output of the Virginia fields for the coming year.

Ashland, Ky.

Small Output in Northeast Kentucky—Railroad-Fuel Mines Favored—Old Vicious Practice

The situation generally in the northeastern Kentucky field, during the week ended March 20, was described as one of the worst since last November, when strike conditions were responsible for a greatly reduced production. The output during the third week of the month reached only 106,185 tons or 42 per cent of capacity, while on the other hand the total loss was 148,180 tons or 58 per cent of capacity. Virtually all of such loss, or 144,225 tons, equivalent to 56 per cent, was due to a car shortage.

The output during the period above stated represented a decline in production, as compared with the previous week, of 15 per cent; it was less than the output for the corresponding week of last year, when the production was 112,000 tons. This was a time when many of the northeastern Kentucky mines were closed down entirely, and others working on part time on account of poor markets.

While both the Chesapeake & Ohio and the Louisville & Nashville railroads showed a marked falling off in the car supply, the mines on the latter railroad were particularly affected, as they did not average more than a two-day run for the week

In the face of the poor service on the part of the Chesapeake & Ohio operators report that that road had attempted before and did attempt again, during the third week of the month, to return to the vicious practice of the use of assigned cars for mines, in the northeastern Kentucky district, supplying the road with fuel

Until numerous slides, resulting from heavy rains throughout the past week, interfered with transportation conditions, railroad-fuel mines were being given cars in excess of their daily allotment, with the result that empty cars were constantly standing behind such tipples at the day's close

It is stated that such cars could have been utilized to excellent advantage by other mines, which were able to work only about half time owing to the dearth of cars. Formal complaint was made to the proper authorities at Washington, with the hope of securing an immediate stoppage of the assigned-car practice

The operators in the district, it was said, familiar with the new transportation act, in which the assigned-car practice is forbidden, were surprised to find the Chesapeake & Ohio attempting to violate the law. Furthermore, the opertors expressed the opinion that there was every reason to expect that the Chesapeake & Ohio management would be severely crticized by the Interstate Commerce Commission for its defiant attitude.

A delegation of the more conservative operators of the field left for Washington on the twenty-second to attend a meeting of the board of directors of the National Coal Association to discuss several quite important questions relative to the constitutionality of the Lever Act as applied to present-day conditions.

Victoria, B. C.

Settlers' Rights Act Again Considered—Minister of Mines Active in Matter—Situation Reviewed

For the third time since the present Government of British Columbia came into power, an effort is being made to obtain for the settlers within the Esquimalt & Nanaimo Ry. belt, on Vancouver Island, the right to advance evidence to prove the validity of their claims to the coal deposits within the limits of their homesteads.

"An Act to Amend the 'Vancouver Settlers' Rights Act' 1904" has been presented to the Legislative Assembly by Hon. William Sloan, Minister of Mines. It proposes giving the settlers twelve months from the date of the coming into force of the act to apply for and obtain a hearing on their claims. If they are able to prove the justice of their claims, Provincial Licenses to the coal rights will be issued.

This is as much as the Provincial Government can do. Their Acts of 1917 and 1919, both of the same character, were disallowed by the Dominion Government; notwithstanding that they differ in no particular from the legislation of 1904, passed by a former Provincial Government and sustained on appeal by the Privy Council of the Empire.

The Act of 1917, however, was not declared invalid by the Federal authorities, until after the lapse of almost the entire twelve months allowed the Department of Justice for the consideration of enactments of the Provinces. In that interval several Provincial coal licenses were issued to settlers, with the result that one of the largest coal industries of Vancouver Island, namely that of the Granby company at Cassidy's, is in operation. This company acquired some of these liceness, which carried considerable areas of coal lands, and in their development, the installation of necessary plant, etc., made necessary investments running into millions of dollars.

The legislation of 1919, however, never took a place among the statutes of British Columbia, the Lieutenant Governor withholding his signature. Finally, shortly after the opening of the present session, announcement of its disallowance was received by Premier Oliver, from Ottawa.

It appears to be conceded that the Hon. William Sloan's action, in asking the Legislature to re-enact the measure, will receive the endorsement of the House. The hope is expressd that the Dominion Government will be persuaded to reconsider the policy heretofore adopted. In this case it is recognized that the Government is determined to maintain its legislative rights, as set out under the British North America Act; also it is appreciated that it is the Government's intention to continue the effort for the establishment of the just claims of the settlers within the railway belt

WEST VIRGINIA

Williamson — Fire completely destroyed the large tipple and washery of the Howard Collieries Co., near this city, on the night of March 17, entailing quite a heavy loss. The fire was first discovered in the roof of the tipple. The blaze had gained such headway, however, when discovered, that the structure burned rapidly. A make-shift tipple was constructed the day following the fire and only about a week's work was lost. The company will erect another tipple without delay, installing machinery

Keyser — A reorganization of the old Upper Potomac Coal Operators' Association, which ceased to exist several months ago, was effected at a meeting held at Cumberland, Md., on March 19. The new organization is known as the Upper Potomac Coal Association operators of the Upper Potomac field on the line of the Western Maryland Ry. composing the new organization. The roster of officers elected is as follows: President, T. M. Dodson, Bethlehem, Pa.; vice president, James A. Brown, Frostburg, Md; treasurer, Howard P Bridon, of Cumberland, Md.; executive secretary, Daniel M. Carl, of Bethlehem, Pa., formerly of Cumberland.

Fairmont—Officers and directors for another year were chosen at the annual meeting of the Consolidation Coal Co., held in Baltimore on March 17, C. W. Watson again being chosen as the head of the company. In addition to Mr. Watson, the following officers were elected: Vice presidents—Frank R. Lyon, S. D. Camden, Arthur Hale, F. W. Wilshire, W. L. Andrews and E. M. Moncourt; general auditor, A. K. Bowles; secretary, T. K. Stuart; treasurer, S. L. Watson; assistant treasurers—H. H. Snoderly, T. K. Stuart, Walton Miller and D. P. Cary. According to the report of the president, the company at the end of the year had a net surplus available for dividends of $3,207,422. Gross earnings of the company were $23,507,556.64 The profit and loss account and special surplus on Dec. 31, 1919, was $56,923,729. The following are the directors: H. Crawford Black, Starr J. Murphy, Geo. C. Jenkins, Van Lear Black, S. Davies Warfield, Brooks Fleming, Jr., Frank Altshul, Samuel McRoberts, A. W. Calloway and Geo. T. Watson.

Charleston—Accidents in West Virginia mines during February resulted fatally in 22 instances, according to figures compiled by the West Virginia Department of Mines. Ten deaths out of the 22 followed falls of roof and slate. One death was due to a mine-car accident, two to motor accidents and one to electrical shock. Three miners were killed, however, in an explosion of local gas, there being in all 18 deaths inside the mines, including a death caused by a premature explosion Of the four other fatalities, three were caused by mine cars. Nearly one-third of the mine fatalities were in McDowell County, there being seven in that county; Kanawha and Marion counties coming next with three deaths. In the counties of Boone, Fayette and Logan, there were two deaths each. In the counties of Harrison, Mercer and Ohio, there was one death each

No definite plans were evolved at a conference between the coal operators of Kentucky and West Virginia and the directors of the Chesapeake & Ohio R.R., held in New York on March 18. At this conference the directors were requested to authorize the expenditure of approximately $50,000,000 upon equipment and the extension of facilities for handling the vast tonnage of the coal fields along the Chesapeake & Ohio. While the railroad directors professed a desire to co-operate with the coal men in aiding in the development of the industry; nevertheless, it was stated that funds were not now available for undertaking improvements on such a scale as had been suggested. It was indicated, however, that the road would probably make arrangements at an early date for additional equipment in order to try to relieve the car shortage. Another conference is scheduled to be held in April.

ALABAMA

Birmingham—Fire of unknown origin destroyed the commissary of the Tennessee Coal, Iron & R.R. Co., at Ishkooda, with an estimated loss of approximately $100,000. Owing to lack of water supply, little could be done to fight the flames and the building was burned to the ground with total loss.

Officials in Birmingham coal industries are taking the initiative in meeting the coal-car shortage by the purhase of cars on their own account to meet their individual needs The industries propose to supply their own cars and pay the railroad companies a revenue for the hauling, thus relieving the situation to a considerable degree Morris W Bush, president of the Birmingham By-Product Co., Shelby Iron Co., Coosa Pipe & Foundry Co and the Majestic Coal Co., is the first to adopt this plan to make sure of keeping his mines as well as his byproduct plants going. He has just purchased steel hopper-bottom, self-cleaning coke cars from the Delaware, Lackawanna & Western company, which will be immediately put into service between the Majestic and Bradford coal mines and his new byproduct plant near Birmingham. Railroad officials in this city have commented on the step as going far in relieving an acute situation in the Birmingham district and expressed the hope that other heads of industries would follow Mr. Bush's example.

The big byproduct plant of the Sloss-Sheffield Steel & Iron Co., at North Birmingham, representing a cost of some $4,000,000 to $5,000,000 is nearing completion, and the drying-out process will begin in a few weeks. The construction of power transmission lines and sub-stations and the installation of electrical equipment at the mines of the company and at the power plant at North Birmingham is also practically finished. When the byproduct plant begins operations, electric power will supplant steam at all mines of the company in the district

OHIO

Crooksville — The machine shop, tool house and blacksmith shop of the San Toy (Sunday Creek) Coal Co. at San Toy, Perry County, was totally destroyed by fire recently. The blaze originated in the blacksmith shop, presumably from sparks from an anvil. The loss will total many thousands of dollars. A large quantity of valuable machinery was destroyed, which it will be difficult to replace.

Columbus—Following an inspection trip of President George W. Stevens, of the Chesapeake & Ohio R.R., which controls the Hocking Valley Ry., announcement was made by M. S. Connors, general manager, as follows: The work of double tracking between Columbus and Toledo, which was stopped by the war, will be resumed at once and pushed to completion. The first work will be done on sections betwen Marion and Morral and between Meredith and Prospect.

Columbus—There is said to be considerable doubt if the plan of the the Ohio Mining Department to establish five mine-rescue stations in the mining fields of Ohio can be carried out. The Ohio Legislature adjourned recently without making the necessary appropriation for the stations; now interested parties, including State Mine Inspector Watson, are working to have the State Emergency Board provide sufficient money to start the sub-stations. It was proposed to establish two of the stations in the eastern Ohio field, one in the Hocking Valley, one in the Pomeroy Bend field and one in the Cambridge field.

Plans are being made for holding the annual convention of the Michigan-Ohio-Indiana Coal Association some time in June, the exact date to be announced later. The board of directors and Secretary B. F. Nigh, of Columbus, have been in communication by letter to set a time and place for the meeting. The 1919 convention was not held because of the unsettled condition of the trade. Members are looking forward to a most interesting convention this year, and Secretary Nigh has already started on the preparation of the program.

INDIANA

Princeton—The Royal coal mine, at Francisco, east of this place, was unsealed recently after air tests had shown but 12 per cent of oxygen. Both exhaust fans are working and it is believed that there will be no difficulty about placing the mine in operation shortly. The mine was sealed the latter part of January, when a windy shot, which killed Moron Wall, a shotfirer, set fire to the shaft.

ILLINOIS

Benton—There is a rumor in Franklin County that Jesse Diamond, a large coal operator and the Southern Gem Coal Corporation (the latter operating several mines in Franklin County) are negotiating for the purchase of the Wabash, Chester & Western R.R., which recently went defunct. Mr. Dimond and the Southern Gem company own a large acreage of coal land in Jefferson and Franklin counties, and it is thought they want the road in order to give them an outlet for the product of their mines.

Duquoin.—A number of large coal operators in this field are urging Senator Medill McCormick to present an amendment to the income-tax law. They contend that the application of the law to coal operators is discriminatory, and a feature to which they particularly object is that affecting the liability fund. They want the law so amended as to allow companies, who carry their own liability insurance, the same latitude as those who do not. It is planned to have a number of operators go to Washington to appear before the Senate committee on income tax.

Drills are at work on a tract of land a few miles from Tamaroa in Perry County, Illinois, and a depth of 360 ft. has been reached. It is expected that a workable seam of coal will be found at a depth of between 400 and 450 ft. Options have been secured on 5,000 acres in this vicinity, and should the first test hole prove favorable, other holes will be sunk. Should the company holding the options decide to buy the coal rights, it is said it will pay the owners $25 per acre. The Southern Gem Coal Co. is stated to be behind the parties securing the options. It is also rumored that the Chicago, Burlington & Quincy R.R. is considering a line from the Franklin County fields to St. Louis, and should this road be built, it will tap the Tamaroa field.

Springfield—According to records, more than four times as many men met death in mining accidents in Sangamon County during the year ended March 1, 1919, as compared with the year ended March 1, 1920. The records show that 17 inquests were held to determine the cause of death of men injured in the mines during the year ended March 1, 1918; twelve inquests during the next year and only four during the year just closed. The decrease is said to have been due to the strenuous campaign the coroner has waged during his term of office for a strict compliance with the state mining laws and obedience to the safety rules by both mining officials and the miners.

Sesser—The Old Ben Coal Corporation is preparing to erect a new wash house at its No. 16 mine at this place, in Franklin County, Illinois. The building will be of brick construction, modern in every detail and strictly sanitary. It will be commodious enough to take care of the present employees, as well as any increase in their number, which will gradually take place as development progresses.

COLORADO

Purcell.—A new coal field is said to have been discovered in Weld County, just five miles east of here on lands where a company of Eaton and Purcell capitalists have been drilling. They secured a five-year lease on 640 acres of land and started prospecting for coal. At a depth of 101 feet they struck a seam of coal four feet thick. Continuing the drilling, they went through eight in. of slate and found another seem three ft. thick. A company has been formed to develop the new coal field as soon as it is proved, tipples will be built in a short time and actual commercial mining of coal started. A spur of the Union Pacific R.R. will be built to the mines.

Foreign News

Wellington, B. C.—The Nanoose-Wellington Coal Co.'s collieries at Nanoose Bay, Vancouver Island, were inspected recently by Louis Williams, the president, and a party of the directors and shareholders, all of [illegible] Americans. The visit was made in order that those who are directly interested in the development of the property, might obtain a personal knowledge of [illegible] what is proposed. [illegible] demand for the product, the output of these collieries is to be [illegible] to 500 [illegible] a day. The tract [illegible] coal land situated four miles northeast of Wellington; the seam under development is a part of [illegible] James Dunsmuir interests, as the old Wellington [illegible] order to [illegible] underground [illegible] coal [illegible] worked with open [illegible] A new shaft [illegible] at Nanoose [illegible] 600 ft. [illegible] The company has [illegible] amount of fresh water [illegible] general use, and the [illegible] improving the [illegible] employees, [illegible] surroundings, will make the conditions under which the workmen live as satisfactory as exists [illegible]

Obituary

Culpepper Exum, prominent in industrial and civic affairs of Birmingham, Ala., for the past twenty-five years or more, died March 14, after an illness of several years, influenza being the immediate cause of death. Mr. Exum was president of the Crescent Coal Co. and an ex-mayor of the city.

J. R. Hudelson, treasurer of the Franklin Coal & Coke Co., which operates two mines at Royalton, in Franklin County, Ill., accidentally shot and killed himself recently, while at a trap-shooting contest at Royalton. In addition to being treasurer of this company, Mr. Hudelson was also general manager of the mercantile department of the concern. He resided at Royalton. Mr. Hudelson, together with his father, developed the No. 1 mine of this company, later selling to the Franklin Coal & Coke Co.

WILLIAM D. OWENS

William D. Owens, of West Pittston, Pa., died on March 12, of pneumonia, which developed from a complication of diseases of long standing. He was widely known as a mining man, who had worked his way up from one of the lowliest places in the mines to that of division superintendent of the Lackawanna division of the Lehigh Valley Coal Co. A reproduction of a photograph of Mr. Owens and a sketch of his life appeared in the April 28, 1917, issue of *Coal Age*. However, a brief statement, giving the main facts about his mining career, will be given here for the benfit of those who may not have seen the other account.

William D. Owens was born in Cynffig, near Pyle, South Wales, Nov. 10, 1846, and was 73 years of age at the time of his death. He began work in the mines of his native place at the age of nine years. When about 12 years old he moved to Briton Ferry, and at 18 to Gwmdare, near Aberdare, South Wales.

In 1876 he obtained a certificate as colliery manager under the British Government, and acted in this capacity at Fernhill colliery, Blaen, Rhondda. He had now gone through practically every department of mining, from door boy to manager, and had worked in bituminous, anthracite and semi-anthracite mines, with both long wall and chamber systems of mining.

In 1878, Mr. Owens landed in the United States with his family and settled in Plains, Luzerne County, Pa., where he was employed by the Lehigh Valley Coal Co. as a miner and company man. In 1884 he was made mine foreman for this company.

Mr. Owens' success with the Lehigh Valley Coal Co. is attested by his promotion in 1894 to the position of district superintendent, with headquarters in West Pittston, where he lived until the close of his life. Another promotion came to him in 1905, when he was made superintendent of the Lehigh Valley Company's Lackawanna division. He continued in this position until ill health necessitated his retirement about three years ago.

Mr. Owens was prominent in mining affairs. In 1912 he was appointed by Governor Tener a member of the State Commission to revise and codify the anthracite mine law of the State. He was a member of the North of England Institute of Mining and Mechanical Engineers, of the American Institute of Mining Engineers, and of the Northeastern Pennsylvania Society of Mining Engineers. He had often been called on to act in a consulting capacity in important mining cases. Mr. Owens gave valuable assistance on the occasion of the Twin Shaft disaster in Pittston, on June 28, 1897. He had taken an active interest in the training of choirs for over 42 years and had the honor of serving as adjudicator of music at 19 eisteddfods.

Coming Meetings

National Coal Association will hold its annual meeting May 25, 26 and 27 at the Traymore Hotel, Atlantic City, N. J. Secretary, W. B. Reed, Commercial Bank Building, Washington, D. C.

The American Association of Engineers will hold its annual convention at the Planters Hotel, St. Louis, Mo., May 10 and 11. C. E. Drayer, secretary, Chicago, Ill.

National Foreign Trade Convention to be held in San Francisco, Cal., May 12, 13, 14 and 15.

Chicago Coal Merchants' Association will hold its annual meeting April 13, at Chicago, Ill. Secreatry, A. H. Kendall, Chicago, Ill.

American Chemical Society will hold its annual meeting at St. Louis, Mo., April 13, 14, 15 and 16. Secretary, Dr. Charles L. Parsons, 1709 G. St., N. W., Washington, D. C.

National Retail Coal Merchants' Association will hold its annual meeting June 10, 11 and 12 at Detroit, Mich. Secretary-manager, Ellery Gordon, Philadelphia, Pa.

Kentucky Mining Institute will hold its annual meeting June 4 and 5 at Lexington, Ky. Secretary, C. W. Strickland, Huntington, W. Va.

American Society of Mechanical Engineers will hold its spring meeting May 24, 25, 26 and 27 at St. Louis, Mo. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

Chamber of Commerce of the United States of America will hold its eighth annual meeting April 26, 27, 28 and 29 at Atlantic City, N. J. Assistant Secretary, D. A. Skinner, Washington, D. C.

West Virginia Coal Mining Institute will hold its annual meeting June 7 and 8, at White Sulphur Springs, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

American Institute of Mining and Metallurgical Engineers, New York section, will hold its regular monthly meeting April 7 at the Machinery Club, 50 Church Street, New York City. Secretary, E. L. Gruver, 29 West 39th Street, New York City.

Trade Catalogs

Giant Grip Traction Equipment for Motor Trucks. The Challoner Co., Oshkosh, Mich. Booklet. Pp. 16; 3½ x 6 in.; illustrated. Information concerning equipment of interest to truck owners and operators.

Smooth-On Home Repairs. Smooth-On Manufacturing Co., Jersey City, N. J. Booklet. Pp. 31; 3½ x 6 in.; illustrated. An explanation of how to repair leaks in boilers, cracked water jackets, leaky radiators, etc.

Reversing Drive for Planers, Slotters, etc. General Electrical Co., Schenectady, N. Y. Bulletin 48,029. Pp. 14; 8 x 10½ in.; illustrated. A description of a motor application to machine tools. Its various applications noted.

American Steam Conveyors. American Steam Conveyor Corporation, Chicago, Ill. Folder. Pp. 4; 8½ x 11 in.; illustrated. A steam ash conveyor. Some 50 trade marks or trade names of concerns using the American Conveyor are shown.

Wahl Dewaterer. H. W. Wahl & Co., engineers, Chicago, Ill. Bulletin D-1. Pp. 19; 6 x 9 in.; illustrated. A description of a machine which elevates, drains off the water and discharges solids from the device automatically.

Is this Sound Reasoning? The Westinghouse, Church, Kerr & Co., Inc., 37 Wall St., New York, N. Y. Folder. Pp. 3; 6½ x 9½ in.; illustrated. An explanation of why the oldest organization of its kind in the country thinks its way of doing business is fairest to its clients and to itself.

Steam Tables for Condenser Work. The Wheeler Condenser & Engineering Co., Carteret, N. J. Pp. 32; 4 x 7 in.; illustrated. A handbook of steam tables, with pressures below atmosphere expressed in inches of mercury referred to a 30-in. barometer.

Corona Discharge. By Earle H. Warner with Jakob Kunz. University of Illinois Bulletin. Engineering Experiment Station. Vobana, Ill. Bulletin 114. Illustrated; pp. 138; 6 x 9 in. A theoretical consideration of certain electrical phenomena.

Modern Mining Transportation. Enterprise Foundry & Machine Works, Bristol. Va.—Tenn. Bulletin. Pp. 23; 6 x 9 in.; illustrated. Devoted especially to mine-car wheels; their construction is noted, also some interesting facts of importance to the user in and about mines.

Racks. Pp. 16; 6 x 9 in.; illustrated; metal racks for storage purposes in buildings. **Sanitary Washbowls**; pp. 8; 6 x 9 in.; illustrated; individual or in batteries. **Sanitary Drinking Fountains**; pp. 8; 6 x 9 in.; illustrated; bubbling and special fountains. **Victory Washbowls**; pp. 4; 8½ x 11½, illustrated; sanitary washbowls in batteries—price list on separate sheet. Made by the Manufacturing Equipment & Engineering Co., Boston, Mass.

Industrial News

St. Louis, Mo.—Cosgrove & Co., of Chicago, has opened up an office at 703 Central National Bank Building. D. M. Cohen in charge. This office will take care of the business from Cosgrove & Co.'s Illinois mines that will move through the West.

Salt Lake City.—It was reported here recently that the Western Pacific Railroad had taken over the Utah Fuel interests from the Denver & Rio Grande road in part payment of a judgment for $35,000,000 held by the Equitable Trust Co.

Renton, Pa.—The Union Collieries Co. has awarded a contract to the J. G. Fullman Co., Pittsburgh, Pa., and inaugurated active work on the construction of a total of 30 two-story and basement dwellings for miners' service. The cost of the structures ranges from $2,000 to $5,000 each.

Adrian, W. Va.—The Buckhannon River Coal Co. has adopted plans to open another mining plant at this place, in Upshur County, and to build 150 miners' dwellings. The company is producing about 250 tons a day and is employing about 100 men. It has resumed the manufacture of coke after its ovens had been idle for about two years.

Centralia, Wash.—The Lincoln Coal Co. has started shipping coal from its mine at Galvin. The latest mining equipment has been installed by the company. The coal is mined from a nine-foot seam and screened over shaker screens. The officers of the Lincoln Coal Co. are T. E. Martin, president; J. O. Humbert, secretary, and M. H. Humbert, vice president.

Shinnston, W. Va.—Shinnston business men have organized the Hood Coal Co. with a view to the development of coal property, near that place, in the early future. The new company has an authorized capital stock of $50,000. Instrumental in effecting a preliminary organization of the new company were: C. P. Hood, C. A. Cole, Marion Riley, F. A. Barnett and W. M. Burnett, all of Shinnston.

Crawfish, Ky.—The Clay County Coal Co. recently increased its capital to $50,000, and is having plans prepared for the development of about 160 acres of coal properties in the Crawfish district. Complete equipment and machinery for all features of operation will be installed, to provide an initial capacity of about 200 tons daily. I. H. Buchanan is general manager.

Charleston, W. Va. — Charleston people have launched the George Creek Coal Co., with a capitalization of $50,000, holdings of the company being in Malden district of Kanawha County. No plans for development, so far as can be learned, have been made. Actively identified with the new company are: A. G. Lovett, J. F. Bouchelle, C. P. Miller, Berkeley Minor, Jr., P. G. Jefferson, all of Charleston, W. Va.

Fairmont, W. Va.—A tract of 1,000 acres of coal land, 12 miles west of this city, has been purchased by C. B. Turner, of Pittsburgh, Pa., it is reported, although it has not become known yet whether the property was acquired merely as a real-estate investment, or for development. Mr. Turner has in the past, however, been successful in developing properties in Kentucky and in the southern part of West Virginia.

Huntington, W. Va.—It is understood that the Solvay Collieries Co. contemplates the construction of storage bins at both its Marytown, W. Va., and Big Sandy, Ky., operations. If such bins are constructed, as now seems to be probable, it will permit the mines at the points mentioned to run full shifts to take care of the available car supply and avoid the necessity of utilizing part shifts only.

Clarksburg, W. Va.—A large company, for the development of coal lands, in Harrison County, has been formed by prominent business men of Clarksburg as follows: Fred C. McIntyre, Olandus West, Carl L. Hornor, J. Hornor Davis and E. B. Templeman. This company has been capitalized at $150,000. Mines are to be opened in Clark district, of Harrison County, near Clarksburg, the mines to be on what is known as the Charles B. Stout property.

Wilkes-Barre, Pa.—City solicitor Charles F. McHugh announced on March 7 that the recent decision of Judge J. B. Woodward, of Luzerne County, in the case of the Scranton-Pittston Coal Co. against Pittston city, in which he held that the ordinance of Pittston city, regulating coal mining within the city limits, gives Wilkes-Barre the right to take steps to prevent coal companies from causing mine caves. Wilkes-Barre council is to act accordingly.

Columbus, Ohio—In order to facilitate handling the growing business in California, Arizona, Nevada and the state of Sonora, Mexico, the Jeffrey Manufacturing Co., of Columbus, Ohio, has opened up a branch office in Los Angeles, Cal. This office will be in charge of F. R. Field, who has been the manager of the company's Denver office. Mr. Field is well known in this territory and has a thorough personal knowledge of the West and the requirements of its buyers.

Princeton, W. Va.—Work has been initiated on the new plant of the Monticello Coal Co., at Herndon, Wyoming County, W. Va., and contracts awarded for the construction of 50 dwellings for miners. The company was organized shortly before the first of the year for the purpose of mining smokeless coal at the point named, the capitalization of the company being $400,000. The president and general manager of the company is V. M. Lee, of Princeton, W. Va.

Morgantown, W. Va.—Monongalia County is to be the seat of operations of the Connellsville Big Vein Coal Co., of Point Marion, Pa. However, development work may be undertaken in other counties of the state. This corporation is capitalized at $200,000. The company will mine and sell its own coal, according to the terms of its charter. Incorporators of the new company were: J. L. Kendall, of Pittsburgh, Pa.; S. A. Kendall, of Washington, D. C.; J. L. Kendall, Jr., of Cheat Haven, Pa.; D. H. Horton, of Connellsville, Pa.; A. A. Arison, of Point Marion, Pa.

Charleston, W. Va.—Another new coal combination has been launched to be known as the Elk River Coal Association. It is to be composed of operators with mines on Elk River, principally in Clay and Kanawha counties. The association will have a capital stock of $5,000. Incorporators of the new association were: C. L. Voglesang, B. C. Barber, C. L. Hall, of Clay; A. J. Fay and John B. Hart, of Charleston. The probabilities are that the association will have its headquarters at Weston, W. Va., the division headquarters of the Coal & Coke R.R.

Williamson, W. Va.—There is to be no change after all in the ownership of the Red Jacket Consolidated Coal & Coke Co. and the Red Jacket, Jr., Coal Co. Nevertheless, it appears that there have been negotiations in progress for the sale of the properties named, and it was even reported on reliable authority that the Red Jacket holdings had been sold to Colonel T. E. Houston. However, officers of the company now announce that all such negotiations have been abandoned, and that the ownership will continue as heretofore. At the same time, it is also announced that it is the intention of the company to take the necessary steps immediately to greatly increase production.

Bluefield, W. Va.—The Co-operative Fuel Co., of this city, has been organized for the purpose of conducting a general sales business, handling the product of the mines in the Pocahontas and Tug River section as well as in Kentucky. The company will handle both coal and coke. Its capital stock has been fixed at $25,000. Officers of the company are Geo. S. Strader, president and treasurer, and Jas. P. Cofer, vice president and secretary. Mr. Strader is a capitalist of Bluefield, having been identified with a number of mining and shipping companies, and having had a number of years experience in the selling and operating line. Vice president Cofer has for the last seven years been with the Tierney interests at Powhatan, W. Va., in the operating end of the business and has also been handling the sales for one of their mines.

Morgantown, W. Va.—Extensive improvements on the Morgantown & Wheeling R.R. are to be undertaken in the quite near fture, or as soon as weather conditions permit. Under a new rating, just effective, mines on the Morgantown & Wheeling R.R. are entitled to 250 cars a day, equivalent to about 3,500,000 tons a year. It is stated that nearly one-half the fuel handled by the Monongahela R.R. between Fairmont, W. Va., and Brownsville, Pa., originates on the Morgantown & Wheeling. Development of territory on that road has been so rapid, it is said, as to necessitate numerous improvements and additional facilities and extensions for the handling of more tonnage.

Huntington—The Exeter Shaft of the Solvay Collieries Co. is, in the future, to be operated independent of the other Hemphill operations of the same company. Although work was recently suspended at the Exeter shaft, for the time being, on account of high water, it is indicated that in the near future the company will be getting out coal on a large scale at its Exeter shaft.

Huntington, W. Va.—For the time being at least the headquarters of the Central Coal Association, composed largely of West Virginia and Kentucky operators, will remain at Cincinnati, Ohio. The directors of the association, at a meting held in Cincinnati during the third week of the month, decided to leave the question of the removal of the headquarters to Huntington in the hands of the members of the association as a whole. A general meeting is to be held in the near future at Huntington, at which time officers and directors will be elected and a decision made as to the future headquarters of the association.

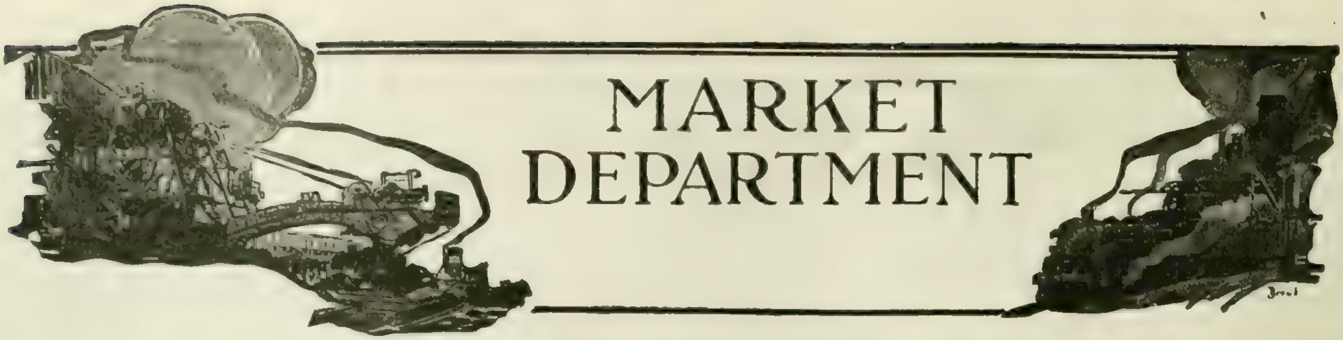
Chicago, Ill.—The American Steam Conveyor Corporation, of this place, announces the appointment of the Brooks-Fisher Co., Candler Bldg., Atlanta, Ga., as the southeastern representatives of the American corporation. The Brooks-Fisher Co. is a comparatively new concern, organized to carry on a business of manufacturers, agents and contractors. Of this firm, Mr. Fisher was for 15 years in the erection department of the Babcock & Wilcox Co., the last six of which he was district superintendent for the Atlanta territory. The other member of the firm, Mr. Brooks, was assistant sales manager for the Atlanta office of the Babcock & Wilcox Co.

New York, N. Y.—M. F. Burns, of Burns Brothers, of New York; F. S. Peabody, of Chicago; and Harry F. Peters, of Williams & Peters, of New York, are members of the board of directors of the United States Distributing Co., of this city, recently formed to distribute essential commodities, as coal, ice, lumber and building materials. George F. Getz, president of the Globe Coal Co., of Chicago, is the president; L. J. Hunter, vice president, and Walter L. Whittsley, secretary. The other directors are Henry J. Fuller, Mr. Getz, Harvey D. Gibson, G. M. P. Murphy, J. Ernest Richards, S. M. Schatzkin, E. V. R. Thayer, H. E. Ward and W. C. Watt. The company has $25,000,000 authorized stock, of which $5,000,000 has been issued.

Huntington, W. Va.—Further progress was made by the Chesapeake & Ohio R.R., in the movement to establish large yards at Danville, in Boone County, for handling the large coal tonnage originating in Coal River territory when (during the second week of March) negotiations for rights-of-way were completed by representatives of the company. The company plans an initial outlay of about $1,000,000 for the establishment of a 12-track yard, the erection of a round house, repair shops, a Y. M. C. A. and other buildings. It is proposed to assemble coal produced on the Spruce and Pond forks, of Little Coal River, at Danville. By providing increased facilities for handling coal at Danville, the Chesapeake & Ohio will materially contribute to the further development of the coal territory in the Little Coal River area. West Virginia has made wonderful progress in mine development in the last 12 months.

Clarksburg, W. Va.—The Clarksburg Engineering Co., whose offices in the Goff Building, in this place, have been closed during the past year, on account of the absence of C. P. Collins and W. S. Baver, was reopened on March 1. Messrs. Collins and Baver were in the service of the Government. Mr. Collins was employed by the engineering branch of the Passenger Transportation and Housing division of the Emergency Fleet Corporation, at Washington and Philadelphia, as senior engineer in charge of designs of the sewerage and drainage for the various housing projects built to serve the employees of the merchant shipyards. Mr. Baver entered the service of the Government as a sanitary engineer, and is still in the service as a First Lieutenant in charge of sanitation at Camp Benning, Ga. The new firm will be known as The Clarksburg Engineering Co., Inc.

Washington, D. C.—A suit to test the powers of the Federal Trade Commission was instituted on March 10 in the Supreme Court of the District of Columbia by the Maynard Coal Co. of Columbus, Ohio. This was the first of several legal actions planned by the National Coal Association to determine how far the commission may go in requiring private corporations to furnish information of their business. An official announcement by the association said the suits were started in a friendly spirit and in no way constitute an attack on the commission. An injunction was requested on the following three grounds: First, that the order of the commission requiring the reports exceeded the authority vested in the commission by Congress; second, that if Congress gave the commission authority to require such reports the act is unconstitutional, and third, that any power vested in the commission to require such reports was transferred to the Fuel Administration by presidential order.



MARKET DEPARTMENT

Weekly Review

Government Price Regulation on Bituminous Coal at an End—Production Increases with Car Supply—Early Movement in Lake Trade—Export Business Shows Little Increase

EFFECTIVE today (April 1) price regulation by the Government on bituminous coal is at an end. This announcement, made by the President March 19, was received favorably by operators throughout the country, for had those prices been continued together with the increase recommended by the Commission, it would have been impossible to run any mine at a profit.

Salesmen are now, or soon will be, in a position to quote prices for contract coal. It is expected that the coal which heretofore had been mined in March will this year not be mined till April and this will keep the mines working steadily, and with an improvement promised in car supply, operator, wholesaler and jobber are well satisfied.

Shipments from the anthracite mines during the past week have been light, because floods and washouts in certain sections of the country interfered with the flow of empties. It is a notable fact that hundreds of cars which left the mines in January are just reaching New England gateways, so great has been the congestion on the intervening and originating roads. More urgent requirements have been met during the past week by means of diversions, but this practice also is at an end, for the President has taken this right away by doing away with the Fuel Administration.

With the arrival of spring and much milder weather, the ice in the Lakes has almost disappeared and there has been a slight movement of ships plying between lake ports. Shippers have been notified of increases in freight rates, but these increases have not been excessive. For example, where in 1918 the rate to the head of Lake Superior from Cleveland was 42½c. per ton, the present rate is 50c., an advance of 7½c. Some shippers had hoped that the rates for 1918 would still be maintained in 1920.

Some interest has been shown in the President's effort to stabilize the coal industry. He has directed the various Federal departments to place their orders and store coal supplies for next winter. This will assist in keeping the mines working steadily and assure the administration of a constant supply of coal.

New contract prices for both bituminous and anthracite have not as yet been made public, but the indications are for a sharp advance. Steam sizes of anthracite are somewhat less in demand. A large tonnage of rice and barley has been moving recently, but this is likely to slope off with the coming of the new coal year.

Coke production also has shown an increase because of improved car supply. As promise of larger profits is evident, coke operators are likely to hold coke and pay demurrage until after April 1. It is thought that after that time there will be an excited market and that coke will sell at varying prices. With the removal of limitations on the byproduct industry, producing an open market, byproduct operators can bid up the price of coal considerably. The customary one-day holiday observed today, together with the usual time taken off because of Easter, will have a marked effect on this week's production.

WEEKLY PRODUCTION

The weekly report on the production of bituminous coal, anthracite, and beehive coke, compiled by the Geological Survey, Department of the Interior, March 27, 1920, states that for the third week in succession production of soft coal has averaged 1,715,000 tons per working day. Incomplete reports from the carriers indicate a total output during the week ended March 20 (including lignite and coal coked) of 10,281,000 tons, almost exactly the same figure as that for the preceding week. These estimates, however, are subject to revision as changes in organization attending the return of the railroads to private operation have necessarily disturbed the system of reports.

Little change in the production of anthracite occurred during the week ended March 20. Shipments reported by the nine principal carriers—in part estimated—are placed at 31,291 carloads. On this basis the total production, including mine fuel and local sales, is estimated at 1,607,000 net tons, an increase of 4,000 tons over the preceding week.

Production per working day in January was at the rate of [illegible] tons. In February the daily rate declined to [illegible] tons, and during the first three weeks of March it has averaged [illegible] tons. The decline in February was due to the bad weather, which [illegible] of empty cars from New [illegible]. At present the output is being curtailed at some of the collieries [illegible] the exceptionally heavy [illegible] of the past winter. With only a week and a half of the working year remaining, the cumulative production of the coal year 1919-20 to date is 3,976,000 tons behind its predecessor.

Production of beehive coke during the week ended March 20 is estimated at 446,000 net tons, the largest reported for any week since the last of January. This estimate is based upon telegraphic reports of coke loaded by 26 railroads which originate approximately 97 per cent of the beehive coke transported by rail. All districts except West Virginia reported an increase.

Atlantic Seaboard

BOSTON

Movement all-rail continues to improve. Shipments increase. Withdrawal of fixed prices a hopeful sign. Contracts still being made. Tidewater Coal Exchange to be discontinued. Hampton Roads despatch better.

Bituminous—Spring weather has enabled the railroads very much to improve deliveries. It is a notable fact, however, that hundreds of cars that left the mines in January are just now only reaching the New England gateways, so great has been the congestion on the intervening and originating roads.

The receipt of this coal at various industrial centers has relieved many of the emergency needs, although for the next few weeks it is likely that the larger consumers will be anxious about supply. Efforts are being made through diversion and otherwise to meet the more urgent requirements, but latterly these efforts have happily been confined to regular shippers and not to railroad channels.

Shipments from the mines the past week have continued very light. Floods and washouts interfered for a time with the flow of empties, but recently there has been a distinct improvement. The smaller originating roads, after weeks of indifferent car supply, are now getting cars in daily quotas and production should soon show an upward curve.

The President's announcement that all price restrictions would be withdrawn April 1 has been received very favorably. To have continued the present price basis would soon have meant an impossible situation, and the fact that consumers may now arrange for supply without fear of transgressing the law will go a long way to remedy the current shortage. In itself it is a hopeful sign and even though this action has been discounted for several weeks it is now fairly certain that New England's needs will now begin to be taken care of.

Most of the high-grade output of central Pennsylvania, so far as it can be spared from export and bunker trade, has now been sold and at what should be considered lucrative prices. The quality coals have sold from $4.50@$5 per gross ton, plus wage increases, and from those figures the medium coals have ranged down to $2.95@$3.50 per net ton, also plus increases. Naturally, in this market the lower grades have been little heard from, many buyers continuing their old policy of waiting to see how the market turns.

At the New York and Philadelphia piers there is still very little coal available for the open market. Pier shipments have been confined largely to contract obligations. Permits for export cargoes have been distributed closely and the aggregate tonnage has been relatively small. All efforts to continue the Tidewater Coal Exchange have come to nothing and it was announced on March 22 that, effective May 1, no coal is to be consigned to the Exchange at any of the piers.

It appears that several of the railroads after making exhaustive studies of their records are clear that the experiment has by no means proved the blessing it was claimed to be. Possible saving in switching has been offset by disadvantages and there are no tears shed either by railroads or shippers.

The Hampton Roads situation shows only gradual improvement. Car shortage, together with floods, drove output down to minimum tonnages, with expensive steamer detention in consequence. Several coastwise bottoms were held 10 to 12 days at Norfolk, with Newport News making almost as poor a showing. Average delay is now 4 to 5 days with car supply increasing gradually.

Contract prices on Pocahontas and New River have not yet been made public. Rumors that appear to be well founded are to the effect that certain of the agencies have already named $4 per net ton as a contract basis f.o.b. mines, but as yet confirmation is lacking. At $4.48 per gross ton it would mean $6.54 f.o.b. vessel at Hampton Roads, or about $9.50 alongside, Boston. Deliveries all-rail from Pennsylvania, as to price, will continue therefore to have a marked advantage in this territory.

Anthracite—The important news of the week is the advance on March 25 of Philadelphia & Reading Ry. barge freights on anthracite. The new rate to Boston points is $2.10 alongside, compared with $1.55 prevailing hitherto for several months. To points like Bangor, Me., the advance is $1, making the revised rate $2.80.

Taken together with the expected increase in the price of coal and in railroad tolls the new delivered costs are mounting to high figures. Yet there is no sign of any slackening demand in any direction. On the contrary, retail dealers are lining up for their season requirements very much as in other years.

Steam sizes are somewhat less in demand. Buckwheat some of the anthracite roads are confiscating in transit, presumably because of expected increases in price. A large tonnage of rice and barley has been moving recently, but this is likely to slope off with the opening of the new coal year.

NEW YORK

Dealers start new coal year with empty bins. Demand continues strong for all sizes. Production reduced because of flooded mines. New England wants coal and objects to retroactive agreement with miners.

Anthracite—Although the new coal year begins today (April 1) the month just ended has been almost on a par with the coldest month of the past winter. There was no easing up in demand, especially for the domestic coals, and dealers start the new year with their books well filled with orders while retail dealers cannot boast of full bins.

Production continues in reduced measure because of the numerous floods, causing many mines in various parts of the coal regions to remain idle while others are only able to operate on a part time basis. As a result shipments from some of the smaller mines are of a negligible amount.

More interest is being taken in the outcome of the wage conferences and consumers look for an increase in prices. The taking of orders for April delivery has been active although no one knows what the prices might be. The adoption of the resolution providing for a retroactive wage agreement to date from April 1 has made the price situation uncertain and many producers are selling coal for April delivery subject to the new prices. There are, it is said, some others who are naming prices high enough to cover any advance that might be granted the miners. In many instances dealers are so anxious to get coal that there is little hesitation over the prices to be paid.

Demand is not restricted alone to the Metropolitan district. Dealers from New England, which has been under partial embargo for some time, who are flocking here, describe conditions in those states as serious and want coal. Retail yards are said to be almost empty while consumers have little or no coal in their bins. As coal-consuming temperatures are likely to continue for several weeks longer, the dealers point out the necessity for fuel. They, however, object to the uncertainty of the price to be paid because of the agreement of the mine owners to make the new wage scale retroactive.

Bituminous—The local situation has been uneasy. The removal of the Government maximum prices to take effect today (April 1) was received with considerable enthusiasm by the trade and since then breathing has been easier. While some dealers seem to be excited over what might happen under private control and when it is known just what wage increases the miners will receive as a result of the Bituminous Wage Commission's report, others are counselling moderation.

Some dealers predict that with a good demand throughout the summer, the early fall will find the market flooded with a lot of cheap priced coal. Orders are being blocked for deliveries after April 1 at prices showing a wide divergence, namely: $3.25 to $4.50, according to grade.

The closing of contracts is not as easy as some consumers anticipated it would be. Many operators are determined not to sign up their entire output and are not willing to take on any new business in this way. Most of them are willing to take their chances with the free coal demand. Prices vary considerable but a good range is from $3.75@4.50 for good coals. Some of the better grades are being held at higher quotations.

Government prices prevail on all coal not shipped on contract, and are as follows:

	Mine-Run	Prepared	Slack
Central Pennsylvania....	$2.95	$2.95	$2.95
Western Pennsylvania.....	2.35	2.60	2.35
Fairmont (gas)	2.50	2.75	2.25
Georges Creek, Upper Cumberland and Piedmont Fields	2.75	3.00	2.50

PHILADELPHIA

Anthracite prices fixed temporarily. Old winter schedule until new wage scale is effective. Buckwheat and rice increased. Heavy demand for all prepared sizes. Premiums increase. Dealers flooded with orders. Miners to work during interim of wage parley. Bituminous price control lifts April 1.

Anthracite—Late in the week, on March 26, one of the big shipping companies made a most important announcement as to prices, pending the wage negotiations with the miners, which it is expected will be carried far into April. This company announced to its customers that on all prepared sizes shipped during April the present winter circular would apply, that is, the price for egg will be $6.35, stove $6.60, nut $6.70 and pea $5.30, and these prices are not to be retroactive, despite any wage advance that might be granted the miners.

Steam trade continues very active and the increases made by the shipping companies have had no effect on the demand; as a matter of fact the independent shippers promptly advanced their steam coal prices and then exacted an even greater premium than before, as sales of buckwheat are being quoted around $4.25. Rice is also selling at premium prices. $3.25 being common. Barley is the one size that can be had at company circular and even below.

In this connection it is also well to state that all sales of broken coal are being made by the company at $6.35. It will be recalled that the company had made contracts on this size last year at $5.95, but later advanced the spot price to $6.35 when egg coal reached that level last fall. With all broken contracts expiring on April 1 shipments of broken will be priced at $6.35, which is virtually an increase of 40c., as little tonnage of this size was sold on the open market.

The prices in accordance with the above changes per gross to f.o.b. cars mines for line delivery and f.o.b. Port Richmond for tide are as follows:

	Line	Tide
Broken	$6.35	$8.20
Egg	6.35	8.20
Stove	6.60	8.45
Nut	6.70	8.55
Pea	5.30	6.90
Buckwheat	3.75	4.80
Rice	3.00	3.90
Boiler	2.50	3.50
Barley	2.25	3.15

Bituminous—Of course the big factor affecting the soft-coal trade was the announcement of price removal on April 1. In a manner this action by the Government was discounted some weeks since, it would appear, by the record of prices at which sales have been made, until by the time of the issuance of the statement a large number of shippers were asking prices at a fair premium in excess of the Government figure.

Now that the control is to be taken off there is a decided tendency in the market to run wild, as even now we have reports of coal being offered at $4.50 and from then up to $5.25. Now while it would perhaps be difficult to point to actual sales being made, it would appear that so long as offerings were being made at high prices it is not at all unreasonable to surmise that sales have been made at such figures.

It will be recalled that before the Government took control at the beginning of the war figures had closely mounted to the $6 level and it would be no surprise that they will again touch that point within a week or so after April 1, despite the caution of the Government.

With the lifting of control definitely in sight the contract business took a new spurt, with figures increased over previous offerings. Whereas when contracts were offered three weeks ago the price range for the high grade coals was $3.25@$3.50, it has now advanced by gradual steps until at this writing $4 is the favorite price, with a tendency to advance beyond that point

Even then most contracts are being made with the understanding that these figures will be subject to an advance should the miners receive an increase above the 14 per cent which they received in February, and as this is a foregone conclusion the consumers in closing contracts realize that they will have to pay even more than is shown in the agreement.

For one thing the settling of the price question, partially at least, puts the trade in position to go ahead with more certainty, since the shippers are in position to assure them that coal will now reach you after it has once been consigned from the mines and will not be subject to the vagaries of a distribution committee.

There is a general tendency throughout the trade to store all the coal possible at this time, but before any storing can be done there must be a heavy tonnage shipped into this market to allow the big consumers to accumulate a comfortable margin of fuel, as practically all of the heavy users have exhausted their reserves.

There can be no doubt that it will be an extremely busy summer, especially since the railroads have announced it as their intention to store a three months' stock before July 1. It is quite doubtful whether they will be able to accomplish this in that period, as the needs of industry are so great that it is believed that it will be a job for the entire summer to take care of their demands.

In a general way there has been a somewhat heavier tonnage arriving lately, but not anywhere near what the consumer desires. A spot market is once more springing up and the small consumer who uses but four or five tons a year, or less, is coming in as usual and endeavoring to have his needs taken care of in the spring. It is this class of trade that will have to pay the heavy spot price and as a matter of fact it is his anxiety to get coal now that has had much to do with the rapidly increasing price.

With the lifting of price control it is also believed that the export trade will take on a heavier tone, as many shippers have big orders on their books and have been waiting for months to ship them. The one drawback to this trade, of course, is the scarcity of carriers.

BALTIMORE

Confusion as to the basis of trading after April 1 is sharply evident. The few contracts being made are running around $4 to $5 mine basis, with the wage rate increase problem included as an extra in most cases. Export permits allowed where vessel and coal are at tide.

Bituminous—The market is in a confused state of mind. No one seems to be able to figure just what prices are to be after April 1. On contract the lowest guess for the new basis is around $4 and the top price usually quoted as around $5, mine basis, although some are talking of $6 coal. The spot market guess runs all the way from $1.50 to $6. But all this is largely guess work. For the present the trade is shipping only "bunker and export coal at bunker and export prices."

Meanwhile industries here are growing desperately short. Coal shipped to local plants, and indeed many cars of coal consigned to the piers under the export ruling, has been confiscated by the railroads. The roads are apparently bent on confiscating every pound of coal possible before April 1. The result is that while the export ban has been lifted—at least for shipments where the handler can show both coal and ships at the piers—there is no great movement. The reserve at the Curtis Bay pier, for instance, while increasing gradually, is only around 25,000 to 30,000 tons on any one day. With thousands of coal cars still tied up in the West and New England as a result of the government policy of extensive diversions, the car supply in the mining regions continues so poor as to prevent any prompt relief. Both movement and production are now at ridiculously low figure. The car supply on the entire B. & O. system the past week only ran around 50 per cent. The daily movement averaged around 2,500 cars, although 3,521 were loaded on one day.

Anthracite—The hard-coal men are not much surer of their ground than are the soft-coal producers and handlers. The retailers here are being urged now by many customers to deliver at once on the existing price schedule, the public awakening to the belief that much higher rates are to be paid this summer, rather than a spring reduction being in order. Prospective miners' raises and freight rate jumps are making everybody guess that from $1.50 to $2 per ton is likely to be added to the present schedule.

The receipts here continue comparatively light, however, and the coal men are necessarily cautious in taking orders which they cannot see a prospect of filling promptly.

Eastern-Inland

PITTSBURGH

Leading operators insist they will be conservative in matter of prices, but premiums for early deliveries, over contract prices, are expected.

With a wide-open market scheduled for April coal operators have been carefully considering the situation from all angles. The common report is that conservative counsels are going to prevail, and that large operators will hold the market from advancing as it was claimed it would if the usual practice were followed of each seller seeking the highest price he could obtain.

Interpreted into figures, the conservative price referred to is about $3.50 for mine-run, per net ton at mine, Pittsburgh district. While buyers may not consider this a conservative price coal operators do. While the restrictions are nominally in effect until the end of March there has been some negotiating resulting in definite sales understandings even though contracts may not be signed formally until April 1. In one instance cited ¾-in. gas coal of good grade has been sold at $4 to the end of the year.

Even if the general market, particularly on contract, is held by the action of large operators within certain bounds, it is thought probable that fancy prices will be obtained by some of the smaller operators for some time to some, and a wild market may characterize the first few days of April. The circumstances may duplicate those obtaining before the Peabody agreement in June, 1917, when the steel industry was conspicuous for bidding up prices.

Not a few steel mills, particuarly in the Youngstown district, have had curtailed operation of late from coal shortage, entailing increased cost of output per ton and great loss of profits through restricted output, so that these mills can well afford to pay almost any price for coal to insure full production of steel.

Technically, the market at this writing is quotable at Government limits, $2.10 for slack, $2.35 for mine-run and $2.60 for screened, per net ton at mine, Pittsburgh district. Practically, the new market may be forecast at something like $3.50 for mine-run on contract, and $3.50 and higher for prompt lots.

COLUMBUS

Speculation as to what price will prevail after April 1 is the principal feature of the Ohio coal trade. Larger producers and shippers will make an effort to prevent a runaway market. Good demand for all grades and varieties.

[illegible] far as [illegible] after April 1 [illegible] taken on a [illegible] the for the [illegible] and shippers [illegible] much [illegible] They [illegible] supply [illegible] prices or [illegible] of the price [illegible]

suddenly become active in every way. Buyers immediately appeared, offering high prices for tonnage to be produced after April 1.

The question of price is now attracting a larger part of the attention of coal men. Everyone concedes that higher prices will prevail, which are entirely justified by the increased cost of production, but just where the levels will remain after the first flurry is the momentous question. Offerings of $5.50@$6 for Pocahontas lump were made immediately after the lifting order was published. Those prices are expected to prevail for some time at least. In the other West Virginia fields the prices are expected to be about $5 for lump and $4.50 for mine run. Hocking lump prices are expected to be about $3.75@$4, mine-run about $3.25@$3.50 and possibly higher and screenings around $3. This is expected to include both the thin and thick-vein regions. Pomeroy Bend prices are expected to be about the same as Hocking

Milder weather has taken the edge off the domestic demand, which has been the outstanding feature of the trade for several months. Retailers have been able to secure some stocks and are generally in a position to supply their customers with fuel. This is true more especially of central Ohio while there is still some shortage in domestic stocks in northwestern and western Ohio. Retail prices are still unchanged but heavy advances are expected immediately after April 1. Instead of charging $6.50 for Hocking lump, prices are expected to be $7.25@$7.75 and possibly higher. Other advances accordingly are expected in West Virginia grades and Pocahontas.

Steam demand is becoming extra strong, as some of the larger users are making strenuous efforts to secure some reserve stocks to guard against emergencies. But the continued confiscation of cargoes for railroad fuel has prevented much of the stocking desired. Most of the steam plants are being operated from hand to mouth as it were. Active preparations are being made for an early opening of the lake trade and already some tonnage has been tied up. But producers are loath to contract under present uncertainties of the market.

CINCINNATI

Situation unsatisfactory. Car supply only 30 per cent. Public Utilities running on small reserves. No free coal to be had.

An increase in the wholesale and retail price of coal is certain to come on April 1. The price fixed by the government was below the cost of production at the mines in most instances. L. A. Colter of the Coal Exchange said that if the miners accept the increase of 27 per cent in their wages fixed by the majority of the Bituminous Coal Commission in their report, the increase of $200,000,000 in their wages will have to be passed on to the consumer according to the President's recommendation.

The situation in Cincinnati during the past week has been very unsatisfactory. Car supply was around 30 per cent. The high stage of the Ohio river prevented shipments reaching Cincinnati, which combined with the crippled railroad traffic made matters unpleasant for the operators and dealers. The domestic trade was very small, owing to the warm weather here during the past ten days. Industrial plants are still clamoring for fuel, while confiscation and diversion still are in evidence.

Investigation conducted by the Cincinnati Coal Exchange shows that a large number of manufacturing plants here are without reserves and are almost wholly dependent on receipts from day to day to enable them to continue in operation while in many of the coal yards the supply of bituminous is so small that household consumers often find it difficult to obtain it. The demand from that quarter has dropped off some with a rise in temperature.

Reports have been circulated about the city that certain dealers are charging in excess than the Government rules allow. However none could be found, while a majority of the dealers would welcome an increase to help them clear their overhead expenses. The local trade is of the opinion that only the repeal of the Lever Act can bring conditions back to normal.

Now with the opening of spring weather, jobbers, wholesalers and distributors believe the warm weather will help relieve the intensity of the situation. There is practically no free coal on the market even of the poorer grades. Every grade is scarce and dealers who even two or three weeks ago had pretty well caught up on certain grades are now unable to give their customers any definite promises regarding shipments.

A steady stream of buyers passed through the coal offices the past week all crying for fuel, some asking for at least a car. However they left the city with about the same hopes they entered. Dealers are impressing upon the public the advisability of buying next winter's fuel early. Many of the concerns are enlarging their coal bins in hopes of receiving large shipments and thus enabling them to lay away enough tonnage in case of an emergency.

Southern

LOUISVILLE

Domestic demand quieter, due to mild weather. Industrial demand continuing keen. Mines operating on usual short run basis due to steady car shortage. Prices expected to advance.

Due to much milder weather retail demand for domestic sizes has slumped off considerably, but retailers' stocks are very low, and there is a good demand upon the jobbers and producers for block and lump, as well as smaller sizes.

Industrial demand for coal is very keen, especially for byproduct and gas coal, and producers report that buyers are active in the fields, and doing everything they can to secure immediate deliveries.

Mines are operating about three to three and a half days a week, although some slight improvement is being noted in car supply as a result of good weather and better traffic conditions.

As a result of announcement to the effect that Federal control will be lifted on April 1, prices are expected to advance sharply. Producers have been taking orders for some time past subject to market advances in event control was lifted, while many have been taking orders only for immediate delivery. With much production tied up on contracts coal available for immediate delivery will probably soar considerably due to car shortage and small production, creating a keen demand.

At this time last year demand was dull due to the country being well stocked. Conditions are different this year, and coal men claim that it is a sellers' market.

Louisville retailers recently asked the High Cost Commission for a 65 cent increase on the ton over the $2.20 gross margin allowed by the Fuel Administration. Indications are that unless the commission allows the increase, it will be taken Otherwise retailers expect to base prices on mine price, plus freight, war tax and a $2.85 allowance. Jobbers will probably advance the brokerage slightly to take care of increased operating expenses.

So far it is too early to figure out what effect lifting of Federal control may have. Producers haven't had time to decide just what they will do. Retailers feel that domestic demand will be dull for some months, and that it may be hard to advance prices, especially in view of keen river competition.

BIRMINGHAM

Coal market showing great strength, as demand increases for steam and domestic grades. Car supply on about the same basis as a week ago. Shortage of equipment prevents mines from producing sufficient coal to meet the trade requirements.

The supply of coal from this district continues to be woefully short of meeting the needs of the trade, the market being exceptionally strong for all grades. The shortage in production at the mines is attributable almost wholly to the car situation, as there is ample labor to get out sufficient coal for all needs if the equipment was available. As it is, the scant supply has to be distributed to the trade in the most equitable manner possible.

The Louisville & Nashville, Central of Georgia and Seaboard Air Line have requested bids on the Alabama quota of their fuel supply for the next twelve months, the contracts of the two former expiring April 1st, and the latter July 1, 1920. All lines are short on fuel supply and the Central of Georgia has been reported as confiscating practically all coal passing to its tracks. The Southern is also taking over some coal for use on its lines.

The lifting of price control April 1 is expected to be followed by some increase in mine prices over the Government schedules, some operations being forced upon a very small margin of profit in absorbing the 14 per cent increase in wages put into effect Dec. 1. A meeting of all Alabama operators has been called for March 27, to discuss the award of the wage commission and consider the action to be taken thereon. The indications are that the present schedule of wages and working conditions will be continued in effect in this field, as any further advance would have to be passed on to the consumer in increased coal prices.

The production for the week ending March 20 will fall short of the previous week due to excessive rains which flooded mines and interfered with transportation. The output for the week of March 13 was approximately 325,000 net tons.

Lake Region

BUFFALO

Still the car shortage and coal confiscation. No real improvement yet. Look for higher prices with the dropping of restrictions. Anthracite more plentiful, but demand heavy.

Bituminous—Demand is not very heavy, so the light supply manages to keep ahead of it, but the margin is small and does not appear to grow much. It is probable, now that the storm shut-downs are over, that there will be coal enough to keep all the factories going, so that by midsummer the trade will assume something like a normal condition.

Still there is far from a normal car supply and if that does not improve it will be no easy matter to keep everybody in coal. There is not the big surplus in consumers' hands that has sometimes met a shortage of supply. The shippers have done what they could, but never before have they been obliged to meet so many difficulties at one time. It seems as if every possible trouble had come upon them at about the same time. If they were not all at once they followed in such a train that it amounted to that. How the consumers were kept from running out entirely in many districts is a wonder.

The new problem now is the throwing off of the Government restrictions. Whether the authorities think the worst is over or have doubts as to the value of outside regulations is not reported, but the trade is agreed that the best thing to do is to drop them and try to forget them. The one thing to strive for is a better car supply. Most of the difficulties would disappear in a day if the movement could be brought back to the normal, so that a shipper could be sure when he filled a consumer's order the coal would be delivered in a reasonable time.

Of mining difficulties, coming out of the annual fixing or soaring wages, nothing can be said now, except that the prospect of suspension does not seem as great as it was. The miners will get an advance and if it is granted without the usual war it may be as well. The going up of wages continues everywhere, so that the cost of living must be greater right along. Not till workingmen are made to see that they are the chief promoters of general expense and lack of industrial operations will they stop demanding more wages.

The Buffalo bituminous trade is in anything but a satisfactory condition, but it may be on a par with most others. Shippers have a way of going to Pittsburgh for comfort and information whenever they get to the end of their own resources, but they have for some time come back with little of value in either direction. As to bituminous prices it may be of account to quote the Government prices again, $4.70 for Allegheny Valley sizes, $4.50 for Pittsburgh and No. 8 lump and three-quarter and $4.25 for all mine run and slack, but they have been anything but well kept lately.

Anthracite—The late scarcity is not made up yet, but the danger of a famine is over, although coal does not come in as fast as it should. Receivers do not seem to know what is done with it and are as anxious as anyone, for they could sell much more coal than they are getting. Sometimes the Eastern trade takes all the surplus, but that territory seems to be as short as we are.

Everybody is ordering coal for next season, as the idea is general that prices are going to be higher soon and not come down. Anthracite is not going to be plentiful always and will never be cheap again. What is going to take its place cannot be said, but people are looking to oil or electricity among other things. An effort is making to consolidate the two gas companies here, natural and illuminating, which shows that neither of them promises to meet the requirement alone. Electricity has badly hurt gas for lighting here, for it is one of the few things that are both cheap and efficient.

The lake coal trade will open late, even if the ice goes soon, for there is no coal to ship by that route yet. The fleet is getting ready, for there are other things to move. A rate of 60c. net from Ohio ports to Chicago has been made and of 50c. to Duluth This means 10 or 15c. more to the lesser ports. This port has not yet accepted the rate, but is expected to do so, as it generally does.

CLEVELAND

Negotiations for large tonnages of No. 8 coal have been opened as the result of the lifting of Government price control. Sentiment seems crystallizing on mine-run and slack around $3. Lake coal is talked of at $3.25. Great Lakes coal freight rates for the 1920 season have been fixed at a considerable advance over the 1919 ones.

Bituminous—Announcement of the terms of the new bituminous-coal wage scale is all that is necessary to set off the largest contracting movement since pre-war days While several large blocks of No. 8 coal have been "spoken for," no actual contracting yet is reported. Negotiations, however, have been opened and if miners accept the 27 per cent award some tonnage will be placed at $3@$3.25. It seems probable that $3 will be the minimum f.o.b. mine for No. 8 mine-run and slack, with $3.25 the top figure mentioned here so far.

It is believed most lake coal will go also at these figures. The larger operators, realizing that Government prices have been suspended and not abrogated, say they will make every effort to prevent a runaway market, and to this end will seek to keep as large a tonnage as possible out of brokers' hands. Hereafter, it is announced, No 8 slack and mine-run will be quoted on the same level with ¾-in. coal 25c. higher and 1¼-in. coal 15c. still higher.

Milder weather and more expeditious handling of cars have combined to bring local receipts up to 70 per cent. In the past week stock piles have begun to rear their heads, and in some cases as much as a three-week's supply has been thrown down. Demand exists for every ton of slack and mine-run that can be had. The leading utility is now 15 days ahead, compared with two days two weeks ago. Some coal is going to the lake-front docks, but this movement has not yet really begun. Mine operations are gaining slowly but steadily. All interest, however, is not centered on contracts.

Pocahontas and anthracite—Domestic demand for these grades, as well as domestic bituminous, has fallen so low dealers' yards are showing sizable piles Some domestic users are buying for next winter, but they are in the minority. Prices on both grades show no softening.

Lake trade—A Cleveland vessel interest has taken 1,000,000 tons of No. 8 coal at 50c. a ton to the head of Lake Superior and 60c. to Milwaukee. In 1919 the rates were 42½c. to Lake Superior and 47½c. to Lake Michigan. In 1918 48c. to Lake Superior, and 55c. to Lake Michigan. It was thought that the 1918 rates would rule for 1920, but they did not prove high enough to meet shippers' ideas. A large lake shipper says he is hopeful that the lake coal maximum will be $3.25 for No. 8 coal. Slow start is looked for, both because of heavy ice in upper lake harbors and the car shortage.

Prices of coal per net ton delivered by retail dealers in Cleveland are:

Anthracite—Egg, $12.20@12.40; chestnut, $12.50@12.70; grate, $12.20@12.40; and stove, $12.50.

Pocahontas—Shoveled lump, $9.00@9.25; and mine-run, $8.00@8.25.

Domestic bituminous — West Virginia splint, $8.30; No. 8 Pittsburgh, $7.00@7.50; Massillon lump, $7.40@7.65; Cannel lump, $11.00; and Coshocton lump, $7.35.

Steam coal—No 6 slack, $6.00@6.25; No. 8 slack, $6.00@6.25; Youghiogheny slack, $5 40@5.75; No. 8 ¾ in., $6.60@6.85; No. 6 mine-run, $6.35@6.60; and No 8 mine-run, $6.45@6.60.

DETROIT

Shortage of car supply and confiscation of shipments continue to reduce Detroit's receipts of bituminous to an inadequate minimum. Active inquiry for both steam and domestic sizes.

Bituminous—With an active inquiry for both steam and domestic sizes of bituminous, Detroit jobbers are encountering much difficulty in getting coal to supply their customers regularly and promptly. Though some coal is being brought into the city, the amount is said to be wholly inadequate for requirements of the local trade.

Failure of the railroads to supply cars and motive power in sufficient quantity to enable the mines to maintain full-time production is held to be responsible for the inability of the mines to send out a normal tonnage. The amount of coal ultimately arriving in the market is still further reduced, the jobbers assert, by the continuance of the railroads' policy of confiscating shipments at the mines, en route and even after arrival on local terminal tracks.

With the present uncertainty and irregularity of supply, the jobbers find it very difficult to provide for the needs of their customers, and feel they are working against discouraging odds in an uphill fight to continue in business. Their dissatisfaction is increased by the retention of the government-fixed margin of 15c. a ton allowed them on sales. Since the margin was fixed at that amount, office rentals have advanced, wages of office employees have been raised and the cost of all supplies and accessories of the business has been placed on a higher level. Jobbers feel that the Government's attitude in ignoring the change in working conditions renders them the victims of a serious injustice.

Anthracite—Receipts of anthracite are very light and lack regularity. In prospect of labor trouble in the anthracite districts, demand from consumers has been sharply stimulated. Because of the long period of very low temperatures since Jan. 1, stocks in the yards of retail dealers have been worked out to near the vanishing point and with little coal arriving the outlook for consumers is far from bright.

Lake Trade—Shortage of cars on the roads handling rail-lake shipments and the strong demand in markets at the lower end of the route seem to preclude the possibility of shipments over the lake route attaining very large volume early in the season, though docks at the head of the lakes will have little stock remaining at the opening of navigation.

Middle West

MIDWEST REVIEW

No radical increase in prices expected. Removal of Government control pleases operators. Market is still strong.

On Tuesday, March 23, the public was informed that effective April 1 price restrictions on coal, and Government supervision of the coal industry, would be removed. This, however, does not apply to export coal. President Wilson's statement came as a pleasant surprise to coal men in the Middle West, although they were hoping and expecting that the Government would take its hands off of the coal industry soon. It is too early yet to make any predictions as to what the price of coals produced in this territory will be after April 1. It is pretty generally thought, however, that the price will be very reasonable and fair, taking into consideration the car shortage and the advance already being paid to the miners.

Practically all of the coal-producing companies and distributors in this territory have made up their minds that there will be no radical increase in their prices. It is said that domestic coal from Franklin County will be offered to the public at a price of $3.35 per ton f.o.b. mines for the month of April. This price will advance ten cents per ton until September, thus putting into effect, in a modified manner, Senator Freylinghuysen's idea.

This sliding scale price is nothing new in the Franklin County fields, as they have followed this procedure for the last few years. The southern Illinois coal fields will probably follow in the footsteps of the Franklin County operators, although some southern Illinois coal men will probably give out an opening price of ten cents or so less than the Franklin County prices. As we mentioned above, the tendency is not to increase prices too sharply. It is feared, however, that a number of smaller and less experienced operators, feeling grieved over the suppression of the industry and having lost considerable money during the last price restriction era, will feel that the opportunity has come to them to recoup their fallen fortunes.

The trade has watched with considerable interest the press notices appearing from day to day relative to the removal of price restrictions. If the daily press is a true reflection of public opinion, the coal operators and the coal industry are very unpopular with the public. It is pretty generally thought that a group of men, say for instance, the National Coal Operators' Association, ought to undertake a campaign of publicity in the daily papers, educating the public and justifying the prices which the public will be asked to pay. There is no denying that the coal industry has been the goat for a number of years, and that this position is undeserved. The industry has been so poorly and loosely organized that they have not been in a position to fight off the press attacks

Coal operators in the Middle West have had an opportunity to think over Senator Freylinghuysen's plan providing for a 25c. decrease in freight rates on coal during the summer months, and an increase of 25c. in the winter months, as well as a like decrease and increase in the cost of coal, to the public, during the two periods. Considerable opposition has resulted to this plan. Operators claim that the railroads are opposed to it, as in normal periods of operation during the summer months there is no surplus of coal cars, but that on the contrary there are sometimes extreme shortages.

In addition, the plan, if carried out, will result in a great disturbance of differential rates which will necessitate the opening of a new market on some grades of coal and throwing out other grades from their established markets. In short, the industry does not take very kindly to Senator Freylinghuysen's plan, so far as a summer and winter differential in freight rates and the price of coal is concerned

The market on all kinds of coal has kept up very strongly. We have been told by both buyers and distributors that the situation of coal today in this territory is more precarious and in a more critical condition than it has been at any time, even during the war, or during the strike. So far it has been almost impossible to place a contract with an operator, but it is hoped that after April 1 the industry will settle down to look over the situation, and map out what can best be done to serve the public.

CHICAGO

Retail trade at this time of the year is chiefly concerned in contracting and buying anthracite coal.

Lucky indeed is the dealer who has been buying from one firm regularly, as he is sure of being taken care of this season. Shippers and distributors of anthracite coal are not looking for new business, as they are having considerable difficulty in taking care of their own trade, already established. This is equally true of the Pocahontas operators who normally take care of this territory. We understand no prices have been given out as yet on Pocahontas coal, but some dealers have prevailed upon their usual connections in West Virginia to take care of them during the year on a basis of price current at time of shipment.

If one is to judge the coal situation in Chicago from the state of its various retail yards, it would be decided that Chicago was in pretty good shape, as there is a tremendous amount of coal and a lot of it has been spotted at the various yards. The public is showing an inclination to stock coal early, and one of our retail friends tells us that it is impossible to keep certain grades of coal on hand, no matter how quick he has it shipped to him. This is especially true of Eastern coals such as Pocahontas and southeastern Kentucky coal, rather than on Illinois and Indiana coal. The best grades of Illinois and Indiana coal, however, cannot be shipped fast enough to take care of the demand.

Steam-coal buyers continue to come into Chicago in a vain endeavor to place contracts. Operators are holding out some hope to them that they will be able to cover their needs after April 1, when the price question can be finally decided upon. Operators who have small mines — mines too small to maintain a sales organization—are having no difficulty in selling their product to the wholesale trade in Chicago. It is pretty generaly conceded that the present strenuous demand for coal will continue for some time.

ST. LOUIS

Car shortage continues. Coal scarce and demand for everything exceeds supply. Buying good on account of anticipated shutdown and increase in cost.

The local situation is just a trifle tense. The feeling here is that there may be a shutdown of from one to two or three weeks on the part of a great many of the [illegible]

[illegible] exceeds the supply on all kinds. The local trade is [illegible]

[illegible] about [illegible] field [illegible] ten mines [illegible] represented [illegible] tral Louisville & [illegible] Ohio Missouri [illegible] tric

That condition is a sample of what the field is going through. The miners still show a dissatisfied feeling. This is more pronounced in some sections than in others. In the Mt. Olive field somewhat better working time has prevailed during the past week, but this is largely on account of railroad coal which moved north and west. The operators in this field seem to think that there will be no suspension of work.

In the Carterville field of Williamson and Franklin County there has been a slight improvement in cars on all roads with the exception of the Missouri Pacific, and the same old incompetent railroad tactics prevail now on this line as heretofore. This road has no coal ahead and seems unable to keep any supply on hand, with the result that it is taking practically everything produced on its own rails.

Other roads are showing up better in the way of cars and movement and in a general way the field is producing heavier this past week than heretofore.

The railroad tonnage on all roads out of this field is heavy. Everything produced finds a ready market. It is undestood that on April 1 the Franklin County prices will start off at about $3.40, with a ten per cent increase every month for the domestic sizes. Nothing definite has been announced as yet on steam.

The feeling here is that there will be an advance of about 75c. per ton on everything in the Standard and Mt. Olive fields, which will bring these prices up to about $3.25 at the mines for lump, egg and nut, but competition, if cars are plentiful, will soon cut this price, inasmuch as there is an overproduction if eighty per cent cars are furnished.

There has been no change in the retail prices in St. Louis. The situation here is easy, although some anthracite is moving in, but small in comparison with what will be needed, and no smokeless at all. No anthracite is promised for this market after April 1.

The wholesale prices on coal are the same as last week:

	Williamson and Franklin Counties	Mt. Olive and Staunton	Standard
Prepared sizes (lump, egg, nut, etc.) .	$2.55@ $2.70	$2.55@ $2.70	$2.55@ $2.70
Mine run...	2.35@ 2.50	2.35@ 2.50	2.35@ 2.50
Screenings	2.05@ 2.20	2.05@ 2.20	2.05@ 2.20

Williamson-Franklin rate to St. Louis is $1.10 other rates $0.95.

MILWAUKEE

Coal supply down to a very low ebb. Lifting of the ice blockade on Lake Michigan permits a meager flow of car ferry. No relief promised until navigation can be resumed.

Coal dealers are "scraping the dish," so to speak, and will continue to do so until navigation between the upper and lower lakes is resumed. The ice blockade on Lake Michigan has lifted, however, and the meager flow of coal by rail and car ferry, which was cut off on that account, is in evidence again. Some small dealers have not been able to deliver anthracite for the past two weeks.

The dwindling soft coal piles on the docks represent supplies held to cover ironclad contracts. Soft coal is coming from Illinois and Indiana, but car facilities are short of the needs of the service. Warm weather prevails, but the demand for coal would be heavy just at present under any circumstances, because of the anticipated advance in prices in April. Coke screenings are being advertised at $9.50. delivered. Prices of the other grades of coke, and of anthracite and bituminous coal remain undisturbed, however.

Pacific Coast

SEATTLE

Quotations at the present time are as follows:

Seattle—$6.75 per ton 2000 lb., f.o.b bunker tips.

Tacoma—$6.75 per ton 2000 lb., f.o.b bunker tips.

Portland—$8.75 per ton 2000 lb., f.o.b bunker tips.

Portland—$9.50 per ton 2000 lb., in the stream over the ship's rail.

The above rates apply to the standard grades of Black Diamond and South Prairie coal.

Quotations on British Columbia coal in Seattle Harbor are as follows:

Comox Lump—$10.00 per ton of 2240 lb., f.a.s.

Comox Marine Mixture $9.85 per ton 2240 lb., f.a.s.

SAN FRANCISCO

Pending a settlement of the controversy as to the increase in wages to be given the miners, dealers in San Francisco are worrying along with the stocks they have on hand.

Coal men look for no drop from the $3.65 f.o.b. net ton, wholesale, on stove and lump coal at the Utah and Wyoming mines, and a raise may come any day. The bunker coal situation is very satisfactory. More ships than in years past are calling at the Golden Gate on the way to the Orient from the Atlantic for replenishment of their bunkers and many cargo carriers discharging and loading at San Francisco are taking on large amounts to be burned on voyages to the Seven Seas. The King Coal Co. has a sufficient supply in its bunkers at its depot for all needs of the ocean fleet. No vexing car problem exists, as the coal is shipped to San Francisco by the U. S. Fuel Co., of Salt Lake. which owns its own cars.

The bunker price at present is $13.55. which has been maintained for some time. For domestic use, bituminous prices from Utah and Wyoming, f.o.b. net ton, are: Stove, $3.65; Lump, $3.65.

Coke

CONNELLSVILLE

Predictions of $9 coke with open market. Byproduct output to increase. Much second quarter coke for negotiation.

With the Government price restrictions still nominally in effect, but an open and higher market certain for April 1, there is no quotable market at the moment. If the strict letter of the law were not evaded, an operator would be still better off holding coke, paying demurrage to sell April 1. Just why the common prediction is that furnace coke will go to about $9 is difficult to ascertain, but that figure represents the general run of the predictions.

Some reference is made to the price that would be realized for coke at this time on a contract calling for a ratio of 4½ to 1 on basic pig iron, valley, which is now quotable at $41.50 or $43 according to different authorities, but a difficulty is that contracts now in force are rather at 5 to 1, which would mean only a trifle over $8 for the coke.

In the past three months the appearance has been that practically all the coke produced in the Connellsville region went out on contract, but as a matter of fact much of this contract tonnage was either on contracts made for the quarter only or was against general understanding that the coke be shipped and billed at the ruling market. In either case there will be coke released for actual sale and an active market is expected. Removal of the price restriction will not increase production, which hinges upon car supply, but larger production is in prospect as transportation conditions continue to improve, now that spring has come.

The production of byproduct coke will undoubtedly increase materially, as the operators will be in position to bid whatever prices are necessary to secure coal, and thus coke supplies will be increased. Despite this prospect it is predicted that high prices will rule for Connellsville coke. Pittsburgh district coal is predicted to sell at about $3.50, and that would perhaps justify a price of about $8 for furnace coke. At the moment the coke market is unquotable.

The *Courier* reports production in the Connellsville and the Lower Connellsville region in the week ended March 20 at 249,240 tons, an increase of 4,770 tons. Previously, since the first of the year, production had been reported at an average of about 240,000 tons weekly

BUFFALO

The situation follows that of bituminous coal, the demand being quite equal to the supply. The furnaces have had some difficulty in getting as much as they needed but no special complaint has been heard lately. Prices remain nominally at $9.60 for 72-hour Connellsville foundry, $8.60 for 48-hour furnace, $7 for low grades and $7.75 for domestic sizes, per net ton, f.o.b. Buffalo. It is expected that more ore will be brought down by lake this season than was last and it will begin to move as soon as the ice is out of the lakes.

COAL AGE

New York, April 8, 1920

Volume 17 Number 15

Forward—With the Industry

An Announcement to Our Readers

COAL producers today are facing many problems in both the technical and the economic phases of the industry.

The war and its aftermath of industrial reaction and readjustment have developed to a marked degree what some would call the ailments of the coal industry, and have focused public attention on the three-sided relationship of the operator, the miner, and the consumer. Added to the technical problems of mining have come labor problems, transportation questions, distribution difficulties. Even if the coal producer desired to hold himself aloof from these problems, he could no longer do it. Concerned, as he is, with a basic industry there are few of the practical problems in our complex industrial life which have not been put squarely up to him during the last few years.

The way out in answer to these problems, which are age-old in principle, but new in complexity, lies in the study, exchange of thought, development of ideas, education, and the application of sound economic principles—in a word, just plain commonsense.

COAL AGE has been from its beginning, and will continue to be, the leader in all the engineering and technical features of coal production. With the ever mounting cost of production comes a greater need of sound, efficient engineering and mine management. Coal Age has always stood foremost as a medium of exchange of advanced technical and scientific thought in the industry.

Coal producers are facing today, with executives in other industries, a new kind of labor problem. The engineers and managers who stand between capital and labor, and friends of both, are the men on whom will largely fall the task of solving this labor problem. Coal Age will maintain its position of authority on this question.

BUT in addition to the technical and labor problems of efficient, low-cost and safe production of coal are the problems of profitable production, of transportation, of distribution, and of merchandising. Coal Age is broadening out to meet these new needs, just as in the past it has met the engineering problems of the producer.

Coal Age will make its pages a forum for the discussion and the interpretation of the practical ways to meet these new economic problems of the industry. Just as we have, as a result of the war, replaced the map of the United States with the map of the world, so as coal operators, we have learned to think in terms first of national, then of world fuel problems. The hard knocks of the past year or so have brought us together in a community of interest, at times with our backs to the wall, in an attitude that augurs well for the future exercise and further progress of the industry.

COAL AGE proposes to bring to the men of the industry the news of the industry, interpreted as to its effect on their business. It proposes to bring to them the views of other operators, those whose experience and judgment command respect.

Coal Age believes in the opportunities of the coal industry. It is broadening its field in the same spirit that has built it in the past. With the growing problems of transportation, of distribution, of markets, of prices, has come the need of sound and efficient marketing methods.

THE coal question is national. It concerns every one. The problems are local, national, and world-wide. Coal Age approaches these problems in the spirit of service for each reader, whether he be miner, superintendent, engineer, operator, distributor, or banker.

Coal Age is associated with a group of technical magazines of other industries. It has opportunity through nation-wide organization to keep in touch with the industrial progress of the country, to pass the news on to its readers.

In common with the associated publications, it will serve under this banner: "Live for your industry, not on it."

New Editorial Plans—and a New Man

By R. DAWSON HALL

Harris & Ewing, Washington, D. C.

C. E. LESHER

COAL AGE, to fill its mission, must consider the industrial problems as well as the technical, and it must work out its plan of campaign with the right sort of leadership. If this is to be so, a man must be sought who will adequately fill such a need as this. One does not have to look far. Conditions have marked out the man so unerringly that but one remains for choice.

When Edward W. Parker left the U. S. Geological Survey, leaving behind a marvellous record of the statistics of production, we all wondered who would be found to succeed him, for Parker had filled the place with distinction. He had been one of the Anthracite Coal Commission and had been influential in framing its valuable decisions, and he left to be Director of the Anthracite Bureau of Information.

IN his place came C. E. Lesher, then little known to any one but the Survey chiefs. A native of Colorado, he had attended the state's celebrated School of Mines and spent a few years professionally in British Columbia, Illinois and New York State. He then entered on the work of the Survey and was assigned to collaborate with the Coal Land Classification Board of which he later became chairman.

From this position he was called to fill the place vacated by Edward W. Parker, which gave him charge of the Coal Statistics in the Survey's Division of Mineral Resources. While there, the volumes of "Production" originated by Mr. Parker, not only continued to appear as well edited and reliable as before but supplemented by a smaller annual volume on "Distribution." Mr. Lesher was already broadening as far as the purse of the Geological Survey would allow him. He was unconsciously laying the foundations for his great war work, and when the war arrived he had both the knowledge and the well-developed judgment that enabled him to be of service to his country.

WHEN the Council of National Defense was formed it was able from the first to plan intelligently its course in regard to coal, because it had Mr. Lesher on whom to rely as a guide in regard to the affairs of the coal industry. Before long Mr. Lesher became in effect the technical advisor of the Peabody Committee on Coal Production. During the strenuous days of that short-lived committee he found time also to take a leading part in the formation of the National Coal Association.

Mr. Lesher soon after became head of the apportionment division of the U. S. Fuel Administration, and there he directed expenditures which were made at the rate of $400,000 annually and guided the work of 500 employees. It was then that the country first got reliable figures on coal consumption.

The statistics gathered by the Fuel Administration, in an effort to get the maximum benefit from every ton of coal consumed, were by far the most comprehensive statistical compilations of this character ever gathered in any country. The charts of weekly production, the weekly analyses of mine idleness from car shortage, strikes, mine disability and lack of orders are a monument to his industry and ability.

After the war, when he was about to be designated head of Mineral Resources branch, Mr. Lesher resigned his position with the U. S. Geological Survey that he might accept the Directorship of the National Coal Association's Bureau of Economics. In filling this important charge he prepared the statistical compilations which were presented by the National Coal Association to the President's Bituminous Coal Commission.

NEXT week Mr. Lesher will officially join our staff as coeditor with me of *Coal Age.* Our journal has set for itself even higher standards of accomplishment in the technical and engineering sides of coal production, over which I shall have jurisdiction, and the staff welcomes Mr. Lesher in the added field of development in the industrial and distribution phases of the paper that it will be his privilege to direct beginning with the issue of April 22.

Working Both Freeport Beds Together

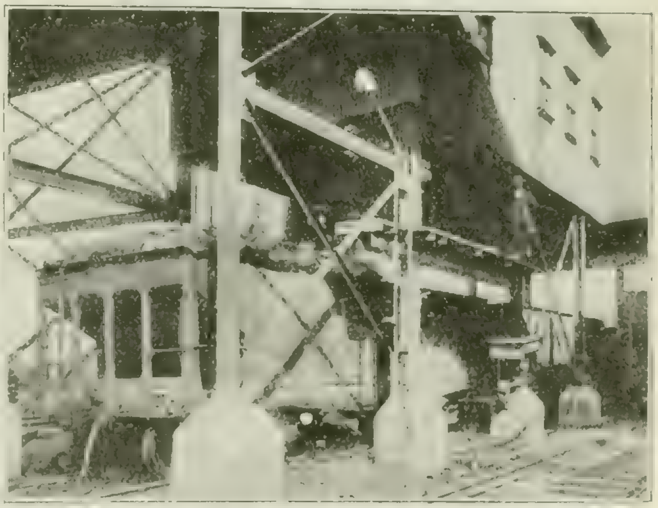
At This Operation the Upper and Lower Freeport Beds Are Separated by Six Inches of Boney—Both Beds Are Therefore Worked Simultaneously—Some of the Boney Is Burned for Fuel—A Record of the More Notable Mechanical Details of the Plant

By Donald J. Baker
Pittsburgh, Pa.

MINES in Allegheny County, Pennsylvania, are not confined entirely to the Pittsburgh coal bed, since there are several operations where the Upper and Lower Freeport beds are under development. One of the most up-to-date plants in the western end of the state is situated at Bairdford, on the Bessemer & Lake Erie R.R. out of East Pittsburgh. This operation is known as the Berry No. 3 mine of the Ford Collieries Co. It is here that the Upper and Lower Freeport beds of coal attain their greatest thickness and adaptability for mining.

The Ford Collieries Co., which is a subsidiary of the Michigan Alkali Co., was organized in 1909, at which time the coal properties now held were purchased. It was not until 1915, however, that the Berry No. 3 mine was opened and the surface buildings completed. The company has an unbroken tract of 8,000 acres of coal in this section of northern Allegheny County, all of which lies in a nearly rectangular tract. For the development of this coal acreage three shafts have been sunk on the property—the Benjamin No. 1, at Curtisville; the Francis No. 2, which is situated about a mile north of Curtisville, and the one already mentioned, which is located about 2½ miles west of Benjamin No. 1.

It is possible that a fourth shaft will be sunk to the north of Berry No. 3 at some time in the future, although this is still problematical and will not be done until the development work in the three mines already mentioned has reached a stage that will clarify the possible haulage problems to be encountered. The No. 1 and No. 2 mines were opened the same year that the company was organized.



LOADING COAL UNDER THE TIPPLE
The car is partly loaded with lump coal and the lead of a car retarder may be seen attached to this car.

The Freeport beds of coal in this locality average a little more than 6 ft. of workable thickness. The upper bed runs about 42 in. thick and the lower about 34 in. A 6-in. layer of boney separates the two beds, while

GENERAL VIEW ON THE DUMP FLOOR OF THE TIPPLE

The crossover dump, a portion of the tracks leading to and from the kick-back and the car haul are plainly visible.

directly over the upper a bed of cannel coal is encountered that varies from 12 to 28 in. in thickness.

The two beds are worked as one. The boney does not mix readily with the coal when the two beds are shot down, and consequently it can readily be gobbed. All the boney has to be handled in gobbing and in that respect is a dead waste, but that disadvantage is offset by the fact that the roof is firm, the cannel forming the best kind of material to work under. No trouble is ever experienced with air-slacking or weathering—a condition that causes much trouble in the Pittsburgh bed, where a soft friable roof is encountered more often than a firm one.

SIDE VIEW OF MAIN HOIST HOUSE

[illegible] illustrates the substantial brick and [illegible] employed in the surface buildings.

The layout of the Berry No. 3 plant, which is the best equipped of the three operations, is highly compact. The general construction of the surface buildings is of a substantial type as well as an artistic one. All of the buildings are of brick construction with concrete foundations. As can be noticed in Fig. 1, there are two shafts, one of which is utilized for hoisting the coal while the other serves as an airway and a material shaft. The main hoisting shaft is 210 ft. deep and is concrete lined. It is 29 ft. long by 10½ ft. wide in dimensions. At the bottom a concrete archway extends 7 ft. in each direction, the sides of which are supported by steel sets with tile walls between.

The cages in use were made at the machine shop of the No. 1 mine. In connection with the making of the cages it might be mentioned that the officials of the company are unusually resourceful men. Much of the apparatus and equipment that has been installed around the mine was made at the shops. In many cases manufactured apparatus has been so largely rebuilt in order to secure better service that the parent design is almost lost in the present one. Many ingenious safety devices have been constructed. W. D. Thomas, superintendent of the Berry No. 3 mine, who is a mechanic of no small ability, is credited with having built many of the devices. While much of this apparatus is not universally known, the company has obtained patents on most of it. This has been done merely as a protection from unscrupulous manufacturers. A separate article describing and illustrating some of the many devices that have been installed at these mines will be presented to *Coal Age* readers next week. Each can be made at the ordinary mine blacksmith or machine shop. In this article only passing mention will be made of this apparatus.

CONCRETE LINING PROVIDED IN BOTH SHAFTS

The air and material shaft is of the same depth as the hoisting shaft and is concrete-walled to the bottom, excepting in a few places where solid rock was encountered in the sinking. It is divided into three compartments, one of which serves as an airway, another as a hoist compartment, while the third is utilized for a stairway and contains a steel staircase.

The headframe is of steel and was erected by the Dravo-Doyle Construction Co., of Pittsburgh, which also supervised the sinking of the shafts. In the hoist compartment there is one cage which is counterbalanced by weights running on guides in the air compartment. One of the details in the construction of the headframe tending toward efficiency is the installation of an electric chain hoist permanently suspended. By this means all heavy supplies that are to be taken underground are handled in the easiest and most efficient manner.

The hoist serving the air and material shaft is located in the power-plant building. This is divided by a brick partition so as to house the boilers in one room and the generating units and hoist engine in another. This engine is a steam-driven Vulcan machine with a single 6-ft. drum. It is of the balanced type and is equipped with a steam brake, a hand brake and a Nicholson engine stop.

The balance of the engine room contains three direct-current generating units. Each is of General Electric make and of the same capacity, viz: 200 kw. A direct-current voltage of 250 is delivered for use within the mine and around the plant. Each generator is direct-connected to a Ball steam engine. In one section of the room a separate unit provides the current that is used for lighting the town. This is a General Electric machine of 50-kw. capacity. This generator delivers 2,200 volts alternating current. A four-panel switchboard completes the electrical installation at this point. Incidentally, the water-gage fan register has also been placed here.

The boiler room contains three batteries of horizontal tubular boilers set in pairs, each having a capacity of 200 hp. These are hand-fired. Coal is delivered from the tipple by a flight conveyor to overhead bunkers and thence fed to the floor through steel chutes. Mine water is used for boiler feed. It is pumped from the underground pumping station to a tank on one of the hillsides and flows from this point to the boiler room by gravity. A Cochrane heater has been installed for heating the feed water.

Between each pair of boilers a forced-draft fan driven by twin engines has been installed. The draft is automatically regulated and maintains the steam pressure at approximately 100 lb. to the square inch. The boney coal that finds its way to the surface is crushed at the tipple and mixed with about 25 per cent of clean slack, and this mixture is used under the boilers. Thus the fuel costs are kept down, as little marketable coal is burned. A concrete bin beneath the boiler room collects the ashes. They are then loaded into a trolley-type larry that passes through a concrete tunnel extending under the railroad tracks and dumped from a drift opening.

Another unit of the plant buildings is the main hoist-house. This contains a double 36 x 22 in., conical-drum, steam-driven Vulcan hoist engine. This machine is equipped with automatic safety devices and winds a 1½ in. steel cable. The tipple was designed and constructed by the Heyl & Patterson Co., of Pittsburgh. It is built with a steel framework covered with corrugated steel siding, and was designed to accommodate a daily output of 3,000 tons.

The mine cars, which are of 2-ton capacity are hoisted to the top of the tipple in plain cages built at the company shops. From this point they run by gravity to a horn type of crossover dump. After discharge the car is held in place by the horns until the next loaded car to the rear depresses the dump "grasshopper," forcing the horns away from the rails. The standing empty is thus released and passes on, after which the horns assume their normal vertical position. The car travels by gravity to a kick-back and is engaged by a chain haul, which raises it to a point higher than the cage landing. From that point it runs to a second kick-back and thence by gravity to the opposite side of the shaft, where it is lowered.

FANHOUSE AND MATERIAL HEADFRAME

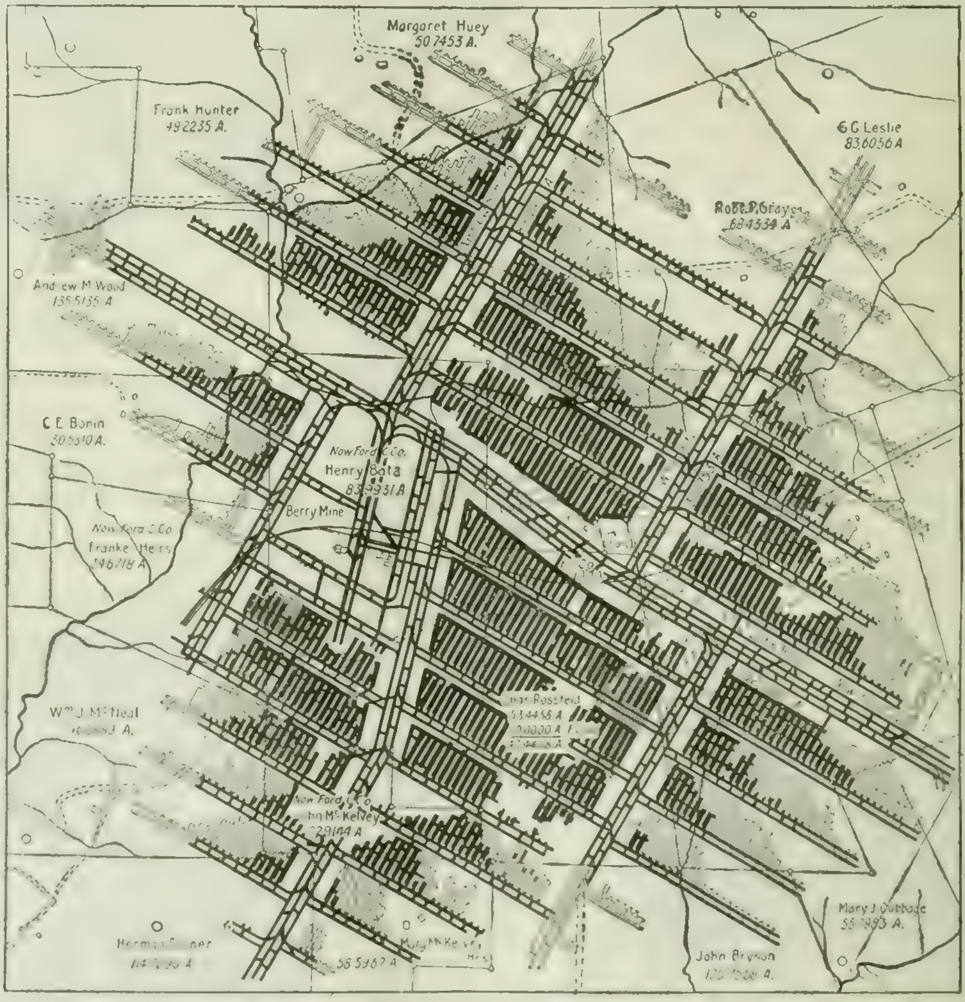
One compartment of the air shaft is employed for lowering men and materials into the mine

As the coal is dumped it passes over a dead plate, by

ONE BUILDING HOUSES BLACKSMITH, CARPENTER AND MACHINE SHOPS

This shop building, as may be noted, is in close proximity to the main shaft. This is advantageous from several points of view which it is spread for even distribution to the screen bars. When a car of boney coal is brought to the surface the dead plate is raised and the boney passes directly into a storage hopper. Some of this boney coal is sold when there is a demand for it. The greater portion, however, is loaded into electric larries and transferred to a nearby dump. A small amount of the boney is crushed and mixed with slack to enter a conveyor that leads to the overhead bunkers in the boiler room. When the boney storage hopper is empty steam coal may be dumped into it. The same larry is then utilized for collecting the coal and discharging it into wagons for domestic needs.

The larger portion of the coal that is shipped from the tipple is loaded as mine-run since it goes to the parent organization eventually to be crushed and used under kilns. However, some is loaded as 1½-in. lump and slack. This passes over a traveling picking table, where it is given careful preparation.



Map Showing Underground Workings

Projection is made on a modified triple entry system, with main headings driven four-entry; rooms are developed in panels. Thirty rooms are turned off each butt entry, these passages being driven 300 ft. apart.

There is not much of the boney mixed with the clean coal underground despite the fact that a 1-in. layer of this material divides the two Freeport beds. The utmost vigilance is exercised over the loading at the face by men who are known as boney bosses—a term that is somewhat of a localism, by the way. Whether clean coal is being loaded can be gaged with fair accuracy by the thickness of the boney in any particular room and the consequent size of the gob pile.

One of the chief surface buildings is the blacksmith, carpenter and machine shop, which is situated on the opposite side of the tipple from the power plant. The blacksmith shop, which is separated by a partition from the other two, contains forges and blowers. An electrically driven line shaft runs lengthwise through the building and operates various machines by belt connection. All of the saws and drills are made safe by wooden guards constructed around them. The Ford Collieries Co. is one of the leaders in the safe-practices movement, and the results accomplished are readily apparent to anyone who visits any of its mines. As has already been mentioned, the more important of the mechanical devices for eliminating danger will be taken up in a succeeding article.

The lamphouse is situated near the air and material shaft and is of the same characteristic construction as the other surface buildings. Little gas is encountered within the mine, yet electric cap lamps are employed. Those in use were made by the Witherbee Igniter Co. and are of two-volt capacity. The recharging racks are so constructed as to accommodate 370 batteries at one time. The charging room also is used in repairing and rebuilding the batteries. One of the advantageous features of the Witherbee type of lamp is that the batteries can be rebuilt at the mine.

A nominal fee of 4c. per day is charged against each miner for the use of a lamp. This is a lower rate than that charged by most companies in the Pittsburgh district. It is needless to say that this fee does not cover even the cost of maintenance.

A novel and effective method of handling the lamp checks is employed. Seventeen wooden cleats have been nailed lengthwise on a board that measures 32 x 26 in. Horizontal slots are sawed in the cleats and each check is held to the board by placing it in the cleat slots. A board of this size will accommodate 800 checks. Each check slot is numbered and as the man returns his lamp, he is given the check as a receipt. All check numbers must be accounted for at the end of each day.

The fanhouse is located close to the air and material shaft and contains a 16 x 6-ft. reversible Jeffrey fan. This is connected by belt to a steam engine. A concrete tunnel leads from this building to the air and material shaft.

A bathhouse with accommodations for 100 men also has been installed. A janitor is in charge, and it is his duty to keep the place clean as well as to guard the clothes of the men. Equipment within this building comprises 24 lavatories, 4 showers, the necessary urinals, etc. Rectangular-shaped wire baskets, with hooks beneath, serve to hold the clothes of the men as well as individual towels and soap. The showers are separated by slate panels. Plumbing fixtures, which were supplied by the Speakman Mfg. Co., include shower heads of the cantonment type which are fitted with a ball-joint connection.

The remaining unit of the surface buildings is a combination first-aid dressing station, mine-foreman's office and supply house. There is nothing that deserves more than casual mention in this building and it consequently will be passed over lightly in lieu of the more interesting sections underground.

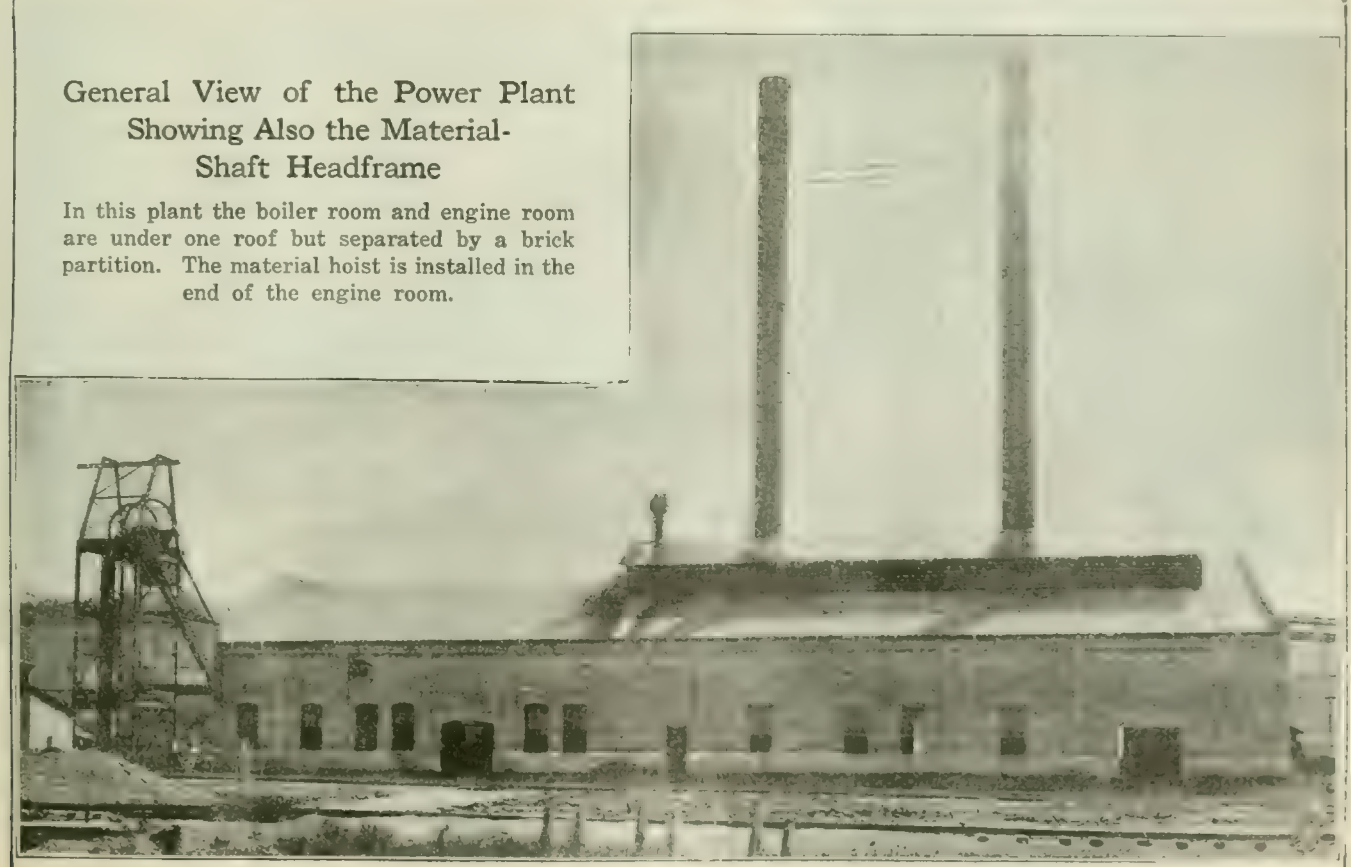
The layout around the shaft bottom is different from that usually found. A double track has been laid on either side of the shaft for a distance of 500 ft. One side handles the loaded cars and the other the empties. An automatic switch-throw, devised by Mr. Thomas, allows the cars to be caged rapidly by a Bowerston caging apparatus. As trips of loaded cars are brought to the shaft bottom the locomotives cut off to a parallel entry and swing around to the empty storage yards, where a trip of empties is made up.

A rest room has been provided for the men at the bottom of the air and material shaft. Benches have been provided in this room for the waiting men. The caging arrangement is such as to give what might be called a turnstile effect, since only one man can enter the cage at a time. This arrangement eliminates crowding at the bottom at the end of the day and also assures each individual a trip up the shaft in the order in which he arrived at the bottom with respect to his fellow workers. Thus there is small chance for an accident to occur from crowding on the cage or around the landing.

TIPPLE SEEN FROM THE EMPTY CAR TRACKS

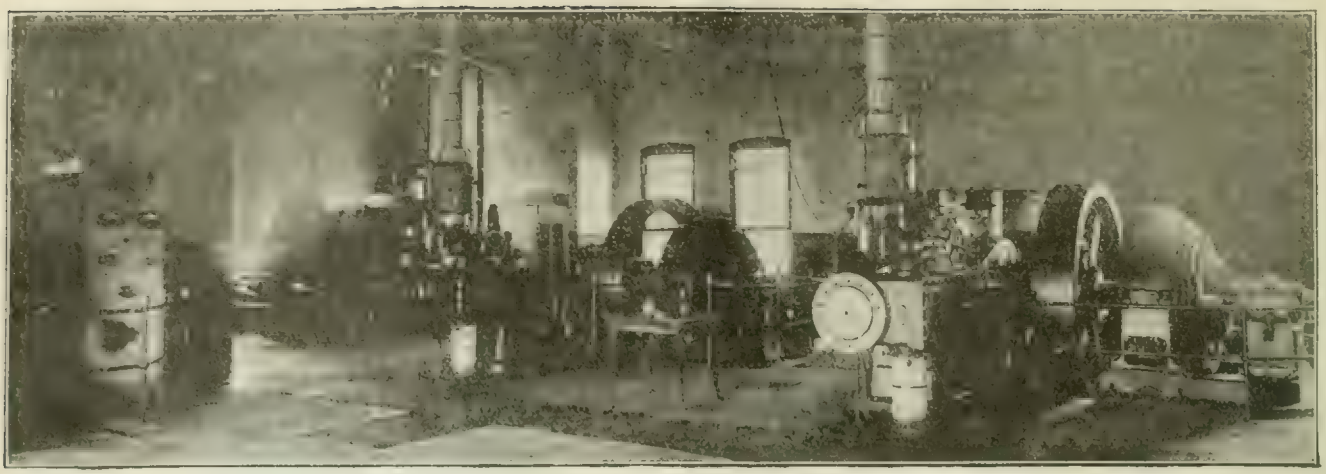
This is a view of the tipple from the opposite side to that shown in the frontispiece.

Near the bottom of this shaft a hospital has been built. It is 30 x 20 ft. in dimensions and is electrically lighted and equipped with hot and cold water. A lavatory, benches and first-aid supplies are arranged con-



General View of the Power Plant Showing Also the Material-Shaft Headframe

In this plant the boiler room and engine room are under one roof but separated by a brick partition. The material hoist is installed in the end of the engine room.



INTERIOR OF THE ENGINE AND GENERATOR ROOM

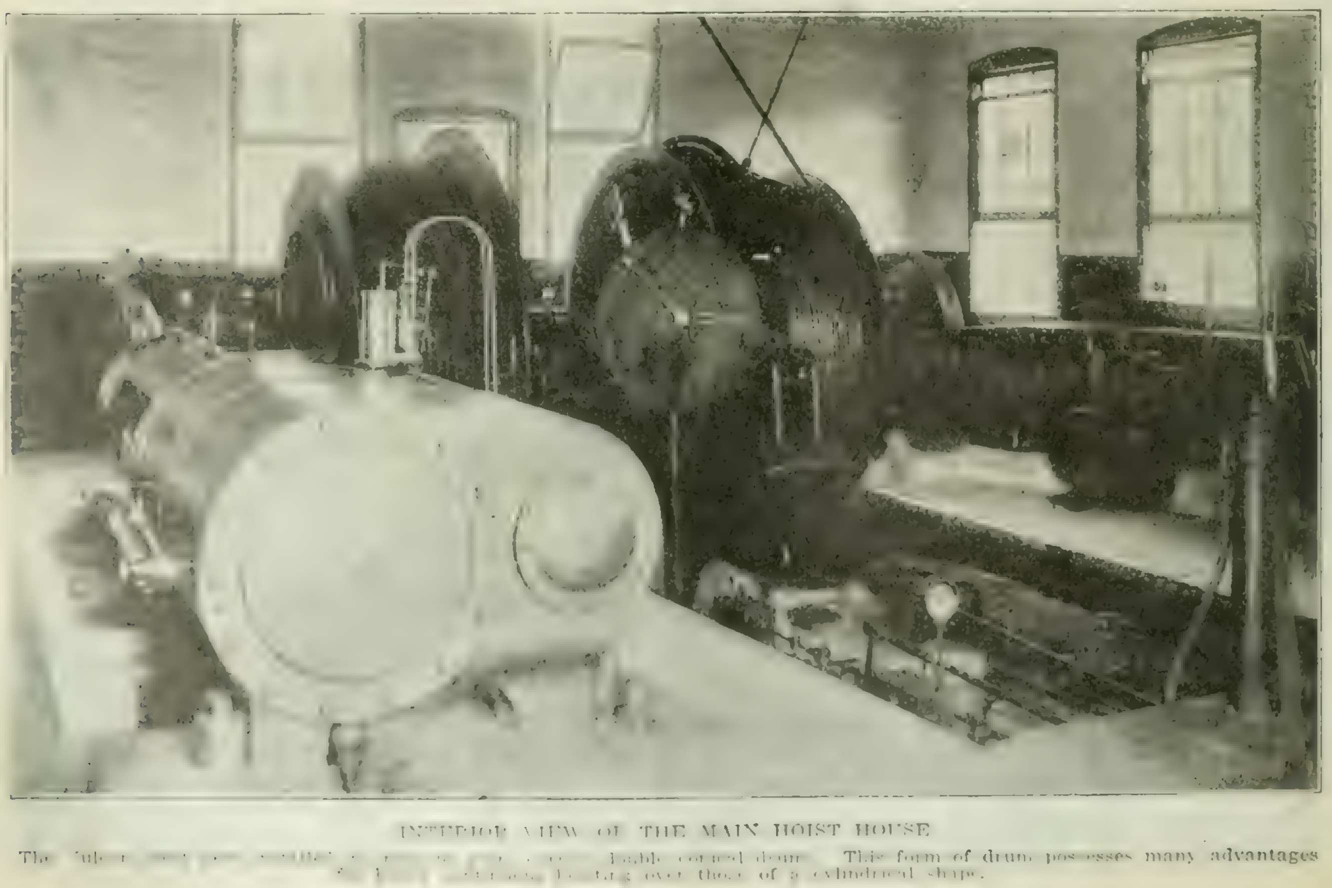
Two generating units may be seen as well as the material hoist in the background.

veniently. This is the only first-aid station within the mine. The common practice of locating such stations throughout the workings has been abandoned in favor of the plan of having one spacious room near the shaft bottom.

An electric locomotive ambulance, which was designed and constructed at the company shops, is kept in readiness at the motor barn for hurried calls. It is nothing more than a converted locomotive, but the idea is distinctively original and of this device more will be said in a subsequent article.

The main sump is located at the shaft bottom. A 14 x 10 x 18-in. single-plunger, horizontal, steam-driven Dean Bros. pump suffices to void the water to the surface through a 10-in. discharge line, although a 10 x 7 x 12-in. pump of the same type and make is used as a spare. Each pump is equipped with an Ohio Grease Co. lubricator. Grease has been found more effective than oil in lubricating the cylinders. It has not been necessary to refill the lubricator oftener than once in 44 hours. Each lubricator will hold from one to two quarts of grease.

There is but one pumping station underground. However, portable field pumps are utilized in some sections where local dips are encountered. The pump room is 26 ft. long by 15 ft. wide and is constructed with tile siding. Six 10-in. I-beams support the roof. The steam used in driving the pump passes from the cylinder to condenser coils outside of the room, where it is utilized in drying sand for the locomotives. From the condenser coils the hot water passes to the hospital room and is again used, this time in heating the water that must be constantly available at this point. The sand is



INTERIOR VIEW OF THE MAIN HOIST HOUSE

The [illegible] double conical drum. This form of drum possesses many advantages [illegible] hoisting over those of a cylindrical shape.

brought down the air and material shaft and is screened underground after having been dried.

The electric current that is used within the mine is brought down the air and material shaft by a 1,000,000-circ.mil cable. It is distributed to different sections of the operation from a switchboard located at the shaft bottom and containing four single-pole knife switches. A Streeter-Amet automatic scale recorder has been installed in a room near the hoisting shaft. It is of 5-ton capacity.

As can be noticed in the accompanying map of the underground layout, the coal is developed by a variation of the triple-entry system with a panel scheme applied to the rooms. The main shaft was located square with the railroad tracks beneath the tipple. The main entries were then driven square with the shaft. This has placed them at an angle of about 13 deg. from a north and south line. After the bottom layout had been established the main face entries were driven 30 deg. northeast and southwest. The butt entries were then driven perpendicular to these, which places them at an angle of 30 deg. northwest and southeast. The main haulage entries are quadruple.

The face entries are 1,800 ft. apart, which permits a development of 30 rooms off each butt entry. The butt entries are driven 300 ft. apart. All entries are 12 ft. wide and spaced on 50-ft. centers. The rooms are 25 ft. wide and likewise spaced on 50-ft. centers. Barrier pillars 100 ft. in thickness have been left to protect all of the main entries and bottom construction. Few of the pillars within the panels have been removed to date but this work will proceed wherever surface conditions will permit.

Coal Undercut by Nine Shortwall Machines

All of the mining machines and locomotives in use are of Goodman manufacture. There are two 13-ton series-parallel control locomotives for use on the main haulageways. Each is driven by a 278-hp. motor. Eight 6½-ton gathering locomotives of the low 30 type with parallel control are used in making up the trips in the face entries. The coal is undercut by nine 50-hp. shortwall mining machines, of which but seven are actually in use, the other two serving as spares. Where the rooms are driven with the dip, the cars are removed to the butt entry by the gathering locomotives, which are equipped with auxiliary crab reels and wire rope.

Sixty-pound rails are laid on the main haulage entries and 40-lb. steel in the face entries. The butt entries as well as the rooms have been laid with 20-lb. steel. Steel ties have been employed practically throughout the mine.

One of the most important features of the underground work is the common-sense application of safety principles, which has been given special attention. The Ford Collieries Co. has proved that efficient operation can go hand-in-hand with safe practices.

The main offices of the company are located at Curtisville. A. R. Pollock is general manager of mines; W. G. Shallcross, general superintendent; G. G. Long, chief engineer, and J. H. Byers, purchasing agent. W. D. Thomas is superintendent of the Berry No. 3 mine, as has already been mentioned, while Mr. Flenner is mine foreman. The hearty co-operation of these men has aided materially in the collection of data for this article, and *Coal Age* gratefully acknowledges the many courtesies extended by them.

The article that will follow this one, which will be descriptive of numerous safety devices, will also take up the first-aid and rescue program of this company. This important phase of mine operation is under the direction of M. S. Murray, safety engineer, who has also developed a first-aid program that is as effective as it is original. Steady production is possible only where the workmen are not subject to accident. This the Ford officials have long recognized. To be among the leaders in the safety movement requires persistent application of safety principles. Only where such persistent application is given to safety will results be obtained and the industry find that its safety labors yield the immunity from accident that is desired.

Low-Temperature Carbonization Gives Huge Byproduct Yield

By Method Being Employed in Great Britain 640,000,000 Gallons of Fuel Oil Would Be Obtained from 50,000,000 Tons of Bituminous.

A SMOKELESS fuel known as coalite, which is claimed to be a natural briquet, generating as much heat per unit as coal, is being manufactured by a British company recently organized, Consul H. C. Claiborne, London, reports. The volatile constituents of the coal are collected by a process of low-temperature carbonization, recent experiments establishing the following products obtained at one time from one ton of bituminous coal:

Three gallons of motor spirit—nearly double the usual yield of motor spirit from processes where coal is distilled at a high temperature. This spirit is refined and is suitable for motor cars, aero engines, tractors and every purpose for which petrol (gasoline) or benzol is used today.

Sixteen gallons of oils for burning, lighting and lubricating. This oil is similar to crude petroleum. It can be burned without refining, direct under boilers for naval and maritime purposes generally. If distilled the products obtained are even more valuable and find a ready market for many purposes. The crude oil may be separated into motor spirit, cresylic oils, burning oils for lamps, lubricating oils, oils for Diesel engines, and pitch of superior quality for insulating and other purposes.

Seven thousand cubic feet of gas. This gas is of higher quality than that made by gas works and is of great value for lighting, heating and power purposes. Its heat value is 600 B.t.u. per cubic foot, after removal of the light oils, whereas that of ordinary coal gas, similarly treated, is about 500 B.t.u.

Twenty pounds of sulphate of ammonia, for fertilizers and high explosives.

Fourteen hundredweight of smokeless fuel.

The coal output of the United Kingdom in 1913 was estimated at 280,000,000 tons, valued at $973,300,000. Between 40,000,000 and 50,000,000 tons are devoted to domestic consumption, and if this amount were converted into smokeless fuel by low-temperature carbonization some 640,000,000 gallons of fuel oil would be obtained annually. If this system were applied to all coal consumed in the United Kingdom the quantity of byproducts recorded would be enormous.

A Coal Tipple for a Stripping Operation

This Tipple Is Extremely Simple Yet Any Size or Combination of Sizes Can Be Made by Merely Changing the Setting of Two or Three Gates—Provision Is Made for Future Crushing

By Frank J. Schraeder, Jr.
Chicago, Ill.

A COAL tipple of marked simplicity in construction, equipment and flexibility in loading various sizes of coal and their combinations is that at the Allied Coal Co.'s stripping operation at Sonora, Muskingum County, Ohio. A description of this installation will undoubtedly be of interest to many operators since balanced horizontal picking-table screens are here used as well as a novel provision for future crushing facilities. The tipple is designed to handle 250 tons of coal per hour. It consists broadly of a housed receiving hopper of 35 ton capacity, a feeder, a steel apron-type elevating conveyor, a set of Jacobsen balanced horizontal picking-table screens combining coal-preparation and refuse-disposal facilities, a refuse storage, a lump loading boom and a compact power plant.

Stripping coal is getting a bad name in the market because too many strippers believe that nothing more is necessary than to provide for uncovering, digging and loading the coal. Because the coal comes from an open cut is no reason why it should not be as carefully prepared as any other fuel and with as much care as is taken in this tipple.

The coal is brought from the strip pit to the tipple in trains consisting of an 18-ton dinkey locomotive and Western side-dump cars of 4-cu.yd. capacity that discharge into the wooden steel-lined receiving hopper of 35 tons capacity. The receiving hopper is provided with a reciprocating feeder for uniformly feeding the coal onto the lower end of the steel apron conveyor, which extends into the waterproofed concrete pit supporting the receiving hopper. Power is imparted to the feeder by a chain drive from the conveyor foot shaft, while a clutch is provided for disengaging the feeder so as to permit operation of the conveyor independently of this device. Thus, most conveniently, the conveyor, at the close of each day's work, may be left entirely free from coal. The apron conveyor elevates the coal for direct discharge to the tipple screens. It has a capacity of 250 tons per hour, is 36 in. wide and approximately 105 ft. long and is belt-driven from the countershaft indicated in the accompanying line drawing. The discharge end of the conveyor delivers the coal at a uniform rate over a chute directly to the horizontal shaker screens.

The Jacobsen balanced horizontal picking-table screen as here installed consists of a pair of horizontally reciprocating troughs, an upper screen section and a lower steel trough section. The screen and the trough section have relatively reverse conveying motions, and as they are mounted on floating-type rollers, there is no vertical motion in the movement of the screen, so that coal can be readily hand-picked directly on the screening surface. The two screens, or troughs, are so arranged that the vibratory effect of one is balanced by the counter effect of the other.

The operating mechanism for driving the reciprocating screens is shown in one of the illustrations. Two pairs of oppositely mounted ordinary eccentrics are driven from a shaft, each pair operating one of the screens. A uniformly rotating, power-driven, differential fly-wheel pulley is so arranged as to impart to the shaft a motion that is slow at first, gradually accelerating toward the end of the stroke, then quickly reversing and slowing down toward the end of the return stroke.

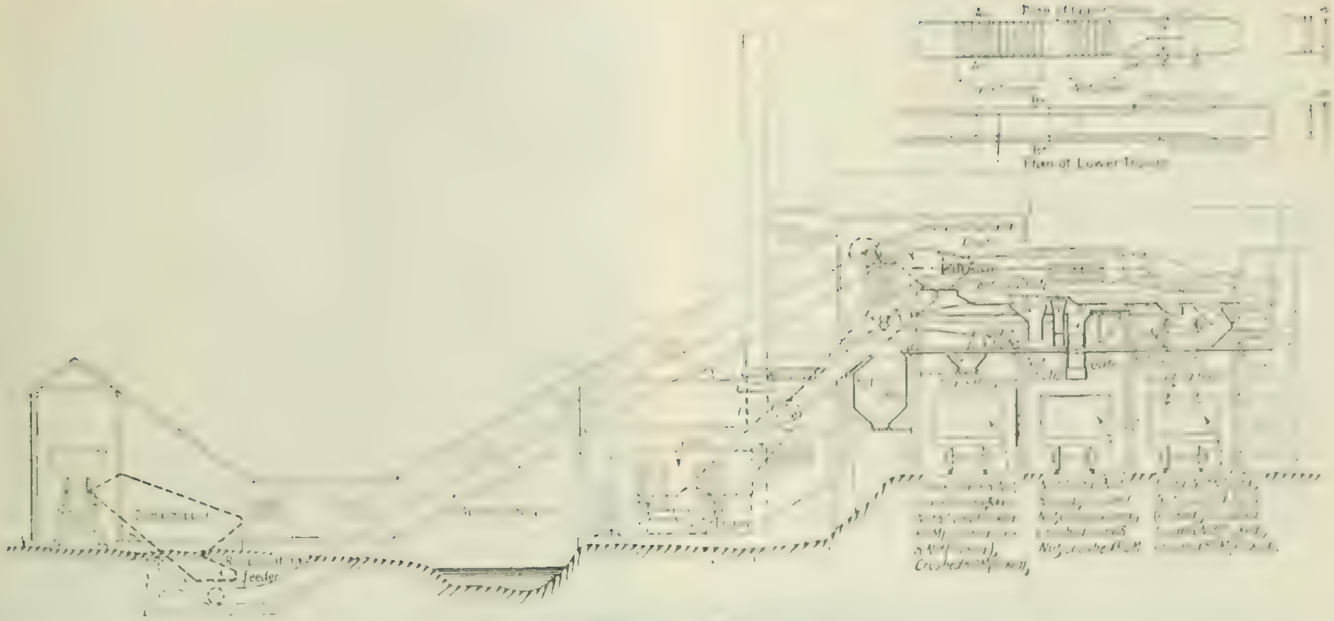


FIG. 1. CROSS-SECTION OF PREPARATION PLANT
Side-dump cars deliver the coal to a hopper from which it is fed to a conveyor that delivers it to the screening plant. Almost any combination of sizes can be delivered to almost any track under the tipple.

All parts of the machine are carefully designed and constructed. The eccentric straps and all the important elements are castings of steel. Bronze bushings are used in the bearings. The whole driving mechanism is mounted on a cast-iron base, and the equipment is all placed on one floor. This not only makes possible a more simple and less expensive tipple structure but also affords greater accessibility.

The upper screen is 5 ft. wide and approximately 45 ft. long. It is arranged to receive the coal directly from the conveyor chute, under which it extends and reciprocates. For removing the slack the coal is first passed over 12 ft. of $\frac{5}{8}$ x $\frac{7}{8}$ in. lip screen. Part of the slack coal is caught on the short horizontal deck under this screen and conveyed forward to the slack chute, which is flared at the top to receive the remainder of the slack. This delivers the fine material to the center compartment of the lower trough, which, as above stated, has a reverse conveying action and will therefore carry its contents a short distance back for discharge into the slack hopper. A standard rack-and-pinion gate controls the discharge of the slack from the hopper into the slack car.

The lump-and-nut coal, which has been relieved of the slack, can now be picked as it passes over the blank plate and then over the 6 ft. of $1\frac{1}{4}$ x $1\frac{1}{2}$ in. lip screen for removing the nut. The nut coal is received on the lower deck, and is lowered through a gate onto an ele-

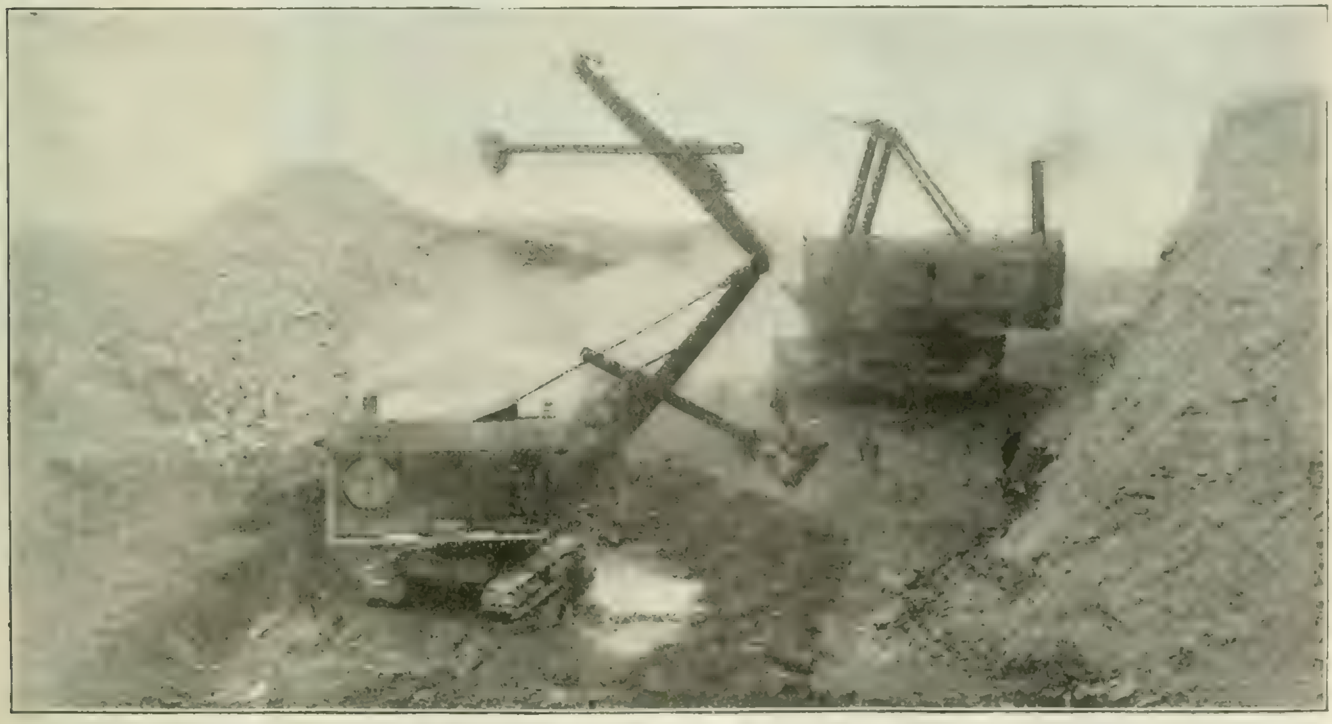


FIG. 2. TWO SHOVELS AT WORK IN THE STRIP PIT
This stripping is not particularly different from others except that Western side-dump cars are employed for removing the coal. Both shovels are full-revolving and the smaller is mounted on caterpillar trucks.

vated trough, which is rigidly supported on the lower trough and will therefore convey the nut coal backward for discharge into the nut chute which is provided with a special hinged apron discharge for proper loading into the nut car.

The lump coal in its travel is slightly deflected to one side of the screen trough and then discharged with practically no drop through a gate into a short chute and thence onto the apron-conveyor loading boom. This Webster loading boom, which is employed for lowering the lump into the car without breakage, is 48 in. wide, has a 20-ft. horizontal section and a 24-ft. hinged section which is so pivoted that it can be raised and lowered for careful loading and trimming of the cars. When first loading an empty car the discharge end of the boom is placed a short distance above the car floor, The loading boom is belt-driven from a countershaft.

Simple manipulation of a pair of cables from the trimmers' platform will operate either one of a pair of clutches that control the operation of the small hoisting drum, which is connected to the boom drive and arranged to raise and lower the hinged section as desired or to stop or start the conveyor.

If it should be desired to mix the nut with the slack, it is only necessary to open a gate in the upper section of the shaker. This will discharge the coal directly into the center compartment of the lower trough. With the gate in this section closed, the nut coal will be conveyed back toward the slack hopper, where, preceding its discharge thereto, it is mixed with the slack coming from the upper screen through the slack chute.

Lump and nut can be loaded over the loading boom by the proper manipulation of the gates controlling the movements of these sizes. This will permit the discharge of the lump and nut over the chute to the loading boom. If it is desired to load the lump and nut on the nut track a different setting of the gates can be made so that both sizes will be conveyed toward the end of the upper screen and discharged into the lower trough compartment, in which both sizes are conveyed backward for loading on the nut track.

In loading picked run-of-mine the nut and lump after being picked on the screen are by-passed as above explained to the lower trough. It is obvious that if the nut gate is closed the lump and nut coal will be conveyed farther back for direct discharge into the slack hopper.

The present installation provides for future crushing of the nut or lump coal by the simple addition of a suitable frame structure as shown dotted on the drawing and the installation of a crusher to receive the coal from the end of the upper screen. It may be readily perceived that the lump coal can be discharged onto the loading boom for careful loading on the lump track and that the nut, or, in other words, all sizes between the slack and the lump, can be passed directly into the crusher by closing proper gates. In this operation the crushed coal is discharged directly onto the extension of the lower trough and is conveyed backward for loading either on the nut track or for mixing with the slack and loading on the slack track as picked, crushed run-of-mine.

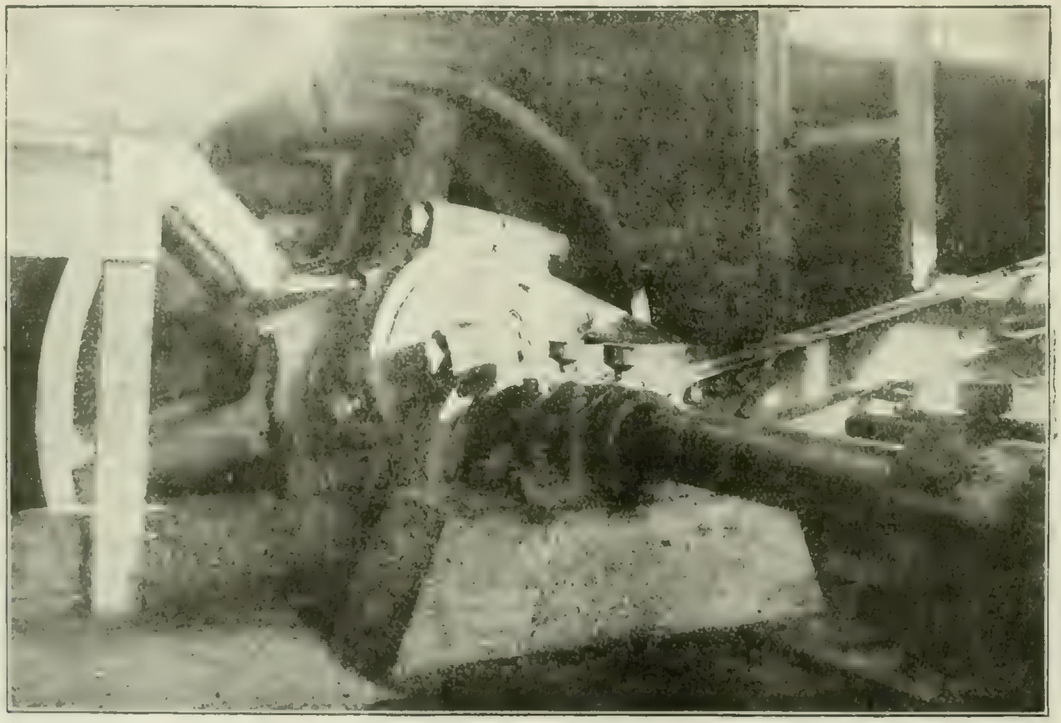


FIG. 3

Mechanism Driving the Shaking Screens

A uniformly rotating, differential, flywheel pulley drives the eccentric shaft at a now-uniform speed of rotation. The screens are thus given unequal or conveying oscillations.

In crushing, the closure of the proper gates permits the lump to pass directly into the crushed and over the lower trough for loading on either the nut track or for mixing with the slack. The nut coal in this case is discharged onto the loading boom for loading on the lump track. The entire equipment is so flexible that a simple manipulation of gates will readily afford the loading of the various sizes and their combinations as indicated in the drawing.

The conveying action of the coal over the upper screen is such that the refuse can be conveniently removed by hand. The pickings are dropped into chutes which feed into the two narrow refuse troughs formed integrally with the lower coal trough and of course have the same backward conveying action. This causes the

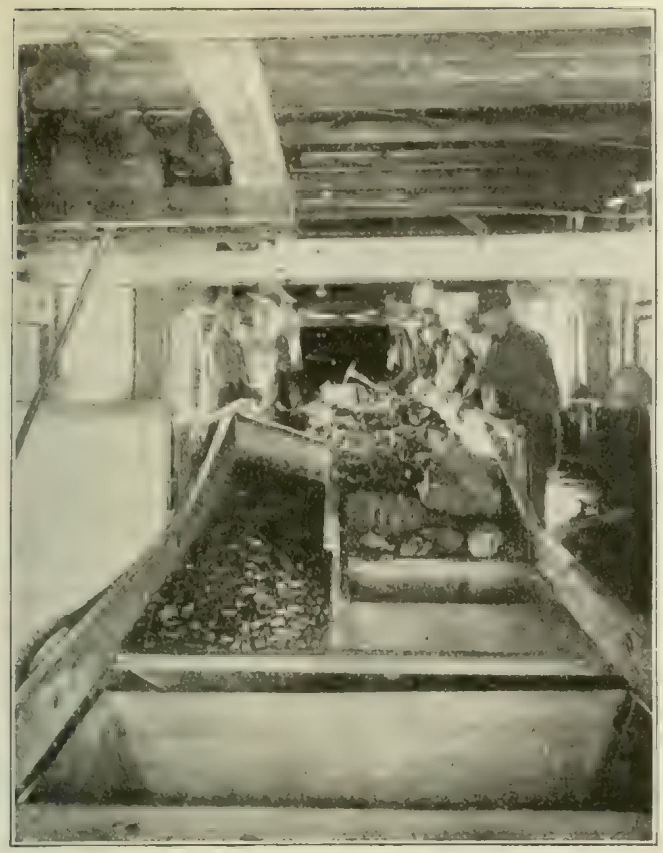


FIG. 4. SCENE IN THE PICKING ROOM
The pickers are seen at work on the upper deck of the horizontal conveying screen. The lump coal is pushed to one side of the shaker before delivery.

refuse to discharge into the refuse storage bin, whence it can be conveniently removed at desired intervals.

This horizontal screen gives better preparation and more thorough screening than is possible with similar devices of the inclined type. The sizes are delivered from the screen to the cars with less degradation than with an inclined screen, because the distance traversed is shorter.

The entire tipple and power plant is of frame construction built on concrete foundations. The power plant consists of one 150-hp. 72 in. x 16 ft. Erie City high-pressure stationary boiler, and 16 x 18 in. "Vim" heavy-duty, center-crank, automatic engine rated at 125 hp., manufactured by the Ames Iron Works.

This article would not be complete if it did not make reference to the group of men whose vision and effort have made possible the complete development of this project. These include Edward A. Langenbach, president and general manager; A. J. Tice, vice-president and director of sales; A. A. Serva, assistant general manager, secretary and treasurer, and C. H. Flynn, general superintendent. The entire plant was designed and built by Jacobsen & Schraeder, Inc., engineers and constructors, Majestic Building, Chicago, Ill.

Need For Study

BY J. T. BEARD

The answers given below were selected from replies made to various questions which were asked at recent mine foremen's examinations. The examiners did not penalize for either poor spelling or bad grammar. How would *Coal Age* readers grade these answers?

Ques.—What are the dangers of blasting coal "on the solid"

Ans.—(1) It is lible to fly back and hit yo
(2) Danger on aftermaten into loss of lives.
(3) It is tight shots

Ques.—In what velocity of air is a safety lamp unsafe?

Ans.—It would not be safe in 20,000 cu ft. of air

Ques.—How would you handle a safety lamp when found full of flame?

Ans.—A safety lamp should be removed with precution to where they was a curant of air consealed under your coat

Ques.—Describe the various systems of mine haulage with which you are familiar

Ans.—(1) Split and continnerus.
(2) Sum has muls, sum has motors; sum has dinke

Ques.—In opening a new mine what are the principal questions to be considered?

Ans.—(1) Ventlehun.
(2) That depen on the loking of the seam the most serious question is shipping point.
(3) In the opening of new mines is to open it at the least expense posibell.

Ques.—Which are preferable overcasts or undercasts?

Ans.—A overcast is bettir than a undercast for the reason the air will go up better than down.

Ques.—Which should be the larger, the upcast or the downcast shaft?

Ans.—(1) The upcast should be the largest on account of having largest area for returnig of air.
(2) The upcast should be the larger because the air going up should have more room will pull better.

Ques.—How would you ascertain the quantity of air passing through an airway?

Ans.—If there is a small quantity of air it will move very slow if at all wher there is a larg quanity it circulates fast.

Ques.—How may each of the mine gases be detected, etc.?

Ans.—(1) By a flame cap, brilliancy of light, sweet taste and pains in the back, headache and by suffocation.
(2) Carbon Dioxide is detected by putting the light out. If mixed with 7 times as much air will cause explosion.
(3) Carbon dioxide is on the bottom and is brathed slowly untill an offell acking of head and back and limbs and will kill if not removed.
(4) Marsh gas at a certain % will explode and will kil or else burn him up.
(5) Marsh gas is liter than air in large quanites may cause sleepns and probley death. White damp is the oction taken from carbon and it will cause sleepness and dizyness. Marsh gas will be detect by headache. Several mine gases may be detected by headache are by getting your breath hard are by getting weak in your joints.

Ques.—Describe the anemometer and explain its use.

Ans.—(1) A anmometer is a vary fine piece of machinery that a safe current of air will cause it to oprate.
(2) Is a small thing round in the shape of a dollar clock and each revelation of this long hand registers one hundred feet of air.
(3) Is an ensterman in the shape of a wach case with hands to shoe the pressher of the air.

Ques.—What is the difference between a true fault and a fault of erosion?

Ans.—(1) A fault of erosion come unexpected and a true fault is where the coal plays out.
(2) A fault of erosion is where the coal stoped or was no more.

Ques.—What does the law require relative to the handling of powder and the charging and firing of shots?

Ans.—Handlig of powder sould bee handlid with care and charign and faring of shots a miner should his best gugement charigen and faring of shots.

It is not unusual to find answers such as these in the papers submitted by candidates in examination. The fact is evidence of the ever present necessity of mining companies organizing and maintaining educational classes for giving instruction in English, spelling, arithmetic and the rudimentary principles of coal mining.

Instruction should be free to ambitious workers, on recommendation of the foreman. The results will show on the cost-sheets of the mine if the instructors and their methods are of the right kind. Superintendents should take notice.

Official Report of Coke Industry in 1919

Production Decreased but Capacity of Byproduct Ovens Increased—Number of Ovens Under Construction Falls from 1,815 in Beginning of 1919 to 853 in Beginning of Present Year—11,232 Ovens Are Now Built and Building

OUTSTANDING features of the coke industry during the year 1919 were the great slump in demand that followed the armistice and a remarkable increase in the proportion of byproduct coke made as compared with beehive coke. According to preliminary estimates made by F. G. Tryon, of the U. S. Geological Survey, the total production of coke in 1919, including beehive and byproduct but excluding gas-house coke, was 44,821,000 net tons, a decrease, as compared with 1918, of 11,657,000 tons, or 20.6 per cent.

The decrease was confined almost entirely to beehive coke, the production of which fell off 36 per cent. The output of byproduct coke decreased only 3.2 per cent. The output of byproduct coke consequently exceeded that of beehive coke for the first time. In 1918 about 46 per cent of the total coke made in the United States was produced in byproduct ovens and 54 per cent in beehive ovens. In 1919 the proportions were reversed, 56 per cent coming from byproduct and only 44 per cent from beehive ovens. The year 1919 thus marked a turning point in the history of coke manufacture in the United States.

COKE MANUFACTURED AT GAS PLANTS

The quantity of coke manufactured in 1919 at illuminating-gas plants, not included in the figures given above, was about 3,200,000 tons. The total quantity of coke produced in 1919 was therefore about 48,000,000 tons. The figures for beehive coke are estimated from shipments by rail. Those for byproduct coke are based on reports collected from producers in a preliminary canvass. The figures for both are subject to revision and will be revised when the annual statistical canvass is completed.

The blast furnaces are the great customers of the coke industry. In 1918, according to the statistical report of the American Iron and Steel Institute for 1918, they consumed 45,704,000 net tons of coke, or 81 per cent of the total output of beehive and byproduct coke combined. In 1919 the production of pig iron fell off 22 per cent and the demand for coke declined in proportion. The reaction was especially felt by the producers of beehive coke. With the growth in the output of byproduct ovens, the beehive coke industry is likely to become more and more an auxiliary source of supply, carrying the peak load in times of extreme activity and correspondingly restricted in times of depression. This fact makes the current output of beehive coke a highly sensitive business barometer.

BEEHIVE COKE OUTPUT FOLLOWS PIG IRON SUPPLY

Table I shows in parallel columns the monthly output of pig iron and of beehive coke in 1919. The post-war slump in the demand for both began to be seriously felt about March 15. The low point for the year was reached in May. Thereafter production slowly recovered, only to be further interrupted by the steel workers' strike, which began Sept. 22, and the coal strike of Nov. 1 to Dec. 10.

TABLE I. ESTIMATED MONTHLY PRODUCTION OF BEEHIVE COKE AND OF PIG IRON IN THE UNITED STATES IN 1919

Month	Beehive Coke (Net Tons)	Pig Iron (a) (Gross Tons)
Monthly average, 1918	2,540,000	3,255,000
January	2,384,000	3,306,000
February	1,787,000	2,948,000
March	2,091,000	3,088,000
April	1,343,000	2,474,000
May	1,103,000	2,108,000
June	1,148,000	2,114,000
July	1,482,000	2,424,000
August	1,699,000	2,742,000
September	1,755,000	2,481,000
October	1,521,000	1,864,000
November	1,647,000	2,407,000
December	1,690,000	2,630,000
Totals	19,650,000	30,586,000

(a) Figures for 1918 quoted from American Iron Steel Institute; those for 1919 from *Iron Trade Review*

As a result the production of beehive coke fell off 10,831,000 tons, or 36 per cent, from 1918 to 1919. The total output in 1919 is estimated at 19,650,000 net tons (Table II). All districts shared in the decrease. The production in Pennsylvania and Ohio is placed at 14,861,000 tons, as compared with 22,276,000 tons the year before.

TABLE II. ESTIMATED PRODUCTION OF BEEHIVE COKE, BY GROUPS OF STATES, IN 1919, WITH COMPARATIVE FIGURES FOR 1918 IN NET TONS

	1918 *a*	1919 *b*	Decline Per Cent
Pennsylvania and Ohio	22,276,000	14,861,000	33.29
West Virginia	2,717,000	1,061,000	60.95
Alabama, Tennessee, and Georgia	2,042,000	1,695,000	17.00
Virginia and Kentucky	1,535,000	1,201,000	21.76
Colorado, Oklahoma, and New Mexico	1,401,000	558,000	60.17
Washington and Utah	510,000	274,000	46.28
United States	30,481,000	19,650,000	35.54

(*a*) Final figures. (*b*) Estimates.

BYPRODUCT COKE

The total output of coke produced in byproduct ovens in 1919 was 25,171,000 net tons, a decrease, as compared with 1918, of 827,000 tons, or 3.2 per cent. The effect of the decline in demand for byproduct coke upon production was largely counteracted by the completion of new plants. The rate of production was higher during January, February and March than during the remainder of the year.

TABLE III. RATE OF PRODUCTION OF BYPRODUCT COKE PER 30-DAY MONTH IN 1919

	Net Tons
First quarter	2,260,000
Last three-quarters	2,043,000
Year	2,098,000

The dull season in the steel industry was most pronounced from April to July. During the last quarter of the year the byproduct coke industry suffered from the combined effects of the steel strike, which restricted the demand, and of the coal strike, which curtailed the supply of coal.

The output by states is given in table V. The figures show a general decrease as compared with 1918, which affected all states except New Jersey, Ohio and Pennsylvania. The producers in Ohio reported an increase of 4 per cent. A larger increase (16 per cent.) was made in New Jersey, and the largest of all in Pennsylvania, where the completion of new ovens caused an increase of 25 per cent.

TABLE IV. BYPRODUCT OVENS UNDER CONSTRUCTION JAN. 1, 1920

Operator	Location of Plant	No. of Ovens	Type of Oven	Probable Date Operation
Birmingham Coke & Byproducts Co.	Birmingham, Ala	50	Koppers	Mar. 1, 1920
Sloss & Sheffield Steel & Iron Co	Birmingham, Ala	120	Semet-Solvay	May 1, 1920
Tennessee Coal, Iron & R R. Co	Fairfield, Ala	77	Koppers	Feb. 1, 1920
St. Louis Coke & Chemical Co.	Granite City, Ill	80	Roberts	June 1, 1920
Donner-Union Coke Corporation	South Buffalo, N. Y	150	Koppers	June 1, 1920
Lackawanna Steel Co	Lackawanna, N. Y	60	Semet-Solvay	July 1, 1920
Cambria Steel Co	Johnstown, Pa	60	Cambria-Belgian	June, 1920
Jones & Laughlin Steel Co	Pittsburgh, Pa	60	Koppers	Apr. 1, 1920
Pittsburgh Crucible Steel Co	Midland, Pa	100	Koppers	June, 1920
Domestic Coke Corporation	Fairmont, W. Va	60	Koppers	May 1, 1920
Steel & Tube Co. of America	Mayville, Wis	36	United-Otto	Jan. 1, 1920
Total		853		

In order of rank Pennsylvania came first, with 5,747,000 tons; Ohio second, with 5,445,000 tons; and Indiana third, with 3,691,000 tons. Pennsylvania has thus regained first place as a producer of byproduct coke, a position held by that state from 1915 to 1917 but lost to Ohio in 1918. Pennsylvania is now supreme in the coke industry. It is not only the largest producer of both beehive and byproduct coke, but it supplies much of the coal consumed by byproduct ovens in other States.

TABLE V. BYPRODUCT COKE PRODUCED IN 1918 AND 1919, BY STATES, WITH INCREASE OR DECREASE IN NET TONS

	1918		1919		Increase (+) or Decrease (–)	
State	Ovens	Tonnage Produced	Ovens	Tonnage Produced	Tons	Per Cent
Alabama	847	2,634,451	906	2,255,000	— 380,000	—14
Colorado	120	(a)	120	(a)	(a)	(a)
Illinois	626	2,285,610	714	1,705,000	— 581,000	—25
Indiana	1,026	3,898,215	1,216	3,691,000	— 207,000	— 5
Kentucky	108	517,749	108	408,000	— 110,000	—21
Maryland	180	474,368	360	356,000	— 118,000	—25
Massachusetts	400	556,397	400	393,000	— 163,000	—29
Michigan	269	(a)	389	(a)	(a)	(a)
Minnesota	220	784,065	220	586,000	— 198,000	—25
Missouri	56	(a)	56	(a)	(a)	(a)
New Jersey	260	682,148	315	789,000	+ 107,000	+16
New York	615	1,069,587	591	751,000	— 319,000	—30
Ohio	1,658	5,226,334	1,608	5,445,000	+ 219,000	+ 4
Pennsylvania	2,368	4,586,981	2,846	5,747,000	+1,160,000	+25
Rhode Island	.	.	40	(a)	(a)	(a)
Tennessee	24	124,469	24	105,000	— 20,000	—16
Washington	20	30,129	20	28,000	— 2,000	— 7
West Virginia	214	603,393	214	393,000	— 210,000	—35
Wisconsin	268	(a)	232	(a)	(a)	(a)
Combined States(b)		2,523,684		2,519,000	— 5,000	—0.2
Total	9,279	25,997,580	10,379	25,171,000	— 827,000	— 3

(a) Included in combined states. (b) Includes Colorado, Michigan, Missouri, Rhode Island and Wisconsin, combined to avoid disclosing operations of individual companies.

BYPRODUCT OVENS COMPLETED IN 1919

In 1919 a total of 1,228 new byproduct ovens were completed, of which 718 were new plants and 510 were extensions at existing plants. Pennsylvania put the largest number of new ovens in operation—478. Indiana came second, with 190, and Maryland third, with 180. One new state, Rhode Island, entered the ranks of byproduct coke producers in January, when the Providence Gas Co.'s plant was completed.

During the year 128 ovens were abandoned or were so rebuilt as to be classed as new ovens.

Table IV summarizes returns made to the United States Geological Survey from byproduct operators on new ovens in construction at the beginning of 1920. In all 853 ovens are scheduled to come into operation by July 1, 1920. Of these ovens 247 are in Alabama, 220 in Pennsylvania, 210 in New York, and smaller numbers in Illinois, West Virginia and Wisconsin. They are distributed among 11 projects, 6 of them new plants and 5 of them additions to existing plants.

Summing up ovens under construction 497 are Koppers, 180 Semet-Solvay, 80 Roberts, 60 Cambria-Belgian and 36 United-Otto ovens.

The completion of these projects will mean an increase of 8 per cent in the total number of byproduct ovens in the country. Construction is more active now than in the years immediately before 1914, when the European war began, but is less active than it was during the war. Much of the construction now under way was projected before the armistice. The number of byproduct ovens under construction in recent years has been as follows:

TABLE VII. BYPRODUCT OVENS IN CONSTRUCTION, JAN. 1, 1914–1920

1914	504	1917	2,084
1915	644	1918	2,260
1916	1,191	1919	1,815
1920	853		

The following table shows the number of ovens of each type in existence on Jan. 1, 1920, the number on Jan. 1, 1919, and the number now under construction. Of the ovens put in operation in 1919, 860 were of the Koppers type; 240 were Semet-Solvay, and 128 were Wilputte.

TABLE VIII. OVENS IN USE AT BEGINNING AND END OF 1919, BY TYPE

	In Existence Jan. 1, 1919	In Existence Jan. 1, 1920	Building Jan. 1, 1920
Koppers	4,829	5,659	497
Semet-Solvay	2,035	2,275	180
United-Otto	1,840	1,754	36
Rothberg	281	257	...
Wilputte	78	206	...
Cambria-Belgian	90	90	60
Gas machinery	60	60	...
Klonne	42	42	...
Roberts	24	24	80
Piron		12	...
Total	9,279	10,379	853

The capacity of a coke oven naturally depends upon the number of hours adopted as standard coking time. The maximum capacity of the byproduct plants of the

TABLE VI. NEW BYPRODUCT OVENS COMPLETED AND PUT IN BLAST IN 1919

Company	Location of Plant	Number of Ovens	Type of Ovens	Date Blown In
New plants:				
International Harvester Co.	South Chicago, Ill.	88	Wilputte	Nov. 13, 1919
Steel & Tube Co., of America	Indiana Harbor, Ind	120	Semet-Solvay	Aug. 28, 1919
Ford Motor Co	Detroit, Mich	120	Semet-Solvay	Oct 14-Dec. 6, 1919
Jones & Laughlin Steel Co	Pittsburgh, Pa.	240	Koppers	June 18, 1919
Painey-Wood Coke Co	Swedeland, Pa.	110	Koppers	Aug 26, 1919
Providence Gas Co.	Providence, R. I.	40	Koppers	Jan. 28, 1919
Additions to existing plants:				
Tennessee Coal, Iron & R.R. Co	Fairfield, Ala	77	Koppers	Dec. 17, 1919
Citizens Gas Co.	Indianapolis, Ind.	40	Wilputte	Jan 31, 1919
Indiana Coke & Gas Co.	Terra Haute, Ind.	30	Koppers	Jan. 1, 1919
Bethlehem Steel Corp.	Sparrows Point, Md.	(a) 180	Koppers	Jan. 1, 1919
Seaboard By-Product Coke Co.	Kearny, N. J	55	Koppers	Jan. 21, 1919
Carnegie Steel Co.	Clairton, Pa.	128	Koppers	June 3-July 1, 1919
Total		1,228		

(a) Completed but not put in blast.

country, defined as "the maximum quantity of coke of the grade desired by the operator which can be produced when all conditions are favorable, with all ovens active," has been as follows:

TABLE IX. MAXIMUM CAPACITY OF BYPRODUCT COKE OVENS IN THE UNITED STATES, JAN. 1, 1918 1920, NET TONS PER ANNUM

1918	27,000,000
1919	33,700,000
1920	39,500,000

In the year 1918 there was thus an increase in the annual capacity of coke ovens amounting to 6,700,000 tons, or 25 per cent. The increase during the year 1919 was somewhat smaller—5,800,000 tons, or 17.2 per cent.

The annual capacity of the plants completed and in operation at the beginning of 1920, including ovens temporarily idle, was 39,500,000 net tons. This figure represents the output at full capacity—operation of 100 per cent. In actual practice an average operation above 90 per cent cannot be assumed for the country as a whole. Weekly reports received from the byproduct plants during the war show that from Dec. 28, 1917, to Feb. 1, 1919, the highest percentage attained for the entire country was 92.2, the output reached in the week ended Sept. 28, 1918. The average for the year 1918, when every effort was being made to speed up the recovery of byproducts, was 86.9 per cent of maximum capacity. The average for 1919 appears to have been about 70 per cent.

ESTIMATE OF COKE AND BYPRODUCTS RECOVERABLE

In estimating the coke or the byproducts recoverable from the country's existing byproduct ovens the assumed percentage of operation should therefore not exceed 90 per cent. Indeed, the safer figure of 85 per cent would appear better justified by experience. The present capacity of the byproduct ovens of the country in net tons per annum would therefore be that shown in table X, the yield of coke from coal being taken as 71.2 per cent. the average for 1917-18.

TABLE X. CAPACITY OF BYPRODUCT COKE OVENS IN 1920. IN TONS

	Coke	Coal for Charge
Assuming 90 per cent operation	35,500,000	49,800,000
Assuming 85 per cent operation	33,600,000	47,100,000

The completion of the plants now under construction may raise the capacity to a maximum of approximately 43,300,000 tons, or 36,800,000 tons under an operation of 85 per cent. In connection with the supposition that a limit to the production of byproduct coke may be reached, it may be noted that this quantity is 65.2 per cent of the coke produced in 1918, the largest quantity ever used by the country in one year. It is 69 per cent of the coke required for producing 49,666,000 gross tons of pig iron, the annual capacity of the coke-burning blast furnaces completed or building on Jan. 1, 1919, according to the annual statistical report of the American Iron and Steel Institute, the coke consumption being taken at 2,375 lb. per gross ton of iron. It is 61.7 per cent of the country's total requirements for coke in the war year 1918, as estimated by the United States Fuel Administration, less sales of gas-house coke, amounting to 1,814,000 tons.

Final statistics showing the quantity and value of byproducts recovered in 1919 are not yet available, but an idea of the quantity may be obtained by multiplying the number of tons charged into the ovens in 1919 by the average quantity of byproducts recovered in 1918 per ton.

TABLE XI. AVERAGE RECOVERY PER NET TON OF COAL CHARGED INTO BYPRODUCT OVENS IN 1918

Ammonia (all forms) expressed in terms of equivalent ammonium sulphate, pounds	18.9
Tar, gallons	7.1
Crude light oil, gallons	2.4
Gas, 1,000 cubic feet	10.4

The figures, if multiplied by the 35,353,000 net tons of coal charged in 1919, as estimated from known coke production on yield of 71.2 per cent—the average for 1917-1918—would give 668,200,000 pounds of ammonium sulphate or its equivalent, 251,000,000 gallons of tar, 84,800,000 gallons of crude light oil, and 367,700,000 cubic feet of gas.

For purposes of comparison the actual production of byproducts in 1918 is reprinted below.

TABLE XII. BYPRODUCTS OBTAINED FROM COKE-OVEN OPERATIONS IN 1918

Product		Production	Sales	Value of Sales
Tar	gal.	263,299,470	200,233,002	$6,364,972
Ammonia:				
Sulphate	lb.	436,388,134	423,515,836	19,061,777
Liquor	gal			
Anhydrous or free ammonia (a)	lb	65,230,159	61,442,933	7,381,174
Gas:				
Illuminating and household purposes	M.cu.ft.	385,035,154	33,437,991	7,130,113
Industrial purposes	M.cu.ft.		124,920,488	6,569,402
Benzol products:				
Crude light oil	gal.	87,222,450	3,764,272	963,042
Secondary light oil	gal.	339,644	121,191	15,472
Benzol	gal.	44,804,900	43,441,980	11,966,367
Toluol	gal.	8,861,948	8,541,366	12,249,702
Solvent naphtha	gal.	3,540,162	3,123,815	439,983
Other oils	gal.	636,707	571,752	53,880
Crude naphthalene	lb.	10,614,799	10,403,758	287,581
Refined naphthalene	lb	5,472,699	5,486,689	362,648
Other products (b)				1,756,345
Total				$74,602,458

(a) Includes liquor and sulphate sold by pound of ammonia.
(b) Includes sodium ferro-cyanide, pyridin oil, nut coke, drip oil, spent oxide residue, coal-tar paint and wash oil.
(c) Does not include value of 1,999,370 net tons of coke breeze.

If the figures showing the recovery of byproducts per ton are multiplied by the number of tons given above as the annual coke capacity of the ovens now built and building in the United States, namely, 36,800,000 tons—a moderate estimate, assuming 85 per cent operation—the annual capacity for the recovery of byproducts by the end of 1920 will become 977,100,000 pounds of ammonium sulphate, or its equivalent, 367,000,000 gallons of tar, 124,000,000 gallons of crude light oil, and 537,300,000,000 cubic feet of gas.

Harlan Miners and Guards Fight

BANDS of mine workers are searching the woods of Harlan County on the Kentucky-Virginia border for the operatives of a protective agency who were alleged to have started a fight at Wallins Creek on Saturday night, March 20, which resulted in the death of three persons and the wounding of several others.

It is said that the Kentucky Steam Coal Co. imported onto their mine holdings a number of guards or detectives, to take care of the property, a strike of the mine workers being in progress, and that a clash resulted in which Bud Taylor, a miner; Deputy Sheriff John Burke and James Hall, a detective, tried to arrest a son of Bud Taylor. This precipitated the battle, which at first was a duel between Taylor and Hall, but soon became a general mêlée as the result of mine workers and guards arriving on the scene.

More than one hundred shots were fired before the detectives were driven to retreat. Much ammunition is said to have been received by the mine workers and a general strike was expected on April 1.

Safe Plan for Taking Powder Into Mines

Powder Is Placed by the Shaft Tender in Non-conducting, Tight Boxes, Each Holding Five Kegs—The Boxes Are Lowered One at a Time in an Otherwise Empty Cage Trip.

By DEVER C. ASHMEAD
Tarrytown, N. Y.

SAFETY FIRST is one of the slogans of the Kingston Coal Co. of Kingston, Pa. Handling powder at a mine is probably one of the most dangerous of operations and one in which every possible precaution should be carefully considered. Ways and means therefore should be provided for reducing the danger of accident arising from explosions. Unfortunately, there have been in the past numerous instances where, from some cause or other, explosions have occurred causing very serious loss of life. Probably the most disastrous recent occurrence of this nature was that at the Baltimore Tunnel, where 92 men were killed.

COAL COMPANY'S IMPOSING POWDER MAGAZINE
Miner receiving his powder supply. He is here given the powder sign, which he has already around his neck, so as to give proper warning to all around him that he is handling explosive material.

SHAFT TENDER RECEIVING POWDER FROM MINERS
The miners are required to deliver the powder to the shaft tender who places it in specially prepared box which holds five kegs.

At the mines of the Kingston Coal Co. the greatest care is taken to prevent accidents of this character. Rules, regulations and instructions are provided so that the men will take the proper precautions, willingly, if possible, but if not willingly they are made to be reasonably cautious by the mine officials.

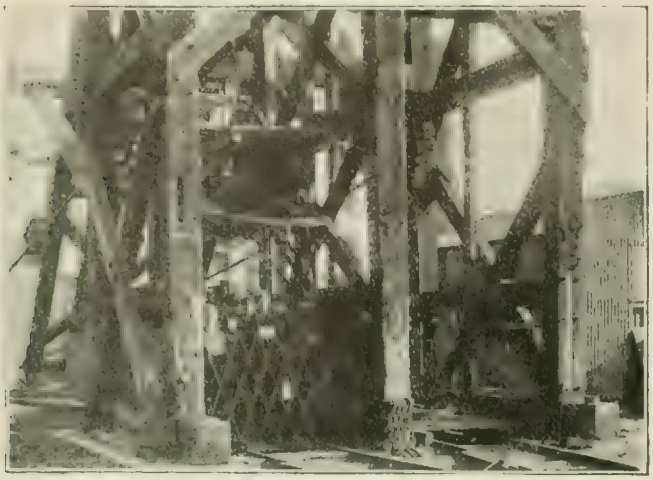
In the morning, when going to work, the men who have powder orders take them to the magazine, where they are filled. Each man is given a large red tag on which the word powder appears in white. Strings are attached to this sign and it is hung around the man's neck. In one of the accompanying illustrations a miner is seen at the powder magazine receiving his sign preparatory to hanging it around his neck. As may be observed in the same illustration the magazine is well and attractively constructed of concrete.

After the miner has received his powder and his sign he proceeds to the shaft down which the powder is to be sent. The explosive is delivered by the miner to the shaft tender, who places it, as shown in one of the illustrations, in a specially constructed box. This is just the proper size to hold five kegs of powder and has handles on each end for convenience in carrying.

FILLED POWDER BOX READY TO BE LOWERED
Note the box on the floor of the otherwise empty cage. No men are permitted to ride on this trip, thus avoiding danger from the falling sparks of the mine works' exposed lights.

There is a well-built and strong cover for the box to protect it from falling articles or flashes of fire. The box is a non-conductor and protects the contained explosive from electric discharges. Both sides of the box bear the word "Powder" painted in large red letters, while on the top also in red are the words "Safety First."

The next illustration shows the box containing the powder placed on the platform of the cage ready to be lowered into the mine. No men are allowed on the cage while the powder is being lowered. This removes the danger incident to the men carrying lighted lamps while on the powder cage. If there is an accident from other causes there are no men on the cage to be hurt and in that case the damage will be done only to the company's property.



MINERS WAITING ON CAGE TO BE LOWERED
On the next trip to the one on which powder is sent down the miners are lowered and when they reach the bottom their powder is given them to carry on foot to the working face.

The last illustration shows the men, whose powder has been sent below on the previous trip, just about ready to descend into the mine, where they will receive their kegs of powder and will surrender their tags. Underground the men are not allowed to transport their powder on trips, but must carry it by hand to their working places.

With Decline in Tonnage, Fatal Accidents Decreased in 1919

Fatality Rate Per Ton Increased Slightly—Surface Fatalities Declined 25 Per Cent; Mine Cars and Locomotives, 28 Per Cent; Coal and Rock, 15 Per Cent

A COMPLETE statement of the coal-mine fatalities occurring throughout the United States during the calendar year 1919 has just been issued by the Bureau of Mines, Department of the Interior.* The reports received from the inspectors for the year just closed show a reduction of 10.58 per cent in coal-mine fatalities as compared with 1918, while in 1918 the reduction was 4.5 per cent from 1917 figures. The total number killed was 2,307 in 1919 and 2,580 in 1918, a reduction of 273.

There was a decrease of 128, or 25 per cent, in fatalities resulting from mine cars and locomotives, and a decrease of 198, or 15 per cent, in the fatalities due to fall of coal or rock. Surface accidents show a decline of about 25 per cent as compared with the previous year. There were, however, increases in accidents due to gas and dust explosions and also explosives. There occurred during the year nine disasters in which five or more men were killed, representing a total of 201 fatalities.

The worst disaster of the year was the one occuring at the Baltimore Tunnel 2, Wilkes-Barre, Pa., resulting from the explosion or burning of a number of kegs of powder, by which 92 lives were lost. This disaster emphasizes the need for stricter regulations relating to hauling men and explosives into the mine at the same time. The question of whether electricity was responsible or not does not affect the consideration of the various dangers which arise in underground transportation and handling of explosives.

At best the handling and hauling of explosives is hazardous, and such being the case, no one, other than the necessary attendants, should be permitted to ride in cars or cages transporting explosives. As a result of this disaster, the report of the coroner's jury to the Governor of Pennsylvania brings out some important dangers to be avoided in the use and transportation of explosives.

The conditions under which the mines were operated in 1919 were not normal, as the country had not become adjusted to the new commercial conditions brought about as a result of the war. There were numerous labor troubles during the year and on Nov. 1 a strike almost completely shut down the central bituminous field, with the result that but little coal was mined during the month of November and the early part of December.

According to the preliminary estimates of the U. S. Geological Survey for the year 1919 the total production was 458,063,000 tons of bituminous coal, which is a reduction of 121,323,000 tons as compared with the previous year. The anthracite production is estimated by the U. S. Geological Survey as 86,200,000 tons, or a reduction of 12,600,000 tons from the preceding year.

While the actual number of fatalities is considerably less than in 1918, the ratio, on a tonnage basis, is slightly higher. The number of tons produced per fatality in 1918 in the bituminous mines was 285,552, as compared with 275,000 tons per fatality in 1919. In the anthracite field the production per fatality in 1918 was 262,873 tons, as compared with 135,700 tons per fatality in 1919. The average for the entire coal-mining industry was 235,900 tons per fatality, as compared with 262,873 in 1918, 241,618 in 1917, 265,094 in 1916, and 234,297 in 1915.

Complete figures showing the number of men employed are not available, but estimates received from the inspectors total about 765,000. Although the number of names on the payrolls may be slightly in excess of 1918, the actual number of days' labor performed during the year will be much less than in the preceding year because of the irregular working of the mines on account of car shortage, strikes and the unsettled demand for coal.

When the number of employees is properly weighted on the basis of full-time workers, the reduction in accident rates may not be as great as first appears. This rate on a tonnage basis does not show any improvement; in fact, the contrary is indicated.

Even Today Uncertainty Rules

MOST of the operators in the East are marking time, awaiting the settling of conditions before naming contract prices. The general feeling is one of hesitancy. The operators are asking: Are the prices being contracted for likely to be stable and would it be well to follow them in making other contracts? There is a fear on the part of the smaller operators that the large companies may "bear" the market. The large companies, however, are afraid that the little fellows, by reason of an incorrect knowledge of costs, will undercut prices.

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*Copies of the publication may be obtained free of charge by [illegible] the Bureau of Mines, Washington, D. C.

In a few instances, quotations have been made to large consumers, of $3.50 for r.o.m. and $4.00 for ¾-in. lump from the Pittsburgh District; and $3.75 to $4.25 from central Pennsylvania. These prices are basic for April 1, and subject to whatever increase in mining rates may be applied thereafter.

Several large contracts have been closed in recent weeks "at the government rate while the same lasts, and a price be agreed upon thereafter," thus protecting the consumer's tonnage. It does not appear probable that definite prices may be expected in all districts before another week.

Alaska Lignite Makes as Much Steam Per Pound as Cord Wood*

After 14 Months It Had Lost 6.08 Per Cent in Weight, Mostly Moisture—Weathered Only Where Unprotected by Lignite in Pile

THE Fairbanks (Alaska) Station of the Bureau of Mines has recently completed two series of tests designed to determine, first, the comparative steaming value of Alaska lignite and spruce wood, and second, the resistance of lignite to weathering when stored in piles in the open. The tests were made under the direction of John A. Davis, superintendent of the station, who was assisted by Paul Hopkins and John Gross. These investigations are of special interest to Alaska, since much has been written about the large lignite fields of the Nenana district and their possible value as a fuel supply.

The steaming tests were run to determine the relative value of lignite and spruce wood in the small boilers commonly used in the mining camps of Alaska. Spruce wood has been used for steaming purposes almost exclusively in the past, but the price has risen from $7 to $20 per cord in the last 15 years, and other sources of fuel are sought. The lignite used in the tests was not of the highest quality, since it was obtained near the surface. Both the wood and the lignite were carefully weighed, sampled and analyzed, so that the results of the tests could be accurately compared. The boiler used was one of a battery of two horizontal water-tube boilers, each rated at 125 b.hp. Two grades of lignite, one from the Lynn mine and one from the Burns mine, and one grade of wood were tested.

The results showed that under the conditions of these tests, when compared pound for pound, the value of spruce wood lay between the values of the two samples of lignite. The relative water evaporations per pound of fuel were: Lynn lignite, 3.06; Burns lignite, 3.99; spruce wood, 3.68 lb. However, in comparing a cord of wood with a ton of lignite, it was shown that a cord of wood is equivalent to more than a ton of lignite from either mine.

In the weathering tests several hundred pounds of Nenana lignite were used. It was first carefully sampled for analysis and then sized through a series of rings from ⅜ in. to 2 in. in diameter; 80 per cent of the sample was retained on a 1-in. ring. The lignite was then spread in shallow trays and placed on the roof of the station, where it was allowed to remain, fully exposed to the weather, for fourteen months. At the end of a week it was noticeably weathered on the surface and at the end of a month it had broken up into small pieces.

At the end of the test period it was found that the surface portion, immediately exposed to the atmosphere, was entirely disintegrated, while that farthest from the surface was only partly disintegrated, although very fragile. Over 50 per cent would then pass through a ⅜-in. ring and 85 per cent through a ¾-in. ring. The average loss in weight through weathering was 6.08 per cent, mostly moisture.

The weathering at the end of 14 months, however, seemed only slightly more than that at the end of one month. In large piles only, the surface to a depth of 4 in. to 6 in. would weather badly and the material beneath would be so protected as to suffer little change. These tests show that the behavior of these lignites is substantially the same as that of North Dakota lignite.

"Right" of Strikers to Obtain Reinstatement

ON MARCH 25 was reported in the "Coal and Coke News" department under Birmingham, Ala., the decision of Judge E. H. Dryer, umpire between coal operators and mine workers, to the effect that when a man goes on an illegal strike he cannot demand reinstatement. A case in the West Virginia mines shows to what extravagant lengths such reinstatement claims are stretched.

For declining to reinstate a check-weighman who had refused to report for work even after the conclusion of an illegal strike the Price Hill Coal Co., operating at Price Hill, Fayette County, has been subjected to a somewhat prolonged strike at the mine mentioned. Its mine workers to the number of 85 went on strike in the first instance, not over the appointment of a check-weighman but because the company failed to employ two brakemen on its coal trains.

Upon the failure of the company to provide these two men a strike followed. It lasted only a few days, however, when 75 men out of the 85 returned to work. The old check-weighman was not among those so reporting and consequently another check-weighman was chosen. When, after the lapse of about a week, the old check-weighman appeared and demanded his old job the company refused to displace the new man.

Upon the refusal of the company to make the change the mine workers went on strike again. Heretofore there has been little friction between the miners and the management of the Price Hill Company, that company having been one of the companies which early put the check-off system into effect.

Resent Reduction in Mining Rate

FOR several days the mine workers at No. 10 mine of the Big Muddy Coal and Iron Co., near Murphysboro, in Jackson County, Illinois, have been on strike, the men, who number 130, declaring that the company has endeavored to reduce the rate of pay for the mining of low coal.

President McAllister, of the 8th Sub-District, United Mine Workers of America, advised the men to return to work pending adjustment of the matter, but they refused to do so. Company officials say they will not undertake any adjustment while the men remain out of the mine, and the men refuse to return to work until the matter has been satisfactorily adjusted.

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*U. S. Bureau of Mines Monthly Reports of Investigation.

It may be gathered from the action of the union officials that the strike is not against the violation of a definite scale but for the perpetuation of some alleged concession relating to a small portion of the mine.

Mobile Protests Against High Coal Export Rates

Differential of $1.50 Less Than South Atlantic Ports Has Not Been Put in Effect

MAINTAINING that the differential of $1.50 on export coal from Mobile to South American ports below the rate applying from Charleston and Norfolk has never been put into effect, T. C. McGonigal is preparing to go to Washington within a few days to take up the matter with the Shipping Board officials there.

Exporters are claiming, it is said, that the schedule published by the shipping board Jan. 9, said to be the last received by the local office, does not allow the differential. According to information given out at the Shipping Board office the matter of whether this is provided in the latest schedule is being investigated.

Through the efforts of Traffic Manager Cobb of the Chamber of Commerce and coal exporters the Shipping Board several months ago ruled that Mobile was entitled to a lower rate than South Atlantic ports, but failed to publish the rates. After a time a committee from Mobile went to New Orleans to see M. P. Billups, then in charge of this division, in regard to putting the rates into effect and was assured by him that they would become operative at once.

That was on Jan. 5, and as the decision was made even earlier, it has been the opinion of local shipping board officials, according to J. G. Santa Cruz, in charge of the local office, that the rates published for Jan. 9 included this reduction. Mr. Santa Cruz stated that he is making an effort to have the matter cleared up.

Public Should Not Buy Too Early Is Opinion in Washington

May Cause a Runaway Market—Middle West Market Is Weak Already—Not Advisable to Store Coal Subject to Spontaneous Combustion

WITH an open market and with the "buy early" legacy left by the President's Bituminous Coal Commission, coal specialists in Washington fear a runaway market. As nearly as it can be calculated the amount of coal stored in the country is negligible. Since no one is under the delusion this year that coal prices will be lower in the fall very heavy buying is expected. This tendency is being influenced markedly by the President's request that Federal, state and municipal authorities set the example by storing three months' supply of coal.

The consensus of opinion among those following the coal situation in Washington is that the abnormal rise in prices will be of short duration. It is pointed out that the bidding up of the price of the more desirable coals is not general, as is indicated by the rather soft market in the Middle West. One factor which is expected to check buying for a month or two at least is the fact that a large percentage of the consumers are not equipped to store a three months' supply of coal.

It is also pointed out that those of the consumers whose use of coal is seasonal hardly can be expected to go more heavily into storage than they did during the war. It also is known that coal men themselves are fully alive to the inadvisability of putting out for storage purposes the class of coal that will not stock. As a result many will not be able to get the class of coal which can be stored profitably until December.

Freight-Rate Differential Strongly Opposed in the Senate

Railroads Might Hamper Low-Rate Summer Shipments—Frelinghuysen Coal Commissioner Looked On with Little Favor

SENTIMENT on Capitol Hill is not such as to insure the early passage of the Frelinghuysen bill which makes mandatory a differential of 30 per cent in railroad rates in favor of coal moved in the summer against coal moved in the winter. Already members of Congress have been hearing that there are two sides to the seasonal-rate question, and it is certain that extended deliberation will precede the enactment of any statute to that effect.

The desire and need for this method of encouraging summer buying was originated in the West. The East, which represents the greater part of the coal production, is still to be heard from, with some indications that it may have an entirely different opinion as to the beneficial results of special rates. The opportunity which would thus be offered to the railroads to use their influence to delay as much of the coal movement as possible until fall, when there would be a difference in the freight rates of as much as 40c. a ton, also is being considered. The temptation would be great to find ways of keeping as many cars as possible out of coal transportation during the low-rate period.

Even in the Middle West an important economic factor would have to be met in attempting to keep the coal mines working steadily throughout the summer. If these mines were to be kept busy throughout the spring and summer some are of the opinion that the Middle West would be forced to discontinue the greater part of its farming. It is said that with abundant opportunity for men to work in the coal mines at the present high rates of pay it would be impossible for farmers to secure labor.

Despite the argument against the seasonal variation in railroad rates the probabilities point to the application of the idea in some modified form. Any step in that direction, however, is not expected to be immediate, and even Senator Frelinghuysen, who is an enthusiastic champion of the seasonal regulation of rates, says that nothing much can be done in the matter just at present. The Interstate Commerce Committee of the Senate has made no provision for a hearing on the Frelinghuysen bills.

Nor is the bill providing for a Coal Commissioner meeting with favor. Many are of the opinion that it would be impossible to administer a law setting forth duties of such a far-reaching character.

Tilson Would End Lever-Act Powers of President Wilson

Leaves Federal Trade Commission Power to Make Inquiry as to Production Costs—Gives President Thirty Days to Wind Up Regulation

IN ORDER to end the excessive regulation of coal by the President, Representative Tilson introduced on April 1 H. R. 13,405, terminating "certain powers of the President in respect of fuel." Section 1 repeals the provisions of Section 5 of the Lever Act in so far as they apply to fuel, including fuel oil and natural gas. Section 2 modifies Section 25 of the same act giving the Federal Trade Commission the power to "make full inquiry, giving such notice as it may deem practicable, into the cost of producing coal and coke under reasonably efficient management at the various places of production," exercising such powers as were given it under the act creating the commission approved Sept. 26, 1914.

Section 3 extends "the powers of the President, the Federal Trade Commission and any other agency of the Government to fix the price or to regulate the method of transportation, sale, shipment, distribution, apportionment and storage of coal and coke for 30 days after the passage of this act, to the extent that may be necessary to complete the shipment and regulate the price of coal or coke in transit at the time of the passage of this act, in accordance with the provisions of any regulation or order issued in the exercise of such power with respect to diversion of such coal or coke." The President is authorized and required to wind up "all matters arising out of the exercise of the powers terminated thereby" in 30 days.

Section 4 prevents the act from being regarded as pardoning offenses committed against the Lever Act when in full force and effect, whether committed prior to the passage of this act or during the 30 days sequent on its approval.

West Virginia Will Not Strike

No Conferences Will Be Held Until Settlement in Central Competitive Field—27 Per Cent Increase Probably Will Be Paid

OPERATORS and miners in both District 17 and District 19, United Mine Workers of America, though belonging to what is known as the outlying districts, are expected to ratify the action taken in New York on March 29 when a 27 per cent increase in wages was agreed upon, and in fact to ratify whatever agreement may be made as to working conditions, etc. However, no conferences looking to an agreement on a wage scale and other matters requiring agreement will be held between operators and miners of the organized fields of West Virginia until negotiations between the operators and miners of the Central Competitive Field are consummated.

No statement has been made by West Virginia operators as to whether the 27 per cent increase agreed upon in New York would be paid in the organized fields of West Virginia, but it is taken for granted generally that they will do so, although when all wage contracts in West Virgina except those of the New River field and of the Kingston Wesley districts on Paint Creek expired on April 1 there was no cessation of work on the part of miners except to celebrate the anniversary of the establishment of the eight-hour day, nor, in the opinion of Fred Mooney, secretary of District 17, U. M. W., and of T. L. Lewis, former national president of the United Mine Workers, but now secretary of the New River Operators' Association, will there be any cessation.

Any agreements which may be reached in District 17, covering the Kanawha and northern West Virginia fields, and in District 29, covering the New River field, will be modeled largely after the agreement for the Central Competitive Field. Indictment of Central Field operators and miners for entering into "check-off" agreements may have a bearing on the continuance of the check-off system in West Virginia, although so far there has been nothing whatsoever to indicate that outcome.

Bill to End Federal Coal Control

Measure Introduced in the House Also Provides That No Railroad Shall Seize or Divert Coal

JOHN M. ROBSION, of Kentucky, introduced into the House of Representatives March 23, 1920, a bill to terminate Federal control of the coal and coke industry and to end the confiscation and diversion of coal and coke by common carriers (H. R. 13,231).

It terminates "the power and authority to license the importation, storage, mining and distribution of coal or coke; to requisition coal or coke; to requisition or operate the plant, business or any appurtenances thereof belonging to any producer of, or dealer in, coal or coke; to fix prices for coal or coke; to regulate the production, sale, shipment, distribution, apportionment or storage of coal or coke, and all powers and authority incidential thereto, conferred on the President, or on any other agency of Government in pursuance" of the Lever Act, except that such powers shall continue in effect for 30 days after this act becomes law to the extent that may be necesasry to settle up all matters, affairs and transactions growing out of the exercise of such powers and authority and the execution of the provisions of the Lever Act.

This termination of the power and authority of the Lever Act shall not affect any act done, or any right or obligation accruing or accrued, or any suit or proceeding commenced in any civil case before the date this new act becomes law; but all rights and liabilities under the Lever Act, arising before the termination of its authority shall continue and may be enforced in the same manner as if such powers and authority had not been terminated. Any offense committed, and all penalties, forfeitures, or liabilities incurred prior to such termination may be prosecuted or punished in the same manner and with the same effect as if such authority had not been terminated.

Section 1 of the Interstate Commerce Act is amended by adding the following paragraph: "Hereafter no carrier by railroad subject to this act shall confiscate, seize, or divert for its own use, or for any other purpose, whether with intent to make proper compensation therefor or not, any coal or coke of which it is in possession solely as a common carrier, and which the owner has not voluntarily sold or transferred, or entered into a contract to sell or transfer, to such carrier by railroad."

Open-Price Bureau and Scheme to Sustain Price Declared Unlawful

American Hardwood Manufacturers Association Conducted "Plan" for Open Prices, Reports on Stocks on Hand, Output and Circulated Statements Prophesying and Urging High Prices

ONE of the leading activities of the National Coal Association has been to establish a practice of reporting the price of coal as sold by members who were willing to divulge this form of information just as stock exchanges report sales of stocks, grain, cotton, etc., for the good of the public and the information of members. Since the National Coal Association is about, with the end of Federal control, again to keep a record of its selling prices it naturally inquires—Are the courts likely to adjudge such actions as being an attempt to sustain prices and to "restrain trade and commerce" in violation of the terms of the Sherman Act?

National Coal Association is about to resume the practice of reporting coal prices with the end of Federal control. Counsel of the association believes its new Bureau of Economics is not in violation of law, as it is being conducted solely as a bureau of record. The decision of Judge McCall granting a temporary injunction in Hardwood Association case is of much interest in this connection.

In this connection the judgment of John E. McCall, United States District Judge, who as an outcome of hearings on March 8, 9 and 10 held at Memphis, Tenn., filed an opinion granting a preliminary injunction to the United States in the case against the American Column and Lumber Co. and 332 other defendants, is of great interest. The counsel of the National Coal Association believes that its new Bureau of Economics is not in violation of the law, being unaccompanied by an attempt to maintain prices and being conducted as a bureau of record without any sinister intention of any kind.

The Government showed in the case of the American Hardwood Association, the association of which the American Column and Lumber Co., and the 332 persons enjoined were members, had an "Open-Competition Plan" under which the members of the plan continuously exchanged with one another, through a common secretary, reports showing their respective rates of production and stocks on hand, and also showed the prices which each member had received on actual sales of lumber.

Notwithstanding the affidavits of practically all of the defendants that there had been no agreements between them to increase prices, Judge McCall held that—

> It cannot be with reason denied that defendants formed a combination to promote the interests of the members of the plan by maintaining price levels, and it is difficult, if not impossible, on this record to escape the conclusion that the purpose and intention of the plan was to suppress competition among its members in the hardwood-lumber manufacturing business, wherein the production of hardwood lumber was to be kept low enough to maintain prices on an ascending scale but not so low as to drive prices to such heights that consumers would be induced to use substitutes. These two objectives mark the margins of the channels through which the members of the plan conducted by its manager of statistics were to steer interstate commerce in hardwood lumber and through which it was successfully steered on up to the filing of this bill.

Therefore he enjoined the defendant from continuing to exchange the reports in question.

This proceeding was of a civil character; but the Department of Justice considers that the law as applied in the case is clearly established. The members of other similar organizations will not be considered by the department as entitled to conduct operations of a like nature in future because they may have filed papers at Washington, or because of other similar reasons; and the department will, if necessary, institute proceedings of an appropriate character to enforce the law. The judge in his opinion said:

The bill of complaint is brought under section 4 of an Act of Congress, 26 Stat. L., 209, by the United States of America against the American Column and Lumber Co. and 332 other manufacturers of hardwood lumber, residents and citizens of some 16 different states, charging the defendants with combining and conspiring together to suppress competition among themselves and to enhance their selling prices for such lumber, in restraint of interstate commerce, in violation of section 1 of said Act of Congress, which is as follows:

> Every contract, combination in the form of trust or otherwise, or conspiracy in restraint of trade or commerce among the several states, or with foreign nations, is hereby declared to be illegal.

It is alleged that the defendant companies comprise the most important manufacturers of hardwood lumber in the United States and have been engaged for a long time in cutting down trees of the hardwood varieties and converting them into logs; in moving such logs to sawmills and lumber factories; in manufacturing them into lumber; and in the selling and shipping of such lumber, in interstate commerce, to manufacturers of sashes, doors, flooring, mill work, etc., and to other manufacturers and to wholesale and retail dealers for the purpose of resale. It is charged that at the beginning of the year 1919 the defendant companies were still demanding for their lumber approximately the same prices that had prevailed before the signing of the armistice in the war with Germany, and that manufacturers and wholesale and retail dealers were buying from the defendants only in small quantities, for the purposes of immediate necessities, in the belief that the prices demanded were too high. The latter expected to largely increase their purchases of such lumber from the defendants, in interstate commerce, as soon as the prices should be reduced by competition among the defendants to more reasonable levels.

Under these circumstances, in January, 1919, and continuously thereafter to the present time, it is further alleged that the defendant companies and individual defendants unlawfully combined and conspired together, in restraint of interstate commerce in hardwood lumber manufactured by them, to maintain the prices demanded in said month of January, 1919, for their lumber and to double and treble the prices, in violation of the said Act of Congress and against the public policy of the United States, by suppressing competition in prices among the defendants; by substituting therefor co-operation and agreements among themselves having the purpose and effect of maintaining and increasing prices.

The bill then proceeds to state the means resorted to by the defendants to accomplish the purpose of the alleged combination and conspiracy, which are in substance as follows (hereinafter referred to as overt acts): By joining together as members of a so-called "Open Competition Plan" under the slogan "Co-operation, not competition, is the life of trade"; and by providing and financially supporting at Memphis, Tenn., a suite of offices, clerical force and the defendant, F. R. Gadd, as manager of statistics, for the successful operation of said plan; by dividing the members of the plan into four geographical groups and holding meetings of each group each month; by printing and causing to be distributed among the defendants recommendations to make oral agreements at such meetings to eliminate competition among these defendants who had been competing.

MEMBERS REQUIRED TO MAKE STOCK REPORTS

By this means parties to the plan proposed to suppress "evil practices," meaning thereby the practice of competing in prices so as to secure business, by requiring each member of the plan to make monthly "stock reports" to the manager of statistics, showing the normal stock, the entire actual stock, the unsold stock, of each defendant company; and also to make to said manager "production reports," showing the normal monthly production, the actual monthly production, and the estimated future production of each defendant company; and also "sales reports," showing separately each actual sale of hardwood lumber made by each defendant company, giving the name of the buyer, the kind of lumber sold, the destination, and the selling price; by having these reports tabulated by the manager of statistics and distributed among the members of the plan.

The bill also charges that the plan provided for distributing among the defendants printed recommendations to discuss prices at their monthly meetings, and orally discussing at such monthly meetings said stock reports, production reports, and sales reports, so as to produce at each of such meetings a mutual exchange of oral statements of approval of high prices reported in the sales report as assurances that the defendants would further sustain such prices by maintaining prices as high as or higher than such prices; the mutual exchange each month through the manager of statistics in connection with the production reports, written predictions by the several defendants that high prices reported in the sales report would continue to be maintained and enhanced, so as to thus furnish further assurance that the action of each defendant in maintaining and enhancing such prices would be supported by like action on the part of other members of the plan.

A further feature alleged to be part of the plan was the practice of the manager of statistics to distribute among the defendants printed expositions of the theory of each defendant, to be observed as a guide to prices reported as received by other defendants, to the effect that knowledge regarding prices actually received was all that was necessary to keep prices at reasonably stable and normal levels, there being no agreement to follow the practices of others, although members naturally followed their most intelligent competitors if they knew what their competitors had been actually doing, this being the theoretical proposition at the basis the Open Competition Plan.

EDITED REPORTS TO DISCOURAGE LOW PRICES

Questionnaires are said to have been sent out by the manager of statistics to each member of the plan asking for information showing how the theory of the open competition plan worked in practice, and the manager of statistics edited these answers and caused to be distributed among the members such parts of them as tended to show that it was successful in producing a steady advance in the prices of their products. The manager of statistics is said also to have printed and caused to be distributed among the defendants arguments against low prices, on the ground of shortage of lumber disclosed by the stock reports, and explaining how the disclosure of such shortage in the stock reports prevented prices from being lowered, followed by arguments for still higher prices on the ground of the shortage disclosed, for continued co-operation to secure higher prices on the ground of shortage in stocks, and the elimiantion of competition, causing to be reprinted with approval and distributed among the members statements emphasizing the advance of prices following the shortage of lumber and urging the defendants against increasing production by night work, which would in effect "kill the goose that laid the golden eggs" and would be criminal folly.

The arguments were coupled with the suggestion made in the sales report that the combination or association called the "Open Competition Plan," to maintain and enhance prices, would not be prosecuted; that prices would continue to advance so long as the shortage of lumber was maintained, and that the Sherman Law, designed to prevent the restraint of trade, should be repealed.

COURT ASKED TO ENJOIN PRICE CONTROL

It is further alleged that similar means are still being employed and are about to be further employed by the defendants, at Memphis and elsewhere, in consummation of their alleged unlawful combination and conspiracy to maintain the prices of hardwood lumber at and enhance it beyond the present high levels, in restraint of interstate commerce in such lumber. It is the doing of these things by the defendants, characterized as overt acts, that the Court is asked to enjoin.

The defendants file a sworn answer, in which they substantially admit doing these things charged in the bill, characterized as overt acts. They deny that they were wrongful acts and assert that the defendants were clearly within their rights under the law in the course which has been pursued, and especially do they deny every charge or intimation in the bill of any unlawful combination or conspiracy and that the doing of those things did not and does not restrain trade in interstate commerce, but on the other hand it is asserted that the Open Competition Plan promotes competition in interstate commerce and especially among the members of the plan in that it furnishes them with information by which they can more intelligently and effectively conduct the management of their business as manufacturers of hardwood lumber.

MANAGER OF STATISTICS SUPPLIED DOCUMENTS

They deny that the defendants, by their course of conduct as charged in the bill, curtailed production, suppressed competition in, or maintained and increased prices of manufactured hardwood lumber. Much documentary evidence and many affidavits were introduced in support of the contention of the respective parties, all of which were documents coming from the office of the manager of statistics or affidavits of the defendants themselves, except a certain line of affidavits by parties who were not members of the plan but who were dealers in hardwood lumber, or furnished supplies to the defendants for the manufacture thereof.

In the view the Court has taken of the case these later affidavits, in so far as they are material to the question to be decided, are but expressions of opinion of the party making the affidavit. It should be said that the affidavits made and filed by the defendants do not controvert the allegations made in the bill of overt acts, but they do deny that affiants were parties to any combination or conspiracy or agreement to restrain trade in interstate commerce in the hardwood manufacturing business, by suppressing competition in prices among themselves or otherwise.

As the Court understands this record, there is no conflicting evidence to reconcile, since it comes entirely from the defendants and, whatever the case is for the Government, it is made such by the acts and words of the defendants, or some of them, themselves. It, therefore, remains for the Court to determine whether the conclusions drawn from the evidence of the Government, as stated in the bill of complaint, are in its judgment warranted.

QUESTION OF CONSPIRACY CONSIDERED

The first question arising is, whether the defendants in associating themselves together under the so-called "Open Competition Plan" thereby formed a combination or conspiracy. In other words, was there in the minds of two or more of the defendants a design to accomplish by and through the plan a common purpose? If so, there was a combination or conspiracy, since a combination or conspiracy consists only in a mere meeting of the minds of two or more persons to accomplish a common purpose.

> A combination or conspiracy is not necessarily unlawful, but if unlawful, then anything done or said by a party thereto to consummate the unlawful purpose need not in itself be unlawful. [illegible] combination or conspiracy in itself lawful may be made unlawful by acts in furtherance thereof which are themselves unlawful. An unlawful conspiracy, when proven, may be brought [illegible] condemnation of law by proof of facts and circumstances done in furtherance thereof which are not in themselves unlawful. [illegible] which has for its object the accomplishment of a lawful purpose may be brought into condemnation of the law [illegible] to consummate that purpose. (*Pettibone* [illegible], 148 U. S. 203; *Bouvier's Law Dictionary*, Vol. 1, p. [illegible].)

It cannot be with reason denied, nor indeed do I understand that it is denied by the defendants, that they formed an association, a combination, or an agreement to promote the interests of the members of the plan who were engaged in the manufacture of hardwood lumber, by maintaining price levels.

The second and more difficult question is, did and does this combination or association restrain trade in interstate commerce, within the meaning of the law? If so, it is unlawful, and any act done or anything said or written by any member of the plan in furtherance of its object was the act of all and the injunction should issue.

The evidence shows that the defendants were members of the American Hardwood Manufacturers' Association (hereinafter called the association), but that all the members of said association are not members of the "Open Competition Plan." Query: What benefits did those members of the association who joined the plan expect to derive from it which were not equally available in the association alone? There must have been some additional advantage contemplated and expected. That purpose, I think, can best be determined from the evidence tending to show what the members of the plan said and did from the time of its formation and on up through the months until this suit was filed.

A NEW DEFINITION OF THE LIFE OF TRADE

As has been seen, this evidence was created by the defendants themselves, and it is uncontroverted. We come now to consider it. It appears that in the early months of 1919 the stock of hardwood lumber on hand was low, the demand was light, and prices at a comparatively high level. The first sales report by Mr. Gadd, as manager of statistics, was issued on Jan. 25, 1919, and issued weekly thereafter. Quoting from the first one we read:

> Co-operation, not competition, is the life of trade. Membership in the plan is not compulsory but members who enter into the plan and practise the idea of a fair deal for all, eliminating suspicion and acting with good will toward each other, will find that returns come back to them with added interest in dollars and cents.

February 3:

> Before the organization of this plan the members in a majority of cases were competing with each other, even when neighbors without a personal acquaintance.

February 8:

> The matter of price is the principal point at issue between the buyer and seller. Buyers who have been looking for a downward revision of prices are going to be disappointed. * * * It is no longer merely a question of who can or will hold out the longest—that condition no longer exists. Buying has been resumed after a period of waiting and uncertainty, and it is confidently expected that the move in this direction will long be continued. The tendency to buy only for current needs is less apparent than at any time since the armistice was signed. * * * Stocks remain below normal. Total stocks on hand in the Southern territory are two million feet less, all grades combined, as compared with last month. * * * Production in the Eastern territory, however, is not more than sixty per cent of normal at the present time. * * * The car supply is ample. * * * It must be apparent that the outlook on the whole is favorable for a strong market for all the lumber that can be produced during the coming months.

February 15:

> There's a reason for everything, and the reason of an association is more than good fellowship, though getting to know the other fellow is usually the first step in the direction of correcting trade abuses.

March 1:

> The report of stocks on hand sold and unsold as of Feb. 1, 1919, develops a situation that we believe is unparalleled in hardwood lumber industry. In no single month within our recollection has there been such a large and general decrease in stocks on hand as shown by this report. The chief factors contributing to this situation are curtailed production and increased volume of sales. * * * At this rate, it will not be long before there is a famine of hardwood lumber. We hear a great deal about the waiting attitude of the buyer with the expectation of price recession, but with such conditions as are above recited it is difficult to understand why holders of hardwood lumber need worry as to the future. * * * With stocks low and ill-assorted, and with no prospect for restoring them to even last year's meager quantities, the outlook for strong prices on all hardwoods could not be better.

March 8, quoting with approval an article from the Southern Lumberman, the report says:

> For instance, at the recent meeting of the Open Competition Plan of the American Hardwood Manufacturers' Association in Memphis, the fact was developed that the production of mills embraced in that group of manufacturers is at the present time only fifty-six per cent of normal, and that practically the same situation exists through the harwood producing territory * * * Certainly in any other industry the buyers could never expect anything but an advance in price when the supply is below normal, the production is far below normal, and the demand is improving.

March 22:

> It is one thing for men in a meeting to say, one after another: "My price is so and so," with the result that after the meeting all their prices prove substantially the same as the figures mentioned. It is quite a different thing for the same men to come to a meeting and each report: "My actual sales for the past month *have been* so and so, and I have reported the details of each transaction to the association."
>
> In the statement there is no direct or implied agreement to maintain prices, no obligation of any kind to refrain from cutting. The theoretical proposition at the basis of the Open Competition Plans is that: *Knowledge regarding prices actually made is all that is necessary to keep prices at reasonably stable and normal levels.*

March 29:

> Naturally the situation ought to have an important bearing on the plans of every hardwood lumberman if the facts were better understood; offers of business now at shaded prices would get scant consideration and there would not only be no good reason to cut prices but there would be every reason why they should be held at reasonable profit-making levels.

With the low stock of hardwood lumber on hand and the reduced production during the first few months of the year, as indicated by the sales reports, the plan, through its manager of statistics, on April 5, began a propaganda to encourage home building, for the purpose of creating a greater demand for hardwood lumber. On the first page of the report of that date there appeared in bold letters the words "Build Now."

Thereafter on June 7 following this propaganda the weekly sales report begins: "The Open Competition Plan to the American Hardwood Manufacturers' Association has arrived; it is an unqualified success and any member or any manufacturer who does not think so is simply overlooking the most important of our several association activities. * * * Read the following excerpts from letters written by members."

I quote only a few:

"We believe we have profited from $500 to $1,000 during the past 30 days by being *correctly* informed relative to the prices stock is really being sold at.

FINDS PLAN PRODUCES HIGHER PRICES

"The very first report which we received under this plan enabled us to increase our price $6 per thousand on a special item in oak."

"Since we became members we have been selling out lumber at several dollars per thousand more than formerly."

"I consider the report of actual sales of great help in determining the market value of hardwood lumber and believe that the plan is a stabilizing influence, which tends to raise the prices of those who are inclined to cut their prices to the top market prices."

"It is obvious that no one wants to sell his lumber for less than the other fellow is actually getting and your reports of actual sales enable the manufacturer to see what his neighbors are getting for their lumber, and through this course of education, I might say, all those who have access to your reports bring their prices to the top."

"There seems to be a friendly rivalry between members to see who can get the best prices, whereas under the old plan it was cut-throat competition. Now it is a pleasure to sell because we know what we are doing and have information at our finger tips that enables us to know these things before the other fellow does."

There is much other documentary evidence to like effect, but this is enough to indicate the common note running through it all, and that common note is "increase of prices." It is difficult, if not impossible, on this record, to escape the conclusion that the purpose and intention of the plan was to suppress competition among its members and create and perpetuate a condition wherein the production of hardwood lumber was to be kept low enough to maintain prices on an ascending scale, but not so low as to drive prices to such heights, under the stimulating influence produced by the propaganda to "Build Now," that consumers would be induced to use substitutes.

These two objections mark the margins of the channel through which the members of the plan conducted by its manager of statistics, Mr. Gadd, were to steer interstate commerce in hardwood lumber and through which it was successfully steered, on up to the filing of this bill, until prices of hardwood lumber had increased from 150 to 250 per cent within a period of twelve months.

I do not doubt that some of the defendants, if not all of them, were advised that the plan was lawful and that their participation in its operation was lawful, but their conduct must be here considered in the light of results.

It would serve no useful purpose to analyze the evidence or to enter into a discussion of the decided cases which have heretofore arisen under the Sherman Act. Each case must be determined upon its own facts and if these facts establish the proposition that the combination entered into unreasonably restrains trade in interstate commerce, by suppressing competition in prices, it falls within the condemnation of the act.

Competition and co-operation by and with those engaged in the same business is not necessarily inconsistent. Successful business will likely result from a proper balance of the two, but too much of either may lead to disaster. Competition without co-operation means destructive competition. Co-operation without competition means the destruction of competition—price fixing.* The latter is the state of the Open Competition Plan, as disclosed on this record.

It results from what has been said that temporary injunction will issue as prayed for in the bill of complaint.

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*Hurley's "Awakening of Business."

Rules Framed for Prospecting and Leasing Government Coal Lands

Not More Than 2,560 Acres—Lessee May Hold Only One Lease in Any One State—Prospecting Permits To Be Granted

SECRETARY Payne has approved rules and regulations for the prospecting for and leasing of coal deposits of the United States under the act of Feb. 25, 1920. The act provides for the disposition of all coal deposits owned by the United States, except in national parks, military or naval reservations, and in the Appalachian Forest Reserve. Known coal deposits are to be divided into leasing units of not exceeding 2,560 acres each, and one person or corporation may hold but one lease in a state.

Leases for the units are to be offered for competitive bidding at a royalty fixed in advance, not less than 5c. per ton, and awarded to the qualified person bidding the highest bonus. The Secretary of the Interior is authorized to grant prospecting permits to qualified citizens to search for unknown coal deposits or to explore undeveloped lands where preliminary work is necessary to determine the existence or workability of the deposits. In such cases the permittee who finds or demonstrates workable coal deposits may have a lease on such royalty as may be fixed by the Secretary of the Interior.

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Has The Public a New Heart?

AUSPICIOUS indeed is the news that the Public Utilities Commission and the City Council of Norfolk, Va., have each severally established a platform which reads "Capital legitimately invested in public-utility properties must be safeguarded and protected by municipalities, both as to principal and as to a just and inviting return to the company for expenses incurred in providing service." The resolution was unanimously adopted. Norfolk wants strong corporations to build and maintain public accommodations, and it knows it must pay them a just price or go unserved or badly served. It has showed its faith in the principle that it has enunciated by finding officially that the City Gas Co. of Norfolk was entitled to a price for gas of $1.64 per thousand cubic feet. However, as the company only asked for $1.60 the petitioned price was allowed it with the proviso that the rate should be varied to accord with the price of oil used in the manufacture of the gas. Thus, gradually, the United States is getting back the kindly heart to public utilities which it had in earlier days.

Minority Report of Bituminous Coal Commission

JOHN P. WHITE'S minority report is an odd sort of document. It is not a calm, judicious setting forth of facts from the record and a drawing of conclusions therefrom. It is chiefly a criticism of the majority report, and to bolster up these criticisms and demands it resorts to *prejudicial* citations of facts. One reads it through in the hope of finding something constructive, but lays it down at the end with a sense of disappointment. Evidently it was written after the majority report had been completed and hence took advantage of the fact that Messrs. Robinson and Peale would have no opportunity for reply. The value of the statements in the report are indicated by a few salient features.

Mr. White gives the impression that he accepts the figures covering earnings which were submitted to the Commission by the coal operators. Then he proceeds to cite only those figures which relate to northern Illinois, a small district in which employment conditions are not at all representative of most producing fields in the industry and in which the earnings of men in the coal mines are supplemented by their earnings from other occupations in which they work during the remainder of the year. There is no citation at all of the figures of earnings for such districts as southern Illinois or Pittsburgh, which would give the reader a more complete and fairer knowledge of the earnings of the miners under the Washington agreement.

Another example is the accusation of profiteering which is brought against the bituminous-coal producers. That question is dealt with in the majority report simply by submitting tabulations from the operators' tax returns to the Treasury, which show that in 1918 the bituminous-coal producers, after paying their taxes, earned only about 9 per cent on their capital invested in the business.

The majority showing here is a simple incontrovertible statement from authentic sources. Mr. White attempts to *twist* these figures to his advantage by resorting to compilations based on "capital stock" instead of capital actually invested, although such compilations would be misleading. The only further information on the subject which he offers is a reference to one of the miners' exhibits, a table of returns of some 32 companies which publish annual statements.

Examination of the names of the companies in that exhibit shows it to be a ludicrous mixture of anthracite operators, lumber manufacturers, byproduct coke makers, bituminous-coal producers, jobbers and retail coal dealers. Yet this hash is gravely submitted as proof of profiteering on the part of the soft-coal operators. Worse yet, it is offered as counterbalancing the authentic Treasury figures on over 1,500 producers. That is astounding stuff to appear in a presumably impartial report of a semi-official agency set up by the Administration to deal with basic problems of industry and labor.

The arguments advanced for the six-hour day cannot impress any serious-minded reader. Mr. White's very presentation of reasons for this demand proves clearly that it is simply an effort to maintain in this industry a greater number of workers than would be necessary if the production conditions were stabilized. The majority report moves to eliminate the occasional need for these surplus men, freeing them for work in other industries. That purpose is really constructive and has the welfare of workers, operators and consumers at heart. Mr. White's proposal would keep these surplus miners in the industry by paying them for their idle time without regard to the cost to the public.

Consideration of the minority report would be incomplete without examination of its theory of wages. Reduced to clear exposition, Mr. White is not content with an advance to keep pace with a generous estimate of increased living cost; he wants the earnings of the miners increased still more to elevate their position. Here again there is a frank disregard of the interests of labor generally and of the consumer of coal. This is essentially a selfish demand, an advantage to be wrested from fellow laborers in other walks of life. If the common lot of all who toil is to be bettered it can be accomplished not by a mere redistribution of the things now produced. We must have greater production of all the essentials and luxuries of life if more of us are to enjoy them. Shorter hours and higher wages otherwise are only another effort to lift ourselves by our bootstraps.

Because, in his wage demands, the mine worker showed no sense of obligation to the public, he is told to go back to work at a fixed wage—while the operator is free of legal obligation as regards prices. How long will that liberty be continued if the operator asks an unreasonable price increase? Instead of using the freedom of the market as an opportunity to outvie one another in prices, coal operators should figure on a satisfactory profit and rely on the justice of their cause to prevent a renewed imposition of government control.

Coal Replaces Oil In Gas Making

AGAIN it is oil vs. coal, and the score is proving to be very large in favor of coal. Two large gas companies have just announced plans for coal-gas installations to replace carburetted water gas, thus replacing anthracite or coke and oil by bituminous coal. And this is only a beginning of the change.

The latest printed U. S. Geological Survey reports on municipal gas supplies give figures for 1915. In that year 550 plants produced 136 billion cubic feet of water gas, using for that purpose more than 550 million gallons of oil and two million tons of coke and anthracite coal. Much of this production will be eliminated in the near future, and coal gas, manufactured with the use of bituminous coal, will be substituted. The reason for this is not difficult to find when one knows the decided upward tendency in price of all petroleum products.

The Washington Gas Light Co. on March 18 announced that it was planning to build a coking plant with a capacity of ten million cubic feet of gas per day in order to permit the substitution of coal gas or coke-oven gas for much of the water gas which is now supplied. This will mean that from one thousand to two thousand tons of bituminous coal will be required per day, according to the processes chosen, or in other words from one-third to two-thirds of a million tons of bituminous coal will annually find a new market in the capital city. The immediate cause of this change was the large increase in price for gas oil, which has advanced from 7½c. a gallon on the last contracts to offerings at over twelve cents a gallon, and some uncertainty as to whether adequate deliveries can be expected. The coking plant thus finds a large advantage which was not previously enjoyed, and bituminous coal comes into its own as a fuel from which the city gas supply will be made.

Another somewhat similar plant was announced a few weeks ago in Chicago by the Koppers Co. of Pittsburgh. This company has made public the plans for building in Chicago a combination coke-oven and water-gas plant, which will be located in the western part of the city, to augment the gas supply of the People's Gas Light and Coke Co., which supplies all of Chicago. In this case, too, it was desired to build only a coke-oven plant; in fact extensive plans were prepared several years ago to this end, but the plans for construction were interrupted by war. Now the situation is such that some water-gas installation must be made immediately in order to increase at an early date the output of gas, but the coke-oven installation is planned in such a way that great extensions will probably be made later with the idea of ultimately replacing much of the water gas by coke-oven gas. These changes in the city of Chicago represent plans for 12 million cubic feet per day of coke-oven gas, representing about 650 thousand tons of bituminous coal per year.

Similar changes to these two are inevitable in many places if the petroleum market stays as now, and we, therefore, can confidently look forward to changes within the next few years which will mean that perhaps a hundred billion cubic feet of gas now made by water-gas process will be produced by other means, principally through coke ovens or coal-gas plants. The production of gas in byproduct or retort processes varies from five to ten thousand cubic feet of gas per ton, averaging perhaps seven thousand feet per ton of coal carbonized under the conditions which are indicated by present plans of installation. On such a basis, we can foresee at these plants a prospective additional demand for about twelve to fifteen million tons of bituminous coal.

Byproduct production will be a large factor, too, as eight to ten million tons of coke, 125 thousand to 150 thousand tons of ammonium sulphate or its equivalent in other forms of ammonia, 100 to 120 million gallons of tar, and thirty to forty million gallons of light oils will be entering our markets as the result of such changes.

It behooves the coal man to keep watch on these plans, especially if he is interested in gas or byproduct coals. Big things are on foot and bigger still are to come. It appears more than likely that the invasion of the coal industry by oil will be met by advances by coal on what has come to be regarded as coal territory. Already it is found impossible to provide the oil that construction of oil-burning ships has made necessary.

Keep Prices On a Fair Level

BY JOHN H. JONES
President, Bertha Coal Co.

Present times are so critical that all the business and financial interests of the country should be satisfied with a minimum profit, and coal companies should not advance the selling price of coal more than the actual increase in cost of production over the Government rate in effect in 1918, except in some districts where prices were entirely too low. For certain high grades of coal I would consider a fair price at the present time would be: Fairmont and Pittsburgh steam mine-run and coal of the same quality from other districts, $3 per ton; gas mine-run 25c. per ton more; or $3.25. In the Central fields the prices should run from $3.50 to $3.75 for thin-vein low-volatile coal.

I realize, in making the above statements, that I shall be criticised by many coal operators who have lost money during the past eighteen months and who insist that they should take advantage of the present opportunity to recoup their losses; but I feel confident that the standard companies owe it to themselves to do all they possibly can to discourage pyramiding of prices at the present time —first, because it is unfair to take advantage of the public at a time like this when there is a great shortage of coal; second, because it is the patriotic duty of every good citizen to help lower the cost of living and to take no advantage of his fellowmen; third, because the coal men are on trial.

Will they rise to the occasion? If they do not the penalty will be a loss of self-respect, a loss of prestige, and they will convince the public of their irresponsibility and will cause great unrest among workingmen in general, who will be compelled to purchase coal at abnormal prices. It will also arouse a spirit of unrest among mine workers, who will feel that they are not getting their share of the price paid. I am heartily in favor of the enactment of legislation permitting the coal operators to agree on a fair price to be charged for coal, subject to the approval of a proper agency for safeguarding the public.

Easy is the assumption of Attorney-General Palmer that Dr. Garfield's war estimates of the cost of producing coal are well warranted in peace time. With steady work and every mine worker doing his utmost the rates fixed during the war, even with the 10c. for steady work deducted, were doubtless enough to provide profits to mines managed with a reasonable degree of efficiency. But with 50 per cent full time, day workers soldiering and miners leaving the mine early, a different condition confronts the industry. An increase in wages of 14 per cent capped the climax and only the sale of contract coal at increased rates made operation possible in all but a very few greatly favored mines.

DISCUSSION *by* READERS

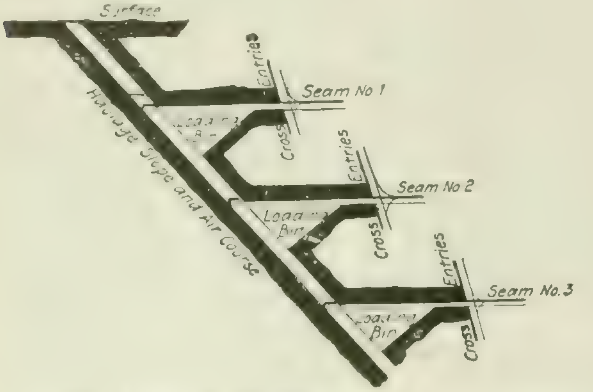
EDITED BY JAMES T. BEARD

Working Kanawha River Coal

Letter No. 3—After an experience of 37 years in the mining of coal, most of which has been at the end of a pick handle, I have been much interested in the question of Arthur L. Sheldon, *Coal Age*, Feb. 26, p. 419, regarding the best method of extracting the coal from three seams underlying the Kanawha River. If the information given is correct, these seams lie at depths of 50, 100 and 160 ft., respectively, below the surface, of Cedar Grove, W. Va. Taking these in the order named, I will assume that No. 1 seam is 3 ft. thick, No. 2 seam, 5 ft., while the thickness of No. 3 seam varies from 6 to 9 ft.

In the first place, having selected a suitable point on the surface, I would drive a steep slope, say a slope having an inclination of 10 or 12 in. per foot of depth, cutting the three seams. The size of the slope must be determined in accordance with the territory to be developed; but I will suppose it to have an area 6 x 12 ft. inside of the timber, which will provide ample room for the installation of a conveyor system should that be deemed advisable, in the later development of the mine.

Where the slope cuts No. 1 seam, I would drive a gangway or level in that seam, for a distance of 100 ft., before turning off cross-entries. Likewise, where the slope cuts No. 2 seam I would follow the same plan and repeat the operation in No. 3 seam. As I have endeavored to indicate in my sketch submitted herewith, it will then be possible to build large concrete bins, below each level, and arrange these bins so as to load coal into a skip or discharge it into a conveyor in the slope.



SHOWING STEEP HAULAGE SLOPE AND GANGWAY LEVELS IN THREE SEAMS

It has been my experience, in the working of overlying seams similar to these, better results are always obtained by keeping the extraction of the coal in the upper seam some distance in advance of the working faces below. Thus, in this case, the working face in No. 1 seam should be kept a short distance in advance of that in No. 2 seam; and the face in No. 2 seam, likewise, a short distance in advance of that in No. 3 seam.

I have found that it is almost impossible to work the coal in an overlying seam when the extraction in a seam lying but a few feet below, is in advance of that in the upper seam. Not only does the caving of the intervening rock strata destroy the roads in the upper seam, but there results no end of trouble in the seam below. For the sake of economy and safety, therefore, I prefer to develop the upper seam in advance of that lying below, in every case.

Speaking of the concrete bins, these should be built by shooting the bottom in each level. Each bin should have a capacity of, say from 50 to 100 tons, or sufficient to fill a railroad car. I would use mules or locomotives to haul the cars to each seam, employing these as the increasing development required.

In the ventilation of the mine, I would make the main slope a downcast and carry the air in two splits, the first split entering No. 2 seam and then circulating through No. 1 seam, before returning to the air-course, which should parallel the slope. The second split is conducted directly to the foot of the slope and made to ventilate No. 3 seam, after which it enters the return air-course and is conducted to the surface. I forgot to mention that, at the inner end of each bin, a cradle dump should be erected provided with a kickback, and the levels laid with double track. J. B.

Cranberry, W. Va.

Letter No. 4—Referring to the inquiry on this subject submitted by Arthur L. Sheldon in the issue of *Coal Age*, Feb. 26, p. 419, I believe that if the pillars are to be drawn and a maximum recovery of coal is expected it will be necessary to work the upper seam first, the middle seam next and the lower seam last. By this I do not mean that it will be necessary to completely exhaust the overlying seam before the next one below is attacked.

The point I wish to emphasize is that the workings of an upper seam should generally be kept in advance of the one next lower. If any ribs are drawn in a lower seam, before an overlying seam is exhausted, care must be taken not to draw any such ribs in the lower seam till the corresponding rib immediately above in the upper seam have been drawn.

The reason is that, with only fifty feet of strata between the two seams, the drawing of ribs in the lower seam will undoubtedly break the strata between it and the upper coal, making the mining of the upper seam difficult, owing to the coal and rock below it being broken and crushed. If two or more seams are worked simultaneously it may be, and probably will be advisable to lay out the entries, in the different seams, one above the other and keep the upper ones ahead.

No pillars should be drawn under the river, unless possibly this might be accomplished with the exercise of due caution, on the wind-up in the lower seam. Only narrow entries, with the roof well supported, should be driven under the river, in the upper seam; and even this should not be attempted, unless there is a good slate or rock strata overlying the coal. Even then, considerable water is liable to find its way into the mine, especially if there are faults or slips extending to the surface or river bed.

Providing for an Output of 1,000 Tons a Day

Regarding the kind of opening, I believe a slope opening will be the most economical; and, while the upper seam is being developed, the sinking can be continued down to the next seam. For a mine with a capacity of 1,000 tons per day, I believe it would be more economical to bring the cars to the surface, than to install bins below ground and bring the coal to the surface by means of conveyors, elevators or skips. An installation of that kind would be somewhat expensive for an output of only 1,000 tons a day. However, for a capacity of from 3,000 to 5,000 tons a day, such an equipment, I believe, is well worth considering.

In this connection, let me suggest that, for the production of only 1,000 tons per day, one or at most two seams would be all that would be necessary or advisable to work at one time, and this plan would be more advantageous, as the work could be kept more concentrated, which is always desirable. The lower seam or seams can be developed while the upper ones are being wound up, and a constant output will thus be maintained during the change from one seam to the other.

In regard to the method of working, this would depend largely on the size and shape of the tract to be developed; but, in a general way, I believe that the panel system would be best. In adopting the panel system, the butt or room entries can be driven to the boundary or end of the panel and the rooms turned and the pillars drawn on the retreating plan.

The number of entries to be driven would, again, depend largely on the size and shape of the tract; and the width of entries, rooms and pillars would depend on the amount of cover, roof conditions and hardness of the coal. **Edward H. Coxe.**

Brownsville, Pa.

Dead-End in Trolley Haulage

Letter No. 3—Referring to the question asked in *Coal Age*, Feb. 19, p. 367, regarding the distance that the dead-end of a trolley wire should be located from the face of a heading, my answer is as follows: The trolley wire should never be carried beyond the last breakthrough in the heading, whether gas is generated in the place or not.

There are two reasons, in my mind, why it is not well to extend the trolley line beyond the last breakthrough. In the first place, there is more traveling, back and forth, between the last breakthrough and the face of the heading than anywhere else; and the men engaged in driving the heading are more careless, in passing to and fro, there than they would be if traveling the haulage road.

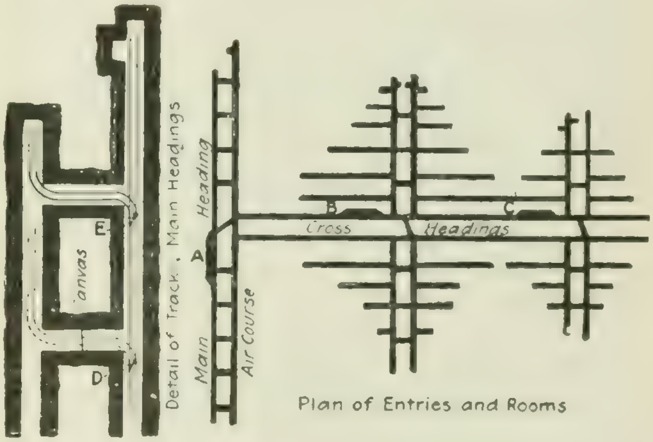
Hence, it must be admitted that there is every liability of the men coming in contact with the wire if carried beyond the last breakthrough. Especially in a mine generating gas, the trolley wire should be kept outside of the last breakthrough, because there is more chance of gas accumulating in that portion of the heading and greater danger of the gas being ignited by a flash from the trolley.

It seems to me that the mining law of Pennsylvania, or one of the other coal states, specifies that the trolley wire must not be extended inside of the last crosscut or breakthrough in the heading. I notice that this inquiry comes from West Virginia, and I am anxious to see what conclusions will be reached and to learn the opinion of others. **Mine Electrician.**

Conemaugh, Pa.

Letter No. 4—In connection with the question of how near to the head of an entry the trolley wire should be carried, it may be of interest to cite a case that I have in mind where the conditions were such as to necessitate carrying the trolley wire closer to the face of the heading than would otherwise have been done. The circumstances were somewhat as follows:

The main headings in a large mine were being driven for development and, at the time of my story, the head of these entries had been advanced about 1,000 ft. beyond the last pair of crossheadings. In the sketch I submit, the general plan of the cross-entries, butt-headings and rooms is shown on the right; while an enlarged detail plan of the main heading and tracks is shown on the left.



In order to insure the continuous future development and maintain the output of the mine at its usual standard, it was important to drive the main heading and its air-course steadily without intermission. In this mine cable-reel locomotives were used to gather the coal from the rooms on the butt-headings, and haul the cars to the sidetracks marked *B* and *C*, in the figure; while a small trolley locomotive was used to haul the cars from these sidetracks to *A*, and then to the tipple.

The gathering locomotives were kept exceedingly busy as each of them served a large number of men. For this reason, it was found impracticable to take one of these motors and run it a thousand feet up the main heading, to clean up the coal produced at that point. This would have to be done several times during the day and there would necessarily have been much delay and loss of time to the men driving the main headings. The haulage locomotive, on the other hand, had but a short haul and spent considerable time, each day, waiting at the partings for coal.

To obviate these difficulties, it was decided to extend the trolley wire up the main heading and use the haulage locomotive to serve the men driving that pair of headings. At first, the locomotive took the cars only as far as the end of the trolley wire, which I have marked *D* in the sketch; and the two miners, assisted by the motorman and brakeman, switched them by hand and placed them in position for loading at the head of the entry and its air-course. Later, however, owing to adverse grades in the heading, it was found necessary for the motorman to push a train of empties ahead of his locomotive so that the machine could handle the cars to a point nearer the face of the entry.

It is quite evident that this scheme was only a makeshift, and it soon became necessary to adopt a different plan, in order to expedite the work. Referring to the detailed sketch on the left of the figure, the dead-end of the trolley wire was now extended to a point just outby of the last open crosscut, which is marked *E*. As soon as this crosscut was driven through to the air-course, a switch was laid on the main heading and the track carried through the crosscut and extended to the face of the air-course. The old switch and track, indicated by the dotted line in my sketch, was then torn up and a permanent stopping built in that crosscut where a canvas curtain had previously been hung.

By following out this plan, the dead-end of the trolley wire was kept from 80 to 150 ft. from the face of the main heading, and it was about the same distance through the crosscut to the face of the air-course. By the use of the cable on the reel, the locomotive was always able to handle the cars in both of these headings, although it was necessary to advance the trolley wire in short lengths of 70 or 80 ft., which was the distance between crosscuts, center to center. However, the dead-end of the trolley wire was kept back a safe distance, as the miners seldom came out past the open crosscut, except on their way to and from work.

Huntington, W. Va. C. W. STAFFORD.

Letter No. 5—I was interested in the question raised by an assistant foreman, of Rawl, W. Va., who asks at what distance from the face of a heading should the anchor bolt holding the end of the trolley wire be driven. Let me say that the dead-end insulator and pin should never be brought closer to the face than the last open crosscut. No rule can be given expressing the distance, in feet, from this dead-end of a trolley system to the face of the heading, as this will vary, from time to time, with the varying conditions.

One thing is important in extending a trolley wire. Great care should be taken to hang the wire in such a way that it cannot swing or jump sufficiently to reach either the rib or the roof of the entry, since contact of the wire with the natural strata might cause sparking and ignite gas. For this reason, if for no other, a trolley wire should not be extended too close to the face of a heading where gas is being generated.

The suggestion that "the dead-end of the trolley line should not approach closer to the face of the heading than the length of the cable on the locomotive," if carried out, would barely enable the locomotive to reach the load that it must pull from the face of the heading.[1] Such a rule is not practical, moreover, since wire extensions would have to be made frequently, and this would necessitate numerous splices and unnecessary expense. My practice is to arrange to hang about 200 ft. of wire at a time, in an entry where the locomotive carries 250 ft. or more of cable. L. L. NEWMAN.

West Frankfort, Ill.

Widening an Airway

Letter No. 1—Referring to the inquiry in regard to the widening of an airway, *Coal Age*, Jan. 29, p. 245, it may be that the following method of solution will be of interest, as supplementing that already given by the editor, in reply to the inquiry. The question states that there are two airways, each 6 x 8 ft. in section, their lengths being 900 ft. and 3,600 ft., respectively; and it is desired to find the required width of the longer airway that will enable it to pass the same quantity of air as the shorter airway, under the same pressure.

In the following solution, I will call the perimeter and the sectional area of the widened airway, o and a, respectively, and write the original equation given by the inquirer thus:

$$\frac{2(6+8)900}{48^3} = \frac{3,600\,o}{a^3} \qquad 1.$$

and

$$a = 25.092\,\sqrt[3]{o} \qquad 2.$$

Then, since the height of the airway to be widened is 6 ft. and calling the required width w, we have $w = a/6$, which gives for the perimeter of the widened airway,

$$o = 2(6 + a/6) = 12 + a/3 \qquad 3.$$

Combining equations 2 and 3 and solving with respect to o, we have for the perimeter of the widened airway,

$$o = 12 + 8.364\,\sqrt[3]{o}$$

and

$$o - 8.364\,\sqrt[3]{o} = 12 \qquad 4.$$

Observing Equation 4, it is possible to find quickly the value of the perimeter (o) that will satisfy Equation 4, by referring to a table of cube roots and solving by trial. It is also evident that the perimeter of the widened airway must be greater than 28, which is the original perimeter.

To find the value of o, by trial, first assume $o = 38$. Then, since $\sqrt[3]{38} = 3.362$, we have $38 - 8.364 \times 3.362 = 9.88$.

This value being too small, try $o = 41$; and, since $\sqrt[3]{41} = 3.448$, we have $41 - 8.364 \times 3.448 = 12.16$.

Finally, this value being but a trifle too large, the exact perimeter is then ascertained by interpolation:

$$41 - \frac{16}{1216 - 988}(41 - 38) = 40.8 \text{ ft.}$$

Hence, for the required width of the airway, we have

$$w = \tfrac{1}{2}(40.8) - 6 = 14.4 \text{ ft.}$$

Unaccountable Explosion

Letter No. 2—Referring to the inquiry of "Superintendent," *Coal Age*, Jan. 22, p. 197, I quite agree with the reply made by the editor, that it is more than probable that the gas in question is marsh gas or methane coming from the floor of the workings.

When gas is generated in this manner, coming from the floor, it diffuses into the air and forms an explosive mixture that would readily be ignited on the open lamps of the men who enter the place.

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[1] Referring to the statement quoted by this correspondent, the meaning intended was that the trolley wire should not be extended, until the distance from the face of the heading was equal to the length of the cable on the machine, or, in other words, until the reach of the machine approached its limit. We are glad to have attention called to this oversight.—EDITOR.

Of the other mine gases that form explosive mixtures with air, carbon monoxide and hydrogen sulphide, the first could not be present, in sufficient quantity to cause an explosion, without its fatal effect on the men being in evidence. On the other hand, the presence of hydrogen sulphide would at once have been detected by the smell of the gas. This gas being heavier than air, specific gravity, 1.1912, it would naturally accumulate at the floor. But, my opinion is that the explosion was due to marsh gas coming from the floor and diffusing rapidly into the air, as stated previously.

Rawdon, Quebec, Canada. C. McManiman.

Letter No. 3—The instance of a mysterious explosion mentioned in the inquiry that appeared in *Coal Age*, Jan. 22, p. 197, is one that should attract the serious attention of mining men, because of its affording an opportunity for the exchange of views and opinions, which are always a source of education in matters pertaining to scientific mining. Our aim, in this connection, should be to reach a solution that will afford greater protection to human life and property.

In my opinion, it happens too frequently that undue pressure is brought to bear on the underground officials, who are often induced to over-reach their standards of safety in an effort to increase the output of the mine. This pressure comes from higher officials of the company whose occasional and hurried visits to the mines afford them but a meager understanding of the conditions that surround the work in the mine.

Relation of Business End to the Operating End in the Coal Industry

Mining is a *business* as well as a science, and it is evident that these two elements seldom function properly together and their true relationship is too often unknown or wholly disregarded. Successful mining, however, is dependent on the equal consideration of both of these factors, which must be co-ordinated to produce results. The business end concerns itself with the amount and cost of production, and the marketing of the product; while the operations of mining the coal require careful investigation of conditions and the devising of means for the safe and efficient extraction of the coal and its preparation for the market.

While it is true that the requirements of business demand the exercise of the strictest economy, it is also true that there are limits beyond which economy cannot be forced without the sacrifice of efficiency and even safety. The result is that underground officials are often in despair with respect to satisfying both the requirements of business and the mining law. The result is much confusion and loss to the company because of these conflicts and cross-purposes. The evils that must follow in the trail of such mismanagement are: Improper methods of mining, which result in loss of valuable coal areas; disregard for the requirements of the law respecting safety, causing avoidable accidents; and increasing the cost of production.

Fixing Responsibility for Mine Explosions

With this preamble defining my position, let me say in respect to the instance cited in the inquiry mentioned, that the aim and value of this discussion will not be advanced by merely stating that the explosion was probably due to gas, coal dust, or oily vapor coming in contact with an open light, as this is common knowledge. While the reference to these factors is well, it will generally be more profitable to consider those agencies and influences that are indeed really responsible for the creation of unsafe conditions in the mine.

It serves no useful purpose to under-rate the ability or condemn the laxity of any mine official. That has been the prevailing custom in the past, with the result that accidents still happen in spite of this criticism and censure. There is nothing mystifying about mine explosions. The strange thing is that, with our knowledge of conditions existing in mines and which make such occurrences possible, no more effective means are yet used for their prevention. It cannot be denied that the business end is largely responsible for this lack of prevention.

To my mind, there is nothing extraordinary in the case under consideration, as sufficient data are given to enable one to come to a reasonable conclusion as to what caused this accident. We know that carbon and oxygen are the elements that unite with explosive violence, under certain conditions and in the presence of an open light. The carbon is a constituent of marsh gas, coal dust and oily vapor, all of which were present in varying quantities, while the oxygen of the air made their combustion possible and an explosion took place when the loader went to the face with his carbide light.

Vaporized Oil a Contributing Factor

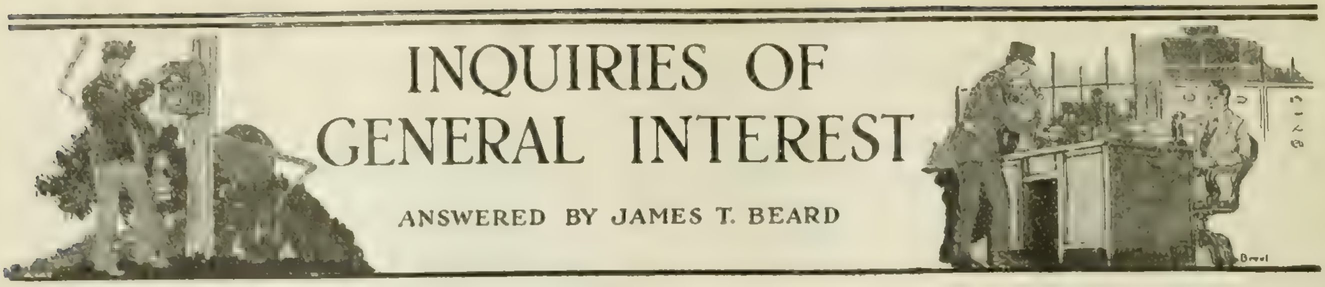
The suspicion that oily vapor may have played a part or even may have been the chief factor in this explosion is not amiss, although authorities affirm that oil seepage does not occur in coal measures to such an extent as to cause apprehension of danger. From our present knowledge, we can only remark that vaporized oil may yet be shown to play an important part in mine explosions, since crude oil is said to vaporize at the low temperature of 60 or 65 deg. F., and have a vapor density of 0.855, while its flashing point ranges between 200 and 400 deg. F.

It is also stated that an explosive mixture is formed when the proportion of vapor to air is 2 vol. of the former to 100 vol. of the latter. These data, if correct, are worthy of careful consideration in connection with mine explosions. The presence of oily vapor, in mine air, has the effect of rendering explosive, mixtures of gas or dust that would not otherwise be dangerous.

In the instance cited, pillars were being cut with machines; the air current had little velocity, which is very probable in a working place under these conditions. Little gas had been found previously, or at least reported, as carbide or open lights were in use in the mine. A cave had occurred in the gob after the fireboss had examined the place two hours before and reported it as "free from gas."

In considering these facts, we know that it is possible for unsafe conditions to have developed, in this place, within a short space of time; besides, much gas may have been released by the roof fall in the gob. As a result of this fall, the fine dust of the machines would be blown into the air by the concussion, and it is possible that this cloud of dust was ignited, even in the absence of any gas. The ignition of dust is dependent on the inflammability of the coal, the fineness of the dust and its free suspension in the air. My conclusion is, therefore, that these conditions made possible this explosion and there is nothing mysterious.

Ladysmith, B. C., Canada. William Wesnedge.



INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD

The Water Gage and an Open Door

In discussing the question of finding a mine door set open, *Coal Age*, Jan. 22, p. 196, John H. Wiley has questioned my previous statement that a fireboss can often detect an open door in the mine, by the reading of the water gage. In order to decide this question once and for all, I want to ask *Coal Age* to answer the following questions:

Suppose the air current in a slope has a velocity of 600 f.p.m. when traveling 5,000 ft. down the slope to the face and returning the same distance up the slope to the fan, which is exhausting. If both the intake and the return airways, in this case, are 6 x 10 ft. in section, I want to ask: 1. What should be the water gage reading when the air is circulating the entire length of the slope? 2. Assuming a door is set open between the main slope and the return air-course, at a point 2,000 ft. down from the mouth of the slope, so that the air is short-circuited at this point, what should then be the water-gage reading? 3. What effect would the short-circuiting of the air have on the speed of the fan?

My contention is that the resistance of the mine is determined by the size and length of the airways through which the air is circulated, and this resistance determines the pressure and the water gage, but not the speed of the fan. Assuming the power applied to the fan shaft remains constant, my belief is that the fan will run at a constant speed and produce a certain velocity in the airways, depending on their size and length, and the resistance set up will develop a certain water gage.

Now when this current is short-circuited, the velocity of the air will, of course, be increased; but, even so, the mine resistance will be decreased, because the rubbing surface is made much less by the short-circuiting of the air current. As a result, there is a drop in the water gage, which indicates the short-circuiting of the air. Let me ask, of what benefit is the water gage to the fireboss if this is not true?

Farr, Colo. ROBERT A. MARSHALL.

Replying to these questions in the order asked, we answer as follows:

1. The water gage produced by a velocity of 600 f.p.m., in an airway 6 x 10 ft., 10,000 ft. long, using the Fairley coefficient ($k = 0.0000001$) is

$$w.g. = \frac{\text{[illegible]}}{\text{[illegible]}} = \frac{.0000001 \times 10,000 \times 32 \times 600^2}{5.2 \times 60} = 3.7\ in.$$

2. Neglecting a slight change in the efficiency of the fan and assuming that the power on the air remains constant when the current is short-circuited at the door, 2,000 ft. from the mouth of the slope, we observe from the formula for water gage that, since the unit resistance (k), perimeter (o) and sectional area (a) are constant, the water gage varies directly as the length of the airway, and the square of the velocity of the current, or as lv^2. When the air is short-circuited the length of the airway is reduced to two-fifths of the original length; but it is still necessary to find how much the velocity is increased by thus shortening the distance the air must travel, assuming the power on the air remains constant. To do this, first write the formula for power on the air (u) expressed in terms of the airway, length (l) and perimeter (o), and the velocity (v) of the current; thus,

$$u = klov^3$$

Regarding this formula it appears that, for a constant power on the air, k and o being constant, v^3 varies inversely as l; and therefore the velocity, in this case, varies inversely as the cube root of the length. In other words, the velocity ratio is equal to the cube root of the inverse ratio of the length of the airway. Calling the original velocity v, for a length 5, and finding the velocity x, for a length 2, we have

$$\frac{x}{v} = \sqrt[3]{\frac{5}{2}} = \sqrt[3]{2.5} = 1.357$$

That is to say, shortening the length of the airway to $\frac{2}{5}$ of its original length will increase the velocity 1.357 times; and, since the water gage varies as lv^2, we have for the increased gage,

$$3.7 \times \tfrac{2}{5} \times 1.357^2 = 2.7\ in.$$

Therefore the short-circuiting of the air, in this case, whereby the rubbing surface was reduced to two-fifths of the original amount, causes a drop of water gage $3.7 - 2.7 = 1$ in. It should be observed, however, that the setting open of a door back in the workings and controlling but a comparatively small split of air in respect to the entire circulation in the mine would often have but slight effect to lower the water gage in the fan drift. The effect produced on the water-gage reading in the fan drift by the setting open of a door will depend on the amount the distance of air travel is shortened by the short-circuiting of the current, assuming, of course, that the size of all the airways is the same. In that case, the power on the air remaining constant, the unit pressure or water gage will vary as the cube root of the length of the airways.

3. As has frequently been stated in *Coal Age*, the short-circuiting of the air current producing any considerable drop in the water gage would be accompanied with a corresponding increase in the volume of air in circulation, the power remaining constant. The increased volume of air flowing through the fan increases the resistance of the ventilator and a larger proportion of the power is absorbed within the fan itself, which reduces the power available for turning the machine, and the fan runs slower as a result.

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Miscellaneous Questions

(Answered by Request)

Ques.—What effect does the presence of carbon dioxide have on a firedamp mixture?

Ans.—Carbon dioxide is an extinctive gas, owing to the fact that it contains no available oxygen to support combustion. On this account, its presence in a firedamp mixture not only dilutes the mixture so as to reduce the percentage of methane present, but the mixture is rendered less explosive by its presence. When a firedamp mixture at its most explosive point contains one-seventh of its volume of carbon dioxide, the presence of the latter gas renders the mixture nonexplosive.

Ques.—What is the range of explosive mixtures of air and methane?

Ans.—The lower explosive limit of pure methane and air is reached when the proportion of gas to air is 1 : 13. The percentage of gas present, at this point, is $100 \div (1 + 13) = 7.14$ per cent. The higher explosive limit of pure methane and air may be taken as indicated by a proportion of gas to air 1 : 5. At this point, the percentage of gas present is $100 \div (1 + 5) = 16\frac{2}{3}$ per cent.

Ques.—A tank that is full of water measures 8 ft. in diameter at the top, 12 ft. at the bottom and is 12 ft. deep. How many pounds of coal will it take to evaporate this water into steam at 70 lb. gage pressure?

Ans.—This tank being a frustum of a cone, its volume is calculated as follows, calling h the height and D and d the respective diameters of the tank:

$$Vol. = 0.2618\,h\,\frac{D^3 - d^3}{D - d} = 0.2618 \times 12\,\frac{12^3 - 8^3}{12 - 8} = 955\ cu.ft.$$

The weight of water in the tank is then 955×62.5 = say 59,690 lb. With a fair coal and boiler, it is customary to estimate on a consumption of 4½ lb. of coal, per horsepower, per hour. But, taking the equivalent of 1 boiler-horsepower as the evaporation of 34.5 lb. of water, per hour, from and at 212 deg. F., it may be assumed that 1 lb. of coal, under fair conditions, will evaporate $34.5 \div 4\frac{1}{2} = 7\frac{2}{3}$ lb. of water, per hour, from and at 212 deg. F.

At sea level, a gage pressure of 70 lb. corresponds to an absolute pressure of, say 85 lb. per sq.in. Referring to steam tables, the total heat above 32 deg. F., in steam generated at this pressure is 1.183.4 B.t.u. Now, assuming the water in the tank has a temperature of, say 60 deg. F., the heat required to convert this water into steam at 70 lb. gage, at sea level, is $1,183.4 + 32 - 60 = 1,155.4$ B.t.u. Again, the heat above 32 deg. F., in steam generated from and at 212 deg. F., is 970.4 B.t.u., which makes the factor of evaporation in this case $1,155.4 \div 970.4 = 1.1906$.

Now, if 1 lb. of coal will evaporate 7⅔ lb. of water into steam, from and at 212 deg. F., the same pound of coal will evaporate $7\frac{2}{3} \div 1.1906 = 6.44$ lb. of water, from a temperature of 60 deg. F. to steam at 70 lb. gage, at sea level.

Under the assumed conditions, therefore, the weight of coal required to evaporate the water in this tank would be $59,690 \div 6.44 = 9,270$ lb., or, say 4.6 tons.

Ques.—Give the force of a blownout shot when 8 lb. of powder made up the charge. Assume that 6 lb. of the powder expanded on the air current when the shot was fired at a point in the intake 4,500 ft. from the fan. The size of the intake is 8 x 10 ft., in section, and the velocity of the air current 700 ft. per min.; temperature, 60 deg. F.; barometer, 30 in.

Ans.—This question cannot be answered from a practical standpoint and possesses no value, either theoretical or practical.

Ques.—Give the size and kind of engine required to hoist 2,000 tons of coal up a shaft 600 ft. deep, in 8 hr. The weight of the empty car is 1,200 lb. and its capacity, 4,500 lb. of coal. The size of the rope is 1¼ in.

Ans.—Since a 1-in. rope weighs 1.58 lb. per lineal foot, the weight of a 1¼-in. wire rope is $1.58\,(1\frac{1}{4})^2 = 2.45$ lb. per ft. The weight of rope hanging in the shaft is, therefore, $600 \times 2.45 = 1,470$ lb. Then, assuming a double hoist in which the weight of the cages and cars balance, the unbalanced load on the engine is as follows: coal, 4,500 lb.; rope, 1,470; or, say a total of 6,000 lb. Adding $\frac{1}{10}$ for friction gives for the total load, in a single hoist, 6,600 lb.

The rate of hoisting, for an output of 2,000 tons in 8 hr., is $(2,000 \times 2,000) \div (8 \times 4,500) = 111 +$ hoists per hr. Making due allowance for unavoidable delays, we will estimate on 120 hoists per hr. or two hoists a minute, making the time 30 sec. per hoist. Now, taking the average speed of hoisting as 25 ft. per sec., for the entire depth of the shaft, gives $600 \div 25 = 24$ sec., which allows 6 sec., per hoist, for dumping or changing cars and accelerating the speed.

Assuming an efficiency of 80 per cent, the horsepower of the engine required for this service is

$$H = \frac{6,000 \times 25 \times 60}{0.80 \times 33,000} = \text{say } 340\ hp.$$

In order to determine the size of engine that will develop this horsepower, we will assume that the mean effective steam pressure (p) in the cylinder is, say 60 lb. per sq.in.; the ratio of stroke (r) to diameter of cylinder, (d) 1.2; and the number of strokes (n), per minute, 300. The diameter of this cylinder, in inches, is then calculated by the formula,

$$d = 80\sqrt[3]{\frac{H}{p\,r\,n}} = 80\sqrt[3]{\frac{340}{60 \times 1.2 \times 300}} = 20\ in.$$

The length of the stroke of this engine is $20 \times 1.2 = 24$ in. The size of this duplex engine is calculated on the basis of the entire power being developed in one cylinder, which is safe practice in hoisting calculations.

Coal Strippers Gain a Point in Anthracite Wage Conference

As the outcome of persistent demand, the 10,000 stripping employees in the anthracite region, who are mostly engaged in the southern part of the field, have obtained an arrangement by which any increase in wage granted at those operations will be made of force as of April 1, regardless of the date at which the agreement is reached. This concession was granted during a session of two hours' duration on the first day of the fourth week of the conference and it was the only advance toward a settlement which that week had to announce.

The resolution adopted by the sub-committee on March 30 at the Union League Club, New York City, read as follows:

"Resolved, that the resolution adopted by this committee on March 24, providing that any agreement reached here be made retroactive to April 1, 1920, be construed to include the employees of stripping contractors."

Railroads Advocate Successor to Tidewater Coal Exchange

Railroads Propose to Carry Half the Burden—Sixty Per Cent of Coal Transshipped to Go Through Exchange—No Increase in Number of Pools

ABOUT one hundred shippers of bituminous coal and representatives of various railroads attended the meeting held at the Bellevue-Stratford Hotel, Philadelphia, on March 31 to consider the action to be taken as to the pooling of Tidewater bituminous coal upon the withdrawal of the Tidewater Coal Exchange on April 30.

The meeting was held in pursuance of a resolution adopted at a meeting of the principal Tidewater bituminous coal railroads using the ports of Baltimore, Philadelphia and New York, and was presided over by G. N. Snider, chairman for the railroads, who is also coal freight agent for the New York Central and Hudson River R. R.

Elisha Lee, of the Pennsylvania R. R., spoke at length on the proposition of continuing the pooling arrangement, after which there was a general discussion.

It was finally decided to appoint a Committee of Fifteen which is to meet with a committee representing the railroads to discuss plans and arrangements for continuing the work now being performed by the Tidewater Coal Exchange. This committee will consider the plans already mapped out for the organization of the Tidewater Transshippers Association, Inc., of New York City. In its plan the committee will also incorporate the following propositions submitted by the railroad representatives:

1. That the railroads propose to the shippers and transshippers of coal through the ports of Baltimore, Philadelphia and New York to pro-rate the expense of conducting a new exchange, if formed, on the basis of 50 per cent chargeable to the railroads and 50 per cent to the exchange.

2. This recommendation is to be conditional upon shippers and transshippers of Tidewater coal giving reasonable assurances that at least 60 per cent of the total coal transshipped at these ports shall be handled through the exchange. (The tonnage handled through the present Tidewater Coal Exchange during the 10 months ending Jan. 31, 1920, as well as the tonnage for January itself was approximately 60 per cent of the total Tidewater coal handled at these ports.)

3. It should be understood that at least 60 per cent of the total Tidewater shipment will be retained for handling through the exchange without increase of the total number of classifications or pools. It is also recommended that special pools now in existence in favor of certain individuals shall be abolished as soon as possible.

4 Supervisory officials in charge of the exchange should be men of railroad experience and acceptable to the railroads.

5 The members of the exchange by methods which may seem to them best will, of course, be responsible for the quality and characteristics of coal going into each pool.

6. The railroads shall asume no financial responsibility of any kind except for their agreed proportion of the cost of conducting the operation of the exchange.

Monongalia County Mines Unionized

Officials of District 17 in northern West Virginia estimate that during the last two weeks of March no less than 1,200 miners were enrolled as members of the United Mine Workers of America at ten different mines on Scott's Run in the Monongalia field, the Scott's Run field, or at least a large part of it, having been heretofore unorganized.

As the field is undergoing rapid development, officials of the U. M. W. expect further large accessions to their ranks from time to time. Mines at which the miners are said to have been organized are the Davis Coal Co., Liberty Coal Co., Berry Coal Co., Agreement Fuel Co., Soper & Mitchell, Anchor Coal Co., South Penn Coal Co., Scott Run No. 1, Randall Coal Co. and Elkins & Stone.

Daily Versus Annual Wage

Anthracite Mine Workers Want 18.7 Per Cent Greater Increase Than Bituminous Mine Workers

WHEN the bituminous mine workers met their employers, they talked about the importance of adequate *annual* wages. What was to be gained, they said, from a large *daily* earning, if the industry was to be continually faced with short time and the incomes of the mine workers were to be fritted away by idle days? Now the anthracite mine workers meet the anthracite operators and talk day wage, saying that for so much work they are entitled to so much pay. It shows that until the bituminous coal field works as steadily as the anthracite there will be continued trouble. First the bituminous mine workers will ask a wage large enough to enable them to live during idle days and hours, and then the anthracite mine workers will want equal daily pay for their steady time.

At the session of March 31 the mine workers presented a comparison of the earnings of anthracite and bituminous mine workers. Figures were offered by the operators upon the same subject, and the whole matter was discussed. So far, it is stated, there has been no discussion on the closed shop, the check-off and the shorter work day, all of which form a part of the demands.

At the session held on Thursday, April 1, the agreement signed on the previous day by the bituminous miners and operators was discussed, and it was said, unofficially, that the wage clauses of the new bituminous wage agreement were read into the records. The mine workers' representatives regarded this as additional evidence—surely there is enough without it—that the anthracite operators intend to argue strongly against the mine workers' demand for a wage increase that will be 18.7 per cent higher than the bituminous mine workers have just secured.

The official statement issued at the conclusion of the session did not say anything about the bituminous agreement, simply reading:

"The operators presented arguments and figures answering the statistics presented by the miners last week, which statistics had reference to the increase in the cost of living as compared with the increase in rates and wages in the anthracite and bituminous regions from 1916 to 1920."

John L. Lewis, international vice president of the union, has announced that, now he has completed the negotiations with the bituminous operators, he will devote his time to the sessions of the sub-committee until an agreement is signed.

The sub-committee adjourned from April 1 until April 5, most of the members going to their homes over Easter Sunday.

The sub-committee resumed conferences at the Union League Club on the afternoon of April 5. While no official statement was forthcoming it is known that some of the miners' officials express the opinion that an agreement will be reached within the next two weeks.

The official statement given out at the conclusion of the session read:

"The sub-committee of anthracite operators and miners met today and resumed consideration of the demands of the anthracite mine workers. The operators made their reply to the demands of the mine workers for a standardization of the rates paid to men in various occupations and presented their argument in refutation of certain data based upon statistics of the Pennsylvania Compensation Commission that had been presented to the commitee by the representatives of the mine workers."

Palmer May Again Indict Coal Men

Declares Price Rise Should Not Exceed Wage Rise and Perhaps Should Not Be Over 20c per Ton

FEDERAL district attorneys were instructed by Attorney General Palmer on April 3 to receive and consider complaints of profiteering in bituminous coal "which may arise in your district under the Lever act."

Mr. Palmer's telegram was prepared after some bituminous coal operators had stated publicly that the new wage scale agreed on under the terms of the award by the coal strike settlement commission would result in an increase of from 60c. to $2 a ton on bituminous coal.

"Now that the government regulation of prices has been discontinued," Mr. Palmer's message reads, "there are indications of an excessive increase in the price of bituminous coal. Our total annual production is approximately 500,000,000 tons. It is estimated that the total increase in wages (to mine workers) will be approximately $200,000,000 per annum. If this entire amount is added by the operators to the price, it would only make an increase of 40c. per ton.

"If however, the operators absorb the 14 per cent increase which became effective in December, there will be left only $96,000,000 to be passed on to the consumer. In this event, the increase in the price of coal at the mine would amount to 20c. a ton.

"I understand that an exaggerated estimate of the demand for export coal is affecting the market price, particularly from Illinois east, this demand having been estimated at as much as 100,000,000 tons. But I am advised that our port facilities are only adequate for the export of 30,000,000 tons per annum—that is to say, only 6 per cent of our total production.

"This should not be made an excuse for raising the price for domestic consumption. It is probable that normal conditions will be shortly restored and fair prices will follow.

"In the meantime, please receive and consider complaints of profiteering which may arise in your district under the Lever act."

Strikes Against Wage Decision

Mine Workers Strike for More Favorable Contract in Kansas, Southern Illinois and Eastern Ohio

KANSAS mine workers are always first to strike and it is hardly surprising to read that on April 5 two thousand of them went on strike despite the fact that the state invoked the powers of the new Court of Industrial Relations and that subpœnas prepared by Attorney-General Hopkins summoned the presidents of all the local unions of the United Mine Workers of America to appear in court, April 6. Judge W. L. Huggins presides over the court which is empowered to deal with all industrial controversies, to issue orders, and which, when any strikes endanger public health or welfare, may take over the industry involved.

The mine workers oppose the day-wage provisions and the deadwork allowances as being inadequate and are opposed to automatic penalties, higher supply costs and the working conditions provided. Alexander Howat, the president of the district union, declared some time ago that there would be a strike on April 1 regardless of the industrial-court law.

Not being pleased with the wage increases granted by the Bituminous Coal Commission, 400 Columbiana County mine workers in northeastern Ohio refused to go to work on April 2. Three mines were crippled in consequence. Two hundred Tuscarawas County mine workers, also discontented with the decision, suspended work on the same day. In eastern Ohio also 3,000 coal mine workers struck, April 2, despite the efforts of union leaders.

In southern Illinois the company men are discontent and at twenty mines have discontinued work, the $1 per day increase not being satisfactory to them

Oil, Being Already in Short Supply, Cannot Displace Coal

Shipping Board and Navy Cannot Secure Enough Oil—Prices Offered Three Times As High As a Year Ago—May Commandeer Oil and Demand Oil As Royalty

By J. H. Dodge[*]
Washington, D. C.

FUEL oil will not be available in sufficient quantities and at prices economical enough to warrant industrial plants now employing coal as a principal fuel to convert to an oil-burning system. This is the conclusion reached following an investigation of the subject made by the Federal Trade Information Service at the behest of the owners of a plant contemplating the conversion of a coal-burning plant into an oil-burning one, should the prospects prove favorable. Probably the most striking single expression on the subject from an authoritative source is that of Dr. George Otis Smith, Director of the Geological Survey, who says: "Personally, I do not believe a barrel of fuel oil should be burned where coal is available and will serve the same purpose." This opinion seems to be concurred in by practically every person qualified to express an opinion, not excepting some of the large companies directly engaged in the oil industry.

Oil companies refuse to take on new obligations in view of oil shortage. Fuel oil is only a third as efficient as coal when price is considered. Oil saves, however, in transportation and storage. Great Britain and Holland are getting oil control. Domestic supplies are found to be unequal to home needs.

In the course of its inquiry, the Federal Trade Information Service sought advice from one of the largest producing companies in the country. This company, though reputed to be dominant in the oil field and to be seeking business, reported that the fuel-oil situation is such that it does not feel itself to be in a position to take on new obligations for fuel oil. Other oil companies are in the same position, as evidenced by the difficulty of the Shipping Board and the Navy in obtaining bids on their requirements. Neither of these agencies has been able to attract bids for quantities large enough to cover their needs and those tenders made are at prices about three times former prices.

There is much talk of Government commandeering of oil supplies in order to obtain sufficient oil for the Shipping Board and the Navy. The Department of the Interior in drawing the regulations under the oil-lands leasing bill is to avail itself of the option to take the Government royalties in oil rather than in cash.

Another large oil company—a refining concern—approached, reported: "That, since at the present time, due to a combination of circumstances, there is really a world shortage of available petroleum, we do not feel that it is the right time for any one to change from coal to oil consumption for steam-making purposes."

Perhaps the expressions of the companies which normally would be eager for new markets for their products are even more convincing than the reports of Government agencies on the subject, but the Government experts are by no means lukewarm in their opinions as to the advisability of abandoning coal for fuel oil.

"It should be realized," says the Geological Survey, "that for a number of years the domestic production of petroleum has been insufficient for the demands, and importations, chiefly from Mexico, have steadily increased since 1912. In 1919 imports of crude oil into the United States amounted to more than 52,000,000 barrels. The obtaining of sufficient supplies of fuel oil to meet future demands for the Navy, the merchant marine and for general industrial use is causing much concern." Students of the situation from the engineering point of view believe that at prevailing prices coal is the more economical fuel. Experiments with the two fuels at prevailing prices result in reported conclusions that fuel costs about three times as much as coal for the same efficiency. While oil has some advantages from the point of view of transportation and storage, still its fugutive quality and its susceptibility to accidental destruction by fire is such that they nearly balance the advantages.

Outlook for Future Oil Production

Opinions differ as to the probability of enlarged oil production. Some scientists believe we are approaching maximum production while others feel that the stores of petroleum are practically unlimited. The appearance of salt water in so many Mexican wells and also in many in this country, has been a discouraging element. On the other hand, new and improved methods of production and handling and, above all, improved measures for the prevention of waste, an item which in the past has been stupendous, have bettered the outlook.

One source of alarm to oil men and consumers is the circumstance that oil reserves apparently are getting out of American control. Foreign countries—principally Great Britain and Holland—have cornered vast reserve supplies of oil in all parts of the world, whereas the United States has scarcely made a move to obtain preference anywhere.

The seriousness of the situation has been pointed out by the Navy Department, the Geological Survey, the Bureau of Mines and other well informed agencies.

Upon all these questions turns the advisability of the adoption by American industry of fuel oil in place of coal. Vastly increased oil production and the gaining of control over extensive petroleum reserves might very conceivably bring the price of fuel oil down to a point where it would prove more economical than coal, but the best information available is that coal, rather than fuel oil, today is the most available industrial fuel and is likely to remain so for some time.

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Central Competitive Field Makes New Basic Agreement

Operators, Afraid to Meet Mine Workers for Fear of Conviction Under Lever and Sherman Acts, Are Reassured by Assistant Attorney-General Ames—Make Basic Agreement in Accord with Majority Report of Bituminous Coal Commission.

RAPID progress was made in the negotiations between the bituminous mine operators and workers when they resumed their conference at the Waldorf-Astoria Hotel on the morning of March 30. Before meeting to take action that might involve them in an indictment similar to that just filed against 123 operators and miners in Indianapolis, the operators wanted to receive, through their Attorney, Ralph Crews, of 55 Wall St., New York City, a letter from the Department of Justice, which came from the pen of Judge C. B. Ames, Assistant Attorney General. He assured them that it would not be a violation of the law for the operators and miners to make the contract which was recommended by President Wilson's commission. The letter, dated March 27, read as follows:

Becoming afraid that the joint agreements advocated by the President and urged on the operators in certain sections of the country by Government officials are of doubtful validity, and subject those taking part in them to fine and imprisonment, the Central Competitive operators insist before meeting with the mine workers and accepting the Government's proposals that they be assured that there is no prosecution in contemplation.

"You advise me that pursuant to the request of the President, representatives of the bituminous-coal operators and miners are to meet next Monday for the purpose of negotiating a new wage agreement, pursuant to recommendations by the U. S. Bituminous Coal Commission submitted to the President on March 10, 1920. You further advise me that because of the indictment which has been returned by a grand jury to the U. S. District Court for the district of Indiana, a question has been raised by some of the parties concerned as to whether such an agreement as has been recommended by the commission would be regarded by the Department of Justice as a violation of the law.

"While the Department of Justice is not authorized by law to give advice to private citizens, under all the circumstances I think it is proper for me to authorize you to say to the representatives of the miners and operators that the department does not think it would be a violation of law for the miners and operators to make the contract recommended by the U. S. Bituminous Coal Commission."

The sub-committee, after hearing the letter read to them, held a short session Tuesday morning, and it was decided to appoint a committee of two to draw up a tentative contract to be presented to the full sub-committee at 10 a.m. on the morning of March 31. This special committee was composed of P. H. Penna, of Indiana, representing the operators, and William D. Green, secretary-treasurer of the United Mine Workers, representing the mine workers.

The committee devoted the entire afternoon to the consideration of a tentative agreement, and late at night it announced it was prepared to make its report to the full sub-committee when it convened the next morning.

Operators attending the conference declared that the increase in wage granted the workers by the President's commission would mean an increase of from $1 to $1.25 per ton in the price of bituminous coal at the mine, with the exception of Illinois coal, where, due to local conditions, which lessen the cost of production, the advance will not be more than 65c. at the mine.

The telegrams sent by President Lewis of the United Mine Workers of America to more than 3,000 locals notifying them of the action of the conference in putting into effect as of April 1 the increase of 27 per cent granted by the majority report of the Bituminous Coal Commission, and instructing the men to remain at work after April 1, cost the union between $4,000 and $5,000.

OPERATORS AND MINERS SIGN AGREEMENT

After considering the report of the special committee appointed to prepare the tentative agreement, the sub-committee accepted it, and it was immediately signed by the International representatives of the mine workers and by two operators and two miners from each of these state—Indiana, Ohio, Illinois and Pennsylvania.

At the conclusion of the conference shortly after 5 p.m. on March 31, a copy of the agreement was made public. It follows:

"Pursuant to instructions of the President of the United States, as communicated to Thomas T. Brewster, chairman of the Coal Operators' Scale Committee of the Central Competitive Field, and John L. Lewis, president of the United Mine Workers of America, in a letter dated March 19, 1920, and which in part reads as follows:

"'I am transmitting to you herewith a copy of the report and award of the Bituminous Coal Commission appointed to adjust matters in the controversy between the bituminous-coal miners and operators of the country.

"'In accordance with instructions in my letter of appointment to the commission and memoranda attached thereto and the agreements by mine workers and operators to abide by the report and award of the commission, this report and award is the basis upon which the wage-schedule agreements between the mine workers and operators shall be made.

"'Operators and miners should, therefore, make arrangements for convening the necessary joint conferences as soon as possible to make such change in the terms, provisions and conditions, mining rates and wage schedules as are set forth in this report and award.'

"We hereby agree:

"First—All coal shall be weighed and paid for on a mine-run basis, except that the Block Coal District of Indiana shall continue upon the present screen coal basis and that the usual methods of applying tonnage rates shall continue.

NEW PICK-MINING RATES

"Second—The pick-mining rate in the thin-vein district of western Pennsylvania and in the eastern Ohio, Hocking, Cambridge and Amsterdam-Bergholz districts of Ohio shall be $1.1164, and throughout the balance of Ohio the pick-mining rate shall be advanced 24c. per ton upon the pick-mining rate in effect Oct. 31, 1919; in the bituminous district of Indiana $1.08 per ton, and in the Danville district of Illinois $1.08 per ton.

"Third—The machine-mining rate in the thin-vein district of western Pennsylvania shall be 94c. per ton; in Ohio, 94c. per ton; in the bituminous district of Indiana, the chain-machine mining rate shall be 96c. per ton and the punching-machine rate 98c. per ton; in the Danville District of Illinois 98c. per ton.

"Fourth—That all day laborers and monthly men (the advance to monthly men to be based on an average of the usual number of days he is required to work in a month), except trappers and other boys, be advanced $1 per day. Trappers and boys receiving less than men's wages to be advanced 53c. per day.

"Fifth—Dead work, yardage and room turning is advanced 20 per cent on the prices being paid Oct. 31, 1919.

DEFINITION OF A DAY'S WORK

"Sixth—That the eight-hour day in effect Oct. 31, 1919, shall continue. An eight-hour day means eight hours' work in the mines at usual working places for all classes of inside day labor. This shall be exclusive of the time required in reaching such working places in the morning and departing from the same at night.

"Drivers shall take their mules to and from stables, and the time occupied in so doing shall not be included as any part of the day's labor, the work of drivers beginning when they reach the change at which they receive empty cars, but in no case shall the driver's time be docked while he is waiting for such cars at the point named

"When the men go into the mine in the morning they shall be entitled to two hours' pay, regardless of whether the mine works the full two hours. But after the first two hours the men shall be paid for every hour thereafter by the hour, for each hour's work or fractional part thereof. If for any reason the regular routine work cannot be furnished the inside labor for a portion of the first two hours the operators may furnish other than the regular labor for the unexpired time.

"Seventh—All internal differences are hereby referred to the various districts for settlement, with the understanding that only by mutual consent shall anything be done in sub-district, district or wage-scale conventions that will increase the cost of production or decrease the earning capacity of the men. All rules now incorporated in existing contracts shall remain in force until changed by agreement between operators' and miners' representatives.

"Eighth—The practice of voluntarily paying more than the contract price, either by bonuses or otherwise, which is done ordinarily for the purpose of enticing employees from other mines, and thereby creating discord and disorder in the coal industry, is condemned. It will therefore be assumed in future joint conferences convened for scale-making purposes that all bonuses or advances in excess of wages provided in the contract were paid because of physical conditions in or around mines where such methods are practised, and the wages so paid shall be considered the base price for such mines, all on the wage scales in effect Oct. 31, 1919.

"Ninth—Whereas stoppage of work in violation of the agreement has become so serious as to menace the success and perpetuity of the United Mine Workers of America and our joint relations, this conference instructs the respective district executive boards to meet the operators in their various districts for the purpose of agreeing on a penalty clause where none now exists, and if necessary to meet also to amend and strengthen existing clauses so as to make the penalty more effective in preventing strikes and violations of agreements.

PENALTY IMPOSED FOR FAILURE TO COLLECT FINES

"All fines provided for in all agreements shall be automatically collected, and any operator failing to collect and forward to proper parties such fine shall pay a penalty of $2 for each employee subject to be fined, the same to be collected and retained in the miners' district organization. And in no case shall any fine be refunded except by mutual agreement of the accredited representatives of the operators and miners.

"It is further agreed that where any employee enters suit in the civil courts to recover any fine collected in accordance herewith the district organization shall reimburse the operator for expense incurred on account of such suit.

"Tenth—That the fulfillment of this agreement is guaranteed by the international union, and the fulfillment of joint agreements entered into in any district shall also be guaranteed by the officers of the international organization, as well as by the officers of the district, and it shall be their duty to see that all such agreements are carried out both in the letter and in the spirit.

"Eleventh—The pushing of cars, loaded or empty, by the mine workers is natural to the industry and is an integral part of the day's work, and in the negotiations of 30 years this work where practised, has been paid for in general in the tonnage rates.

"Twelfth—The prices at which house coal shall be furnished the mine workers at the tipple shall be determined by adding to the price in effect on Oct. 31, 1919, the average percentage allowed as an increase on the wage scale to wit: 27 per cent, and when the coal is delivered to the miners' houses by the operator the actual cost of delivery shall be added.

"Thirteenth—For the purpose of the new agreement the prices charged the miners for blacksmithing shall be on the basis of existing contracts, providing, however, that the maximum charge shall not exceed three-fourths of 1 per cent of the miner's gross earnings.

"Fourteenth—Explosives shall be furnished the miners at cost, which cost is to include handling, transportation and insurance.

"Fifteenth—This contract is effective on April 1, 1920, and shall remain in force until March 31, 1922.

"Resolved, That an interstate joint conference be held prior to April 1, 1922; the time and place of holding such meeting is referred to a committee of two operators and two miners from each state herein represented, together with the international officers of the United Mine Workers' organization.

"Section 11 is not designed to interfere with existing arrangements relating to car pushing or prevent miners and operators from working out mutually satisfactory arrangements with reference thereto."

Claims by the bituminous operators that the increases granted in the new working agreement would result in the price of coal at the mines being increased from $1.25 to $1.50 per ton resulted in a statement being issued by Ellis Searles, editor of the United Mine Workers' *Journal*, on April 1, in which he said the increase does not justify the advance in the price of coal and that it was unfair to charge the miners with the responsibility. Mr. Searles is in New York with the officers of the international union.

OPERATORS REPLY TO SEARLES' STATEMENT

The operators through Chairman Brewster of the operators' committee, replied to Mr. Searles' statement the following night from their headquarters in this city. Mr. Searles' statement says:

"When Dr. Garfield granted the miners a 14-per cent increase in wages last fall he said the 14 per cent could and should be absorbed by the operators and that they could afford to pay it out of their profits, but the operators did not pay the increase out of their pockets. Instead, by increasing the selling price, they passed the increase on to the public in respect to at least 80 to 90 per cent of the coal. The present increase in wages adds 13 per cent to the pay of the miners above the 14 per cent granted by Dr. Garfield. If Dr. Garfield was right in saying they could absorb and pay the 14 per cent out of their profits, then they certainly can absorb at least the 13 per cent now instead of passing it on to the public.

"We see operators quoted as saying they will advance the price of coal $1.25@$1.50 a ton because of the increase of wages granted to the miners. Such an increase would not be justified by the increase in wages. The wage increase was 27 per cent. This means that the increase in the cost of production cannot exceed 40 to 50c. a ton. Then why should the operators boost the price $1.25 or $1.50 a ton even if they pass all of the increase on to the public?

"If the operators make an unreasonable or unnecessary increase in the price of coal, the miners want the public to know they are not responsible for it."

The reply of the bituminous operators, made through Mr. Brewster, reads:

"Insinuations that the coal operators are going to gouge the public because of the recent 27-per cent advance in wages, as put out by the United Mine Workers' spokesmen in the guise of protest in the public interest, are sheer nonsense.

"During the coal miners' entirely unwarranted and unlawful cessation from work all stocks of coal were depleted and a shortage now exists throughout the country. The replenishing of stocks has been retarded by a serious car shortage. Consequently, large consumers of soft coal are competing for the available supply, which has resulted in the offer of higher prices than the operators are willing to accept.

"All responsible operators will condemn unwarranted prices or any profiteering policies. The Bituminous Coal Commission having awarded the miners a wage scale giving them very high earning power, the public now has the right to demand more work, with advanced coal production, and less talk."

WANTS EIGHT HOURS' WORK FOR EIGHT-HOUR DAY

Before leaving for Indianapolis last Saturday night, April 3, Ellis Searles, editor of the United Mine Workers' *Journal*, said: "The operators are endeavoring to justify the high prices they are asking for coal by saying that the increase in wages granted to the miners and a shortage of coal are responsible for it. They say large consumers are offering higher prices for soft coal than the operators are willing to accept. If the operators will operate their mines eight hours a day, six days a week the miners will gladly dig enough coal to meet all demands and keep prices down to a reasonable level. This will relieve the operators of their terrible embarrassment of being compelled to accept larger profits than they think they are entitled to. The operators fought to retain the eight-hour day and succeeded in holding it. Now let them give the miners eight hours' work six days a week."

No question exists that there is a fear on the part of many bituminous-coal operators that coal prices will rise to inordinate levels if a great deal of self-repression is not used. The public is ready, though not willing, to pay almost any price for coal, and it is as hard to prevent the average bituminous operator from selling for all he can get as it is to stop him from giving coal away when orders are scarce. Until recent years it has been considered permissible to let supply and demand govern prices, but a new point of view in regard to the conduct of the producer's business now obtains.

MINERS SEEK TO SECURE EXCESSIVELY HIGH WAGES

While the operator is being condemned for accepting prices set by the market fluctuation, the mine workers have been trying by combination and a strike in restraint of interstate commerce to put up wages above the level set by supply and demand and to fix them at that excessive level by a collective bargain. This is quite different matter from the charge brought against the operator, who merely accepts what is offered. For the operator to accept such offers may be wrong, and just now certainly inexpedient, but it is a privilege that has never been denied the worker in the history of the United States, though it is one that has not always been conceded in foreign countries.

As to the opportunity to work full time, the mine worker in a majority of cases refuses to avail himself of it and if he were willing to do so, it would not be possible to satisfy his desire as cars are frequently lacking, and when they are obtainable orders are not to be secured. Furthermore the wage of the mine worker has just been fixed on a liberal basis with the shortage of time in full view, but the mine worker is, nevertheless, demanding full time as his right as if such liberal increase had not been made.

FOREIGN MARKETS AND EXPORT NEWS

Freight Rates to Europe Advance

Freight rates to Europe have advanced slightly, but rates to other destinations are unchanged, according to W. W. Battle & Co.'s coal trade freight report.

Rates by steamer are as follows:

	Rate	Tons Displaced
Stockholm	$22.00/22 50	800
Gothenburg	about 22 00 —	1000
Antwerp Rotterdam	about 19.50 —	1000
Hamburg	21.00 22.00 —	1000
French Atlantic excluding Rouen	about 19.50 —	800
Lisbon	18.00/19.00 —	1000
Barcelona	21 50 22 00 —	1000
Algiers	21 50 22 00 —	800
Marseilles	21 50 22 00 —	1000
Genoa Leghorn	about 22 00 —	1000
Spezia Savona	about 22.00 —	1000
Piraeus	about 25 00 —	1000
Trieste Venice	about 26.00 —	1000
Port Said	about 26 00 —	1000
Pernambuco	about 15.50 —	500
Bahia	about 15 50 —	500
Rio	about 14.50 —	1000
Santos	15.00 16 00 —	600
Buenos Aires or La Plata or Montevideo	13 00 13 50 —	1000
Para	about 14 50 —	500
Rosario	15 50 16 50 —	750
Bahia Blanca	about 16 00 —	1000
To Nitrate Range	9.00 10 00	750
Havana	6 00 6 50 -	600
Sagua or Cardenas	8 00/ 8 50 - -	300
Cienfuegos	about 8 00 —	500
Caibarien	8 00 8 50 —	300
Guantanamo	about 8.00 —	500
Manzanillo	about 9 00 —	300
Bermuda	7.00/ 7.50 —	300
Bermuda p[illegible] A[illegible]		
Kingston	about 8 50 —	400
St. Lucia	about 9 50 —	500
Barbados	about 9 50 —	500
Santiago	about 8 00 —	500
Port of Spain, Trin	9 50 10 00 —	500
Curacao	8 50 9 00 —	500
[illegible] Curacao		
Demerara	15 00 —	400
St Thomas	about 8 00 —	500

All above rates gross form charter

British Coal Output Estimated at 217,000.000 Tons

There has just been issued an official report of the British coal industry, in which are set forth the findings of Alfred Tongue & Co., chartered accountants, on the estimates of the Coal Control Department with special reference to figures on which [illegible] based the increase of 6s. per ton [illegible] prices last July and the [illegible] figures on which the reduction of [illegible] per ton in the price of coal was based, [illegible] Consul General Robert P. Skinner, London, states. [The values in United States currency are based on normal rate of exchange ($4.86) to the pound sterling. The present value of the British pound is [illegible].]

[illegible] 1919, the coal controller put the estimated production for the year ending July 15, 1920, at 217,588,000 tons, [illegible] profits of [illegible] per ton for [illegible] of [illegible] output and [illegible] the output on which [illegible] would be effective. The findings of the accountants in regard to these figures are summarized as follows:

The estimates [illegible] in respect of a year's [illegible] from July 16, 1919, to [illegible] 1920, ignoring any loss prior to [illegible] 1919, and being estimates so far [illegible] complicated industry could not reasonably be expected to be accurate in view of events and circumstances arising after the date the estimates were made.

Viewed in the light of the data then available, however, we are of opinion that:

The estimated output of 217,000,000 tons was fair and reasonable.

The rate of profit taken as the basis for computation, viz., 3s. 7d. per ton raised, was also fair and reasonable.

The cost of production was underestimated, especially in respect of wages, this cost being estimated at £209,000,000 ($1,017,100,000), as compared with our figure of £216,000,000 ($1,051,200,000).

The revenue was underestimated to the extent of about £30,000,000 ($146,000,000), mainly due to an undervaluation of the proceeds to be obtained from exports and bunkers.

In response to the personal request of the Prime Minister, the accountants present their own provisional estimate of the results for the year ended March 31, 1920, in the light of the facts so far as they are known today, and report: "It will be seen that in our opinion and so far as can be estimated the surplus remaining on the working of the industry for the current financial year will be approximately £6,000,000."

This estimated surplus of £6,000,000 ($29,199,000) as at March 31, 1920, includes the gain accruing on the advance of 6s. per ton on inland coal made in July, 1919, less the loss in revenue resulting from the reduction of 10s. per ton on domestic and household coal, and the reduction of coastwise bunkers, from Dec. 1, 1919.

A cablegram from Newcastle, Australia, announces that 240,000 tons of coal were mined during the month of February. Bunker coal supplied to overseas vessels amounted to 34,380 tons, and 65,271 tons were exported overseas, excluding bunkers. The balance of coal was used for consumption in Australia. Several British vessels have been engaged to take coal to West Africa to which the freight rate is 97s 6d. The marine engineers' strike ended Feb. 26.

Danish Fuel Imports Are Less Than Half Those of Pre-War Days

Denmark's total imports of coal, coke, cinders and briquets in 1919 amounted to only 2,616,997 tons, which is about 300,000 tons more than in 1918, but far below the imports in 1914, which were 7,000,000 tons. Of the imports in 1919, only 383,196 tons came from Germany, the rest coming almost exclusively from England.

Denmark's supply of coal is still very limited and a number of the war-time restrictions have been reintroduced. The resumption of American coal export is not expected to have any material influence upon the general situation, the high dollar rates preventing a large-scale import of American coal

Public Tipple at New Orleans Will Operate May 1

With the early completion of a huge public tipple now in course of construction, New Orleans will be able to offer greatly increased bunkering facilities to shipping in addition to exporting a considerable amount of coal. This tipple, which is costing the state $500,000, will put the port in a position to send 500,000 tons a year to the Panama Canal, as well as large quantities to Mexico, Cuba and South America

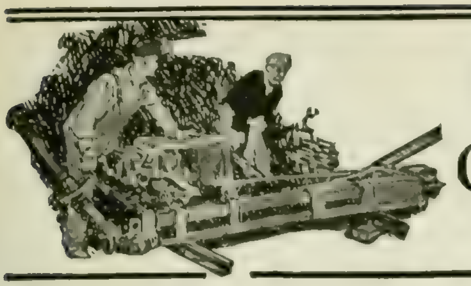
Coal Exports from New York During February

There were 2,933 tons of anthracite, 2,856 tons of bituminous and 1,924 tons of coke with a valuation of $63,672 shipped to foreign countries through the port of New York in February of this year. This was a gain of $8,293 in valuation and 1,951 tons, when compared with the exportations in the same month of 1919 when the shipments were 615 of anthacite, 3,561 of bituminous and 1,586 of coke with a valuation of $55,379 or an average cost per ton of $9.61, as compared with $8.25 for this year's shipments.

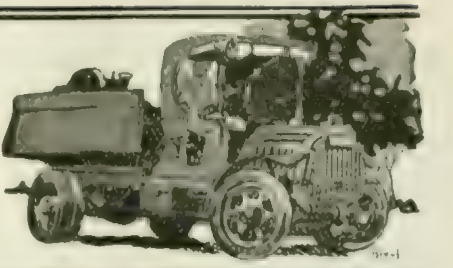
Shipments of anthracite were made to 8 countries in February of this year, as compared with 5 countries in 1919, while bituminous was sent to 6 countries in 1919 as compared with 4 countries this year. The valuation of the 1,924 tons of coke shipped last February to 7 countries was $19.299, while 1,586 tons shipped in February, 1919, was valued at $22,608, a decrease of 338 tons, but an increase in value of $3,309.

The following tabulation shows the shipments in February of this year compared with the same month last year:—

	Anthracite				Bituminous				Coke			
	1919		1920		1919		1920		1919		1920	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value
Argentina					2,017	$13,485						
Barbados	40	$606										
Brazil					300	2,100			190	$1,582		
Canada	223	1,840	1,229	$11,371								
Colombia			3	60								
Costa Rica									27	915		
Cuba											1	25
Danish W. I.					469	3,142						
Dutch W. I.							1,037	$6,222				
Ecuador											10	300
France			7	80					1,311	18,396		
French W. I.									2	65		
Greece			5	55								
Italy			192	2,535	500	5,000						
Mexico							9	245				
Netherlands			520	4,410			1,800	10,800				
Norway											35	438
O. Br. W. I.	50	753										
Panama			289	2,328								
Peru					75	1,154	10	240	36	1,060	1,862	18,225
San Domingo			688	6,027							3	24
Spain											3	73
Turkey in Asia	101	1,285										
Turkey in Europe	201	1,706			200	1,700						
Venezuela									20	590	10	214
Totals	615	$6,190	2,933	$26,866	3,561	$26,581	2,856	$17,507	1,586	$22,608	1,924	$19,299



COAL AND COKE NEWS



Charleston, W. Va.

Chesapeake & Ohio Mine's Big Gain—Monday's Record—Contracts Closing Slowly—Letup in Coal Confiscation

More coal was mined in central southern West Virginia during the week ended March 27 than during any other weekly period of the month, it is believed, the output being in rather marked contrast to the preceding week. While gains were made, therefore, in production, it still left the output far from normal, transportation troubles still being the principal factor in preventing a large output.

Increased production for the week was made possible largely because of an almost normal car supply on the first day of the week; the car supply during the remainder of that period was in rather sharp contrast to Monday. There was a larger supply of cars on hand in all Chesapeake & Ohio fields on the twenty-second than has been observed for the first day of the week in recent years. With nearly 3,300 cars distributed to the mines, the output was almost equal to potential capacity, reaching 163,000 tons.

While Chesapeake & Ohio mines had a somewhat larger run of cars than usual and were able to increase their output, the reverse was true as to mines located on the Kanawha & Michigan throughout nearly the entire week; a slide and a wreck combined, vitrually shutting off the car supply for three days. In fact it was not until Saturday that Kanawha & Michigan mines were able to load anything like a normal output, the supply of cars previous to that day amounting to little more than a handful. In this section of the state, at least, the month's average of cars furnished is just about the same as that for February or from 53 to 55 per cent.

New River Record Smashed

The curve of production was upward in the New River field in the week ended March 27, that being a reversal of conditions prevailing in the week ended the twentieth, an increased car supply making a larger output possible. However, it was the favorable car supply at all mines at the outset of the weekly period, which made it possible to ship more coal than during the preceding week, for after Monday there was scarcely more than a 50 per cent run of cars. With a production of nearly 29,000 tons on Monday, the twenty-second, recent records for Monday loadings were smashed. The total production for the week reached about 125,000 tons, representing an approximate gain of 25,000 tons.

Time was being taken by producers in closing contracts, and it was doubtful, as the month closed, if there was more than 40 or 50 per cent of the New River output for the coal year under contract, many operators having reached a decision to hold a part of their output for the open market. It is the desire of New River producers to hold down prices as much as possible and not to encourage speculation. With that end in view only a price sufficient to cover an increase in wages and to afford a reasonable return will be charged.

Not only was confiscation of coal becoming less general as the month ended, but outstanding accounts for coal taken during the strike were being rapidly liquidated. With permits still being required for export shipments, the overseas consignments from the New River field were rather limited despite the heavy movement to tidewater.

Improved Kanawha Car Supply

Impetus was given the production of the Kanawha field in the last week of March, through a greatly improved car supply on Monday, March 22. In fact on that day production broke all records in recent months, the total output reaching nearly 37,000 tons. That became possible when nearly 740 cars, or virtually a full supply was furnished the mines, and it was largely because of this greatly increased supply that the Kanawha field was able to forge ahead of other weeks in point of production.

As far as the contract situation in the Kanawha field was concerned, producers here seemed to be waiting to get their bearings before closing many contracts, although there were many buyers in the field. Indeed producers hardly know just what a fair price is, being so used to having the Government make the price for them. Some operators believe that after the first of April Kanawha mine-run coal will average about $4 a ton.

While some coal from the field was being confiscated, yet it was stated that such confiscation was not so general as it had been in previous weeks. Much of the output of the field was moving eastward but only a limited amount of Kanawha product was being exported.

Bluefield, W. Va.

Little Change in Smokeless Production.—Operators Slow About New Contracts—Strike of Railway Clerks

Transportation trouble still held production down in the extreme southern part of the state in the period between March 22 and 27. Little improvement was shown in the car service over the previous week, although on the other hand it is not believed that the transportation was any worse. Even with a slightly better run of cars in all fields, it is doubtful if the output of such fields as a whole was more than 55 or 60 per cent, if that much; maximum working time at most of the mines being about four days and in some cases three days.

While sending foreign cars home with dispatch and getting its own cars back to some extent, the Norfolk & Western still had by far the larger proportion of its own equipment on other lines. Despite the fact that there is known to be a shortage of coal cars, railroads are permitting the use of coal-carrying equipment for other purposes, particularly for the transportation of automobiles, and it is believed that such coal cars will be out of the coal-carrying trade for several weeks. Coal cars are being used for shipping automobiles into the coal fields, and they can be loaded with coal on the return trip.

Many Buyers After Smokeless

The week in southern West Virginia was featured by the advent of many buyers seeking smokeless coal for delivery during the new coal year. Producers, however, were not to be stampeded, and it is not believed that many large contracts were closed. In fact southern West Virginia coal men are biding their time, until conditions become somewhat more settled; the larger agencies especially having no desire to precipitate a reign of unduly high prices. Furthermore, southern producers apparently do not propose to tie up their entire yearly output in contracts, but will hold a part of their output for spot sales.

Reports from various sources indicated that indebtedness, in connection with strike coal shipments, was being liquidated with greater celerity, toward the end of March, than earlier in the year; though large amounts were still outstanding, despite the fact that more than three months had elapsed since the end of the strike.

Despite heavy tidewater shipments from various southern fields, exports were not running as large in volume as might be expected, owing to the continuance of restrictions. Complaint of confiscation, however, was less general than in previous weeks.

Lack of adequate transportation facilities was still preventing anything like a normal production in the Pocahontas region, in the period ended the twenty-seventh. As a matter of fact the inadequate car supply was responsible for about a 40 per cent loss, mines being limited to about four days of operation during the week. While the Norfolk & Western appeared to have a few more empties on its lines than during the preceding weekly period, nevertheless the increase was so small as to make no appreciable change in production.

It has been found impossible for the Norfolk & Western to have as many of its own cars returned as had been hoped and as the road had made an effort to do. It was becoming more and more apparent, also, to Pocahontas producers, that railroads were careless in the use to which open top cars were put. Coal men in the southern regions felt that open top cars ought to be confined to the coal-carrying trade, in view of the general shortage of coal throughout the country.

With Government prices out of the way and with producers free to make contracts, there was a bevy of buyers in the Pocahontas region toward the close of the month; however coal companies were awaiting further adjustment of conditions and not precipitately entering into contracts. Only a small proportion of Pocahontas coal was under contract by the end of the month, no particularly large contracts having been reported closed between the twenty-third and the thirty-first.

Cold water was being thrown on the enthusiasm of numerous buyers, jobbers and speculators seeking tonnage, such would-be purchasers having little chance of success except in a small way, as the heaviest producers were evidently not contracting, and were endeavoring to heed the President's request as to prices. During February, shipments from the Pocahontas field were the lightest in five years, amounting to only 927,137 gross tons.

Better Car Supply on the Gulf

There was an upward curve to production in the Winding Gulf field in the period ended the twenty-seventh, chiefly because of a somewhat better car service furnished by the Chesapeake & Ohio; the mines on this road having about a 50 per cent car supply, were able to work about four days out of the six. The car supply on the Virginian was running just about 70 per cent. Winding Gulf producers were in line with other smokeless operators in regard to making contracts, apparently awaiting developments such as the condition of the market, wage advances and so on. Owing to permit regulations, not a large quantity of Winding Gulf coal was being exported as the month drew to a close. Plenty of opportunities were offered for the disposal of the entire Gulf output, but part will be held in reserve for sale in the open market especially in view of the likelihood of quite a heavy demand.

During the week ended March 27, the mines of the Tug River field loaded 82,700 net tons of coal, 1,700 tons in excess of the output for the previous week. With Government supervision almost entirely removed, it is probable that contracts will be largely entered into as of April 1. Buyers were scouring the Tug River field for available tonnage and are offering considerably in excess of the best export price ($4.10). This may have considerable influence on the volume which has been seeking export channels.

Norfolk & Western Railway Clerks Strike

The strike of railway clerks, starting at Roanoke on the twenty-sixth, was assuming serious proportions during the last few days of March. On March 30 it was reported that all the clerks on the Sciota division went out. All clerks at the Bluefield scale house were on strike during the last three days of the month, but volunteers had been able to keep the movement of coal normal.

At such large weighing points as Portsmouth more difficulty was apprehended and it was considered probable that volunteers woud have to be sent from Bluefield. It was stated that the public was not in sympathy with the movement to hamper the railways. Business men in the coal fields were offering any assistance necessary to the transportation company.

Huntington, W. Va.

Logan Output Down to Very Minimum —Export News—Wages to Advance

Car-shortage losses in the Logan field had, in the week ended March 27, reached unprecedented heights, there being no less than 258,000 tons lost from that source alone, cutting down production to the very minimum. In fact the total estimated output for the week in question was only a little more than 175,000 tons, or approximately 35 per cent of potential capacity.

Conditions were just about as unsatisfactory as they could be in the field at the end of the month, chiefly because of a transportation handicap. Not in a long time, however, have cars been more plentiful than they were at the advent of the week. With 1,052 cars on hand Monday, March 22, the mines here were able to produce and ship more than 52,000 tons of coal; that production was far in excess of any previous week since the end of the coal strike.

Logan producers and shippers were declining to be hurried in the matter of completing contract arrangements for the new year, mainly waiting to see what wages and prices generally would be; while rather fancy prices were being offered for Logan coal, this failed to tempt the mine owners, who are unwilling to see prices become unduly high. While Logan fuel is in much more demand in export markets, and enjoys a larger market in the East than in previous years, the quantity for trans-Atlantic shipment was rather limited, although somewhat larger than was the case earlier in March.

There was no question but what the wages in the Logan field will be raised at the proper time in order to meet the advances made in union fields, that having already been done, it is reported, in some instances.

There was a material increase in the tonnage handled by the Chesapeake & Ohio as a whole during the week ended the twenty-seventh, as compared with the previous week, the increase amounting to 1,736 cars or 86,800 tons. In other words, total loadings, during the period ended the twentieth, amounted to 9,792 cars (or 489,600 tons) as against 11,528 cars (or 576,400 tons) for the following week.

Fairmont, W. Va.

Less Idle Mines in Northern Fields—More Coal Goes to Tide—Its Further Destination

Production in northern West Virginia fields, though falling far short of normal, during the week ended March 27, was still much better sustained than during earlier weeks of the month and especially during the week immediately preceding. Even with cars more plentiful, however, there was not much more than a 55 per cent output. As usual the chief obstacle to a larger production was the scarcity of cars.

The initial supply of the week especially on the Baltimore & Ohio Railroad, was such as to swell the week's total production, the first day's supply being the only one at all approaching normal. Monday's car supply on this road was equal to about 89 per cent of requirements, there being in excess of 1,400 cars available for loading on the day mentioned.

While Baltimore & Ohio mines were fairly well supplied on Monday, such was not the case with Monongahela mines, the quota furnished to mines on that road amounting to only about 50 per cent of requirements. Mines on other roads in the northern part of the state were not so fortunate, having only about a fifth of the required number of [illegible].

Throughout the week ended the twenty-seventh, the run of cars, on the Baltimore & Ohio [illegible] below [illegible] other roads [illegible] losses at all mines being less prevalent than during [illegible]. Another factor in building up the car supply, during the week ended the twenty-seventh, was the fact that the [illegible] resumed [illegible] the Fairmont [illegible] on [illegible] Run.

More coal was shipped from northern West Virginia points to Curtis Bay and other tidewater piers for export, and it was believed [illegible] being exported [illegible] during the [illegible]. A stop had been [illegible] from Curtis Bay piers early in the month; but so much complaint was made against prohibiting export shipments from that point, while permitting other tidewater piers to ship coal in the export trade, that toward the latter part of the month restrictions were lifted.

One effect of the removal of restrictions was to increase the loadings to Curtis Bay from northern West Virginia very materially as the month drew to a close. In the absence of exact figures it is believed that the number of cars consigned to the Curtis Bay terminal, in the week ended the twenty-seventh was in the neighborhood of 1,000 or more.

During the greater part of the week above mentioned railroad fuel shipments were running ahead in volume of those of the previous week, no doubt because of the increased number of cars available. While the Baltimore & Ohio was securing a large tonnage from mines reached by it, there was also a heavy tonnage being shipped to New England roads. Not only were New England roads securing a large volume of northern West Virginia coal but other classes of consumers in the New England area were getting large consignments, part of which were being routed by water.

While the President's proclamation, suspending Government price control and Government distribution, was the signal for buyers to invade the northern West Virginia field, yet most producers were feeling their way, being unwilling to close any deals for the delivery of coal, until a general price basis was reached. It was also apparent, as the month drew to a close, that operators did not propose to tie up their entire output in contracts.

It is believed in the northern West Virginia fields, that there will be a heavy demand in the Lake trade this season, and northern West Virginia operators are looking forward to the opening of the Lake movement with a feeling of optimism. The operators will be fully able to take care of Lake business if transportation facilities are satisfactory.

Louisville, Ky.

Coal-Tonnage Tax Urged in Kentucky — Legislative Action — Governor Morrow's Statement—Report of State Geologist

Coal taxation on a tonnage basis has been up for discussion for some time in the Kentucky Legislature. On the night of March 15, an effort was made to amend the Omnibus License Tax Bill, by placing a 2c. per ton tax in this amendment. Lieutenant Governor Ballard ruled the amendment out of order, and on an appeal the decision of the chair was sustained by a 22 to 11 vote.

Mr. Ballard is a coal operator himself, and, while declaring his advocacy of the proposed tax on coal, held that the amendment was out of order as it was not germaine. Senator Smith offered an amendment which was killed by a vote of 21 to 16, and which provided for a tax of $5 a day on 25 to 50-ton mines; $10 for 50 to 100-ton mines; $20 for 100 to 200-ton mines; $40 for 200 to 500-ton mines, and $75 for mines over 500 tons a day capacity.

Coal Tax To Be Scientifically Planned

Senator Antle, in opposing the Smith amendment, stated that Governor Morrow was planning a coal-tax law to be enacted before his term of office shall expire. Governor Morrow when asked concerning the statement said it was true, but that the administration planned to go about it in a broad way, realizing that one of the largest state industries is at stake.

He said: "We will not go about it in the slipshod, hap-hazard way, as indicated by the amendments offered here tonight, and by other measures offered at different times during the session. There is too much at stake. We are going to make a scientific survey of the situation and then pass a measure accordingly. Every measure offered so far has been the result of guesswork. No account whatsoever has been taken of differentials in different parts of the state, or other details that have to be considered for the right kind of tonnage-tax bill."

This statement was approved, as no consideration apparently was taken of high and low-grade coal and profitable and unprofitable mines; and placing a flat tax of 2c. a ton on all grades, from every district, would do a vast injustice to the industry.

W. R. Jillson, State Geologist, in a recent report on the coal conditions in the state, showed that from 1911 to 1918 Kentucky produced 176,105,234 tons as against 157,971,800 tons from 1828 to 1910. Production started in 1828, but in 62 years (from 1828 to 1890) the state produced less coal by several million tons than is produced now in a single year. It now produces as much coal in two years as during the period between 1898 to 1907, when 70,000,000 tons were mined.

The Senate Committee of the Legislature secured some facts in arguing for a tonnage production tax, and figured 1919 coal output at 31,000,000 tons, which is probably about two and one half million tons higher than actual production during the year. In southeastern Kentucky, Pike, Bell, Letcher and Harlan counties have led, and in western Kentucky, Muhlenburg, Hopkins, and Webster. The Hazard district has been growing rapidly, and also the Elkhorn district. During the past ten years, Kentucky has just about made a good start, as a big coal-producing state, and has a great prospect before her.

Ashland, Ky.

Railroad Fuel in Hands of Committee—National Associations Handle Matter —Wages, Prices and Markets

The week ended March 27 was the first period in several months, in the northeastern Kentucky field, when the week's output exceeded the output for the corresponding week of 1919. A "no-market" condition was still quite prominent during the week of the earlier year, production for the period named in 1919 having been 115,500 tons; whereas, during the week ended the twenty-seventh, it had been increased to 122,545 tons or 47 per cent of the total full-time capacity (259,115 tons), the total loss being 136,570 tons, or 53 per cent of potential capacity.

A total of 131,290 tons or 51 per cent was lost during the period above stated, the loss from other causes reaching only 5,280 tons or 2 per cent. The tonnage given represented an increase in production of about 15 per cent and placed the production on a parity with the second week in March.

A quite marked improvement in the car supply was in evidence along the Chesapeake & Ohio and its branch lines, mines being able to work about 60 per cent of the time. To offset that improvement, however, the Louisville & Nashville supply became even worse than that for the previous week, and in many cases the mines were permitted to work only one day during the week, the average supply being approximately 23 per cent.

Vicious Practice To Be Abolished

The Chesapeake & Ohio management, recognizing the unfairness of its position, with respect to preferential car supply, to mines supplying the roads with its fuel, cancelled such instructions and once more placed all mines on an equal distribution basis. In fairness to the railroads, every effort is being exerted by certain operators, in the northeast Kentucky district, to arrange for an adequate supply of fuel for the railroads, in order that carriers may not find it necessary at any time to resort to the assigned-car practice.

In connection with the railroad fuel supply, the Northeast Kentucky Coal Association will support the action taken at Washington recently by the National Coal Association, in appointing a committee to deal directly with the American Railroad Association and the individual railroads, for the purpose of securing full requirements of the railroads in the various districts.

Such an arrangement is predicated, however, upon the railroads paying the regular market price for their purchases. Once the railroads agree to that, there is no question but that they will be amply supplied; if finally effected, this plan will remove for all time the evils resulting from the employment of arbitrary methods by the railroads.

Many sighs of relief were given by the eastern Kentucky operators, about the twenty-third, when news reached Ashland that President Wilson had lifted the ban (effective April 1); the belief was expressed that eastern Kentucky operators would meet fully the wage advance recommended by the majority report of the Bituminous Coal Commission.

Some quite attractive prices have already been made for contract business during the ensuing year, and jobbers' representatives are becoming active in the field with a view to completing their contract negotiations at an early date. The splendid reputation established for the Elkhorn coals, for byproduct, coking and gas purposes, has resulted in many such companies looking to the eastern Kentucky field, thus opening up new markets to the eastern Kentucky producers.

PENNSYLVANIA

Anthracite

Wilkes-Barre—The Stanton mine of the Lehigh & Wilkes-Barre Coal Co. has been partly flooded, due to a breakdown of the pumps, and as a result 400 men have been idle for a few days. At present there is 14 ft. of water in the shaft. Large water tanks are being used to assist the pumps. These tanks have an estimated capacity of 1,000 gallons each and are being hoisted at the rate of about 110 per min. Only the lower level of the shaft, which is about 1,000 ft. deep, is affected. The upper levels are still being worked.

Scranton—The recent thaws have done considerable damage to the mines in this region by causing floods, which have temporarily caused a number of the mines to close down, including the Greenwood and Jermyn No. 1. In the former mine the water is said to be forty feet deep. The Delaware, Lackawanna & Western Company has had considerable trouble at its Bellevue mine, where the water has backed up so that it has overflowed into the Oxford mine of the Peoples Coal Co. The water in this mine was six feet deep at the shaft bottom. The Pennsylvania Coal Co. and the Lehigh Valley Coal Co. have two of their mines near this place flooded. The Temple Coal Co. has had a little difficulty from water but it is reported that conditions at its mines have again become normal. Considerable difficulty has arisen in the handling of the water at some collieries due to a shortage of pipe.

A resolution has been adopted by the Scranton City Council recommending that an excise tax on all anthracite mined in the state be included in the new constitution.

Hazleton—Mine-examining boards report few applicants for miners' certificates, a condition which has brought forth a number of comments. There is a dearth of miners in the Hazleton field; this may be explained by the earnings of "company men" who receive nearly as much wages as the average contract miner and whose duties are lighter. As for laborers, they are not applying for jobs; the places are looking for the men.

The Raven Run Coal Company, a Wentz subsidiary at Raven Run, near Mahanoy City, has let a contract to the Central Pennsylvania Stripping & Quarrying Construction Co., for a large stripping. It is estimated that it will take about ten years to complete the work. The Wentz interest has let another contract to the same contracting company for a stripping east of Hazle Brook near Buck Mountain. This latter stripping will take five years to complete. Several reservoirs must be abandoned to permit the work to proceed.

The Lehigh Valley Coal Co. is contemplating starting some large new strippings, one of which will be at Buck Mountain, where Coxe Bros. & Co. stripped years ago, but where more coal has recently been discovered. Another stripping will probably be near Jeansville and a third close to the Coleraine colliery.

The G. B. Markle Company is considering the purchase of the mines of the Harleigh-Brookwood Coal Co., which is controlled by the Madera-Hill Co. No decision has been reached in the matter as yet. The mines of this company at Harleigh are at present flooded; these workings adjoin the old Ebervale mines. The Harleigh mines could probably be readily dewatered by means of the drainage tunnel at the Ebervale workings.

Considerable difficulty has been encountered by the various coal companies in this region, due to the flooding of their mines with water; a difficulty the G. B. Markle Co. escaped, due to the fact that its mines are drained by a tunnel 15,000 ft. in length. The other mines in this district are not similarly equipped and, as a result, have been forced to shut down either wholly or in part. The Markle company would have had no difficulty at all, if it had not been for the fact that a large drainage canal on the surface overflowed, and the water ran into the mines at the rate of 36,000 gal. per min. for a number of hours. The drainage tunnell successfully handled this water only causing a shut down for about 24 hours.

WEST VIRGINIA

Charleston — Instances having arisen where West Virginia producers have shipped coal to bankrupt concerns, under orders from the U. S. Fuel Administration, Congressman S. F. Reed, of the Third West Virginia district, has indicated that he will either introduce special bills, providing for the relief of those who have been unable to secure settlement for coal shipped, or that he will introduce a bill creating a commission, to pass upon claims of those who are in the same category with a constituent of his. Congressman Reed was unable to make any headway, in aiding in the collection of a bill for a large shipment of coal consigned to a bankrupt firm at the instance of the Fuel Administration, there being no Fuel Administration any longer. The Director General declines to assume any responsibility for the acts of the Fuel Administrator, and the Department of Justice is also unable to furnish any relief, or to make any suggestion as to how the West Virginia shipper might be reimbursed.

Huntington—The headquarters of the Logan Operators' Association has been moved from Logan to Huntington, the change in the location of headquarters having been made about March 27. J. W. Colley, secretary of the association, and R. J. Manley, traffic manager, will both have their headquarters at Huntington. C. J. Neekamp, who will look after the car supply, will have his headquarters at Logan. Many of the operators of the Logan field live at Huntington, the distributing, supply and banking center of the Logan region.

KENTUCKY

Whitesburg—Reports are to the effect that many miners are going back to the farms as tenants or laborers, due to steady car shortages, which are resulting in mining being a poor money-making occupation. Such reports are being received from both the Elkhorn and Hazard fields.

Louisville—A report from Letcher County, Ky., is to the effect that the recently organized W. E. Deegans Consolidated Coal Corporation (a $5,000,000 company of West Virginia), will start two extensive eastern Kentucky developments; one on the Louisville & Nashville, in the Elkhorn field, and the other on the Chesapeake & Ohio, in the Big Sandy field. It is claimed that the company plans two big developments with a capacity of 1,000,000 tons eventually, and that two mining towns will be built.

Estimated production for 1919 in Kentucky has been given at 28,500,000 tons, as compared with 31,612,617 tons in 1918 and 27,807,971 in 1917. The strike last fall more than offset losses occasioned in the fall of 1918 by influenza, while dull business in the early part of 1918, and car shortage from July to the close of the year, reduced tonnage considerably.

While numerous reports have been received concerning plans of the Louisville & Nashville R.R., for improved terminals, longer sidings and double trackage in sections of eastern Kentucky, later reports are to the effect that nothing much will be done this year, due to high costs of material and construction, high money market and difficulty in financing new projects, with rates low and earnings unsatisfactory. The Hazard field today has a production capacity of almost twice the physical capacity of the road to handle, and improvement is needed badly in that field.

OHIO

Columbus—The Southern Ohio Coal Exchange has given out the following figures on car supply in the district for the first three weeks in March: Supply in first week of March—Hocking Valley R.R., 76 per cent; Toledo & Ohio Central R.R., 50 per cent. Supply in the second week in March—Hocking Valley R.R., 71 per cent; Toledo & Ohio Central R.R., 50 per cent. Supply in the third week in March—Hocking Valley R.R., 59 per cent.

ILLINOIS

Duquoin—Coal was recently struck northeast of this city by the Southern Gem Coal Co., under the direction of Jesse Diamond, of Chicago. The Southern Gem people have been doing some extensive drilling throughout this section recently, and this is announced as the first strike of coal in this individual district. The land on which the coal was found lies directly east of Tamaroa, a small town north of here, and the coal is said to be practically of the same quality as the famous Franklin County coal. The seam at this place is six ft. and eight in. in thickness and 469 ft. below the surface.

The Export Coal Co., a newly organized corporation, has announced its intention of erecting a modern coking plant in connection with the mine of the Orchard Coal Co., near Pittsburg, southeast of here. This will give employment to several hundred more men in this district. Coal will also be coked at this plant from many other mines in southern Illinois.

TEXAS

Dallas—According to the officials of the Texas Coal Operators' Association, the mine owners of the state prefer to let the price of coal remain unchanged, rather than to increase the cost of production by raising the pay of the owners as well as the margin of profit, as proposed under the majority report of the wage commission appointed by President Wilson. The Texas operators say, however, that any advance in wages to miners must be taken care of in added cost to consumers, for the coal is now being handled on such a close margin of profit that the operators cannot stand the added cost of production.

In connection with the present coal situation, announcement is made by the Missouri, Kansas & Texas Ry. (the "Katy" system) that it will change nearly all its engines from coal to the oil-burning type. The change is being made, it is announced, because of the increasing demand and growscarcity of coal, resulting from the continued demands for higher wages on the part of miners and the resulting strikes and tie-ups of the mines. It is estimated that the change in "Katy" engines will mean discontinuance of the consumption of approximately 10,000 tons of coal a day. This railroad system has recently enlarged and improved its mine at Coalgate, Okla., at an expense of $50,000. The mine now has a daily capacity of 600 tons and this was to have been doubled by the end of the summer. The change to oil-burning locomotives by the "Katy" will put fully 1,400 coal miners and coal handlers in Texas and Oklahoma out of employment.

Personals

Xen Fagan, formerly manager of the Marion Insulated Wire Co., Marion, Ind., will be the manager of the Rome Wire Co.'s Diamond branch at Buffalo, N. Y.

W. L. Abbott, chief engineer of the Commonwealth Edison Co., Chicago, was a recent lecturer at the University of Illinois, Urbana, Ill., speaking from the topic "The Art of Burning Coal."

Harry Bissell recently resigned as superintendent of the Cambria Collieries Co., at Bellaire, Ohio, a George M. Jones interest. He is now superintendent of the Simpson Creek Coal Co., at Simpson, W. Va.

R. E. Roush, general manager of the West Virginia-Pittsburgh Coal Co., has resigned, announcement to that effect having been made during the second week of March. D. F. Bird, assistant manager, has also tendered his resignation.

J. W. Sidell, who has been superintendent of the Harco mine of the Harrisburg Colliery Co., in Saline County, Ill., has tendered his resignation, effective April 1. Mr. Sidell retires to take a much needed rest.

W. H. Burke, for the past five years fuel agent for the Illinois Traction System, the largest electric railway in the state of Illinois, has been appointed fuel agent of the Frisco Railroad with headquarters in St. Louis.

C. D. Boyd, traffic manager for the Southern Appalachian, Harlan and Hazard operators associations, has been in Washington, D. C., attending the public transportation hearing, at which railroads, shippers, and so on, have been airing their views on transportation matters.

Joseph Shimmell resigned as assistant mine foreman with the Carnegie Coal Co., at the Atlas mine, Atlasburg, Pa., and accepted a position as mine foreman for the W. H. Shinn Coal Co. at Joffre, Pa. Both of these operations are in Washington County.

J. W. Sidell, superintendent of the Harco mine near Harrisburg, Ill., owned by the Harrisburg Colliery Co., recently resigned from active business life. He has been associated with the company many years. No successor has as yet been appointed to fill the vacancy.

Oral L. Garrison, formerly of Marion, Ill., recently received an appointment as private secretary to John L. Lewis, president of the United Mine Workers of America, and will have his headquarters in Indianapolis, Ind. This position will carry him into practically every mining district in the United States and probably some fields in Canada.

George W. Vaux has resigned as general manager of the Zeigler Coal Co., at Zeigler, Franklin County, Ill., and has gone to Toronto, Canada, where he has accepted a position as general agent of the Union Pacific, Oregon Short Line and the Oregon-Washington R.R. & Navigation Co. Mr. Vaux held this position prior to the government taking over the railroads in May, 1918.

Ralph D. Brown, who has been with the O'Gara Coal Co., in Harrisburg, Saline County, Ill., for ten years as chief engineer, has been made general superintendent of this company, succeeding **A. B. McLaren,** who recently resigned. **Dennis B. McGehee,** formerly chief clerk and assistant to the general superintendent of this company, which position he has held for a number of years, has been made assistant to the vice president, and will have charge of the accounting department, workmen's compensation, taxes and the lands of the company.

Joseph Lewis has been made general superintendent of the Chicago, Wilmington & Franklin Coal Co.'s mines in Franklin and Williamson counties, Illinois, taking the position made vacant by the death of Thomas F. Holmes, several weeks ago. Mr. Lewis has been superintendent of the Orient mine of this company since its development, and has been with the company many years. He is one of the competent mining men of the southern Illinois field. The Orient mine holds the world's record for single-car hoisting, having hoisted 6,008 tons in eight hours. Mr. Lewis will have headquarters in Benton, Illinois, where the company maintains general offices.

B. F. Nigh, secretary of the Michigan-Ohio-Indiana Coal Association, should be given credit for the wording of the recommendation in the recent report of the U. S. Bituminous Coal Commission where it asks the public, and especially the large users, to lay in their winter's supply of fuel between April 1 and August 1. In many ways it is said the recommendation follows almost verbatim a recent letter written by Mr. Nigh to the coal commission calling attention to the fact that many users, especially public utilities and public institutions, have not been in the habit of storing coal during the summer months, when such should be done.

George H. Cushing, managing director of the American Wholesale Coal Association, is making a speaking tour during which he is discussing the current problems confronting the coal industry. His itinerary is as follows: Toronto, Can., April 8; Grand Rapids, Mich., April 9; Kansas City, Mo., April 12; Omaha, Neb., April 13; Chicago, Ill., April 15; New York, N. Y., April 20. His New York speech will be before the Purchasing Agents' Association.

Obituary

Captain Darwin G. Case died at his home 466 Fifty-fifth St., Brooklyn, N. Y., on March 27. Captain Case was a large owner of coal barges and had a wide acquaintance in the transportation and coal circles of New York City.

Stewart W. Calder, 40 years of age, assistant to the president of the Kentucky River Coal Corporation, died of pneumonia on March 22. Mr. Calder came to Kentucky from Norfolk, where he was with B. A. Langhorne, of Lynchburg. He had resided at Lexington, Ky., for five years prior to his death.

Melvin B. Newcomb, aged 31 years, chief engineer of the Rubber Machinery Department of The Wellman-Seaver-Morgan Co., died recently after a short illness, at his home in Akron, Ohio. He received his mechanical engineering education at the University of Wisconsin. Mr. Newcomb has been engaged in engineering work with various industrial concerns. He joined the Wellman-Seaver-Morgan Co. in January, 1918. He leaves a wife and two young daughters.

Trade Catalogs

Pratt Ballast Cleaner. The Link-Belt [illegible] Pp. [illegible] in.; illustrated. Gasoline engine operated machine.

Metallurgical Service. New York Testing [illegible] Washington St., New York, N. Y. Folder. Pp. 4; 4 x 9 in.; il[illegible]

Simplex Track Jacks. [illegible] Keely & [illegible] jack of interest to [illegible] Pp. 4; 8½ x 11 in.; [illegible]

Rubber Insulated Wire. [illegible] Manufacturing Co. [illegible] Pp. 16; 3⅝ x 6¼ in.; illustrated. A general description of the [illegible] insulated wire, calling special attention to the Hazard method.

Carrick Combustion Control. Carrick Engineering Co., 538 South Clark St., Chicago, Ill. Pp. 10; 8½ x 11 in.; illustrated. Some facts about power-plant control and description of the device made by the Carrick company for combustion control.

Power Factor Recording Instruments. The Esterline Co., Indianapolis, Ind. Bulletin 395. Pp. 16; 8½ x 11 in.; illustrated. A graphic recording instrument. Fundamental considerations and causes of low-power factors; prevention and correction. Description of instruments.

Superheated Steam in Industrial Service Plants. Bulletin T-3 and T-4, respectively. **Superheaters for Stationary Power Plants.** Bulletin T-5. Pp. 8. These three bulletins are all 8 x 10½ in. in dimension and are illustrated. They are distributed by the Locomotive Superheater Co., New York, N. Y. Bulletins T-3 and T-4 describe the application of the Elesco fire-tube superheater to steam shovels. Bulletin T-5 covers the advantages of superheated steam from a new point of view.

Industrial News

Cullman, Ala.—The capitalization of the Stouts Mountain Coal Co. has been increased to $200,000 to allow for general business expansion.

Youngstown, Ohio—The Uniontown Coal Co. has been incorporated with a capital of $15,000, by Louis S. Baldwin, Arthur M. Lyon, R. H. Kallmerten, Helen E. Jones and J. H. C. Lyon.

Syracuse, Ohio—E. H. Holmes, president of the Brocalsa Chemical Co., of Indianapolis, Ind., will soon establish a branch office in Columbus to look after the development of a tract of about 600 acres of coal land near this place.

New York, N. Y.—The Hyatt Roller Bearing Co. announces that its new office location is Sixth Ave. at 41st St., New York City. All letters, telegrams and other communications for the Hyatt company, should be addressed to this location.

Nelsonville, Ohio—Holderman & Nelson, of this place, has purchased the lease on what is known as the Globe mine No. 3, on the Hocking Valley near Nelsonville and will operate in the future. The lease was formerly held by the Globe Coal Co.

Logan, W. Va.—The McCall Coal Co. has been incorporated with a capital of $500,000 to engage in the development of coal mining properties in the Logan district. J. C. Sullivan, Tralee, W. Va., is named as the principal incorporator.

Charleston, W. Va.—In connection with the purchase of the mines of the Monte Coal Co., on Coal River, the Buffalo-Thacker Coal Co. has increased its capital stock from $550,000 to $1,000,000. L. R. Reese, of Huntington, is the president of the company.

Huntington, W. Va.—A $100,000 tipple and washery is to be built by the Thomas Coal Co., of Bramwell, W. Va., one of the large companies operating in the southern smokeless field of the state; contract for the construction of the tipple having been awarded to the Stevens-Adamson Co.

Montgomery, Ala.—Carl T. Montgomery and associates are understood to be having plans prepared for the installation of machinery and equipment in connection with the proposed development of a total of about 1,000 acres of coal properties located in Mercer County, W. Va.

Stamford, Conn.—The Yale & Towne Manufacturing Co. has moved its general offices from 9 East 40th St., New York City, to Stamford, Conn., where all company communications should be addressed. This move effects a consolidation of the company's selling organization with the factory.

Logan, W. Va.—Extensive developments of coal and timber lands in this region are proposed by W. C. McCall and associates, all of Logan. The McCall Coal Co. has been chartered with $2,000,000 to undertake the enterprise. H. A. McAllister, J. R. Slack and W. H. Lilly are among the incorporators.

Petersburg, Ind.—The Big Four railroad is arranging to build coal yards in this city and sufficient trackage will be laid to accommodate 1,000 coal cars. Coal trains will be made up at Petersburg and a number of train crews will be held here. From two to three train crews are held here now.

Philadelphia, Pa.—The Brown Instrument Co., of this place, announces that the company is erecting two new buildings, one for the manufacture of recording thermometers, and second a research department, at a cost of $100,000. These facilities will enable the company to materially increase the output of Brown pyrometers and recording thermometers.

Columbus, Ohio—The Queen Shoals Collieries Co., has been incorporated with a capital of $150,000 to develop a large tract of coal land in West Virginia. The incorporators are D. H. Armstrong, William A. Lama, E. B. Hughes, M. R. Weltner and R. M. Snetzer. The company will complete its organization by the election of officers within a short time.

Cleveland, Ohio—Word has been given out that the Lake Ore & Coal Exchange, which has been operated with headquarters at Cleveland, under the charge of H. M. Griggs, will be continued by the railroad officials of the interested coal-carrying lines. The exchange has jurisdiction over Lake movements at all of the Lake Erie docks and ports.

Charleston, W. Va.—Capitalized at $75,000 the Mountain Eagle Collieries Co. has been organized to mine coal in Big Sandy district of Kanawha County adjacent to Elk River. Leading figures in the organization of the corporation were: Harold P. Tompkins, W. A. Alexander, S. V. Morris and P. H. Holman of Charleston; Lee Stone, of Lexington, Ky.

New York, N. Y.—Announcement has been made that the Sheridan-Wyoming Coal Co., Inc., a subsidiary of United States Distributing Corporation, has just completed a contract for the sale, to a large Western trunk line railroad, of 600,000 tons of coal per annum for a period of 7½ years. The contract is on a cost plus basis, and is said to be one of the largest ever placed.

Nelsonville, Ohio—E. W. Coyle, manager of the Southern Ohio Coal Co., of Columbus, has purchased the stock of the Meeker Run Coal Co., of Nelsonville, which operates a mine on the Hocking Valley. The purchaser will operate the mine. The property consists of about 1,000 acres of virgin coal lands and in addition a considerable acreage of pillars and worked-over land which will produce a fair amount of coal.

Morgantown, W. Va.—The program of improvements of the Penn-Mary Coal Co. for the next year contemplates the expenditure of $1,000,000 on the various plants of the company in the counties of Monongalia and Preston, West Virginia. Until last October the Penn-Mary company, or what it now represents, was the Elkins Coal & Coke Co. At that time the Elkins estate sold the company to the Bethlehem Steel Corporation. Since then many improvements have been made at different plants, so that the $1,000,000 to be expended is in addition to improvements already made or under way. While the improvements will be made largely with a view to securing a larger production, yet the company also expects to build a large number of miners' dwellings, and to improve the community life generally at its several plants. The maximum output of the seven mines of the company under the old ownership was 750,000 tons a year. Plans made call for increasing the maximum to 1,500,000 tons a year. However it will not be possible to complete all improvements within the period of a year. Within recent months the company has purchased and put in service, seven 5-ton locomotives and 12 new mining machines. Among other improvements to be made is the construction of a large tipple at the Richard mine, the tipple there having been destroyed by fire several months ago. A large storage bin is also to be constructed.

St. Louis, Mo.—The Medart Patent Pulley Co., Inc., of this place, was founded 40 years ago with the Medart steel-rim pulley as the nucleus. Since that time the company has concentrated on the mechanical transmission of power, and today the name Medart is synonymous with everything in line-shaft equipment. Pulleys constitute but a small percentage of total production, which embraces a complete line of the many devices used in power transmission.

Fairmont, W. Va.—The Forest Coal Co. has been launched by Fairmont people, and is capitalized at $200,000. The new concern will have its principal operations in Marion County. Associated in the preliminary organization of the company were: S. D. Brady of Fairmont, well known in the Marion field; A. P. Brady, H. E. Engle, E. M. Showalter and H. W. Showalter.

Knoxville, Tenn.—The Rich Mountain Coal Co has filed articles of incorporation with a capital of $75,000 to engage in general coal mining operations in the Knoxville district H G Croley, T P Witherspoon, and H. B. Lindsay are the incorporators.

Charleston, W. Va.—Pennsylvania coal operators will organize a $5,000,000 corporation for the development of coal land in Monongahela County They have chartered the Connellsville Big Vein Coal Co, of Point Marion, Pa, to undertake the enterprise. The incorporators are A. A. Arnson, of Point Marion; D H. Horton, of Connellsville, Pa ; J. L. Kendall, of Pittsburgh ; J. L. Kendall, of Cheat Haven, Pa ; S. A. Kendall, Washington.

O'Fallon, Ill. — A charter was recently granted the O'Fallon Coal Co., of this place, the purpose of the company being to develop and operate bituminous coal mines, the sale of coal and acquiring options and leases for mining purposes. The capital stock was announced at $1,000,000. The incorporators of the company are: C. G. Onstead, Samuel Meister, E. C. Warren, Wm. A. McDonald, P. C. Pardee, W. S. Fetheringham, Frederick Mohr and A. W. Black

Louisville, Ky.—G. C. Atkinson, president of the St. Bernard Mining Co., Earlington, Ky., was in Louisville for several days during the week, following a trip to the Nashville properties. While in Louisville he visited the Louisville & Nashville offices, in an effort to secure a better car supply. The company mines on the Louisville & Nashville lines are working about 45 per cent of capacity; while those on the Illinois Central, are working on quite a fair basis, but loading out considerable coal for the railroad.

Huntington, W. Va.—The Overseas Coal Corporation, with headquarters in this city, has been organized with a capitalization of $50,000 to mine coal in four counties of West Virginia—Cabell, Lincoln, Logan and Boone. Most actively identified with the new company are: J. W. Feague, John S. Marcum, J. R. Marcum, C. P. Marshall, Jr., H. K. Fox, all of Huntington. The same people have also organized the Westkole Fuel Co., with a capitalization also of $50,000, and also for the purpose of operating in the counties already named.

Cumberland, Md.—The Georges Creek Coal Mining Co. is having plans prepared for extensive operations at its coal properties to provide increased capacity. It is proposed to abandon the use of the steam shovels now in operation, and commence at once on the development of numerous drift openings, including the driving of entries to reach coal in the vicinity of the Jackson workings. The company has recently concluded negotiations for the acquirement of the property formerly held by the Green Coal Co., adjoining its site.

Akron, Ohio—The Goodyear Tire & Rubber Co., of this place, has acquired a large acreage of coal land in Belmont and Harrison counties, together with the going operations of the Somers Coal Co. in those counties, the sale having been consummated about the end of March. The sale price of the mines and holdings of the Somers Coal Co. is said to have been $385,587.96. It is proposed by the rubber company to enlarge the scope of operations by opening a new mine and establishing a new town, of which the mine will be the nucleus.

Williamson, W. Va.—The Tug Valley Fuel Co., organized by local business men with a capital of $50,000, will deal in the output of the Williamson field, having already closed several large contracts covering export shipments. The company, in addition to acting as a fuel agency, also operates its own mines. The incorporators of the company were P. A. West, E. L. Bailey, J. T. Johnson, W. P. T. Varney and Dr. W. M. York. P. A. West, formerly weighmaster of the Norfolk & Western, at Portsmouth, has been selected as manager of the company with headquarters in Williamson.

Fairmont, W. Va.—Authorized under its charter, just secured, to engage in the mining of coal and the manufacture of byproducts, it is believed that the Ayrshire Corporation of Pittsburgh, a nonresident corporation with $100,000 capitalization, will have quite extensive operations in the Marion field before long. No definite plans have so far been announced. Under this charter it is authorized to hold and control 22,000 acres of coal land in West Virginia. The incorporators of the company are: Laurence T. Saunders, Samuel McClay, L. Raymond Martin and John A. Irwin, all of Pittsburgh, Pa.; William Seifert of McKeesport, Pa.

Lester, W. Va.—The Neale Coal Co., which recently filed articles of incorporation with a capital of $[illegible] is arranging plans for the immediate development of coal properties in the vicinity of Lester, Raleigh County. Equipment for all features of operation will be installed. E. L. Bowling, E. V Neale, and J W Lester all of Lester, and A M Herndon and E E Hartsook, Goodwill, W Va are the incorporators.

Bridgeport, Conn.- The Curtis & Curtis Co., of this place, manufacturers of the Forbes pipe threading and cutting machine, is one of the few concerns in this city to receive a "Certificate of Merit" from the War Department for the company's patriotic service during the war. This citation is expressly for "making prompt deliveries and otherwise co-operating with the Construction Division of the Army." During the war Forbes pipe threading and cutting machines were supplied for pipefitting work in the cantonments, battleships and navy yards

Huntington, W. Va.—Largely to replace equipment destroyed during the ice jam of 1917-1918 in the Ohio River, the Island Creek Coal Co. has taken over the river equipment of the Pittsburgh Coal Co., paying for such equipment approximately $500,000. Announcement of the sale was made here during the week ended March 27. Included in the equipment purchased were steamers, barges and repair docks heretofore located at Burlington. However, the purchasing company is having the repair dock moved to Coal Haven, Ky., and rebuilt there.

Huntington, W. Va.—The W E. Deegans Consolidated Coal Co., which recently filed articles of incorporation with a capital of $5,000,000, has perfected its organization and is planning for active operations at an early date. The company has acquired under lease a total of about 15,000 acres of West Virginia and Kentucky coal properties, and is having plans prepared for the installation and operation of a total of ten mining plants. Modern machinery and equipment for all features is planned, and electric power for operation will be arranged for wherever possible.

Peoria, Ill.—The Peoria, Hanna City & Western Ry. has petitioned the Illinois Public Utilities Commission for authority to issue $125,000 in capital stock. The railway is four miles long and runs from Hollis Junction, a mile and a half west of this place and then up to Le March Creek, where the Newsam Brothers and the M E Case mines are located. The road was built to carry coal from the mines, and the capital stock is to be issued to pay the cost of building the road. The stock in the road is owned by the Newsam Brothers and several other stockholders.

Charleston, W. Va. — Recent details learned in connection with the organization of the Callan Coal Co. indicate that this concern will develop about 300 acres of coal land on Campbells Creek near Dana in Kanawha County. As the tract is a small one, the daily capacity will be limited to about 350 tons per day. However the property will be immediately developed. Officers of the Callan company just elected are: A. D. Calahan, of the Logan field (operating mines in that field), president; P. E. Gallagher, secretary.

New York, N. Y.—The United States Distributing Corporation, of this City, has announced that under a contract recently consummated, the Peabody Coal Co., which is operating the mines of the Sheridan-Wyoming Coal Co., Inc., a subsidiary of the United States Distributing Corporation, has become responsible for the sale of the entire output of the Sheridan mines. By this arrangement the United States corporation announces that a single selling agency replaces the six selling organizations previously maintained for the several mines involved with resulting substantial savings to the Sheridan-Wyoming Coal Co., Inc.

Clarksburg, W. Va.—The Peacock Coal Co., organized by Clarksburg people, has elected officers and arranged to develop a tract secured on March 27. The officers of the company are: Olandus West, president; J. Hornor Davis, vice-president; P. M. Robinson, treasurer; Carl Hornor, general manager; E. B. Templeman, secretary. The Peacock Coal Co. closed a deal with the Fairmont Big Vein Coal Co. for the purchase of a tract of coal land near Norwood, W. Va., on Nutter's Run. Development work on the newly acquired properties will begin at once and within a short time the company expects to produce coal. Headquarters of the company are in this city.

Fairmont, W. Va.—The Laurel Hill Coal Co. has completed negotiations for the purchase of the plant and holdings of the Byer Coal Co., located near Philippi, Barbour County, W. Va. It is understood that the new owner is arranging plans for improving and enlarging the plant with consequent increase in production. Included in the property is a tract of about 400 acres of Kittanning coal. J. E. Gaskill and Howard I. Connors, Fairmont, are prominent in the company.

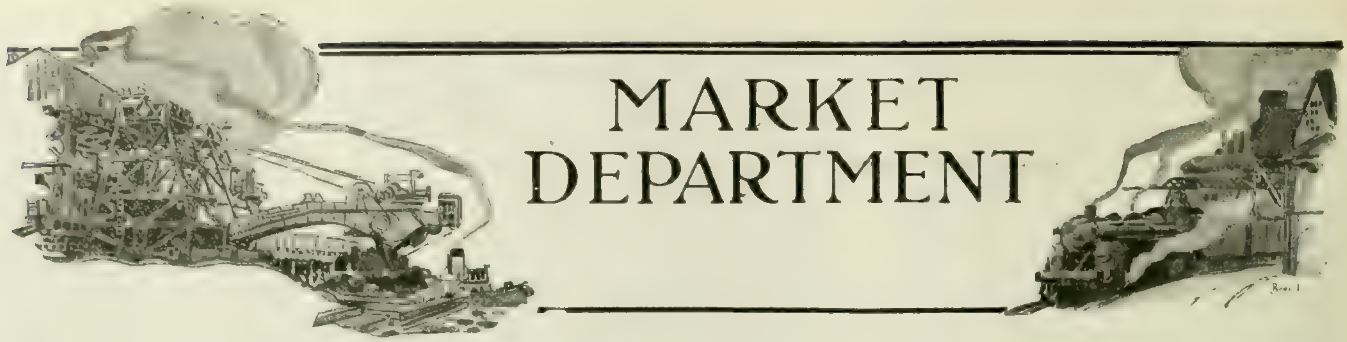
Kingston, W. Va.—Production will be largely increased by the Solvay Co., at its plant at this place, through the opening of a mine in the Powellton seam. The company for some time has been developing the Eagle seam. The Powellton seam here is about 150 ft. vertically above the Eagle seam, and it will be necessary to construct an incline, 1,200 ft. of railroad track and a headhouse. Under present plans it is also proposed to build a storage bin of about 100 tons capacity. Extensions and improvements are to be made to the company's power house so as to provide for the additional load required. As many more miners will be employed, it will be necessary to construct about 100 new dwellings for miners.

Chicago, Ill.—Announcement is made that the general offices of the Chicago Pneumatic Tool Co., of this place, were transferred on March 31, to the Chicago Pneumatic Building, a new 10-story structure erected for the exclusive use of the company at the corner of 44th St. and Fifth Ave., New York City. This move was accomplished without appreciable interruption to business; arrangements were so carefully planned in advance that the jump of this large organization, across half of the continent, was made with practically no interference to the normal routine of business. The Chicago district sales branch of the company, previously in the Fisher Building, has been moved to commodious new quarters at 300 North Michigan Boulevard. The Chicago service branch of the company, formerly at South Dearborn St., has been consolidated with the sales branch at the new address. Both departments will be under the direction of J. L Canby as district manager

New York, N. Y.—Of general interest is the combination recently announced of the organization of Westinghouse, Church, Kerr & Co., Inc., engineers and constructors, of New York, and Dwight P. Robinson & Co., Inc., constructing and consulting engineers of New York. The new company will be called Dwight P. Robinson & Co., Inc., and will occupy executive offices at 61 Broadway, and the engineering and designing offices in the Grand Central Palace, 125 East 46th St., New York. Dwight P. Robinson, the president of the new company, was for many years president of the Stone & Webster Engineering Corporation, and formed his own company in 1918. He has had an unusually extensive experience in the design and construction of industrial plants, the Stone & Webster company specializing in work of this nature. The Westinghouse, Church, Kerr & Co.—established 36 years ago—has also specialized in the design and construction of industrial plants of all kinds. In a way the activities of the two companies are largely supplemental, each making its own specialized contribution to the new company.

Charleston, W. Va.—During February 14 new companies were organized in West Virginia, the combined capital of all such companies being $6,465,000. Besides the new companies formed, 15 coal companies already in existence increased their capital stock to the extent of $2,500,000. The principal companies formed were as follows: Prowagstep Coal & Coke Co., of Cleveland, capital $200,000; W. E. Deegans Consolidated Coal & Coke Co., of Huntington, capital $5,000,000; Meadow Creek Coal Co., of Charleston, capital $100,000; Dearborn Coal Co., Stonewall, W. Va., $125,000; Little War Creek Coal Co., of Tralee, capital $500,000; Hooper Mankin Fuel Co., Huntington, capital $100,000; Tygarts River Coal Co., Philippi, $150,000. The principal companies in the state increasing their capital stock follows: American Fuel Co. to $2,500,000; Kanawha & Hocking Coal & Coke Co. from $3,500,000 to $5,000,000; Alvah Coal Co. to $250,000; Flat Top Fuel Co. to $200,000; Wolf Summit Coal Co. to $750,000; Cadle Ridge Coal Co. to $100,000; Rich Black Coal Co. to $150,000; Rhodell Coal Co. to $200,000; Ivy Branch Coal Co. to $100,000; West Virginia Eagle Coal Co. to $150,000; Lewiston Block Coal Co. to $150,000; American Eagle Colliery to $800,000; Chaplin Collieries Co. to $100,000

MARKET DEPARTMENT



Weekly Review

Freedom from Control of Bituminous Brings with It Sharp Advance in Prices—Many Buyers in the Market—Few Contracts Closed—Car Supply Still Hovers Around 50 Per Cent Mark—Coke Prices Advance Considerably

GREAT interest has been manifested during the past week in regard to the new prices that will become effective with the return to freedom from control in the bituminous-coal industry. The coal market has been in an excited condition and prices have advanced at a great pace. It is to be feared that the development of a steady market is still far off.

Some of the larger operators set out with a determination to hold their prices to conservative limits, but in few instances were these limits adhered to. This was due largely to the eagerness of the smaller operators to sell at the highest prices bid. Taken as a whole, there was not much contract business transacted.

Buyers were in the market in large numbers, but they were in there apparently to obtain quotations only. Large consumers did not seem to be in a hurry to refill their bins with spot coal. They preferred to wait until contract business could be transacted.

Production of both bituminous and anthracite did not show any marked increase. Some of the mines in the anthracite region that were affected by floods and were forced to shut down have not yet resumed operations.

In the Pittsburgh district a level seems to have been found for coking coal, which was selling for $4.50 and quite a number of small-lot sales have been consummated. The steel interests have been the principal buyers, as their needs are greatest and they are in the best position to pay fancy prices. An additional price of coal is but a small item if by paying it the production of steel is thereby increased.

Coal-car supply is not as satisfactory as could be desired. It hovers about the 50 per cent mark, but in the district around Pittsburgh it has fallen as low as 40 per cent. In southern Kentucky also a poor car supply is reported, the Knoxville division of the Louisville & Nashville reporting the extremely low figure of 9.8 per cent. Under such unfavorable conditions labor is deserting mine work.

In Missouri, Iowa, Nebraska and southern Illinois it is interesting to note that the opening prices on Pocahontas coal are almost prohibitive. As a result the retail trade in the states mentioned has turned to Oklahoma smokeless fuel, which the retail dealers consider as good, if not better than the West Virginia product.

The coke market opened with considerable vigor during the past week, at prices far above the Government price limits. Coke has advanced on an average about a dollar a day, but such conditions cannot last long, and a reaction seems inevitable. The market should stabilize at some reasonable level. With an average improvement in car supply in the coke region of about 10 per cent, the production rose to 254,552 tons, the highest point for the year to date.

At Norfolk and Newport News dumping proceeds slowly and for a full fortnight in March, coastwise steamers were on demurrage, as high as $2 per ton having been paid. Export business continues under permit.

WEEKLY PRODUCTION

The weekly report on the production of bituminous coal, anthracite and beehive coke, compiled by the Geological Survey, Department of the Interior, April 3, 1920, states that the production of soft coal during the week ended March 27 increased 5.5 per cent. Preliminary estimates place the total output (including lignite and coal [illegible]) at 10,[illegible] net tons, an [illegible] of [illegible] tons over the preceding week.

The cumulative production since the beginning of the year is shown in the following table with comparative figures for the three years preceding.

	Production First 74 Working Days
1917	133,466,000
1918	13[illegible],530,000
1919	104,202,000
1920	130,658,000

[illegible] 3,000,000 [illegible] slightly ahead of 1918 [illegible] its predecessor, 1919, by 26,450,000 tons.

Shipments [illegible] principal [illegible] estimated amounted to [illegible] during the week ended March [illegible] fuel and sales to local [illegible] a total production of 1,869,000 net tons, an increase of 112,[illegible] per cent over the preceding week.

The cumulative production of anthracite from the beginning of the coal year to March 27, 1920, amounted to 87,766,000 net tons. During the corresponding period last year it was 92,360,000 tons. With only three working days remaining, production for the current year is thus about four and a half million tons short of that of the year 1918-19.

An increase of 7 per cent in the production of beehive coke during the week of March 27, is indicated by the shipments over the 26 principal coke-originating roads. The total output is estimated at 501,000 net tons, as compared with 467,000 tons during the preceding week. This was the largest tonnage reported in any week since February, 1919.

The cumulative production since the beginning of the year is now 5,494,000 tons. Compared with the corresponding period of 1919, this is a decrease of 392,000 tons, or 7 per cent.

Atlantic Seaboard

BOSTON

Embargoes interfere with shipments. Movement improves very slowly. Spot prices firm and hard to control. Fewer contract offerings. Active demand at piers. Despatch again slow at Hampton Roads. Anthracite retail prices advance. Steam sizes in less request.

Bituminous—The New York Central embargo against the Boston & Maine and against the Boston & Albany has effectually shut off practically the whole of New England, so far as concerns coal either originating on or moving via that line to the all-rail gateways. Steam coal emanating on the Pennsylvania can reach certain points, either via the New York, New Haven and Hartford or the Boston & Maine except that the Delaware & Hudson was embargoed by the Boston & Maine on March 29

The New York Central embargo placed on March 25 is now expected to be lifted by April 5. The trade certainly hopes so, for there is increasing anxiety over the failure to get coal forward for April and May needs. The larger buyers, especially, are worried; an embargo of this kind, due to congestion because the Boston & Maine in particular is short of motive power, is regarded only as a forerunner of other and perhaps more serious traffic difficulties later on.

The differential is so much in favor of the all-rail route that there is bound to be a great effort on the part of consumers, railroads included, to get coal through channels from central Pennsylvania. Undoubtedly, there will be frequent tie-ups because of railroad congestion.

Coal that was started prior to March 26 is coming through reasonably well, although the improvement is anything but rapid. There are hundreds of cars now reaching destinations that were shipped around Jan. 15, certainly a record for slow movement into New England. Less is heard from confiscations, although there are rumors that the railroads intend to buy very sparingly for the present, relying upon their power of seizure in case they need coal before prices have receded.

The fact that shipment is now restricted so largely to coals originating on the Pennsylvania has led to what might almost be described as a buoyant market for spot coal. Pool 9 coals have been offered at as high as $4 75 per net ton, but takers have been few. Coals of medium grade are ranging from $4@$4 25, although there is a growing feeling among the more far-sighted operators that it would be a mistake to allow prices to soar. Under the award of the Coal Commission the prices quoted afford a handsome return in most cases, and it would be poor policy to invite new and drastic legislation this coming season.

At the same time there are the greedy few who want to reap while the harvest is good. They form the element that is extremely difficult to control. The attitude of several of large anthracite-producing companies in favor of granting their men a retroactive advance from April 1, but at the same time withholding any advance in price to the trade until the wage increase is agreed upon, is an instance of greater breadth of mind.

There have been distinctly fewer contract offerings the past week. The quality grades, or so much of the tonnage as could be saved for this territory, have now been placed, and buyers are not yet interested in buying the cheaper grades. There is also the feeling that if coals of lower quality will have to be bought the market will be more favorable to the buyer in July than it is now.

All grades are in good request at the Philadelphia and New York piers. The New York Central embargo has resulted in better movement to New York, but the market is readily absorbing all that comes down. On Long Island Sound there is an active market. From Hampton Roads, as well as all-rail, deliveries have been interrupted and were the weather colder there would be a great deal of anxiety over light stocks that are now the rule. Textile and other manufacturers are so prosperous that they will take no chance of shutting down and they are willing in most cases to pay the prices asked.

At Norfolk and Newport News despatch is still very slow. For a full fortnight in March coastwise steamers were on demurrage, as high as $2 per ton having been paid. This makes the on-cars price at Providence or Boston very close to $12. The retail price in Boston is now $11 75, and retailers acknowledge that at this rate per net ton this price is not adequate to cover costs. A strike of clerks on the Norfolk & Western has also had its effect on movement. Despatch is now from five to eight days at all the piers.

Anthracite—Domestic sizes continue in very strong demand. Even at higher barge freight rates retail dealer is bringing the strongest kind of pressure to get coal. Shipments have slowed up materially the past few days, dumpings at Philadelphia and New York having suffered because of car supply. All-rail the New York Central embargo has cut off several large sources supply and there is much anxiety over the outlook for April.

Meanwhile, the public is clamoring for next winter's fuel and even advanced prices do not lessen the demand. Effective April 1 Boston retail prices on egg, stove, and chestnut were increased $1, making the new price $14.50 per net ton delivered. In Providence, R. I. the new price is $15 including housing, and in Portland stove coal was fixed at $16.

Less is heard from the steam sizes. With what seems to be an increased opportunity to get bituminous there has been less inquiry for steam anthracite. This is only natural and could have been foreseen. At the same time the producing companies apparently have an ambition to advance the price on these coals.

NEW YORK

Retail dealers have not advanced prices. Buyers swarm the coal fields and bid against themselves. Bituminous market strenuous. Demand strong with supplies short. Operators endeavoring to keep prices down.

Anthracite—The situation remains strong and domestic coals are in heavy demand and while the supplies have been coming forward in fair shape there is not much free coal on hand. Wholesale dealers are heavily booked, some producers being sold ahead for several weeks.

Receipts have not been anywhere near normal because of the suspension on April 1 to celebrate the eight hour day and Good Friday, but the tonnage produced on the days the mines were operated show that the miners will follow the advice of their leaders and play their part in keeping up the output during the wage conferences.

Not all of the mines affected by the floods of several weeks ago have been restored to normal conditions and as a result tonnage remains below normal.

There has been no general announcement made as to what all the big producing companies will do with regard to billing coal sold after April 1, while the wage conferences are unfinished; that is whether it will all be billed at the regular winter prices or whether it will be sold subject to the new price to be fixed, inasmuch as the wage agreement is to be retroactive.

The retail dealers in this city have not changed the prices in force during the winter and are not likely to do so until the wholesale prices are altered. Most of the retailers in accepting orders for future delivery do so with the understanding that the coal is billed at the price current at time of delivery.

Demand for the domestic sizes is strong. Stocks with the retail dealers are not large and they are delivering steadily to their customers. Some dealers are employing extra trucks.

While the majority of independent operators are sticking closely to the 75c differential there are reports that some of the small operators are quoting as high as $9 at the mines. The mining regions are being constantly visited by buyers who are bidding against themselves and forcing higher quotations.

Steam sizes continue in good demand, the call for buckwheat being due in good part to the lack of bituminous. Rice is strong but the demand for barley is easier. One of the big producers has already announced increases in price of 35c. for buckwheat; 50c. for rice and 25c. for barley, making the mine prices $3.75 for buckwheat, $3 25 for rice and $2.50 for barley. No announcements have as yet come from other big producers. Independent product is in heavy call with quotations in some instances about 25c. higher than the company figures.

Current quotations for company coal per gross ton at mine and f.o.b., tidewater, at the lower ports are as follows:

	Mine	Tidewater
Broken	$5 95	$7 80
Egg	6 35	8 20
Stove	6 60	8 45
Chestnut	6 70	8 55
Pea	5 30	7 05
Buckwheat	3.40@3 75	5 15@5 50
Rice	2 75@3 25	4 50@5 00
Barley	2.25@2.50	4.00@4 25
Boiler	2.50	4.25

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—With the wage conferences ended and the operators knowing what the increases are going to be the bituminous situation has been clarified to a certain degree. The return of the industry to private control on April 1 did not cause any stir, the move having already been discounted.

There are as many different quotations heard as there are sizes of coals. Shippers have no great amount of coal to spare and in most cases the quotations given are subject to change within a few hours.

Buyers are around in large numbers and it is apparent that the quotations obtained are on a secondary consideration, with the result that they bid the market up among themselves.

Notwithstanding this effort on the part of some buyers to get coal at any prices no exorbitant quotations are heard and the great bulk of free coal obtainable is moving at fair prices considering the situation.

Many more contracts have been reported as closed and it is now thought that most operators have gotten all of this kind of business they want for this year. Many producers look forward to a good brisk market in free coals this summer and with better prices than now obtainable.

The producers are doing their best to keep prices within bounds when the high cost of production is considered. It has been pointed out that with the new wage scale in effect coal selling at $3 75 per ton will net the producer about the same as he received when the government maximum price of $2 95 was in force.

Quotations were numerous and varied during the couple of days last week following the removal of Federal control and shippers were not anxious to make them because of the uncertainty of deliveries. For Latrobe coals quotations of $4 75 were reported while Connellsville coal was quoted about 25c higher. Good Central Pennsylvania coals ranged from $3.75@$4.

PHILADELPHIA

Anthracite demand without limit. Retailers besieged with orders. Tonnage cut down by holidays. Increase in steam sizes fails to affect demand. Bituminous eagerly sought after. Government price off.

Anthracite — The strongest kind of demand exists for practically all the anthracite sizes. The decision of the miners to work after April 1 was thought likely to produce some cessation of ordering on the part of the consumers, but the contrary seems to be true. The fact that the companies decided to make all shipments up to the time of deciding upon the wage scale at the circular prices in effect all winter, has stirred the buyers to the point that they are besieging the retailers to take their orders.

The retail men are almost a unit in refusing to take business far in advance at a price, for the manner in which the companies announced the continuance of the present schedule leads to the opinion that the issuance of a new circular will come without further warning. This may be a few days, a week or maybe a month, although it is not thought generally it will be deferred beyond the end of the present month.

Most dealers do have a good tonnage of pea on hand, but are sending out more of this size than they are receiving. It would appear that users of this size who have not been accustomed to store it away are making efforts to put in a few tons, feeling possibly that the size will not be sold after a few weeks.

The trade is beginning to feel that the anthracite production reached its peak two years ago, when with the heavy tonnages yielded from the culm banks, the shipments reached the highest point in the history of the trade. Most dealers under these circumstances, realizing also the condition of labor at the mines, will be almost satisfied if they can keep their tonnage up to the past year. One thing is certain and that is that all companies will make their shipments on the allotment basis and already dealers who have complained about lean deliveries have been told they have had their proportion to date.

While the fact has not gained public attention, it is well known among the retail trade that the labor proposition with them is growing most difficult. Concurrently with the general unrest in labor at this time the laborers about the yards are quietly insisting on a higher rate of pay and, in many instances, dealers have privately increased wages. It is quite likely that with the coming of new wholesale rates the dealers will also be compelled to add quite a little to their gross margin to cover the rapidly increasing overhead, and coal is likely to come close to $15 a ton retail.

The increase in the price of buckwheat and rice coal has not had the least deterrent effect in the demand for those sizes. With the mounting prices of bituminous-steam coals, the call for all anthracite-steam sizes increases from day to day, until even barley is being taken in extremely heavy tonnages. Rice has been almost cleaned out of the big storage yards and while heavy tonnages of barley are still there, they are fast melting away and it is believed that with another three or four weeks of the present demand the yards will be absolutely bare of all sizes.

The individual shippers were quick to increase the price of buckwheat and rice following the lead of the companies and many of them went even higher, with sales of buckwheat close to $4.25 and rice $3 50.

Bituminous — With the removal of the Government restrictions as to prices on the first of the month the prices quickly mounted and the Government price of $2 95 was soon left in the background. There can be no denying that a good many houses were so anxious for business that the Government price had ceased to interest them for some weeks prior to April 1. Of course, various subterfuges to cover sales were taken advantage of.

As was predicted the spot market after being merely a name for a year came right back, with plenty of tonnage offering. Early in this week it was possible to buy good Pennsylvania steam coal at $3 75, but this quickly changed to $4 and from then it moved up by gradual stages until at this time $5 a ton is common and some is reported at $5.25, and a few even higher. Fairmont gas coals are being sold on an average from $4 75 for slack up to about $[illegible] for [illegible]-in., while slack sales are around $4 25. It is really difficult to quote prices and in the few instances that houses are making quotation they notify the consumer that they are for immediate acceptance.

Already there is quite a little criticism of the operators being made by the big consumers, particularly those who a few weeks ago were eagerly solicited to enter into new contracts. Many of them are extremely short of coal and felt the pinch the moment the spot market came into existence again. They feel that the shippers are taking advantage of the higher prices again and neglecting their contract obligations.

However, it is only fair to say for the more important elements in the trade that they are making serious efforts to curb the tendency to a runaway price market. These larger shippers have informed consumers that while they cannot quote a firm price for immediate shipment they will be willing to make purchases in the interest of the consumer at a fair commission over the figure at which they can procure coal. Time will only tell whether their efforts to curb the rising prices will be successful. At any rate it looks at this time as though the $6 spot price will soon be attained, in view of the short working time at the mines during the holiday season that is now upon us.

BALTIMORE

Trade enters April unable to make extensive contracts. All agree that both hard and soft-coal prices will advance. Domestic bituminous scarce in this district, while run of export coal improves.

Bituminous—The coming of April has so far not brought a definite basis of trading to the coal men here. While some contracting is being done the majority of coal handlers are holding off until the wage question and any other immediate factor that is likely to seriously touch soft-coal selling prices are settled.

The few contracts being made are on a basis of $4 or better, with the way left open to add new mining cost charges thereto. The trade has no doubt that the new price schedule will show an advance. While a number of handlers here say they expect to see coal selling in the spot market at a mine basis of from $4@$5, there are others who predict that it will go considerably beyond those figures.

Poor Car Supply Curtails Production

The short car supply and poor production in nearby coal districts is being reflected here in the light receipts of coal for consumption of plants in this territory. The coming of the Holy Week lay-off at the mines added a further immediate complication, but allowed an accumulation of empties for reinforcing the run of cars to the mines that should soon show beneficial results. The entire car supply in the coal regions touched by rail feeders here last week was around 50 per cent, a decrease from the previous.

The high run of cars on any day on the Baltimore & Ohio as a whole was 3,892 cars, and the low 981, with an average of around 2,300, excluding Good Friday lay-off. While many local plants were having difficulty in getting coal, the supply of fuel at Curtis Bay on export and bunker trading showed an increase, the total by days there running between 1,000 and 1,400 cars, while dumpings were from 123 to 254 cars per day. For the last week in March a total of about [illegible] tons of export coal was loaded here, and the figures for the first week in April promise to be slightly in excess of this.

Anthracite — Watchful waiting is now largely the policy of the local hard coal trade. This is not because they have not plenty of orders that they could fill at the [illegible] schedule of anthracite prices, as [illegible] consumers are now urging quick deliveries because they realize that the price of hard coal is sure to go up. The trouble is that the coal is not coming through from the mines in sufficient quantity to meet this demand promptly.

Eastern-Inland

PITTSBURGH

Excited market for prompt, with high prices. Operators holding off from contracting.

Naturally the [illegible] has been a very excited one [illegible] a great deal of [illegible] been [illegible] towards the [illegible] market. Large operators set out with a determination to hold their prices within what they considered conservative limits, but having doubt whether the market as a whole would stay within such limits they have been reserved about making sales, and thus the statements of large operators of what they expect in the market are not a sure criterion of what will occur.

High Prices Seen in Prompt Market

As to the prompt market, the resumption of trading at open prices saw high bids from consumers at the outset, and however conservative may have been the policy of large operators there were many small operators who were glad to sell at the highest prices bid. Sales of prompt lots have been made in the past few days at $4@$4.50 depending on various circumstances, including the grade of coal. Gas coal has readily brought somewhat more than steam coal. Just how long consumers will bid prices like these remains to be developed, but it seems quite possible that this prompt market may last for some time.

As to contracts it does not appear that any business has been done. Ten days ago, leading operators stated, on the basis of the report of the majority of the Robinson wage commission, that the expected to hold the contract market down to about $3.50, at the same time allowing it to be assumed that they had no doubt they would easily be able to secure such a price

With the slightly higher wage rates that it now seems are to be paid some of the operators are disposed to think of $3.75, particularly for gas coal. There is no doubt, furthermore, that operators are disposed to hold off from the making of contracts in fear, apparently, that if they should sell at their present idea of prices other operators would secure higher figures, and this would be objectionable. We quote the prompt market for mine-run, steam and gas, at $4@$4.50, and contract coal nominal at $3.50@$3.75, per net ton at mine, Pittsburgh district.

COLUMBUS

Uncertainty as to prices still continues in the Ohio coal trade. Producers and shippers are not making quotations and are holding off to see the trend of affairs. Demand for all grades continues good.

Contracting is being held in abeyance for the time being until it is seen what trend the market takes. Some bidding of high prices for coal is reported although on the whole, there is little doing in the way of taking orders. Producers as well as shippers are content to wait until the market settled to see "where they are at" so to speak and to get their breath.

Domestic demand is growing stronger and a large majority of the retailers are in the market for immediate shipment. The campaign to "buy early" is already bringing fruit and some householders are laying in their supply for the coming winter. Retail stocks are not large and with a good demand in sight dealers are rather anxious to secure extra stocks.

Dealers are trying to get Pocahontas and West Virginia splints. Pocahontas is coming in to a small degree while splints are coming in better than formerly. The large bulk of the trade is still in Hocking and Pomeroy grades. Retail prices are very uncertain as dealers announce that the usual margin of $2 over and above the price at the mines plus the freight will be changed.

Steam trade is active in every locality. Demand is good from rubber concerns, iron and steel factories and general manufacturing. In addition there is a movement to buy on the part of public service concerns and some state institutions will be supplied for six months in the future. Taking it all in all the steam trade is firm in every way with some bidding for choice steam grades.

Railroads are still using a fair tonnage and a large part of it is being confiscated. This restricts shipments to commercial users to a certain extent.

Production has not been improved in any of the Ohio fields. Car shortage still continues and as a result the output in the Hocking Valley has been but 50 per cent of normal. Pomeroy Bend, Cambridge and Crooksville have produced from 45 to 50 per cent during the past week. In eastern Ohio the official statement shows that the car supply was 44 per cent during the week.

No contracting for Lake shipment is reported as producers are still holding off to see what happens. Lake shippers are anxious for tonnage as there will be a good demand at the head of the lakes. April 1 was a holiday in every mining field and this still further reduced the output in all sections.

CINCINNATI

Early advances in coal prices are predicted, as the result of the miners' new wage scale which went into effect last week.

Retail dealers refuse to quote any prices because of the present uncertainty. They have not the least idea as to what they will have to pay the operators. It is the opinion of many operators that bituminous coal will sell around $8 a ton retail and smokeless lump will be around $10, because there is a scarcity of smokeless and this city will receive only 25 per cent of its normal smokeless coal supply this year.

It is said that the 27 per cent increase in wages allowed the miners will cause the prices of coal in this city to advance at once. The situation during the past week has changed little, the car supply still remaining the prime factor hindering production. While transportation conditions in various other sections of this state may be somewhat improved there is still a most marked shortage in this territory.

Producers generally have refrained from making contacts owing to the uncertainty of wages and also owing to the government price restrictions. With a prospect that a wage scale may be adopted at an early date and with government price restrictions no longer in existence there is believed that much tonnage will soon be under contract.

Up until the proclamation of the President terminated all control of the coal industry, except as to exports, coal produced in this vicinity was being confiscated on an unprecedented scale without any apparent reason and frequent effort to put a stop to such confiscation had proved to be unavailing.

Now that no more Regional Committees are functioning it is reasonable to suppose that the wholesale confiscation of coal, continued after the railroads were returned to private ownership will cease. However operators still report this practice in evidence and say they will take legal steps if it is not stopped immediately.

The market is very strong at the present time not only to take care of current needs but for storage purposes, industrial concerns desiring to store coal before there is material advances in prices. However it is possible for utilities and industries to secure fuel only in limited quantities owing to the inability of producers to ship.

The supply of coal for domestic purposes has been so small that dealers have been and are still unable to meet the demand even though warmer weather is prevailing. At the present rate of supply difficulty is being experienced by producers even in keeping contract customers supplied with enough tonnage to continue operation

Southern

LOUISVILLE

Car supply in Kentucky so far this year has been the worst ever known. No hope for much improvement in April. Mines working about half time as a whole. Demand keen.

Figures secured on car supply in Kentucky on the Louisville & Nashville, and throughout that system, show a deplorable condition. In February of this year supply over the system was 56.65, and in March it is believed that it will not run over 60 per cent, although all figures are not in yet. April is not expected to show any improvement over March, due to increased demand. The Hazard field up to and including March 27, averaged 40 per cent supply for the month. For the week of March 22, average working time at most of the mines was one and eight-tenths days. The Knoxville division of the Louisville & Nashville, on one day of the same week had 98 per cent car supply.

Under such conditions production is very low, and labor is deserting some fields to go into farming and other lines. There is a good demand for all grades, but it can not be supplied. Due to mild weather retail demand for block should drop, but consumers are expecting higher prices, and are ordering, and also asking prices for stocking.

Retailers plan advancement on April 1, of 55c. a ton gross margin, making the gross $2.75, instead of $2 20. This increase had been asked of the High Cost Commission before control was lifted.

It is reported that western Kentucky operators will absorb the 27 per cent wage increase in advancing block coal from $2 60 to $3 15@$3 25, with other grades on the usual differential.

Eastern Kentucky is saying very little, although there is a meeting this week of Hazard operators at Lexington, at which numerous matters will be discussed. It is believed that the eastern Kentucky people will advance prices anywhere from 50c to $1 a ton, as coal has been selling at considerably below what operators have felt that it should bring, especially the high grade gas and byproduct coals which have been in strong demand in the Harlan field.

While some traffic experts believe that car supply will be just as bad in April as it was in March, this view is not held by all operators. During March heavy snows, freezing engines, embargoes, blocked terminals, and general congestion held back movement of both empties and loads. From now on traffic should be much more open, and cars should function much better.

Lake Region

BUFFALO

Bituminous market wild—Prices changing rapidly. Jobbers return home from Pittsburgh dazed—Almost anything to be expected—Not likely to last—Anthracite very scarce.

Bituminous—All members of the trade are lost in an effort to size up the market and if possible, get something out of it before the collapse comes. If the car supply should increase to any great extent the present conditions will not last long. Some predict that prices will go up for a week or ten days and then slack off but nobody really knows what will happen. With prices going up a dollar or so every day or two in Pittsburgh this market is mostly looking on.

In fact there is no market here worth the name, if there is one anywhere else. It was only by a special effort that jobbers just back from Pittsburgh could be induced to say anything as to quotations. They protested that if they gave anything out it would not be likely to mean anything in 24 hours. With the beginning of the week Pittsburgh had no prices, as everybody was waiting for someone else, but by Tuesday quotations began to rise above those former government figures and in a day or two they were asking anywhere up to $5 at the mines for Youghiogheny gas coal and corresponding prices for everything else. It is agreed that this means a market gone crazy.

With the utmost reluctance was anybody induced to speak of the market in figures. What was given out was this: $3 for Pittsburgh slack, $3.25 for mine-run and $3 50 for lump, with Youghiogheny $4.50. To this add $1.75 freight for Buffalo. Of course at such a time as this Buffalo has nothing that approaches an independent market. The buying is practically all on orders received from consumers. If they agree to pay producers' prices then it is safe to buy, but nothing otherwise. The amount of what may be called eager caution necessary to do business is exceedingly great.

What the jobber wants to do is to get a line of production right away and then follow the rapid changes that are sure to follow. There is quite a fair natural demand, but consumers will not of course buy more than they need now. Cars are about as scarce as ever and they do not promise to become any plentier right away. It takes a bold and an experienced shipper to do anything satisfactory now.

Anthracite—Without assuming anything of the wild type of the bituminous market the hard-coal situation is anything but tranquil. No April prices have been given out yet, although they are expected any day. All that the shipping agents will say is that coal will be sold right along and no retroactive prices will be asked. That an advance will be put on in a few days is expected.

At the same time anthracite is very scarce. Everything but the weather has prompted consumers to buy and they are taking every pound that comes in. It will be sometime before the demand is satisfied. Coal will not be plentiful as yet for mining is sure to be light through the Easter season and the scarcity of cars adds further complications. All that the consumer can do is to find a friend in the retail trade and stick to him until he gets coal. Shippers will not need to reduce the prices before midsummer. It will be difficult to meet the demand. Still there is one comfort in that, for but for the summer buying last year the winter supply would have been exhausted, and it came near that as it was.

The prospect of anthracite for the Lake trade is very small yet. It is time that the loading began, but there is no coal to spare. At the same time the supply on the upper-Lake docks is little or nothing and if there is no new supply by May 1 somebody will go without coal.

TORONTO

Serious shortage of coal especially bituminous—Dealers behind in deliveries and refusing orders—Fuel Administrator regards outlook with anxiety.

There is a serious shortage of both anthracite and bituminous coal the shipments coming forward from the mines being quite inadequate to the demand. Dealers are overwhelmed with orders from consumers desirous of laying in supplies early in the season which they are unable to fill, and are generally refusing to accept new orders until they can overtake delayed deliveries.

The situation as regards bituminous is the worse. Industrial plants using coal are unable to lay in stocks and can only obtain hand-to-mouth supplies. H. A. Harrington, Fuel Administrator for Ontario has issued a statement to the effect that the outlook for the coming coal year gives call for grave anxiety and calls for prompt and efficient action.

He says that Ontario is 6,000,000 tons short of bituminous coal and though 35,000 tons should come in daily only 20,000 tons are actually arriving. He estimates the season's requirements at 18,000,000 tons.

Quotations per short tons are as follows:

Retail	
Anthracite egg, stove, nut and grate	$13.50
Pea	12.00
Bituminous steam	11 00
Slack	10 00
Domestic lump	12 00
Cannel	13 00
Wholesale f.o.b. cars at destination.	
Three-quarter lump	9.00
Slack	8 00

CLEVELAND

The question of price advances is wholly one of "how much?" Receipts are slowly but steadily increasing. No. 8 coal is now moving to Lake Erie ports for the Lake trade.

Bituminous—Price quite naturally appears to be the chief consideration at the moment, and it now develops that the new price schedule will be the result more of what buyers bid than what operators ask. The more conservative operators, who claim to be trying to restrict the increase to moderate size, say the advance will at least cover the entire 27 per cent wage advance. This would make No. 8 mine-run and slack, under the government schedule, $2.35 f.o.b. mine, at least $3. But $3.50@$4 are reported freely bid, while one operator is known to have been offered $5. In the face of these offers, which seem to be a surprise even to operators, $3@$3.50 mine-run and slack appears most conservative. How much headway these so-called conservative interests will be able to make in the face of $4@$5 offers at this moment is still a matter of opinion.

Thus far practically no contracting has ben done. The attitude both of operators and buyers confirms the belief that prices will mount up as the summer wears on and that a freight advance of at least 20 per cent is a certainty about Sept. 1. Buyers are more anxious to contract than operators are to sell. Steam-coal users are feverish in their efforts to place tonnage, virtually "shopping" from one operator's office to another's. Others are more cautious, fearing their offers may be used by operators in forcing up other bidders.

A Baltimore & Ohio purchasing official has vainly canvassed Cleveland operators in the last few days. In some quarters it is asserted that the railroads will put the brakes on a sky-rocketing market. That the carriers will provide a large car supply for operators who pass their needs by in the rush for soaring prices is asking too much.

For the present, No. 6 and No. 8 slack may be said to be going at $6@$6.25, No. 6 and No. 8 mine-run at $6.35@$6.60, and No. 8 ¾-in. at $6.60@$6.85. These prices are mere fill-in ones, to tide over the gap between the controlled market and the wide open one, than they are representative of new business. For domestic consumption No. 8 Pittsburgh coal still stands at $7 a ton, delivered, West Virginia splint is $8.30 and Massillon lump is $7.40 @$7.65. No. 8 district mines report car supply at about 60 per cent. Stocking continues at most Cleveland steam-coal users' plants, though on a limited scale. Domestic bituminous buying is a negligible quantity.

Pocahontas and Anthracite—Practically none of either grades is moving at present. Dealers, though, look for heavy summer buying. Prices on both grades are unchanged. Anthracite egg and grate may be had at $12.20 and chestnut and stove at $12.50. The minimum on Pocahontas shoveled lump is $9 and on mine-run $8.

Lake trade—Carrying charges for this season have been firmly established at 50c. a ton to Lake Superior and 60c. to Lake Michigan, and all contracting is being done on this basis. Some No. 8 coal is being loaded at Lake Erie ports, though, so far, not more than half a dozen Great Lakes freighters have been loaded. If the last cargo of the season reaches the head of Lake Superior before the last week of April the lake trade will be surprised.

DETROIT

Jobbers fear the frenzied buying by consumers will precipitate a run-away market. Market is in an unsettled condition.

Bituminous—Among some of the Detroit jobbers and wholesalers the fear is expressed that the coal trade will be brought into disrepute and perhaps under some form of restrictive regulation in consequence of the way prices are being advanced through efforts of some of the buyers to round up coal. These buyers, disregarding the usual trade channels have sent representatives to buy coal direct from producers in various fields.

In their excessive eagerness to supply their needs the men in the field are reported to be bidding against each other thus forcing prices to a level that is alarming to the mor. conservative jobbers, who believe that only great caution can avert a serious condition.

It is pointed out that the better class of iobbers and the leading operators do not desire to see a run-away market; that they believe such a development, particularly at this time, would work lasting injury to the trade. With the buyers rushing into the market and competing with each other in the attempt to get early coal shipments, jobbers say there is almost no limit to the level to which prices may be carried. The jobbers do not feel that the operators can be justly criticised, the fault for present conditions, in their opinion, resting with the buyers.

With the market in its unsettled condition and with very little coal being brought into Detroit, jobbers say it is impossible to give quotations that would possess any degree of stability.

Middle West

MIDWEST REVIEW

Interest centered this week in April prices, and on the day this market report is being written, but few operators in the Middle West territory are in a position to give to the trade an accurate quotation on the various sizes produced at the mines.

It is thought that all of the coal fields in Illinois and Indiana will establish their prices from the Franklin County operators, who have set their price on 6 in. Lump, 6 x 3-in. Furnace, and 3 x 2 in. Small Egg, from $3.55@$3.40 f.o.b. mines. As it is to be expected, the producing mines in the Springfield and other districts, not so favored as the Franklin County field, will probably quote an opening price five or ten cents below Franklin County prices.

The demand for coal, both on the part of steam-coal buyers, retail coal merchants, and the public in general, keeps up in an unprecedented manner. A call was received a few days ago, from a retail dealer who has a large yard in central Iowa. This man has been in the retail coal business for twenty-seven years, and he stated that in his district the buying public had absolutely stampeded, and were in a panic for coal.

As this retailer was fortunate in having a big supply of coal on hand, he did more business in the month of March than ever before in any one month in his career in the coal business. We are giving this as an example of the state of mind of the coal buying public, out here in the Middle West. This dealer's experience so far as the demand for coal is concerned, can be duplicated in countless cases, but unfortunately most of the dealers have but small supplies of coal on hand. The opening prices on Pocahontas coal are so high that this grade of coal is becoming almost prohibitive in the Middle Western states, such as Missouri, Iowa, Nebraska and southern Minnesota.

As a result, the retail trade in the states just mentioned have turned to Oklahoma smokeless coal. It is claimed by many retailers that Oklahoma smokeless coal is as good if not better, than Pocahontas coal, as it resembles it very closely in appearance and burning qualities, with the exception that it holds its fire far longer than New River or Pocahontas. This coal can be produced and sold in the above states at prices under New River and Pocahontas. The high prices of the West Virginia operators have served to introduce in a very large scale, coals which were formerly but little known.

The car supply in the Indiana and Illinois producing fields is still very poor, although it is hoped that conditions will better themselves during the early part of April. The demand for coal, from both states, has kept up very strongly. In fact it looks as if it would take several months run, on a 100 per cent basis, to catch up for the time lost during the strike and that period after the strike when the car supply was, and still is, inadequate.

Every coal man knows that last February it was almost impossible to give away coal, let alone sell it. The public had so much coal on hand they were not interested in coal even at reduced prices. It is believed that the rest of the charges are just as unreasonable as the one mentioned above. It is safe to say that the men under indictment have the backing and sympathy of the entire coal industry in the Middle West.

CHICAGO

Coal is arriving in Chicago in fairly satisfactory quantities, although but few dealers have been able to get enough coal on hand to stock their bins.

The public is buying coal just as fast as it arrives. The steam and retail trade are very anxious to place their orders and are having some difficulty in so doing. While no definite prices have actually been established by circular for the month of April, we are publishing herewith what we believe will be the opening prices for the month, f.o.b. mines

		Freight rate Chicago
Illinois		
Southern Illinois		
Franklin, Saline and Williamson Counties		
Prepared Sizes...	$3.15 @ $3.40	$1.55
Mine-Run	3.00 @ 3.10	1.55
Screenings......	2.60 @ 2.75	1.55
Central Illinois		
Springfield District		
Prepared Sizes..	$3.00 @ $3.25	$1.32
Mine-Run	2.75 @ 3.00	1.32
Screenings	2.50 @ 2.60	1.32
Northern Illinois		
Prepared Sizes...	$4.00 @ $4.50	$1.24
Mine-Run	3.50 @ 3.75	1.24
Screenings . . .	3.00 @ 3.25	1.24
Indiana		
Clinton and Linton		
Fourth Vein		
Prepared Sizes...	$3.00 @ $3.25	$1.27
Mine-Run . . .	2.75 @ 2.90	1.27
Screenings . . .	2.50 @ 2.65	1.27
Knox County Field		
Fifth Vein		
Prepared Sizes...	$3.00 @ $3.15	$1.37
Mine-Run	2.75 @ 2.90	1.37
Screenings	2.50 @ 2.60	1.37
Brazil Block	$4.25 @ $4.50	$1.27
Eastern coals		
Pocahontas and New River Coals		
Prepared Sizes...	$5.00 @ $6.00	$2.65
Mine-Run	4.00 @ 4.50	2.65
West Virginia Splint and Gas Coal		
Prepared Sizes....	$4.25 @ $4.75	$2.65
Mine-Run	3.75 @ 4.25	2.65
Southeastern Kentucky		
Hazard, Harlan and [illegible]		
Prepared Sizes	$4.50 @ $4.75	$2.45
Mine-Run.......	3.75 @ 4.25	2.45
[illegible]	$4.50 @ $5.25	$2.60

[illegible] these prices widest differ[illegible] coals were found especially coals from the New River and Pocahontas fields. Some sales agents and producers state that they [illegible] Pocahontas prepared [illegible] per ton f.o.b. mines, while mine-run will be anywhere [illegible]

[illegible] southeastern Kentucky field, [illegible] true, it will [illegible] fancy domestic [illegible] believed that [illegible] southeastern Kentucky [illegible] $4.75 for their domestic [illegible] heard that some jobbers [illegible] from $5. @ $5.25.

ST. LOUIS

Work has resumed April 2 in a general way throughout the Illinois field.—Car shortage still prevails. Demand eased up. Country domestic demand fair.

The uncertainty that came with April 1 still prevails to a certain extent. Throughout the field there was no work on the first, but with the second perhaps two-thirds of the miners responded at mines where there was work. The feeling is that the entire force will return after the Easter holidays.

The operators are somewhat at sea as to what the increased cost in the Illinois field will amount to. It is figured that it will average about 50c. per ton on the mines that work full time and may be as high as 75c. per ton on mines located on railroads that furnish cars for one and two days a week.

The shortage of cars is still as severe as it has been for sometime. There is nothing to indicate unless the demand lets up that cars will become any more plentiful. As a matter of fact, looking far enough ahead, it is doubtful whether there will be as much equipment tonnage in use in September and October for the movement of coal as there is today in the Middle West.

The local steam demand is pretty well taken care of on storage coal. Locally the domestic demand is easy excepting on storage coal for next winter of the higher grades, such as anthracite, smokeless, coke and Carterville. There are no prices fixed as yet on the anthracite or coke retail

In the Standard field there is likely to be an easing up on all sizes in the very near future. The easing up will be more pronounced in this field than elsewhere in Illinois, but it will not be sufficient to force a surplus of empty equipment.

In the Mt. Olive field conditions are expected to be considerably better than in the Standard field. The chances are that these mines will find a place for the tonnage every day the cars are furnished, for all sizes.

Car shortage still prevails in all fields. There is every reason to believe that most of the railroads will begin early buying this year. The Missouri Pacific is still in bad shape for coal and continues its policy of confiscating coal because of its inability to purchase. It is the one unfortunate blot at the present time in transportation circles in the Middle West.

It is anticipated that not more than twenty per cent of the anthracite needed for this market will be shipped this year and practically no smokeless. The prices effective April 1 retail were:

Standard lump...	$5.00
Mt. Olive lump...	6.00
Carterville lump and egg............	$6.75 @ 7.00

The prices f.o.b. mine effective April 1, were:

Standard 2-in. lump..................	$2.75 @ 2.85
6-in. lump, egg and nut.......	2.75 @ 3.00
Screenings..........	2.50
Mt. Olive lump, egg and nut.....	3.00 @ 3.25
Carterville lump, egg and nut.........	3.25 @ 3.40
Mine-run from all fields...........	2.65 @ 2.80

	Williamson and Franklin Counties	Mt. Olive and Staunton	Standard
Prepared sizes (lump, egg, nut, etc.).......	$3.25 @ 3.40	$3.00 @ 3.25	$2.75 @ 3.00
Mine-run.....	2.65 @ 2.80	2.65 @ 2.80	2.65 @ 2.80
Screenings...	2.50 @ 2.65	2.50 @ 2.65	2.50

Williamson-Franklin rate to St. Louis is $1.10; Other rates 95c.

MILWAUKEE

Coke prices advanced 75c. per ton. Coal handlers decide to postpone action on coal advance until May 1. Coal scarce, but some anthracite is now coming by rail.

The expected advance in coal prices on April 1 did not materialize as far as Milwaukee is concerned. The present supply of coal here is practically all sold and no change will be made in the price schedule until May 1. Coke took a jump of 75c. per ton, however, egg, range and nut sizes selling at $13.25 and pea coke at $10.25. "We expect a general raise in the price of coal here," said Edw. A. Uhrig, president of the Milwaukee-Western Fuel Co., the leading dock company, "but it is impossible to estimate what the increase will be.

"A large percentage of the coal used here comes from Eastern and Southern fields and there is strong competition at these points at present between American and foreign buyers. European buyers are offering fancy prices, which will naturally boost values all along the line." The market at Milwaukee is normal for this season of the year. The supply is poor, but fortunately mild, spring weather prevails.

Pacific Coast

SEATTLE

Quotations at the present time are as follows:

Seattle—$6.75 per ton 2000 lb., f.o.b. bunker tips.

Tacoma—$6.75 per ton 2000 lb., f.o.b. bunker tips.

Portland—$8.75 per ton 2000 lb., f.o.b. bunker tips.

Portland—$9.50 per ton 2000 lb., in the stream over the ship's rail.

The above rates apply to the standard grades of Black Diamond and South Prairie coal.

Quotations on British Columbia coal in Seattle Harbor are as follows:

Comox Lump—$10.00 per ton of 2240 lb., f.a.s.

Comox Marine Mixture $9.85 per ton 2240 lb., f.a.s.

SAN FRANCISCO

Dealers are much encouraged by the newly-acquired habit of householders putting in stocks of coal in the spring and summer for next winter. The practice was begun in the war period under the impression that it was patriotic and has gone over into these days following the great conflict. Factories and manufacturing plants hereabouts mostly use oil but those burning coal try to keep quite a stock on hand.

The weather is so mild there is no difficulty in either getting the coal here from the mines of Utah and Wyoming or in distributing it when it comes. Prices are unchanged at this writing.

The bunker price at present is $13.55, which has been maintained for some time. For domestic use, bituminous prices from Utah and Wyoming, f.o.b. net ton, are: Stove, $3.65; Lump, $3.65.

Coke

CONNELLSVILLE

High opening prices after ending of Government control, and still higher prices afterward. Trading confined to April shipments.

The Connellsvile coke market had a wild opening after the removal of Government price restrictions. While the limitations did not come off until the end of March, trading began before that time as it was for shipment and invoicing April 1 and later. There had been practically no coke to spare after contracts had been taken care of, but a great deal of business expired at the end of March, and this seemed to leave more uncovered consumption than unsold production.

The opening transactions were at $9 for furnace coke. One or two sales for April were made at this figure, together with a few odd lots and one contract for a small monthly tonnage to the end of the year. While predictions had been made that the market would find itself at about $9, it began to advance immediately after the opening transactions, from 50c to $1 a day, until a fairly steady level has obtained in the past two or three days, this being at $11@12 for furnace coke and $13@14 for foundry coke, per net ton at ovens.

Furnaces might possibly have been willing to contract for the remainder of the year at $9 or thereabout, but when the market advanced so far above that level the trading settled down to April delivery exclusively, and most of the unsold production of the month has now been taken up. Of course many contracts had been made for the half year, that tonnage having nothing to do with the present market

The *Courier* reports production in the Connellsville and Lower Connellsville region in the week ended March 27 at 254,552 tons, an increase of 5,312 tons.

BUFFALO

The coke market partakes fully of the wildness of bituminous coal, the latest quotations being $12 for 72-hr. foundry at the ovens and $10 for 48-hr furnace. To these prices add $2.60 freight for Buffalo. No low grades are offered. Buffalo is preparing to do a good amount of smelting this season and ore will begin to come in just as soon as the ice is out of the lakes. The present warm weather promises an earlier opening of the Lakes than was expected, but the ice is still heavy. Work on the Donner-Union coke plant on Bufalo creek in the city progresses, but a report this week states that no coke is likely to be made there before fall.

CURRENT PRICES—MATERIALS & SUPPLIES

IRON AND STEEL

PIG IRON—Quotations compiled by the Matthew Addy Company

	Current	One Month Ago
CINCINNATI		
No. 2 Southern	$44 60	$44 60
Northern Basic	42.80	42 80
Southern Ohio No. 2	43.80	43.80
NEW YORK, Tidewater delivery		
2X Virginia (silicon 2.25 to 2.75)	48.65	47 65
Southern No. 2 (silicon 2.25 to 2.75)	47.70	47.70
BIRMINGHAM		
No. 2 Foundry	41.00	41.00
PHILADELPHIA		
Eastern Pa., No. 2 x 2 25 2 .75 sil	45.35 46 35*	45 35 46 35*
Virginia No. 2	44 25*	43 25*
Basic	43.00†	43 00†
Grey Forge	42.50*	42 50*
CHICAGO		
No. 2 Foundry Local	43.25	43 25
No. 2 Foundry Southern	46.60	46.60
PITTSBURGH, including freight charge from the Valley		
No. 2 Foundry Valley	43.65	43 65
Basic	42.90	42 90
Bessemer	43.40	43.40
MONTREAL		
Silicon 2.25 to 2 25%	43 25	43.25

* F. o. b. furnace. † Delivered.

STRUCTURAL MATERIAL—The following are the base prices, f o b mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

	Mill Pittsburgh	New York Current	New York One Year Ago	St. Louis	Chicago
Beams, 3 to 15 in	$2.45@$4	$3 97@ $5	$3 47	$4 04	$3 97
Channels, 3 to 15 in	2.45@ 4	3.97@ 5	3 47	4 04	3 97
Angles, 3 to 6 in., ¼ in. thick	2.45@ 4	3.97@ 5	3 47	4 04	3 97
Tees, 3 in. and larger	2.45@ 4	4.02@ 5	3 52	4 04	4 02
Plates	2.65@ 4	4.17@ 5	3 47	4 24	4 17

BAR IRON—Prices in cents per pound at cities named are as follows:

Pittsburgh	Cincinnati	St. Louis	Birmingham
4.25	3.50	3.44	4.25

NAILS—Prices per keg from warehouse in cities named:

	Mill Pittsburgh	St Louis	Chicago	Birmingham	San Francisco	Dallas
Wire	$4 00	$4.50	$4 15	$5.75	$5 50	$6 90
Cut		5.40	7.00	....	6.90	7.40

TRACK SUPPLIES—The following prices are base per 100 lb. f.o.b. Pittsburgh for carload lots, together with the warehouse prices at the places named:

	Pittsburgh	Chicago	St. Louis	San Francisco	Birmingham
Standard railroad spikes 9/16-in. and larger	$4 00	$3 62	$4 44	$5.65	$5.50
Track bolts	4.90-5.00	4.62	Prem.	6.65	7.50
Standard section angle bars	2.75	3.02	.27	4.90	....

COLD FINISHED STEEL—Warehouse prices are as follows:

	New York	Chicago	Cleveland	St. Louis
Round shafting or screw stock, per 100 lb. base	$5.50	$5 40	$5.50	$5.00
Flats, squares and hexagons, per 100 lb. base	6 00	5 90	5 50 6 00	5 50

HORSE AND MULE SHOES—Warehouse prices per 100 lb. in cities named:

	Mill Pittsburgh	Cincinnati	Chicago	St. Louis	Birmingham
Straight	$5.75	$7.50	$7.00	$7 25	$7 00
Assorted	5.85	7.50	7.15	7.50	7.25

Cincinnati—Horseshoe nails sell for $4.50 to $5 per 25-lb. box.

CAST-IRON PIPE—The following are prices per net ton for carload lots:

	New York Current	New York One Month Ago	New York One Year Ago	Chicago	St. Louis	San Francisco	Dallas
4 in	$75 30	$70 30	$60.70	$77.80	$71 00	$93 55	$70 30
6 in. and over	72.30	67.30	57.70	74.80	68 00	90.55	67.30

Gas pipe and 16-ft. lengths are $1 per ton extra.

STEEL RAILS—The following quotations are per ton f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5c. per 100 lb. is charged extra:

	Pittsburgh Current	Pittsburgh One Year Ago	Chicago Current	Chicago One Year Ago
Standard Bessemer rails	$55.00	$55.00	$45.00 @ $55 00	$65.00
Standard openhearth rails	57.00	57 00	47.00 @ 57 00	67.00
Light rails, 8 to 10 lb.	2.585*@3 75	3.135	2.585*@ 3 75*	3 135*
Light rails, 12 to 14 lb.	2.54* @3 75	3.09*	2.54* @ 3 75*	3.09*
Light rails, 25 to 45 lb.	2.45* @3.75	3.00*	2.45* @ 3 75*	3 00*

* Per 100 lb.

OLD MATERIAL—The prices following are per gross ton paid to dealers and producers in New York. In Chicago and St Louis the quotations are per net ton and cover delivery at the buyer's works, including freight transfer charges

	New York	Chicago	St. Louis
No 1 railroad wrought	$33 00	$27 00	$25 50
Stove plate	31 00	31 00	30 50
No. 1 machinery cast	41 00	38 75	
Machine shop turnings	16 50	13 75	15 00
Cast borings	19 00	14 00	15 00
Railroad malleable cast	29 00	28 00	26 00
Rerolling rails	33 00	32 50	32 50
Relaying rails	50 00	40 00 50 00	50@55

COAL BIT STEEL—Warehouse price per pound is as follows:

New York	Cincinnati	Birmingham	St. Louis	Chicago
$0 10	$0 16½	$0 18	$0 11	$0 15

DRILL STEEL—Warehouse price per pound:

	New York	St. Louis	Birmingham
Solid	14c.	13c.	15c.
Hollow	16c	...	.

PIPE—The following discounts are to jobbers for carload lots on the Pittsburgh basing card, discounts on steel pipe, applying as from January 14, 1920, and on iron pipe from January 7, 1920:

Inches	Steel Black	Galv.	Inches	Iron Black	Galv.
BUTT WELD					
⅛, ¼ and ⅜	47	20½	¾ to 1½	34½	18
½	51	36½			
¾ to 3	54	41½			
LAP WELD					
2	47	34½	2	28½	14
2½ to 6	50	37½	2½ to 6	30½	17½
BUTT WELD, EXTRA STRONG PLAIN ENDS					
⅛, ¼ and ⅜	43	25½	¾ to 1½	34½	19½
½	48	35½			
¾ to 1½	52	39½			
LAP WELD, EXTRA STRONG PLAIN ENDS					
2	45	33½	2	29½	16
2½ to 4	48	36½	2½ to 4	31½	19
4½ to 6	47	35½	4½ to 6	30½	18½

Stocks discounts in cities named are as follows:

	New York Black	New York Galvanized	Cleveland Black	Cleveland Galvanized	Chicago Black	Chicago Galvanized
¾ to 3 in steel butt welded	46%	24%	40%	31%	54%	40%
3½ to 3 in. steel lap welded	35%	20%	42%	27	50%	37.%

Malleable fittings. Class B and C, from New York stock sell at list + 23%. Cast iron, standard sizes, net.

WIRE ROPE—Discounts from list price on regular grades of bright and galvanized are as follows.

	New York and St. Louis
Hercules red stand, all constructions	20%
Patent flattened strand, special and cast steel	20%
Patent flattened strand, iron rope	5%
Plow steel round strand rope	35%
Special steel round strand rope	30%–10% and 5%
Cast steel round strand rope	22½%
Iron strand and iron tiller	5%
Galvanized iron rigging and guy rope	+12%

San Francisco: Galvanized, less 5%, bright less 25%.
Chicago, +12½ on galvanized, 30 off on bright.

STEEL SHEETS—The following are the prices in cents per pound from jobbers' warehouse at the cities named:

Blue Annealed	Large Mill Lots Pittsburgh	New York Current	New York One Year Ago	Cleveland	Chicago
No. 10	3 55-4 00	7 00- 8 00	4 57	7 30	6 02
No. 12	3 60 4 05	7 05- 8 05	4 62	7 40	6 07
No. 14	3 65 4 10	7 10- 8.10	4 67	7 45	6 12
No. 16	3 75 4 20	7 20- 8.20	4.77	7.55	6 22
Black					
Nos. 18 and 20	4 15-4 80	7 80- 8 80	5 42	7 95	6 80
Nos. 22 and 24	4 20-4 85	7 85- 8 85	5 47	8 00	6 85
No. 26	4 25 4 90	7 90- 8 90	5 52	8 05	6 90
No. 28	4 35-5.00	8 00- 9 00	5.62	8 15	7 00
Galvanized					
No. 10	4 70-6 00	8 50 10 00	5 97	8 50	7 15
No. 12	4 80 6 10	8 60 10 10	6 02	8 60	7 20
No. 14	4 80 6 10	8 60 10 10	6 07	8 60	7 35
Nos. 18 and 20	5 10-6.40	8 90 10 40	6 37	8 90	7 65
Nos. 22 and 24	5 25-6.55	9 05 10.55	6 52	9 05	8 05
No. 26	5 40-6.70	9.20 10 70	6 67	9 20	8 20
No. 28	5 70 7 00	9 50 11 00	6 97	9 50	8 50

SHOP SUPPLIES

NUTS—From warehouse at the places named, on fair size orders, the following amount is deducted from list:

	New York Current	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago	St. Louis Current
Hot pressed square	+$2 00	$1.00	$1.25	$1.45	$0.98	$2.25
Hot pressed hexagon	+ 2 00	1.00	1.05	1.45	0.78	2.25
Cold punched square	+ 2 00	1.00	.75	1.05	1 00	2 25
Cold punched hexagon	+ 2 00	1.00	.75	1.05	1.00	2 25

Semi-finished nuts, 5/16 and smaller, sell at the following discounts from list price:

	Current	One Year Ago
New York	60%	50–10%
Chicago	50%	50%
Cleveland	60–10%	50–10%
St. Louis	45%	....

MACHINE BOLTS—Warehouse discounts in the following cities:

	New York	Cleveland	Chicago	St. Louis
¾ by 4 in. and smaller	25%	50%	35–5%	50–5%
Larger and longer up to 1 in. by 30 in.	15%	40%	25–5%	40–5%

WASHERS—From warehouses at the places named the following amount is deducted from list price:

For wrought-iron washers

New York........$1.50 Cleveland.........$4.50 Chicago..........$3.00

For cast-iron washers the base price per 100 lb. is as follows:

New York $7 00 Cleveland........$3.75 Chicago. $4.25

RIVETS—The following quotations are allowed for fair sized orders from warehouse

	New York	Cleveland	Chicago
Steel 5/16 and smaller	30%	55% off	45%
Tinned	30%	55% off	45%

Boiler, ½, ¾, 1 in. diameter by 2 in. to 5 in. sell as follows per 100 lb.:

New York..$6.00 base Cleveland..$4.00 Chicago..$4.97 Pittsburgh..$4.72

Structural, same sizes:

New York $6.10 Cleveland. $4.10 Chicago $5 07 Pittsburgh. $4 82

CONSTRUCTION MATERIALS

LINSEED OIL—These prices are per gallon

	New York		Cleveland		Chicago	
	Current	One Year Ago	Current	One Year Ago	Current	One Year Ago
Raw, 5-bbl. lots	$1 87	$1 55	$2.05	$2 10	$2.05	$1 66
5-gal. cans	1 87*	1 70	2.25	2.25	2.30	1 86

*To this *oil* price must be added the cost of the cans (returnable), which is $2 25 for a case of six

WHITE AND RED LEAD—Base price

	Red				White	
	Current		1 Year Ago		Current	1 Year Ago
	Dry	In Oil	Dry	In Oil	Dry and In Oil	Dry and In Oil
100-lb. keg	15 50	17.00	13 00	14 50	15.50	13.00
25 and 50-lb. kegs	15 75	17 25	13.25	14 75	15.75	13.25
12½-lb. keg	16 00	17.50	13.50	15 00	16.00	15.50
5-lb. cans	18 50	20 00	15 00	16.50	18.50	15 00
1-lb. cans	20 50	22 00	16 00	17 50	20.50	16 00

500 lb. lots less 10% discount. 2000 lb. lots less 10–2½% discount.

COMMON BRICK—The prices per 1000 in cargo or carload lots are as follows:

Chicago	$14.00	Cincinnati	$19 00
St. Louis, salmon	16.00	Birmingham	15 00

PREPARED ROOFINGS—Standard grade rubbered surface, complete with nails and cement, costs per square as follows in New York, St. Louis, Chicago and San Francisco.

	1-Ply		2-Ply		3-Ply	
	C.l.	L.c.l.	C.l.	L.c.l.	C.l.	L.c.l.
No. 1 grade	$2 00	$2 25	$2 50	$2 75	$3 00	$3.25
No. 2 grade	1.70	1.95	2.15	2.40	2.50	2.75

Asbestos asphalt saturated felt (14 lb. per square) costs $17.00 per 100 lb.

Slate-surfaced roofing (red and green) in rolls of 108 sq.ft. costs $3.00 per roll in carload lots and $3.25 for smaller quantities.

Shingles, red and green slate finish, cost $7 25 per square in carloads, $7.50 in smaller quantities, in Philadelphia.

ROOFING MATERIAL—Prices per ton f. o. b. New York and Chicago:

	Carload Lots		Less Than Carload Lots	
	N. Y.	Chicago	N. Y.	Chicago
Tar felt (14 lb. per square of 100 sq. ft.)	$99 00	$97 00	$101.00	$99 00
Tar pitch (in 400-lb. bbl.)	25.00	22.00	26 00	23 00
Asphalt pitch (in barrels)	40.00	40.00	43.50	43 50
Asphalt felt	98 00	98 00	100 00	106 00

HOLLOW TILE—Price per block in carload lots for hollow building tile:

	4x12x12	8x12x12	12x12x12
St. Paul	$0 087	$0.158	$0 248
St. Louis	12	.23	31
Seattle	.09	.175	.30
New Orleans	.165	.22	.325
[illegible]	065	115	..
[illegible]	1194	2122	..
[illegible]	101	18925	2864
Birmingham	126	.224	

LUMBER—Prices of pine per M in carload lots

	1-In. Rough 10 In. x 16 Ft.	2-In. T. and G. 10 In. x 16 Ft.	8 x 8 In. x 20 Ft
St. Louis	$53 00	$46 00	$42 00
Birmingham	59 00	[illegible] 00	70 00
[illegible]	60 00	60 00	55 00

EXPLOSIVES—Price per pound of dynamite in small lots and price per 25-lb keg for [illegible]

	Low Freezing	Gelatin			Black Powder
	[illegible]	40%	60%	80%	
New York		$ [illegible]	$3 45	.	$2 30
Boston	$0 [illegible]	245 28	25 31	$0 3525	2.40
Kansas City	[illegible]	26	385	.3275	2.40
New Orleans	[illegible]	2275	2475	....	
Seattle	[illegible]	2175	2475	.29	2 45
Chicago	.2175	2525	2975	34	2.45
St. Paul	.185	2275	2525		2 25
St. Louis	.2175	26	.285	295	1.90
Los Angeles	.25	30	[illegible]	275	2 95

MISCELLANEOUS

GREASES—Prices are as follows in the following cities in cents per pound for barrel lots:

	Cincinnati	St. Louis	Birmingham
Cup	8 5	3.7-3.8	8 5
Fiber or sponge	8 5	7.2	8 5
Transmission	10	14.	8 5
Axle	5	5	4 5
Gear	6 5	6 5	8 5
Car journal	12 0	4 7	8 5

BABBITT METAL—Warehouse prices in cents per pound:

	New York		Cleveland		Chicago	
	Current	One Year Ago	Current	One Year Ago	Current	One Year Ago
Best grade	90.00	87.00	70.00	80.00	70.00	75.00
Commercial	50.00	42 00	20.00	21.50	15.00	15.00

HOSE—Following are prices of various classes of hose:

Fire

	50-Ft. Lengths
Underwriters' 2½-in.	78c. per ft.
Common, 2½-in.	35%

Air

	First Grade	Second Grade	Third Grade
¾-in. per ft.	$0.55	$0.35	$0.25

Steam—Discounts from list

First grade 25% Second grade 35% Third grade 40%

LEATHER BELTING—Present discounts from list in cities named:

	Medium Grade	Heavy Grade
New York	2[illegible]%	10–5%
St. Louis	40%	35%
Birmingham	35%	30%
Chicago	45%	40%
Cincinnati	30 5 2½%	40 2½%

RAWHIDE LACING— For cut, best grade, 25%, 2nd grade, 30%. For laces in sides, best, 81c.

PACKING—Prices per pound

Rubber and duck for low-pressure steam	$1.00
Asbestos for high-pressure steam	1.70
Duck and rubber for piston packing	1.00
Flax, regular	1.20
Flax, waterproofed	1.70
Compressed asbestos sheet	.90
Wire insertion asbestos sheet	1.50
Rubber sheet	50
Rubber sheet, wire insertion	.70
Rubber sheet, duck insertion	.50
Rubber sheet, cloth insertion	.30
Asbestos packing, twisted or braided, and graphited, for valve stems and stuffing boxes	1.30
Asbestos wick, ½- and 1-lb. balls	.85

MANILA ROPE—For rope smaller than ¾-in. the price is ½ to 2c. extra: while for quantities amounting to less than 600 ft. there is an extra charge of 1c. The number of feet per pound for the various sizes is as follows: ⅝-in., 8 ft.; ¾-in., 6; ⅞-in., 4½; 1 in., 3⅓; 1⅛-in., 2 ft. 10 in.; 1¼-in., 2 ft. 4 in. Following is price per pound for ¾-in. and larger, in 1200-ft. coils

Boston	$0 33	Birmingham	$0 32
New York	.29	Atlanta	295
St. Louis	.265	Kansas City	.265
Chicago	.275	New Orleans	.255
St. Paul	.275	Seattle	.25
San Francisco	.27	Los Angeles	.285

PIPE AND BOILER COVERING—Below are discounts and part of standard lists:

PIPE COVERING		BLOCKS AND SHEETS	
Pipe Size	Standard List Per Lin.Ft.	Thickness	Price per Sq.Ft
1-in.	$0 27	½-in.	$0.27
2-in.	.36	1-in.	.30
3-in.	.45	1½-in.	.45
4-in.	.60	2-in.	60
6-in.	.80	2½-in.	.75
8-in.	1.10	3-in.	.90
10-in.	1.30	3½-in.	1.05

85% magnesia high pressure........ List

For low-pressure heating and return lines........ 4-ply.... 58% off; 3-ply.... 60% off; 2-ply.... 62% off

WIRING SUPPLIES—New York prices for tape and solder are as follows:

Friction tape, ½-lb. rolls	55c per lb.
Rubber tape, ½-lb. roll	60c. per lb.
Wire solder, 50-lb. spools	46c. per lb.
Soldering paste, 2-oz. cans	$1.20 per doz.

COPPER WIRE—Prices per 1000 ft. for rubber-covered wire in following cities:

	New York			Birmingham		
	Single Braid, Solid	Double Braid, Stranded	Duplex	Single Braid, Solid	Double Braid, Stranded	Duplex
14	$12 00	$13 90	$28 50	$12 23		$33 60
10	18 30	23 85	41 50	24 00		57 02
8	25 54	32 70	56 70	33 60		75 94
6		51 40		60 10		
4		70 00			93 41	
2		101 80			120 40	
1		131 86			155 23	
0		160 00			188 77	
00		193 50			229 19	
000		235 20			278 [illegible]	
0000		288 60			338 41	

FREIGHT RATES—On finished steel products in the Pittsburgh district including plates, structural shapes, merchant steel, bars, pipe fittings, plain and galvanized wire nails, rivets, spikes, bolts, flat sheets (except planished), chains, etc. the following freight rates per 1000 lb. are effective:

Boston	$0 30	New Orleans	$0 385
Buffalo	17	New York	27
Chicago	27	Philadelphia	.245
Cincinnati	23	St. Louis	24
Cleveland	17	St. Paul	495
Kansas City	.59	Pacific Coast (all rail)	1.25*

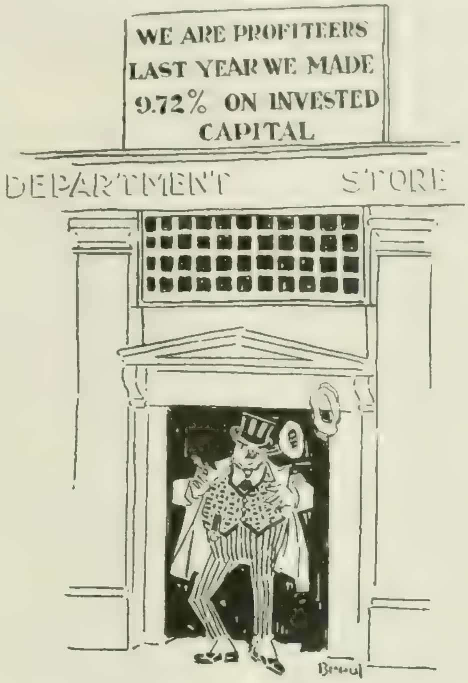
Note—Add 3% transportation tax. *Minimum carload, 80,000 lb.

COAL AGE

New York, April 15, 1920

Volume 17 Number 16

Would a Department Store Put Up a Sign Like This?



What department store would be assailed if it made less than 10 per cent profit per year? Most of them make much more than that on every sale, and nobody is disposed to inquire into the matter

Public's Duty to Coal

"The coal operators' duty to the public." That phrase has been constantly on the tongues of politicians, uplifters, profiteers, common folks and others. They seemed to feel that the duty runs all one way—from the industry to the public. The idea probably never occurred to them that the obligation is two-fold and that the public owes a duty to the bituminous-coal industry, but the majority report of the Coal Commission jams that fact into the conscience of the public with a directness that ought to enlighten and convince.

The observations and recommendations of the majority in this respect are calm and sane. First of all, they turn a curing flood-light of information and sound reasoning upon mischievous misapprehensions which have been fostered in the public mind by designing and prejudiced persons. Such information ought to dispel that dangerous fog of misunderstanding and satisfy the public that the various proposals for far-reaching, un-American regulation and control of the coal industry are wholly unnecessary.

There have been widely heralded charges of profits varying from 100 to 300 per cent and in some instances running up to 2,000 per cent on the capital invested in the mining of coal. Such charges from the high officials responsible for them had to be considered by the commission. In respect to these allegations we are shown a compilation of the selfsame Treasury reports that were so blatantly cited.

That compilation shows that all the bituminous producers reporting, after paying their taxes, made only 9.72 per cent on their investment in 1918, while "the companies reporting very high rates of return upon investment are all small concerns with investments of only a few thousand dollars whose net income represents to a large extent the earnings of the owners for their own labor and management." Only a little over 9 per cent return on invested capital for an enterprise as hazardous as the mining of bituminous coal!

Then Messrs. Robinson and Peale shift the spotlight of common sense onto the threadbare scarecrow of "a combination to maintain coal prices." The consumer is reassured by their conclusion that "such a combination, besides being illegal, is quite impractical, in view of the 7,000 companies involved, located as they are in some 26 or 27 coal producing States."

Accordingly, there is no occasion to doctor the industry with governmental strong medicine designed to cure illegal combination and profiteering. The nation is told plainly that these are not the diseases which afflict the patient. The physicians then proceed to give the correct diagnosis and to prescribe a proper method of treatment.

Consumer Not Without Fault

The consumer of coal is told bluntly that most of his coal troubles are his own fault, springing from the fact that he has been heedless of his duty to the men who dig and ship his coal. He is shown that his dereliction causes injury to the coal industry. After pointing out the fact that irregularity of mining operations is the primary cause of high coal prices and dissatisfaction among the miners, the report says "it is evidently the public's duty to aid in the stabilization of the coal market by purchasing and storing as much coal as possible during the spring and summer."

The report goes on to point out the overdevelopment of mining facilities, the overmanning of the industry, and the excess transportation required to care for the fall and winter peak demand, when belated coal buyers are all in the market at once. At the other extreme are idle mines, idle men and idle coal cars in spring and summer, when these same buyers are "waiting a while" to buy their coal. Prices fluctuate widely and the coal business becomes merely a gamble.

Worse yet, those are most hurt who can least bear the injury. The poor and needy small consumer, who, as a class, buys but a fraction of the nation's coal and who is unable to buy and store coal in the spring and summer, is the chief victim of the high prices brought about by big belated consumers bidding up the market to obtain at the last minute what are to them comparatively small quantities of needed coal. To the poor householder or struggling manufacturer, with no place to store coal, even if he had the funds, that is a most serious hardship. On the other hand, when the spring slump comes and the bottom drops out of prices, small struggling operators are the individuals hardest hit.

The commission faces this situation unshrinkingly. It says unhesitatingly that the railroads, the iron and steel producers, the public utilities and the other big consumers of coal must shoulder the large share of the responsibility for these conditions. It puts the job of effecting a remedy squarely up to them as a duty they owe the coal operators, the miners and the other coal consumers. In this connection it condemns frankly the traditional coal purchasing methods of the railroads and warns them that in the light of fair dealing and broad public interest, preferential car supply as part payment for coal is unconscionable.

The duly authorized branches of government are shown the necessary steps to obtain the full co-operation of the coal industry, the carriers and the consumers in stabilizing the business. Moreover, the commissioners have shown the practical way to accomplish results by going out and getting powerful consumers to accept their public responsibility and to start better methods of handling their fuel supply.

A Return to Common Sense

This way of telling the public of its own shortcomings and advising it to remedy its own faults instead of choosing fantastic theories of economic betterment seems strangely new and refreshing. As a matter of fact, it is a return to cool, American common sense in dealing with our great economic and social relationships, but after the welter of confused thought and strange doctrines that have surged about us how epoch-making the simple findings and practical recommendations seem.

Perchance we have here the herald of a better day. The consumer owes some duties to the producer which he must discharge if our social and industrial conditions are to be remedied. Just consider for awhile the application of that idea to the relations of the public and big businesses.

Ford Collieries Co. Reduced Its Accident Insurance Cost

When a Safety Committee, Composed of All the Officials Who Supervise Work, Is Induced to Function Actively, Tangible Results Are Forthcoming—Only One Fatal Accident for an Output of 3,000,000 Tons

BY DONALD J. BAKER
Pittsburgh, Pa.

WHEN the announcement was made by the Pennsylvania State Department of Mines a short time ago that the Ford Collieries Co. was the first coal producer to receive the benefits of the 40 cent credit under Item 1 of General Safety Standards of the Compensation Rating Schedule, more than passing significance was attached to the statement. In fact, there was a ripple of surprise manifested by some four thousand or more companies throughout the commonwealth.

Who is the Ford Collieries Co. is a fair question? To those who are familiar with the coal-producing firms of the Pittsburgh district the question is readily answered, for this company has been known for some time as a progressive one, one that leans heavily toward providing adequate safety measures in its mines. But to those who are not so familiar with the Pittsburgh region it might be pertinent to mention that the Ford Collieries Co. is a subsidiary of the Michigan Alkali Co.

The mines of the firm, three in number, are located in northern Allegheny County near the Butler County line. The company was organized in 1908 and development of a 2,200-acre tract of the upper and lower beds of Freeport coal was commenced the same year. The main offices of the company are at Curtisville, which is a central location for the three mines. A. R. Pollock is general manager of mines and M. S. Murray is safety engineer. To the latter, of course, falls the lion's share of the credit for the signal recognition of these mines by the state for the practical application of safety principles therein.

How has this company, which is relatively young and comparatively small—having an estimated output of 1,500,000 tons yearly—succeeded in capturing the leading position in a competition of progressiveness? Certainly no company could hope to receive such honor by merely following stereotyped methods that have long been laid down and accepted as standards in the safety movement. There must have been a keen initiative spirit shown. Innovations must have been made in safe practices, and any safety devices that have been installed must by necessity be highly practical. This, in sum and substance, is exactly what the Ford Collieries Co. has done under the guiding hand of the safety engineer. No standards have been accepted until assurance has been given of their practicability.

The entire safety program of the Ford Collieries Co. is centralized around the safety engineer. This is in accordance with article (a) under Item 1 of the General Safety Standards, which provides that the safety inspector have charge of the safety activities. He is at the head of a central safety committee which includes 50 officials of the company's three mines. This com-

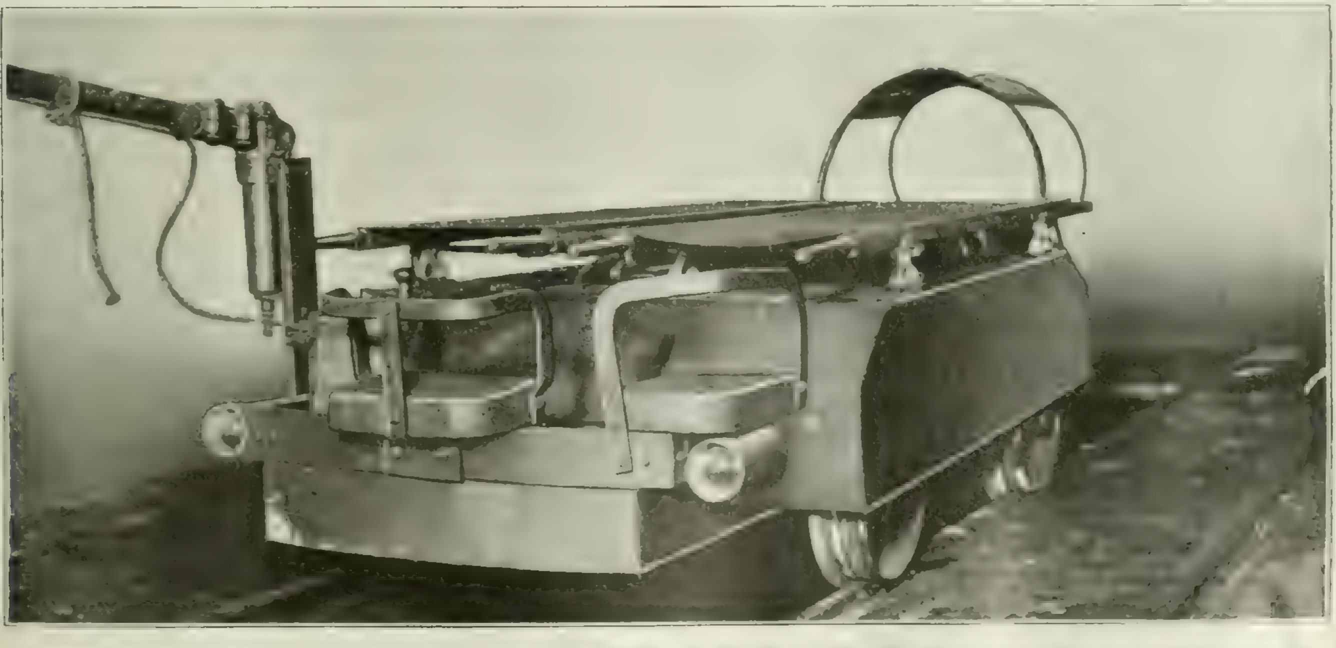


FIG. 1. MOTOR-DRIVEN MINE AMBULANCE

This machine seats four people and carries two stretchers. Note the canvas hood over the end of the stretcher to protect the patient's face and prevent his eyes from following the roof, thus causing nausea.

mittee includes every mine foreman, assistant mine foreman, fireboss, boney-boss, superintendent, and in fact all men who in the performance of their duties supervise the work of others. This committee meets once a month under the chairmanship of the safety engineer. At each meeting a general informal discussion takes place as to how the operation of the mines can be made easier. This theme is in perfect accord with the compensation law.

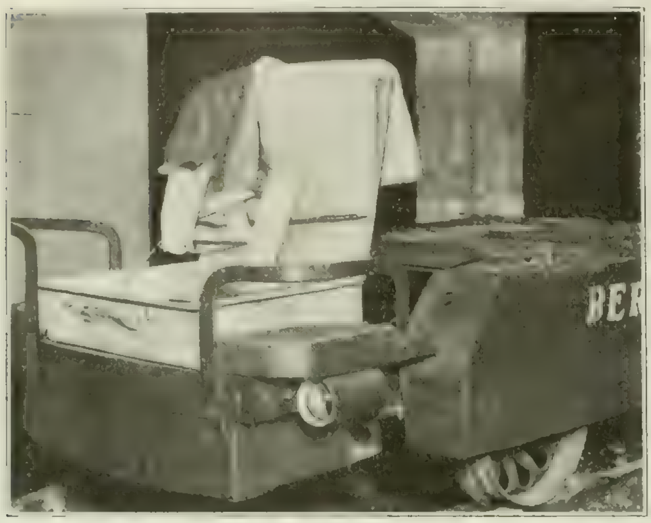


FIG. 2. BLANKET BOX ON MINE AMBULANCE

Blankets, both rubber and woolen, are kept and carried in a galvanized-iron box stowed away in the ambulance. This box also contains first-aid supplies.

Now let us see what can be accomplished under this section of the statute when a company whole-heartedly throws its resources into the balance in an endeavor for safer mines.

The officials of the company that attend these meetings are highly interested in all of the discussion that arises. There is little doubt that each has trained himself to be ever on the *"qui vive"* for a safer practice or to suggest some problem for solution that will lead to the adoption of a safer method of procedure. These men make notes during the month and bring them up for discussion. For instance, suppose the assistant mine foreman in No. 1 mine has, during the past month, noted a hazard in a certain section of his operation. Perhaps this hazard could be eliminated if a different method of throwing a switch could be devised.

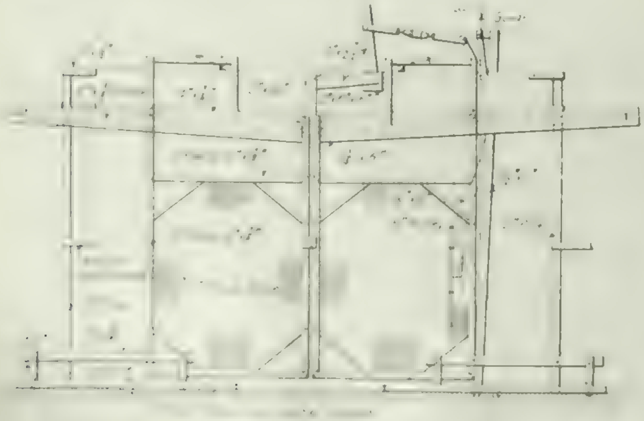


FIG. 3. SHAFT GATE OPERATED BY CAGE

When the cage reaches [illegible] level a cam strikes a roller on a vertical lever, forcing [illegible] outward and through a system of levers and shafts changing the inclination of the gate-supporting tracks [illegible] gravity

This recommendation is noted by the safety engineer and the point in question is investigated. If the facts in the case appear to bear out the assertion, the men of mechanical ability in the company are notified and at once start to devise a safer and more practical scheme to supplant the old one. The theory is not a bad one to work on and as a matter of fact is practical when several minds are concentrated on the same problem. Sooner or later a new method is perfected and then a hazardous practice has been eliminated.

This all sounds highly interesting in theory, but the Ford Collieries people have actually made it work out with excellent results in practice, as will be shown later on. Undoubtedly the whole keynote of a successful functioning of a central safety committee lies in keeping the officials interested. This has been accomplished in this instance without seeking the customary mercenary levels. A competitive spirit has been aroused and each official is made to feel that his particular duties must be kept on at least a par with those of the officials of the other mines. One of the most potent factors contributing to the success of the Ford Collieries Co. in the safety field has been the inventiveness shown by the members of the committee.

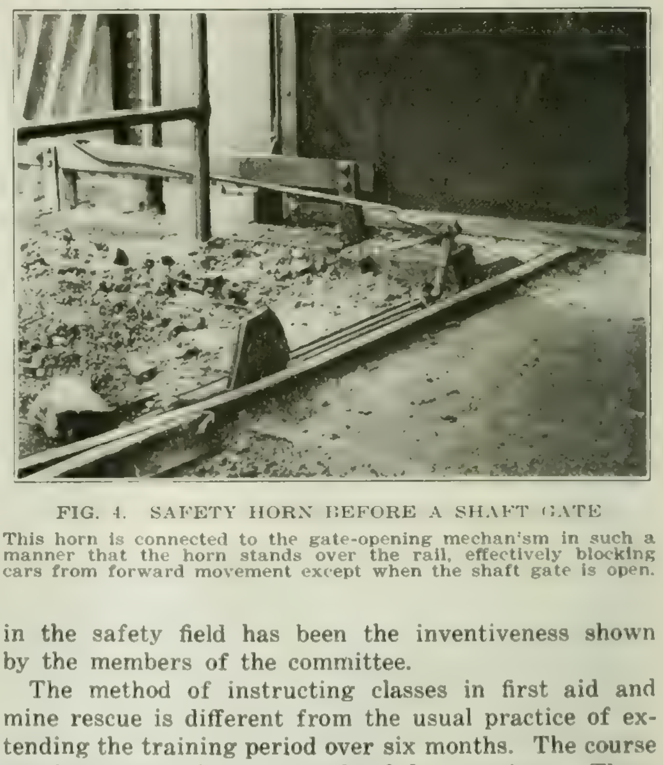


FIG. 4. SAFETY HORN BEFORE A SHAFT GATE

This horn is connected to the gate-opening mechanism in such a manner that the horn stands over the rail, effectively blocking cars from forward movement except when the shaft gate is open.

The method of instructing classes in first aid and mine rescue is different from the usual practice of extending the training period over six months. The course as given covers but one week of five evenings. Three hours are allotted to each evening. In this manner a greater amount of enthusiasm can be worked up, with the result that a greater percentage of the men who start the course finish it. The candidates for certificates are paid for the period of instruction, but not until after the termination of the instruction. That is, no man is paid who does not complete the course.

One first-aid and one mine-rescue team is trained from each of the mines yearly. More tangible results come from this system of instruction than where the training period is extended over a long interval. Too often do coal companies deceive themselves by attempting first-aid training in a more or less haphazard manner. In such cases first-aid meets are held as well as parades and banquets. All this looks well and gives an impression of keen activity, but more often this procedure does not signify as much as it might. The first-aid and mine-rescue training period is long drawn out and by the time the men who are qualifying for certificates have completed the course they have had their interest in the work dulled to an extent that promises no appreciation of the problems that might arise in case of actual accidents.

If the mines are to be made safer, the officials must be quick to sense a potential source of danger. Too often the paths of least resistance are followed. In preference to eliminating the danger points these are allowed to exist and men are instructed in first-aid treatment, in order that accident victims may be given a chance for their lives, which should never have been risked in the first place.

A description of some of the practical safety devices that have been installed within the three mines of this company will show to some extent just why the State Department of Mines has selected this operator as one of the leading exponents of safe practices and has allowed it the full credit under the compensation law. All of the ideas and suggestions of which these devices are the outcome have been the direct result of the functioning of the central safety committee. No pretense is made toward seeking any material gain from the placing of any of these devices on the market. All have been patented, however.

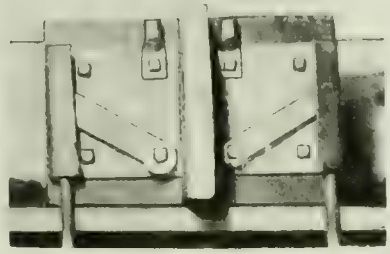


FIG. 5. MINING MACHINE CABLE ATTACHMENT
This device holds the cables securely in place yet releases them easily under proper manipulation.

M. S. Murray, safety engineer, and W. D. Thomas, superintendent of the No. 3 mine, are credited with the evolution of the ideas. Without exception, all of these devices can be made at the ordinary blacksmith shop. They are offered to the readers of *Coal Age* for adoption wherever there may be need for such equipment. They well illustrate the progress that can be made toward safer practices if a certain degree of concentration be given to the solution of the many problems that naturally arise from day to day in any mine.

What is believed to be the first locomotive ambulance ever constructed for underground service was recently installed within the Berry No. 3 mine. Two other machines of the same model are now under construction and when completed will be placed in the other two mines of the same company. The use of an ambulance underground in caring for injured employees is a decided innovation. Since all motor trips within the mines of the Ford Collieries Co. are dispatched by telephone from the mine-foreman's office near the shaft bottom, this ambulance is quite practical in event of an emergency. When an accident has been reported, a full right-of-way is assured for the ambulance along those portions of the mine track that will be traversed. From actual tests, any section of the mine can be reached within 15 min. An underground ambulance places mine accidents in a new light and it is a safe prediction that first-aid training will in the near future center around this valuable addition to first-aid equipment.

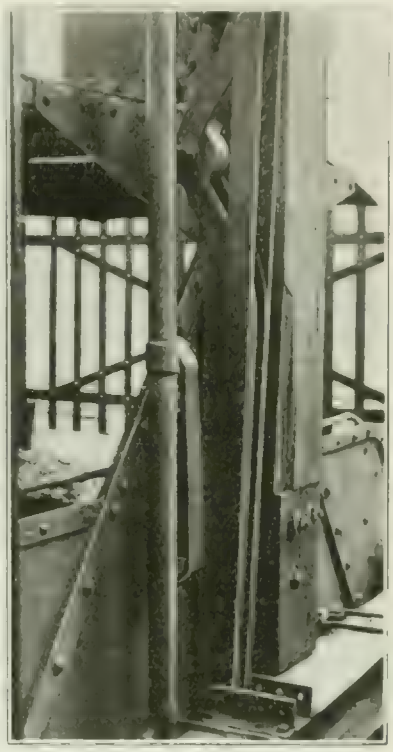
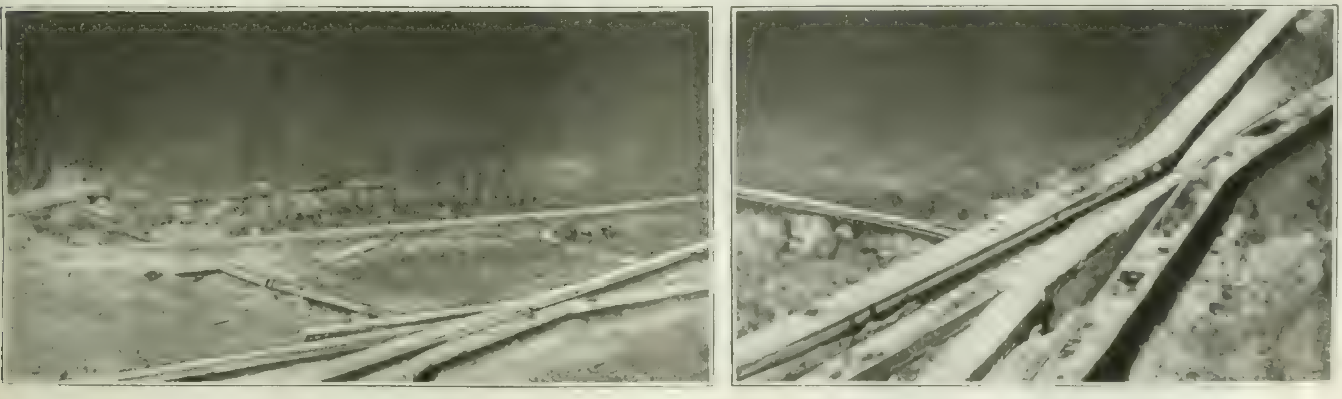


FIG. 6. CAGE APPROACHING GROUND LEVEL
The cam on the side of the cage is about to strike the roller on the vertical level, movement of which will open the shaft gate.

The frame of the ambulance is of 4-in. channel iron 10 ft. long and is mounted on pressed steel trucks which support it by means of cantilever springs. The machine is driven by a 5-hp. direct-current motor. The trucks are chain driven and so geared as to give a maximum speed of 7 miles per hour. Control is supplied through a mine-locomotive controller and a band brake.


FIGS. 7 AND 8. A MOVABLE POINT FROG
Cars frequently "pick" ordinary frogs. In this device the frog point swings with the switch points; therefore wrecks are few and far between.

Headlights, gong, trolley pole and seats for four complete the equipment proper. Upon the sheet-iron casing that incloses the moving parts and guards the wheels cleats have been placed so as to hold in position two stretchers. These are provided with hoods to protect the face of the patient while he is being transported. Within a compartment of the ambulance body is a 20 x 26 x 6-in. galvanized-iron case containing two woolen blankets, one rubber blanket, splints, bandages, compresses, aromatic spirits of ammonia, iodine and absorbent cotton.

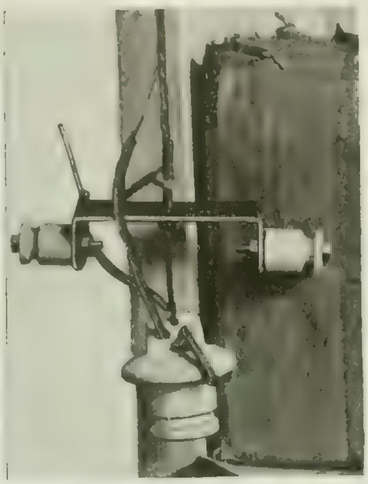
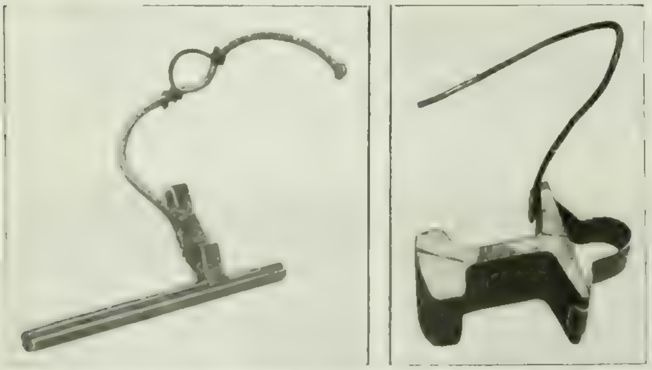


FIG. 9 BRACKET FOR SUPPORTING SMALL WIRES

By the aid of this bracket two telephone or light wires as well as feed cable, if desired, may be supported from one expansion bolt or lag screw set in a roof plug.

The ambulance is kept in a stall at the shaft bottom and a trained first-aid man is constantly available in case an accident is reported. The idea of attempting to establish first-aid stations throughout the mines has been abandoned. There is but one first-aid room underground, and this is located near the shaft bottom. This room is utilized for treating patients before they make the trip up the shaft. A switch off the main haulage road allows the ambulance to run directly into the room.



FIGS. 10 AND 11. WIRE ATTACHMENTS TO TROLLEY AND RAIL

These simple devices give much better results than the common practices of hooking the positive lead over the trolley and winding the return around the head of a track spike.

An ingenious shaft gate has been devised and installed at the ground landing of the main shaft. This is of simple construction and depends for its operation on the changing of the inclination of the track supporting the gate. A horn may be placed over one of the rails that lead toward the landing as is shown in Fig. 4. This latter device prevents any car from running into the gate when it is closed. When the gate is open the horn is not over the rail and no obstruction is present to prevent the passage of a car. Fig. 6 shows the cage suspended about 18 in. from the landing and about to make contact with the roller that operates the gate supports.

When the cage strikes the roller, its movement is transmitted through a series of rods, bellcranks, etc., to the tracks supporting the gates and their inclination is changed. The gates then open by gravity. The reverse of this action takes place when the cage moves down the shaft.

One of these gates has been in operation for three years and has required no attention during that period. There is no jar or shock in operation, which is the chief drawback with many shaft gates. One of the advantages of this gate is the fact that it can be constructed at the blacksmith shop. While it has been patented by the inventor, W. D. Thomas, the mechanical principles involved are worthy of a more general use. No such gate is now on the market.

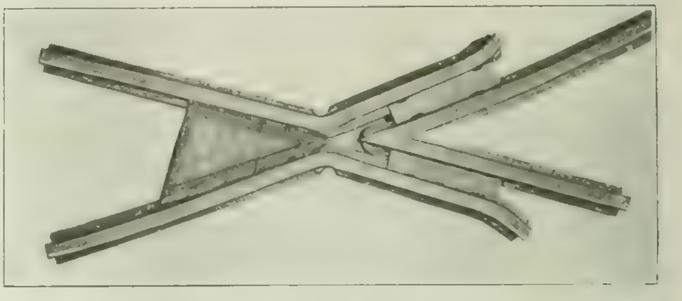


FIG. 12. A PLATELESS FROG

This frog has the advantage of light weight and the fact that any worn portion can be renewed independently of the others.

A movable-point frog was designed to overcome derailments which arose from cars with a short wheelbase "picking" an ordinary frog. Where there is difficulty in keeping the car wheels rigid and in proper alignment, the picking of a frog is more common than the picking of a switch. In construction, the frog point is so made as to extend onward from the point where the balls of the converging lead and transfer rails touch. This portion of the frog is separate and movable and pivots in its base. It is attached by connecting rods to the switch throw and conforms to the movements of the switch points. For a car traversing the curve and passing onto the straightaway while the switch is set for the straight, it functions like any spring switch, as

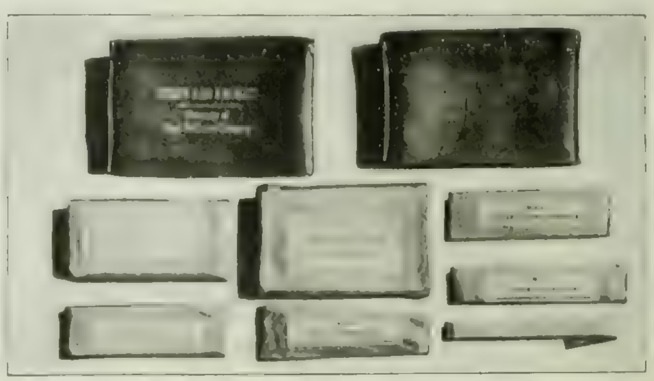


FIG. 13. SPECIAL FIRST-AID PACKET

First-aid packets are usually inclosed in tin containers that are liable to dent, thus injuring the contents. This packet is free from this defect.

there is a yoke and a pair of springs on the connecting rods which allow the frog to open and close.

One important factor of economy is introduced when a frog of this style is used and that is that no guard rails are needed. This appears to be an advantageous type of frog construction and particularly adapted to those points in a mine that receive the greatest amount of traffic. It might be mentioned that one of these frogs has been installed within the No. 3 mine at a place where over 900 cars pass daily. Before the movable point frog had been put in place there had been frequent derailments that averaged nearly one a day. However, since the new frog has been in place there has not been a single derailment. This is sufficient proof of the efficiency of the device.

A mining machine cable attachment has also been devised. This consists of two metal plates, each of which has one edge turned back upon itself for a distance of about 1 in. A groove has thus been formed for the contact of the cable leads. Both plates are mounted on a wooden block and each has a terminal attached for the reception of the positive and return wires. Fastened to each plate is a dog or grip, the face of which is "V"-shaped and provided with teeth. These grips are so adjusted on the plates that they will always fall into the groove that has been made for the wire.

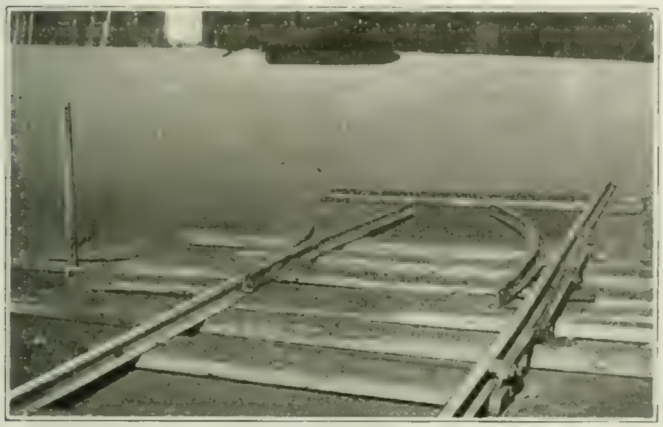


FIG. 14. SAFETY SWITCH USED ON ROOM PARTINGS

This is an ordinary spring switch with certain improvements. The switch remains open unless held closed.

In making a connection, the cable terminals from the machine are placed in the groove of each plate. By a slight downward pull, the teeth of the grip are made to engage the cable and push it into close contact with the sides of the "V"-shaped groove. To disconnect, the cables are pushed upward and outward and drawn out quickly.

A bracket for telephone or electric light wires has been constructed as follows: A channel-shaped bracket made of strap iron and carrying two small insulators at the extremities is drilled at its middle point for the insertion of a lag screw that fits into a plug in the roof or rib. This effective method of supporting the wires has the advantage of carrying the wires at a uniform distance apart. Only one plug is needed for the support of both wires. By means of a hook, the eye of which is placed under the head of the lag screw, this arrangement can be made to support a lamp and socket by taking the stress of its support off the wires. If it is desired to suspend the wires from the rib, the eye of the hook is placed under the head of the lower insulator bolt.

For efficiently making a good connection from a trolley wire, a small spring clamp with an insulated handle may be used to advantage. The handle is composed of rubber or a composite substance and is attached to the spring by means of a screw. The wire is hooked around the screw between the handle and the clamp and held firmly by tightening the screw. When the clamp is in position on the trolley wire it is clear of the locomotive trolley wheel and is rarely displaced.

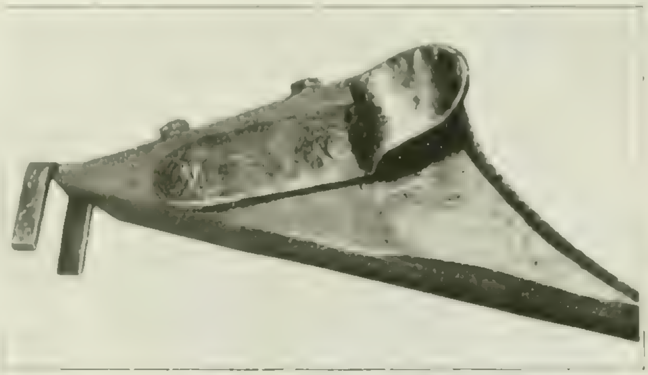


FIG. 15. A NEAT AND EFFICIENT CHOCK

A pair of these chocks are carried on each locomotive and will hold a car or a trip without the aid of sprags.

The rail-return attachment is a spring clamp that fits under and grips the base of the rail. It is attached by bringing pressure on the curved part of the clamp by hand. The return wire is placed between the edge of the rail base and the hook of the clamp. This wire is connected to the clamp and attached to the return wire by the usual splice. Both of these attachments can be easily made and give a better connection than that allowed by the usual practice of wrapping the positive wire around a hanger and the return wire around the head of a rail spike.

An unplated frog was constructed, so as to have all of the rigidity of a plated frog but lacking its weight. However, the chief reason for its use is an economic one, since it can be assembled at the point of installation and any defective part can be removed and another part substituted without lifting the whole frog. It consists of the usual point, straight and transfer rails, all of which are solidly joined together by channel irons bolted to the webs of the rails. Only one size of bolt is used on both fishplates and channel irons and only one wrench is necessary in assembling. As can be noticed in the accompanying illustration, any part of the frog can be removed by taking out four bolts.

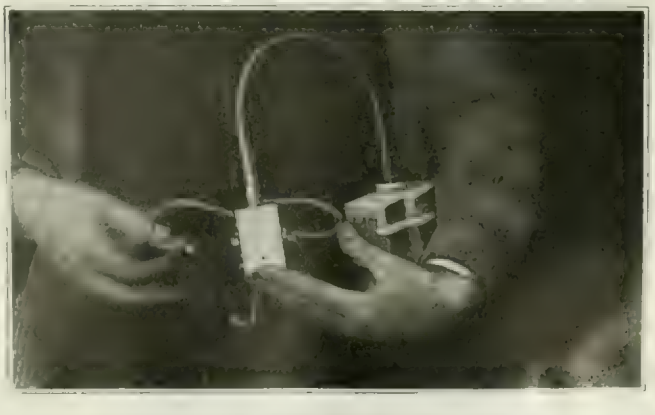


FIG. 16. A SAFE SHOT-FIRING DEVICE

A quarter turn of the key terminal makes the connection and fires the shots; release or withdrawal of the key opens the contact.

An efficient first-aid packet also has been designed. Practically all of the packets of this kind on the market today are contained in a metal case. When these are supplied to the miners they are usually carried in a hip pocket. In a short time the case is bent and dented and quite frequently the sealing wrapper of the supplies is torn. In such a case when the supplies are needed they are liable to be dirty and damp and in a condition that may permit infection to result from their use.

A first-aid packet has therefore been made for the use of the Ford Collieries Co. that will withstand the hard usage to which it is subjected by the miner. The case is a piece of tire casing that will conform to unusual pressure made upon it and at the same time be practically waterproof. The contents of the case embrace items somewhat different from those found in most first-aid packets, including a triangular bandage, a large compress bandage, two muslin finger cots, two gauze roller bandages and a strip of adhesive tape. Compactness has been sought in the size of the case. The supplies are adequate for any ordinary injury, yet as a rule do not include more materials than can well be utilized.

A SAFETY SWITCH FOR ROOM PARTINGS

As may be noticed in the accompanying illustration, the safety switch for use on room partings here employed is a standard spring switch with certain additions or attachments. A spring has been added to the straight point which keeps the switch set for the open unless intentionally held for a curve. Two levers have been attached, the extremities of which lie a little above the rail and parallel to it, the opposite ends being joined loosely. One of these levers is provided with a downward-projecting lug that drops into a recess in a plate that is attached to the end of the bridle bar when the switch is thrown for a curve.

The switch point butts are nicked near the end of the base on the inside and are placed in chairs which have a rivet that engages this nick. The butts are then held in place by "V"-shaped channels which are driven between the curves and the straight rails. A spike is placed behind each channel to keep it in place.

When it is desired to pass a trip of cars onto the curve, the switch throw lever is pulled over until the curve point is against the rail. When the trip has passed the lever is released. The switch is then made to assume the position for the straight by the first car passing along the straight track. The throw is made by the wheel depressing one of the levers and allowing the spring to function.

The old adage that "Neatness is an outward sign of inward efficiency" becomes more and more apparent around coal mine plants. A frequent sight underground is the promiscuous scattering of props and sprags along haulage roads. Heretofore there has been a certain degree of method in this madness, although the method has been woefully inefficient. If a motorman desires to block a trip of loaded cars on a grade, he commonly hunts around for sprags to throw into the car wheels or as a last resort places a post across the track. By the use of a simply-constructed device there will be no need for cluttered haulageways in those mines that do not use brakes on their cars.

This device consists of a triangular block of wood that has one face curved to fit the face of a car wheel. An iron handle is attached to the block and an iron clip or bracket that fits around the flange of the wheel. One extremity is fitted with a fork to hold the chock on the rail. Two of these blocks are carried on each locomotive and are used in making up a trip or in blocking a trip inside of a door. The necessity for finding a sprag or using any available piece of timber thus has been overcome.

Many shot-firing devices are available today, but it is doubtful if any combine more practical features than the one used in these mines. This is composed of a small box that contains two contacts for the current and a rotor on a broken shaft, one end of which is square. The rotor is held in a non-contact position by a spiral spring. The apparatus in its entirety depends for current upon a cap-lamp battery or an ordinary dry cell.

WIDEAWAKE SAFETY COMMITTEE GETS RESULTS

To operate it the terminals of the lead or shot-firing wire—one end of which is a square key—are placed upon the ends of the rotor shaft. The key terminal is given a quarter turn, which is sufficient to bring the contact points of the rotor in touch with the contact points of the current supply, thus firing the shot. When pressure is removed from the key the shaft will rotate in a reverse direction under the action of the spring and assume the non-contact position, thus making accidental contacts impossible.

The practical devices here described show quite clearly the results of a wideawake central safety committee. It is doubtful if many other such committees that have come into existence under the compensation laws can show the same tangible results of conscientious effort as this one. After all, it is not in "getting by" that progress is achieved, but only through honestly seeking a definite goal. From the success that has attended the initial efforts of this company, it has been spurred on to even greater ones.

Numerous other safety devices that go hand in hand with more efficient operation are under construction by this company and will be taken up at a later date in *Coal Age*. For the present, this article, it is hoped, will demonstrate the parcticability of the plan pursued and encourage other companies to make the competition keener. As to the number of fatal accidents occurring in the three mines of the company during the past two years, there has been but a single one. This was the death of a man on the surface who had been trimming cars underneath the tipple. It was purely accidental as the facts in the case prove. One fatality for approximately 3,000,000 tons of coal is a record of which any company might well be proud. This is sufficient cause in itself for the allowing of the full 40-cent credit. More and more does coal mining cease to be a gamble with death.

Wholesalers Will Consider Coal Reconsignment Charges

The annual convention of the American Wholesale Coal Association is to be held in Pittsburgh June 1 and 2. The program has not been outlined as yet, but reconsignment charges will be an important feature of the discussion at the convention. At the same time plans will be perfected for a formal presentation of the reconsignment matter to the Interstate Commerce Commission. The Executive Committee of the American Wholesale Coal Association will meet in Chicago April 15.

Some Methods of Suspending Electric Power Cables

Power Cables in Many Instances Must Be Suspended in Bore Holes or Shafts—They Can Be Supported from the Top Only and Auxiliary Carrying Cables Sometimes May Be Necessary

By R. P. Hines
Fairmont, W. Va.

IN ORDER to transmit electric energy from the surface into a mine, cables are extensively used. The type of cables to be employed, of course, depends upon the exact purpose to be served. Some of their main uses are for supplying underground transformer, synchronous-converter or motor-generator substations, alternating-current, motor-driven centrifugal or reciprocating pumps, alternating-current motor-driven hoists, and to feed the usual direct-current distribution circuits throughout the mine.

Various transmission voltages and systems are employed and the cables used therefor embrace bare cables (usually employed for the negative conductor in grounded direct-current systems) as well as those with various degrees of insulation, to suit the voltage of the system on which they are used, and which may be either single- or multi-conductor. Only methods of suspending cables vertically in shafts and bore holes will be here considered. The mechanical make-up of such a cable will of course be influenced by the depth of the shaft or bore hole, but within the range ordinarily found in most bituminous coal mines no special or unusual features are required to obtain the necessary mechanical strength.

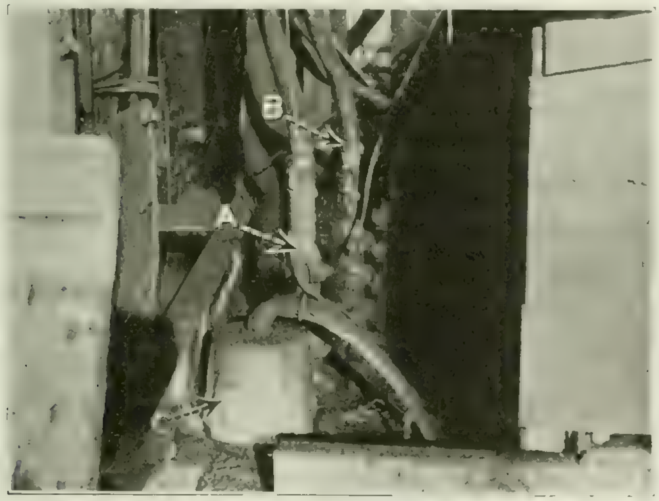


FIG. 1. THREE CABLES CARRIED DOWN THE SAME SHAFT
Two of the cables, *A* and *B* are held by clamps, the third cable is threaded through a cast-iron block, the strands spread, and spelter, or solder, poured around them. This method is applicable only for bare cables at earth potential.

The usual types of cables employed may be classed as follows: Class I—Single conductor cables, (a) bare; (b) insulated, braid covered; (c) insulated, lead covered; (d) insulated, lead covered, wire armored. Class II—Multi-conductor cables, (a) insulated, braid covered; (b) insulated, lead covered; (c) insulated, lead covered, wire armored.

One or more methods of suspending such type of the different varieties of cables under the two general subdivisions as above will be described, while the illustrations accompanying this article show typical suspensions for some of the different classes.

In considering single-conductor, bare cables, it will be found that they, in general, possess sufficient mechanical strength to carry their own weight with a considerable factor of safety. Of course, engineers' opinions vary regarding the safety factor necessary. This feature is determined therefore largely by the opinion of the engineers responsible for the installation. Inasmuch as where bare cables are used they are almost invariably employed for the negative conductor of a direct current grounded system, these cables are at the potential of the earth, and it is not necessary to provide means of insulating them from the ground either at the point of suspension or elsewhere.

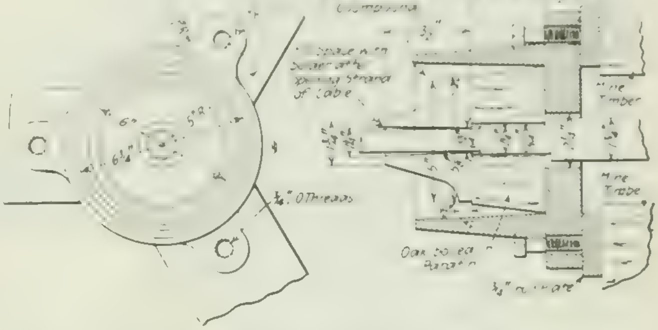


FIG. 2. INSULATED CAST-IRON BLOCK SUSPENSION
This is a modification of *C*, Fig. 1, adapting it to cables carrying appreciable voltage. The cast-iron block into which the cable is soldered is insulated from its surroundings.

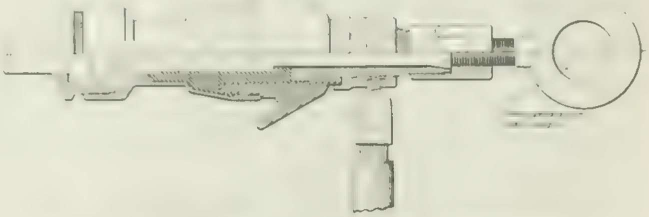
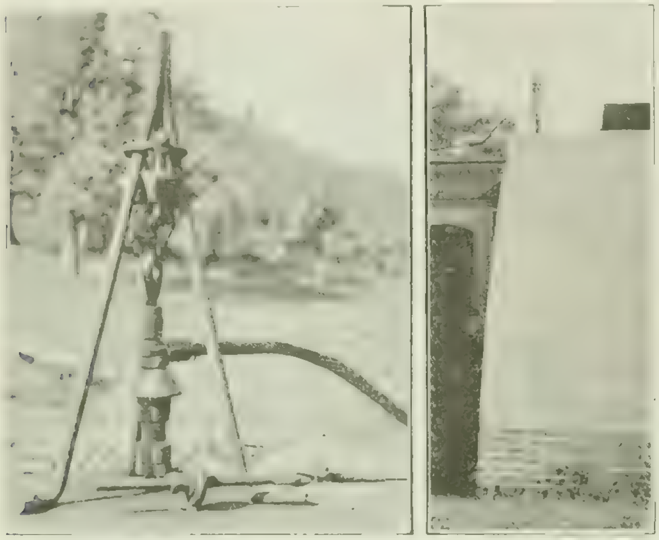


FIG. 3. POTHEAD SUSPENSION TERMINAL
Since the eye of this device is "alive," that is, at the cable potential, its support must be insulated. This is accomplished by means of a strain insulator

This renders the problem of supporting them at the point of suspension by clamps or other means a comparatively simple one. A method similar to that shown at "a" (Fig. 1) has proved satisfactory during several years of service. The conductor is suspended in a fiber conduit placed in the concrete side of a shaft. The clamp in Fig. 1 shown attached to an insulated armored cable, but which works equally well upon a bare conductor, is of cast iron split in two parts, similar to the one shown in Fig. 8, and is arranged to bolt tightly around the cable, the clamp being bored out to just the right diameter to firmly grip the conductor when the eight bolts are drawn up.

The lower end of the clamp is provided with a flat bearing surface to rest on the top of the pipe, or bore hole casing, and has a round projecting element extending below the flat portion. This projection is turned down so that its outside diameter is such as to just allow it to fit snugly inside the conduit. This clamp is about 18 in. long and is designed to give a large contact area for gripping the cable. At "c" (Fig. 1) is shown a method which is extremely simple. The conductor in this case is a 1,000,000 circular mill, 61-wire concentric-strand cable and is suspended in a 4-in. inside diameter fiber conduit, imbedded in the concrete side of the shaft, the depth being 517 ft. The clamp for holding the cable at the top consists of cast iron in the form of a truncated cone, having a tapered hole through the center. This casting is 10 in. in diameter at the bottom, 8 in. in diameter at the top, and is 8 in. high. The diameter of the hole at the bottom of the casting is just sufficient to allow the cable to pass through, but gradually increases to a considerably larger diameter at the top.



FIGS. 4 AND 5 A POTHEAD SUPPORTED ON A FAN HOUSING

An iron tripod placed on top of the fan-casing supports, through a strain insulator, the pothead terminal of a cable suspended in the air shaft.

After the top end of the cable is passed through this hole, the strands are opened out and babbitted or leaded solidly into the casting, the opening of the strands allowing the molten material to penetrate into the interstices, filling them thoroughly.

Other methods which might be employed would be to lead or babbitt the end of the cable into a regular wire-rope socket eye, such as is commonly used with steel hoisting cables, or to employ the two eye halves of the regular feeder-cable clamp. Neither of these two methods has ever been used by myself, although each is entirely feasible.

In considering methods for suspending cables of the insulated, braid covered, single-conductor type, since these cables are practically always at considerably above earth potential, it will be necessary to provide suitable insulation between the ground and the clamp used, in case the clamp is in contact with the metallic portion of the cable. In case the clamp is applied over the insulation and braid no additional insulation will ordinarily be required. For use where the clamp is in contact with the metallic portion of the cable, the method illustrated in Fig. 2 may be used. This is an amplification of the method shown at "a" (Fig. 1), in that means of insulating the clamp proper from the ground is provided.

The means of suspension consists of a cup-shaped casting which is placed over the bore hole and which may be bolted to the concrete in which the casting is imbedded. A block of suitable impregnated wood or other insulating material is placed between this cup-shaped casting and the cone-shaped cast-iron block, which is fastened directly to the metallic part of the cable. The outer braid and insulation are removed from the cable near the upper end, in sections, as indicated, and the bare cable passed through the hole in the cast-iron block. The strands of the cable are then opened and filled with solder or babbitt metal. This fastens the cable securely in and to the casting, which rests on the insulating block in the cup-shaped casting.

The space between the insulating block and the wall of the cup-like casting is filled with the regular type of insulating filling compound generally used to fill end bells on cables. This is a semi-liquid substance, which is readily poured when heated but assumes a semi-solid plastic condition on cooling. Another method of suspending a cable of this type, and embodying both a support and a pothead or terminal, is shown in Fig. 3. It is believed that the cut will be practically self explanatory, except that it may be specially pointed out that the top ring or eye bolt, being in contact with the metallic core of the cable, will be "live," and suitable strain insulators should be inserted in the stranded guy cable or other means employed to support this eye. The photographs, Figs. 4 and 5, show a suspension of this type, indicating clearly the strain insulators.

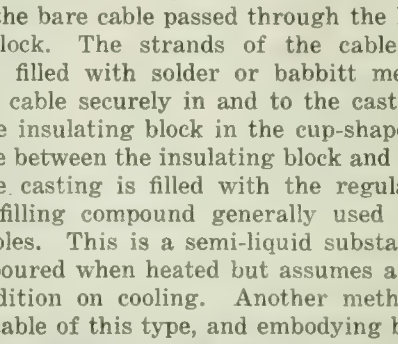

Secure cable to copper supporting wires, every 6 feet in this manner
No 10 B&S Hard Drawn bare copper wire
Securely Soldered
Securely Soldered
2/0 Solid Copper Wire Hard drawn
2/0 Hard drawn Solid Copper Wire

FIG. 6 A POWER CABLE AND ITS SUPPORTING WIRES

Where vertical cables are too long to sustain their own weight auxiliary wires may be attached to the cable at suitable intervals. These wires take much of the weight off the main conductor.

For use in cases where the clamp is applied over the insulation and braid the type of clamp as already referred to and shown at "a" (Fig. 1) is suitable, but must be accurately bored out, so that sufficient pressure on the core of the cable to support it may be obtained, yet not enough applied to damage the insulation. In suspending lead covered cables, as included in class 1, the added weight of the lead covering and means of satisfactorily supporting it must be considered.

Although the method of support already referred to and shown in Fig. 3 is designed primarily for non-lead-covered cables, it may be used without modification for cables so sheathed where the length of the cable is comparatively short. In such a case the lead sheath will not have to be separately supported. This type of support used with a lead-covered cable suspended in an air shaft about 140 ft. deep is shown in Figs. 4 and 5, already referred to. The iron tripod from which the special clamp and end bell are suspended is set on the top of the wind box from the ventilating fan, built over the air shaft, in which the cable hangs. The entire weight is carried by the clamp.

When using lead-covered cables in deeper shafts or bore holes it is necessary to support the lead sheath separately and a usual method is to lash the cable to two or more copper or steel supporting strands. These are fastened to the cable by a wrapping of several turns of wire carefully soldered, the wrappings being spaced every 15 to 25 ft. (See Fig. 6.)

Another type of suspension for lead-covered cables is commonly called the "sheave wheel" method. A standard sheave wheel, such as is usually employed for hoisting cables, is carried between suitable bearings on a timber or steel framework erected over the shaft or bore hole. The cable is passed one or more times over the sheave wheel and the free end is lashed to the side of the cable emerging from the mine. This is done to prevent the cable from slipping back over the sheave.

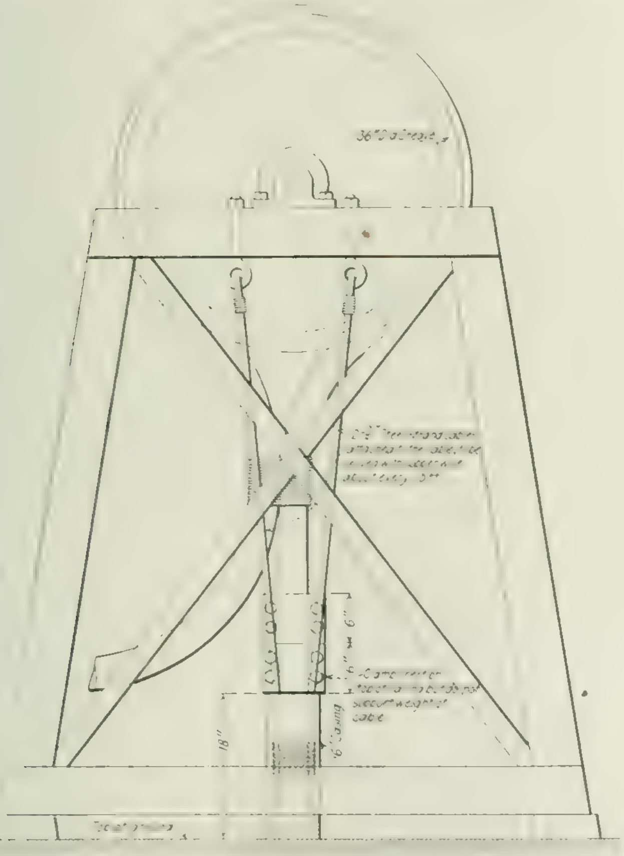


FIG. 7. SUSPENDING A CABLE FROM A SHEAVE
The cable is passed one or more times around a sheave, then lashed to itself. Clamps and auxiliary supporting wires or cables may also be used to advantage.

In the case of heavy or long cables additional safety may be obtained by fastening the cable every 15 or 20 ft. to steel supporting strands, which are in turn connected to the frame supporting the sheave wheel. Adjustable bolts, eye bolts or turn buckles should be used with the steel strands in order to properly take up the stress. This type of suspension is shown in Fig. 7.

Conductors of the 1-d class mentioned above consist of lead-covered cables, over the lead sheath of which there is placed a bedding or layer of asphalted jute, and over this a spiral wire armor. Over this armor there is usually, though not always, a layer of asphalted jute, to protect the armoring wires as much as possible from corrosion by the acid mine water and air.

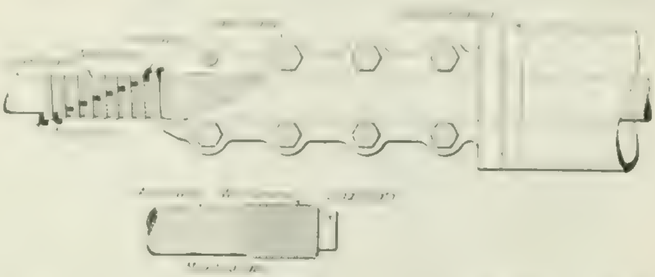


FIG. 8. A CAST-IRON CLAMP ON AN ARMORED CABLE
The clamp fits around the cable, grips it tightly and rests upon the top of the bore-hole casing. The armoring wires may be brought out of the insulating sheath and bent over hook-shaped.

Cables manufactured especially for vertical suspension in shafts and bore holes and called by most cable manufacturers bore-hole cables, are included in this classification. Bore-hole cables are armored with galvanized steel wire, the same as submarine cables, except that one of the wires of the armor is omitted, so that when the service of the armor wire is put around it (which is done while it is in the process of armoring and under tension) it compresses the armor so as to grip the cable tightly, and as this wrapping or serving of armoring wires is placed around the cable every 25 ft., there is no danger of the cable slipping out of the armor.

These cables are designed so that the total weight may be safely carried by the armor wires. The upper end of the cable is so finished as to permit its easy suspension. A wrapping is placed over the armor wires, which are brought out at different points and bent over in a hook. A clamp designed to grip the cable tightly, and also to support it by the wrapping resting on it at the top, is used. This clamp and also the method of finishing the armoring at the end of the cable is shown in detail in Fig. 8. Figs. 10 and 11 show an installation of this type, except that all the armor wires are brought out and bent over at one point.

Another method of supporting wire-armored cables is sometimes used, in which a clamp somewhat resembling two pipe flanges is employed. This has a hole in the center of proper diameter to allow the cable to just pass through. The edges of this hole in the lower half are rounded, so that there will be no cutting or abrading of the cable. The lower half of the clamp is placed over the cable, then the armor wires are untwisted and bent out over the clamp radially.

The upper half of the clamp is then placed over the cable and the two halves tightly fastened together by means of bolts, thus clamping the armor wires securely between the two halves. The ends of the armor wires are then usually bent down over the outer rim of the clamp. This clamp rests on the end of the bore hole casing, thus supporting the cable, practically the entire weight being carried by the armor wires. Fig. 9 illustrates the clamp in detail.

We next come to the multi-conductor cables, and in considering the methods for their suspension it will be found, generally, that the means employed for the different subdivisions of single-conductor cables may be adapted to give satisfactory results when employed with multi-conductor cables of the same subdivisions or general construction. Due to the fact that the single-conductor cables are most commonly used on circuits of low or medium voltage and multi-conductor cables on high voltage circuits, the cross-sectional area of the conductors in the first class will be considerably larger than those in the second class.

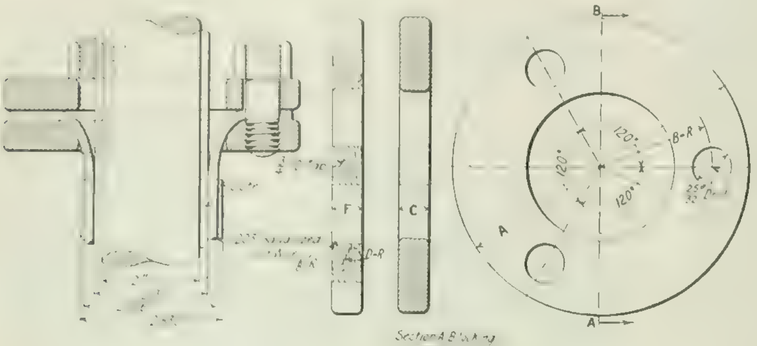


FIG. 9. DETAILS OF A FLANGE CABLE SUPPORT
The armoring wires are unwrapped and brought between the two flanges, which are then drawn tightly together with the bolts. The cable is thus supported by its armor.

For suspending multi-conductor, braid-covered cable, a clamp of the type already described and illustrated in Fig. 1 and in Fig. 8 for single-conductor cables of this same construction will be entirely satisfactory in shafts and bore holes of moderate depth, where the weight of the cable is not such as to require a pressure from the clamp in excess of that which might be applied without injury to the braid covering or other insulation. In deeper shafts and bore holes some additional means of support may be employed, such as two steel strands lashed to the cable by wire wrappings at frequent intervals. The sheave-wheel method would also undoubtedly be satisfactory where the depth of shaft or bore hole was not excessive.

FIGS. 10 AND 11. A POWER CABLE INSTALLED IN A BOREHOLE
[illegible] upon the borehole casing. The casing [illegible] to prevent the [illegible]

For lead-covered multi-conductor cables most of the methods of suspension adaptable to the corresponding type of single-conductor cables are applicable. Among these are: the sheave-wheel type, either with or without the additional supporting strands; the four-bolt clamp, as per Fig. 8 (especially for moderate depths), while in some cases supporting strands only may be employed something after the idea shown in Fig. 6.

Cables of the lead-covered, wire-armored type are usually considered by most engineers and cable manufacturing companies as the conductors "par excellence" for vertical suspension in shafts and bore holes. In a properly designed and constructed cable of this type the matter of suspension is an easy one, since excellent devices are available for this purpose, by means of which the whole weight of the cable is carried by the armor wires, thus relieving the main copper conductors of practically all stress. At the same time the armor wires give excellent protection to the lead sheath and conductors from mechanical injury.

With a properly applied and compounded asphaltic jute covering over the wire armor this is in turn protected from the injurious effects of the sulphur in the mine water. The suspension of the multi-conductor lead-covered, wire-armored cables is effected in exactly the same manner as in the case of the single-conductor cables of the same type. Actual installations, as shown in the photos accompanying this article, cover a wide range of voltage and size of cable as well as depth of bore hole or shaft. Each of these installations has, in its own sphere, served the purpose in hand admirably and given years of satisfactory service.

No Gas Mask Suited to Mine Use

A recommendation with regard to the use of gas masks in coal mines has been issued by the Committee on Safety of the Bureau of Mines, of which George S. Rice is the chairman. The recommendation reads as follows:

"The Bureau of Mines disapproves the use of any military or industrial gas mask so far developed, in fighting mine fires or in recovery work after explosions in any kind of mine, because there always is likely to be carbon monoxide present, or a deficiency of oxygen existing, or both. Self-contained oxygen breathing apparatus should be used under these conditions."

Seasonal Rate Bill in House

A bill identical with the measure introduced in the Senate by Senator Frelinghuysen, providing for seasonal railroad freight rates for the shipping of coal, has been introduced in the House by Representative Cooper of Ohio.

"Agglutinating Curve of Coal"

Laboratory Experiments Disclose Interesting Characteristics in the Coking Properties of Coal When Mixed with Inert Material

By Bykem

An article discussing the effect on the coking agglutinizing properties of coal when mixed with varying proportions of inert material is printed in the English *Gas Journal*, vol. CXLIX, No. 2961 (Feb. 10, 1920, p. 313), under the title—"The Agglutinating Curve." In the experiments described the inert materials employed consisted of sand, anthracite and carbon. The influence of the degree of fineness of the inert substance was studied and reference was made to the "agglutinating curve," showing "the proportion of inert material of varying degrees of fineness a particular coal could sustain and still yield coherent coke." These curves are not included in the published article. Pulverized electrode carbon is recommended as the best inert substance for this test. Coke buttons were obtained by the standard American method for determining volatile matter.

After reading the article referred to, in order to observe more closely this interesting behavior of coal, numerous coke buttons were prepared in the laboratory on three different coals. These tests were undertaken to determine: (1) The maximum per cent of inert material which could be blended with the different coals; (2) the influence of the degree of fineness of the inert material; (3) the crushing strength of the buttons obtained; (4) the agglutinating curve, plotting the per cent of inert material against the crushing strength.

The coals selected were samples of Pocahontas, eastern Kentucky and Illinois coals. All the coals passed a 40-mesh sieve, no effort being made to secure a definite size. The inert materials used were pulverized electrode carbon passing 100 mesh, and sand passing 40 and remaining on 60 mesh, also sand passing 100 mesh.

The maximum proportion of carbon which could be used was found to be 80 per cent. The resulting Pocahontas and Illinois buttons could be easily crushed with the fingers. The Kentucky button was considerably harder than the other two. The results obtained with 50-mesh sand were quite similar to those just described, except that the buttons were somewhat harder. With 100-mesh sand the buttons were somewhat more fragile.

With 80 per cent of 100-mesh sand the Pocahontas and Illinois buttons were practically powders and the Kentucky button was easily crushed with the fingers. In this latter case the Pocahontas button was slightly more coherent than was the Illinois button. In all other cases the Illinois buttons appeared to be as coherent, under similar conditions, as the Pocahontas buttons. One Pocahontas button containing 20 per cent of 200-mesh sand which was made was easily crushed with the fingers.

Efforts were made to determine the crushing strength of the various series of buttons obtained, but no satisfactory method could be devised. Some of the poorest buttons sustained a weight of about 70 grams, while an Illinois button containing 20 per cent of electrode carbon sustained a weight of 66 lb. Since the crushing strengths of these coke buttons were not determined agglutinating curves could not be prepared.

Conclusions reached were as follows: The limiting proportion of inert substance is the measure of the agglutinating value of a coal. This value differs for different inert substances, and decreases with increase of fineness. Hence a given inert material of a definite fineness should be used in comparing all coals in order to secure concordant results.

February Tidewater Shipments Largest in Five Years

Daily Cargoes of Coal to North Atlantic Ports During Month Averaged Nearly 100,000 Net Tons

Tidewater shipments continued in large volume during the month of February. The total quantity of bituminous coal dumped at North Atlantic ports was 2,899,000 net tons. Although smaller than the tonnage of January—3,185,000 tons—this was at nearly the same rate per day. Compared with February, 1919, the month showed an increase of 362,000 tons, or 14 per cent. In fact the movement was the largest attained in any February during the last five years. The total amount dumped during the first eleven months of the present coal year was 35,692,000 net tons. Compared with the preceding coal year (1918-1919) this was a decrease of 4,109,000 tons, or 10 per cent.

BITUMINOUS COAL SHIPPED TO TIDEWATER
(Net tons)

	Coal year 1919-20	Coal year 1918-19
December	2,036,000	3,206,000
January	3,185,000	2,954,000
February	2,899,000	2,537,000
Coal year to Feb 29	35,692,000	39,801,000

Coastwise shipments to New England during February were reported as 793,000 net tons, as compared with 804,000 tons in January. Although smaller in total quantity, the February movement was thus at a higher rate per day, in fact at the highest rate since December, 1918. The cumulative shipments to New England for the coal year, which began April 1, 1919, are far behind the record of the preceding coal year, 8,218,000 tons as against 13,883,000 tons.

BITUMINOUS COAL SHIPPED TO NEW ENGLAND VIA TIDEWATER
(Net tons)

December	674,000	876,000
January	804,000	721,000
February	793,000	554,000
Coal year to Feb. 29	8,218,000	13,883,000

Overseas exports during February were 718,000 net tons, a decrease of 179,000 tons, compared with January. Exports fell off sharply at Philadelphia and Baltimore, and decreased at Hampton Roads. Exports from Charleston, however, rose from 29,000 to 64,000 tons, viz.:

	January	February
New York	.....	.....
Philadelphia	103,000	43,000
Baltimore	174,000	58,000
Hampton Roads	591,000	553,000
Charleston	29,000	64,000
Total	897,000	718,000

Records of Coal Commission Go to Bureau of Mines

President Wilson has issued an executive order transferring all records and files of the Bituminous Coal Commission to the custody of the Council of National Defense. On June 30 they are to be turned over to the Bureau of Mines for consolidation with the files of the Fuel Administration.

Breaker-Chute Linings That Last

Vitrified Clay Pipe Makes a Lining That Will Outwear Twenty Ordinary Linings of the Iron-Sheet Variety, with Practically the Same Cost of Installation

By Dever C. Ashmead
Tarrytown, N. Y.

ORDINARY blue-annealed sheet iron used in the lining of breaker chutes wears out so quickly that several coal companies have been investigating other materials for lining the chutes in their breakers. In the issue of *Coal Age* for Feb. 19, 1920, I called attention to the use of galvanized sheet iron, underground and in the breaker, describing its advantages over the use of blue-annealed sheet iron. Since that article was written I have had the opportunity of examining another lining for breaker chutes which seems to have some advantages over the galvanized sheet iron, especially in troughs of smaller cross-section.

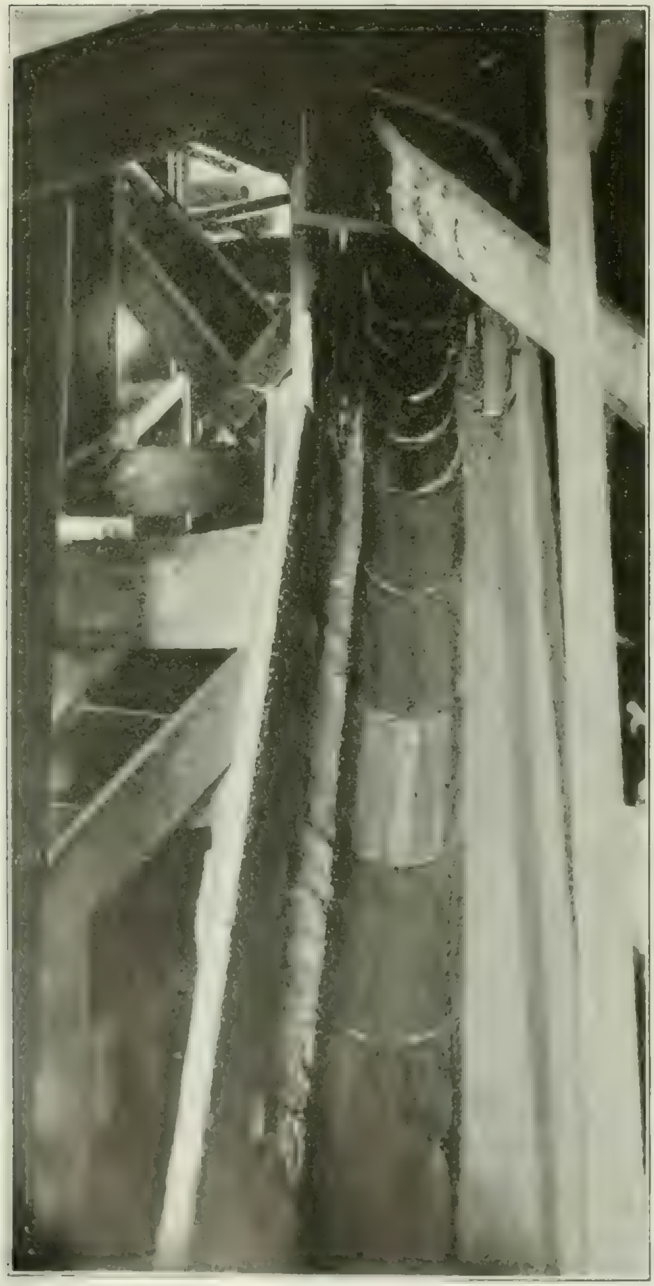


FIG. 1. VITRIFIED CLAY-LINED CHUTE
A 50-ft. chute from the hopper to shaker screens which carries all the fine coal produced in the breaker. This chute has been in service for two and one-half years without renewal of lining.

At the breaker of the Mt. Jessup Coal Co. near Peckville, Pa., the company has been using vitrified clay pipe for the lining of small chutes, and remarkable results have been obtained, particularly as concerns the life of the lining.

As an example, in one of its breakers the company has two chutes lined with vitrified clay pipe. These chutes are each between 40 and 50 ft. long.

One chute carries all the coal in the breaker under pea size, as well as half of the pea coal. The coal drops into the chute from a hopper, the fall being about 3 ft. The material thus lands directly on the clay lining. From this point the coal is carried by the chute a distance of about 50 ft. to a set of shaker screens for sizing. For a period of two and one-half years this lining has been in place, has given continual service and has not been renewed or repaired. At the present time it shows comparatively little wear, indicating that its life will be as long again. This chute with its lining is well illustrated in Fig. 1.

The other chute, shown in Fig. 4, which carries rice coal to a pocket, does not handle as much material as the one just described nor is it quite as long, having a length of only about 40 ft. It will be noted that near the lower end one of the pieces of the lining is broken. This section was broken accidentally, and the company has not as yet procured the proper size of pipe to replace it.

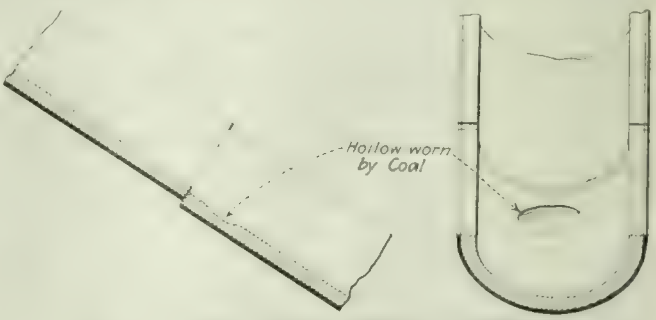


FIG. 2. LOWER LINING SECTION DEPRESSED
This arrangement of lining parts results in unnecessary wear in the lower pipe length.

In a short time the coal company intends to line with vitrified clay pipe all the chutes handling the small sizes of coal, since by experience so far it has found that such a lining will last at least ten times as long as will a lining of blue-annealed sheet iron, while present indications are that it will outwear twenty linings of the iron-sheet variety. From two chutes in this breaker that have been lined with the vitrified clay piping the coal company has received 24 and 30 months of wear, respectively, whereas linings handling the same character of material, and much less of it, but composed of blue-annealed sheet iron have to be renewed every two or three months.

The first cost of the two types of lining was approximately the same, and there is practically no difference in the expense of installation. The cost of upkeep, however, in the case of the clay pipe is much less than that for the sheet iron. The only outlay for upkeep with the clay-pipe lining is when some accident occurs whereby one or more sections are broken. No attention is required after the first installation of the vitrified clay pipe, but with the sheet iron constant attention is necessary as wear is rapid, and the lining must soon be replaced. The Mt. Jessup Coal Co. estimates that it has to reline its sheet-iron chutes on an average once every three months.

Vitrified clay pipe lining is nothing but a good grade of sewer pipe with the bell end removed and the pipe cut in two lengthwise. At times the coal company has had to purchase the pipe whole and do the cutting itself, but upon other occasions it has been able to secure it already prepared for use. When the pipe has been received whole and has had to be cut this work has been done with a diamond-pointed chisel.

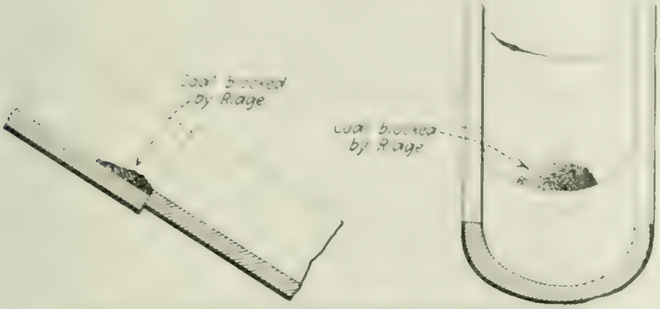


FIG. 3. LOWER LINING SECTION ELEVATED

This results in a tendency to block the chute, with heavy wear on the protruding edge of the lower section.

Great care has to be taken in the installation of the vitrified clay pipe in the chutes to see that the joints, which come about every 2 ft., exactly match. The lower end of the upper section should not be higher than the upper end of the adjacent lower section. If they should not match and the upper one be higher than the one below, the constant passage of coal over this slight drop will have a tendency to wear a hollow in the lower joint of pipe. This is shown diagrammatically in Fig. 2.

By referring to Fig. 4 it will be noticed upon close examination that there are little hollows below a number of the joints. These were caused by the above-described process. Inequality of lining makes a point of wear that could have been prevented if the joints had been properly matched. No matter how close an examination is given to Fig. 1 no hollows will be found, as these joints match accurately, except one or two at the upper end of the chute, where the chute makes a vertical bend. This vertical bend also makes the chute appear in the illustration to have a horizontal curve, but this appearance is only an optical illusion, since the chute lies in a vertical plane throughout its entire length.

If the condition is exactly the reverse of that assumed above and the lower end of the upper joint of pipe is lower than the upper end of the adjacent lower joint, a ridge is formed in the trough or chute which will have a tendency to retard the material as it flows downward. If the chute has only a slight pitch this will tend to stop the coal and possibly clog the chute. This case is illustrated in Fig. 3. In this instance if the retardation of the coal is not sufficient to block the chute this ridge becomes a point of wear and may considerably decrease the life of the lining.

As far as its experiments have gone in the use of vitrified-clay pipe lining, the coal company has come to the conclusion that coal will slide on this substance at the same, or approximately the same, angle as it will on blue-annealed sheet iron. The longer the lining is used the more polished it becomes (as is the case with the sheet iron) and the more readily will the coal move upon it.

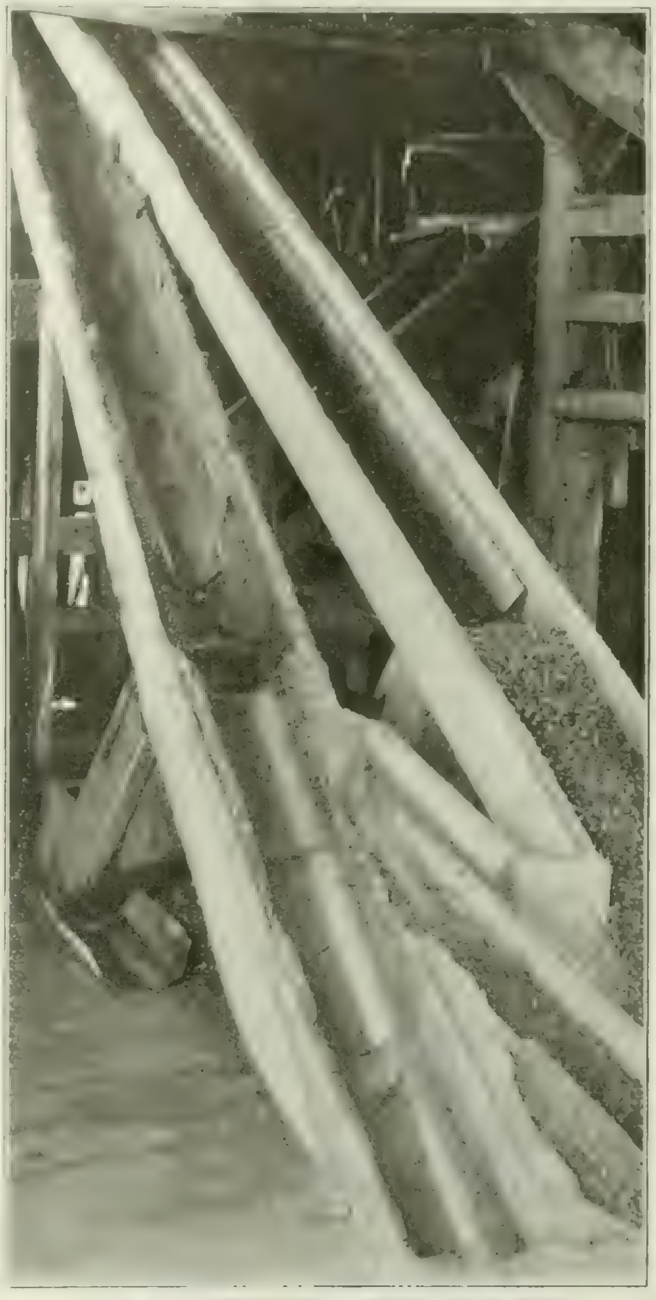


FIG 4 DIFFERENT LININGS COMPARED

The chute on the left carries all the rice coal produced in the breaker. This lining has been in use for two years without repairs, the one broken section having been fractured by the accidental dropping of a wrench. The chute on the right is supplied with blue-annealed steel lining, and it has been found that this chute material needs to be replaced four times a year.

At the present time the company above mentioned is using the lining only for the small sizes of coal, employing only 8 and 12-in. pipe for its chutes. It has not attempted to use this material for larger sizes of coal, but may do so at some future date.

Susquehanna Collieries Co.'s Improvements Near Shamokin, Pa.

Coal Will Be Discharged Underground by Rotary Pump and Hoisted by Skip—This Has Not Been Tried Before in the Anthracite Region—Pulverized Coal Will Be Burned in the Power Plant

MANY new improvements have been made by the Susquehanna Collieries Co., Shamokin, Pa. New shafts are being sunk, miles of new tunnels are being driven, and a new power house is being constructed as well as a new breaker. The *modus operandi* of carrying on the mining was prohibitive because of excessive hauls both underground and on the surface. Consequently some new scheme had to be devised and it was decided to sink the two new shafts—the Pennsylvania and the Richards.

These shafts are only 2,400 ft. apart, but one is in the Pennsylvania, the other in the Richards Basin. To have brought all the coal to one shaft would have meant the expenditure of money for tunnel driving, and would have concentrated so much coal at one shaft as to have interfered with the hoisting.

The Richards shaft is 15 x 23 ft. outside of the timbers and is to be sunk to a depth of 1,000 ft. It is a three-compartment shaft, two for cages and one a combination manway, column and cableway. An electrically driven hoist will be used to operate this shaft. Four levels will be worked from it and 3,000 ft. of tunnels will be driven to connect it with present and new workings. The timbering in the shaft is 12 x 12 in. set on 4 ft. centers. A concrete casing down to a depth of 85 ft. is now in place. Ordinary cages will be used at this shaft to bring the coal to the surface, as it must be transported on a narrow-gage track to the Pennsylvania Colliery breaker. This is at a distance of 2,400 ft. from the shaft. On Jan. 16, 1920, the shaft had been sunk to a depth of 110 ft. A plan of the shaft appears in Fig. 2.

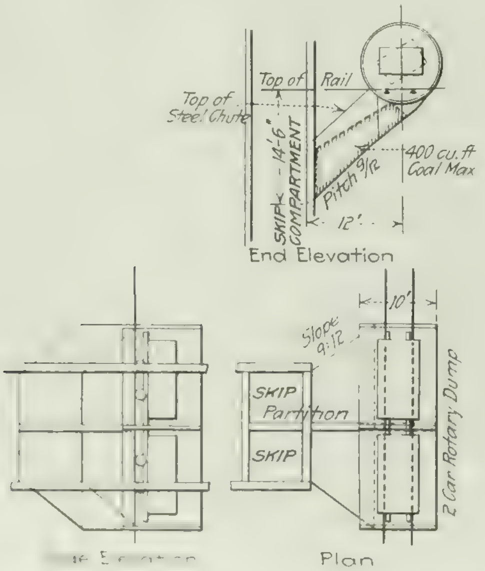
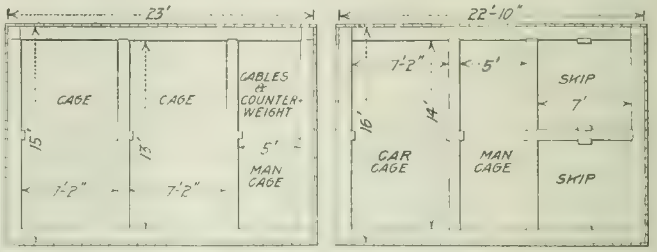


FIG. 1 PROPOSED SHAFT STATION AT PENNSYLVANIA SHAFT

The Susquehanna Collieries Co. contemplates the use of skips [illegible] will make it necessary to dump the [illegible]. For this purpose a rotary dump is proposed.

The Pennsylvania shaft is different in design from the Richards shaft. It consists of 4 compartments, the outside dimensions being 16 x 22 ft. 10 in. Instead of using cages in this shaft the intention is to use skips, which have not been previously employed in vertical hoisting in the anthracite region. These skips will have a capacity of two mine cars each. The two skip compartments extend across the end of the shaft and at right angles to the man- and timber-way. A central compartment between the skip- and man-way is to be used for a pipe- and column-way. Thirteen thousand feet of tunnels will be driven from this shaft to reach all parts of the present workings and connect them with the new shaft. These tunnels are on four different levels. A plan of this shaft is shown in Fig. 3.



FIGS. 2 AND 3. CROSS-SECTIONS OF THE RICHARDS AND PENNSYLVANIA SHAFTS

The first cross-section is of the new Richards shaft, where two regular cages are to be used, while the second cross-section is of the Pennsylvania shaft, in which skips are to be installed. The use of skips makes it necessary to provide a compartment for handling of such crippled mine cars as have to be sent to the surface for repairs.

The Pennsylvania shaft as completed will be sunk to a depth of 1,030 ft. and concreted to a depth of 50 ft. If No. 2 bed is found to be of a suitable depth it will be reached by slopes, but the shaft will not go below the No. 3 bed. The skip will dump directly into the rock-separating house. A steam hoisting engine will be used at this shaft for raising the skips.

The tunnels in this shaft had on Jan. 16 been driven to a total distance of 1,490 ft., the No. 2 level 730 ft. and the No. 3 level 760 ft. No. 2 tunnel was driven 730 ft. between July 21, 1919, and Jan. 16, 1920. This tunnel is 12 ft. wide, 7 ft. high above the rail and carries a ditch 1½ ft. deep below the top of the rail. The tunnel was driven through sandstone and slate. Ingersoll-Rand, water-line, Dreadnaught drills No. 248 are being used in this work. Three of these drills are employed to each tunnel. Thirty holes 8 ft. in depth are drilled to a round and between 100 and 150 lb. of 60 per cent dynamite is used to one shot. The drilling crew consists of six men and the mucking crew of five or six men.

Progress on No. 2 tunnel was retarded to some extent while some coal beds were passed, as trouble in supporting the roof was encountered and concrete roof arches had to be put in place. No. 3 tunnel was driven 760 ft. between the same dates as those given for the No. 2 tunnel. No. 3 tunnel has been driven entirely through conglomerate and is the same size as No. 2 tunnel. Nos. 1 and 4 tunnels are to be driven from the shaft when it reaches the proper point. At the present time sinking operations on the Richards shaft have stopped because of the erection of the permanent headframe. The Pennsylvania shaft has reached a depth of 210 ft.

SERIOUS PUMPING PROBLEM DEALT WITH

The pumping problem is going to be rather a serious one, as the company estimates that the Pennsylvania shaft will make 3,000,000 gal. of water per day and the Richards shaft half of this amount or 1,500,000 gal., making a total of 4,500,000 gal. Two pumping stations will be installed in each shaft, one on the bottom or fourth level and one on the second level. A centrifugal pump will transfer the water from the sump at the bottom of the shaft to the second level, where another pump will pick it up and force it to the surface for use in the breaker. These pumps will be electrically driven.

The general pumping situation at both shafts is rather unusual. At the Pennsylvania shaft the normal pumping requirements are 2,743 gal. per min., while at the Richards shaft there will be handled 1,138 gal. per min. The maximum pumping requirements will be 7,184 gal. per min. at the Pennsylvania and 2,379 gal. at the Richards shaft. The minimum quantities of water at both of these shafts will be handled by direct-acting pumps in two lifts. The excess water will be handled by batteries of centrifugal pumps which will be cut in one at a time according to the requirements. Less water is encountered at the Richards shaft due to the fact that a drainage tunnel takes care of a large part of the water at this mine.

Coal from the Pennsylvania and Richards shafts will be brought first to the rock-separator house, which will be of steel. Coal from the Pennsylvania shaft will be directly dumped at the top of the separator, while that from the Richards shaft will be hauled by a 15-ton electric locomotive to the foot of a car haul, which will take the cars to the top of the separator. After leaving the separator the coal will pass by means of a dragline scraper to the top of the new breaker. This building will also be of steel construction. This will replace the breaker at the Pennsylvania and Richards shafts.

All of the improvements are immediately over large pillars underground with the exception of the breaker and it may be necessary to "slush" the workings under this building. This breaker will have a capacity of 3,000 tons of clean coal per day.

Probably the most interesting feature of the whole development will be the new power house, which will use powdered anthracite coal as fuel. The Susquehanna Colliery Co., after a period of experimentation, decided definitely to employ this type of fuel for this plant. The power house will have a boiler capacity of 12,000 hp. and an electrical capacity of 9,000 kw. Steam turbines and the latest improvements in all equipment will be used. The transmission line will be double and will have a total length of 40,000 ft. The purpose in having two separate transmission lines is to provide a reserve line in case of accident to the main line. Wooden poles will be mainly employed but steel towers will be used at all important crossings. Alternating current will be transmitted at 23,000 volts, 3 phase, 60 cycle. All hoists, fans, compressors, haulage motors, etc., will be electrically driven.

One timber yard, as well as one shop and one warehouse, will serve both of these collieries.

When the mines are operating to their normal capacity the Pennsylvania shaft will have a minimum of 8 and a maximum of 12 electric locomotives underground while the Richards shaft will have a minimum of 6 and a maximum of 10. Forty-five pound rail with a track gage of 44 in. will be used on all haulage roads.

Next to the use of powdered fuel, the most interesting feature of this improvement is the use of the rotary dump underground. This is shown in Fig. 1. The coal is discharged from the car into a coal pocket directly underneath the dump, and from here it is run into the skip for hoisting to the surface. Two cars are discharged simultaneously and the pocket has a capacity of eight cars, or four on each side. The cars are placed on the dump by means of a barney and after discharge they proceed by gravity.

Steamship-Fuel Supplies at Vladivostok

CONSUL David B. Macgowan, Vladivostok, Siberia, Dec. 6, 1919, states that the principal fuel dealers in Vladivostok are two Russian firms and a Japanese firm, which supply launches and small boats only, the Russian firms using for the most part coal shipped to Vladivostok from the Island of Sakhalin, and the Japanese firms using coal shipped from Japan. The Standard Oil Co. has a branch there, which supplies oil and some gasoline for motor boats and motor cars, but oil-burning vessels that have visited Vladivostok always have had sufficient fuel for the round trip or have called at Hongkong for fuel.

The firms referred to can hardly be considered as regular dealers, inasmuch as their supplies are limited, and in the case of the Russian firms fuel is only a side line of their regular business.

The quantity of coal, fuel oil, Diesel oil, and gasoline ordinarily carried in stock is exceedingly small and not to be depended upon for shipping purposes. The average minimum stock of coal probably would not be more than 2,000 tons.

On account of the fluctuations in the ruble-exchange rate and the present unsettled conditions, prices are continually changing. The average price of coal is about $20 per ton, while a few years ago, before the war, steamer coal could be obtained for $5 or $6 per ton f.o.b. As a result of the European war prices of fuel have been multiplied about four times.

The only varieties of coal worth mentioning are "Sakhalin coal" and the Japanese "Ochi lump." These supplies are not used by foreign naval vessels stationed at Vladivostok. Such vessels are supplied with coal by their respective colliers. Neither the Sakhalin nor the Japanese coal is of the highest quality, Sakhalin coal averaging a little better than Japanese. The coal from Sakhalin contains about 8,400 calories per ton and Japanese coal about 7,250 calories; and as coal containing less than 7,200 calories is not considered suitable for steamers it will be seen that the quality of Sakhalin and Japanese coal is little above the minimum for shipping purposes.

U. S. Steel Corporation Acquires Large Coal Acreage

Purchases 8,933 Acres of Steam Coal in Pittsburgh District and 15,662 Acres of Surface in Kentucky—Decrease in Tonnage Mined Last Year as Compared with 1918—Low Accident Record Maintained

DURING the year 1919 the U. S. Steel Corporation made large purchases of coal lands and obtained extensive mining rights to supply its tremendous needs for fuel in its multifarious activities. During the year the Corporation purchased 8,933 acres of steam coal located in the Greene County field, which is in the extreme south of the Pittsburgh district, while in the Connellsville region it purchased some small parcels of coking land aggregating 96 acres of fee and 133 acres of mining rights. In Letcher and Harlan Counties, Kentucky, it acquired 15,662 acres surface and in the Illinois coal fields 153 acres coal land.

The total expenditure of the coal and coke company subsidiaries of the corporation was $12,958,647.86. The inventory of Dec. 31 showed the value of coal, coke and other fuel on hand to be $7,517,024 as compared with $12,526,191 on the corresponding date in 1918.

The report for the year ended Dec. 31, 1919, shows that the corporation mined 28,893,123 tons of coal as compared with 31,748,135 tons the year previous. Of that tonnage 22,955,636 tons were used in the manufacture of coke and 5,937,487 tons for steam and gas and other purposes. During the same period there were 5,933,056 tons of coke manufactured in beehive ovens and 9,530,593 tons in byproducts oven, a total of 15,463,649 tons as compared with 17,757,636 tons the year previous.

LARGE OUTLAY FOR HOUSING AND EQUIPMENT

In the Connellsville district there were expended during the year $385,841.22 for additional housing facilities. At Footedale works an electric-driven hoist and haulage system were completed, at Phillips works an electric system is being installed and at Colonial No. 3 works additions to the electric power plant were completed.

An additional high tension power line from Colonial power plant 3 to works 4 was completed. Pumping equipment to remove mine water is being installed at Leisenring 2 works and additional mine pumps at Dearth and Collier works were completed. At Ronco works additions are being made to the tipple and 100 steel mine cars were acquired. At the Bridgeport works on account of the extension of the electric haulage system a 500-kw. generator and a 20-ton locomotive were purchased.

In the Pocahontas Field, W. Va., on account of additional housing facilities at Nos. 2 to 12 works, there were expended $455,680.52. For a new steel tipple and mine equipment, 108 tenements and an emergency hospital works 8, $230,266.19 were expended. For a coal mining plant and town site at Lynch, expenditures aggregating $2,926,035.40 were made. This development is now practically completed and the new mine is being operated. For 424 steel side dump cars for transport of coal and for 294 mine cars expenditures were made amounting to $534,903.32. For the coal mines at Sygan, Pa., 6 short-wall coal mining machines were purchased.

The corporation's force of employees showed a decrease of 16,000 in 1919 compared with 1918, the report showing 252,106 last year, whereas in 1918 there were 268,710. Of this number 24,595 were employed on the coal and coke properties, while 28,378 were engaged on the same properties in the previous year. On the other hand, the total salaries and wages paid shows an increase of about $27,000,000, the total paid in 1919 aggregating $479,548,040 as compared with $452,663,524 in 1918.

NEARLY 15 PER CENT INCREASE IN AVERAGE WAGE

The average salary or wage per employee per day of all employees exclusive of general administrative and selling forces was $6.12 as compared with $5.33 in 1918, while the average salary or wage per employee per day of all employees was $6.17 as compared with $5.38 the previous year.

The corporation in its Northern coal and coke property has 251,433 acres of coking coal; 123,443 acres of steam and gas coal, and 94,718 acres of surface; 68 coke plants; 21,107 beehive ovens; 2,558 byproduct ovens and has 29 coal plants not connected with coke plants. Of this number there are in the Connellsville region 60,543 acres of coking coal, 23,140 acres of steam and gas coal and 23,988 acres of surface, 53 coke plants, 18,970 beehive ovens and 8 coal plants not connected with coke plants.

WORKS HAS A BENZOL RECOVERY PLANT

Its Southern coal and coke property, known as the Tennessee Coal, Iron and R.R. Co., consists of 191,773 acres of mineral interests and surface, 143,146 acres of mineral interests only, and 14,746 acres of surface only. There are located on developed sections of the above property 9 coal-mining plants, comprising 15 operating mines, producing coal for manufacture into coke and to meet the steam- and gas-coal requirements of the manufacturing plants of the company. In connection with these operations there are 8 coal washing plants and 7 coking plants, the latter comprising a total of 2,974 beehive coke ovens. At Fairfield, Ala., there is located a byproduct coke works consisting of 434 ovens. A benzol recovery plant is connected with this works.

The water supply plants of the subsidiary companies in the Connellsville coke region consist of 13 reservoirs, six pumping stations and pipe lines aggregating 92 miles in length and with a daily capacity of 18,000,000 gallons, furnishing water for use in manufacturing coke and in addition supplying water to three cities.

The total expended by the Corporation and the subsidiary companies during the year for safety work was $1,131,446, compared with $1,110,064 in the preceding year. No material reduction in the number of serious and fatal accidents per 100 employees was made in 1919, but the low record of 1918 was maintained. This showed a decrease in serious and fatal accidents of 46.47 per cent as compared with the record of 1906. The entire time of 112 employees is devoted to safety work, while 5,694 employees are now serving on safety committees.

The total amount disbursed by all companies during 1919 in connection with work accidents was $4,267,355. Of this amount 83.28 per cent was paid directly to injured employees or their families or in taking care of them. To provide prompt and adequate treatment for employees in case of accidents the subsidiary companies have built and are maintaining 286 emergency stations, 25 base hospitals with a staff of 162 surgeons and physicians whose entire time is given to company work, and 104 outside surgeons retained on a salary—all without charge to employees. There are also being conducted 63 stations for training employees in first aid and rescue work.

In furtherance of the established policy of providing modern sanitary facilities for the health and comfort of the employees, much additional equipment was installed throughout the plants and mines during the year. To date 1,496 comfort stations have been installed with 16,999 washing faucets or basins, 2,619 showers and 113,291 lockers. The cost of sanitary work during the year 1919 was $3,208,661.73.

Operators Combat Hysteria in Effort to Stabilize Prices

REPRESENTATIVES of the coal-operating industry in Washington are calling the attention of members of Congress and Government officials to the difficulties which beset the operators in their efforts to hold down the price of coal. To begin with the Sherman Act precludes them meeting and agreeing to reduce prices to levels which would be regarded as fair. In addition, companies accustomed to placing contracts during January, February and March postponed action until the expiration of Government control, so that with the President's request to all Government agencies to make early purchases there is now a clamor for coal.

Despite earnest requests for postponement the Navy insisted upon calling for bids for 1,500,000 tons. As was expected, much less than the quantity required was offered. To be specific, only 400,000 tons was tendered. The announcement far and wide that the Navy cannot get coal even at prices ranging from $1.30 to $1.92 above the Government maximum price in force up to April 1 adds to the hysteria which the operators, compelled to act as individuals, are trying to counteract.

To make the matter worse, law makers and other officials are informed that the railroads are unusually handicapped in their efforts to supply coal cars. The diversion of some 3,000 cars daily so that the interior may be supplied with coal during the strike, coupled with the return of the roads to private operation, has made it extremely difficult to secure the return of these cars to normal channels. Inability to secure cars, it is declared, has added more to the price of coal since the commission's award than did the 27 per cent wage increase.

It is admitted that prices since April 1 have risen more than the increase in the cost of labor and of expenses due to inability to secure cars, but it is pointed out that quite contrary to custom the coal-mining districts are being overrun by buyers who are bidding against each other and making it extremely difficult to prevent the rise of prices to artificial levels. It is said that automobile and luxury manufacturers are particularly to blame for frenzied efforts to buy coal at any price. Little reason is believed to exist for these hysterical efforts to make coal contracts.

It is reasonable to believe that if a car supply equal to that available just prior to the strike, when a weekly production of 12,000,000 tons was attained, were to be made available production would be abreast with demand within ninety days. As there is no immediate hope of adequate car supply, however, it is argued that this is not the time to make contracts.

The Attorney General is being criticized for aggravating the situation to some extent by his statement in regard to the export situation. In his statement to district attorneys he said that our port facilities are adequate to the export of only 30,000,000 tons per annum. This has given the impression that with the lifting of the ban on exports coal at the rate of 30,000,000 tons will begin to leave the country.

As a matter of fact ocean tonnage is not available for more than one-third of that amount, even if a market were available.

Another obstacle to stabilized prices is the practical certainty that freight rates will be substantially increased before next winter. This fact is spurring large consumers to greater efforts to obtain as much coal as possible before the increase goes into effect.

Stafford Gets Five-Year Sentence and May Be Deported

After refusing to grant a new trial, Judge T. J. McGinnis at Beckley, W. Va., on April 5, sentenced Tony Stafford to serve a term of five years in State Penitentiary at Moundsville, W. Va. Stafford was convicted at the January term of the Criminal Court of Raleigh County as one of the ringleaders of a gang of armed men who shot up the mines of the E. E. White Coal Co. at Glen White in November, 1917.

The State charged that Stafford was a national organizer of the United Mine Workers and caused him to be arrested in February, 1919, more than a year after the crime with which he was charged had been committed, and had eleven others taken into custody at the same time. The twelve men were indicted and Stafford was tried at the October, 1919, court, the jury being unable to reach a verdict. At the January term of court he was convicted of attempted murder in the first degree, the maximum penalty for which is five years in the penitentiary. Stafford therefore received the maximum sentence. Deportation proceedings also are pending against him.

As related heretofore, four of the men under indictment with Stafford confessed at the March term of court and each was sentenced to serve a year and a day in the State Penitentiary. The trial of Ed Snider, who was one of the leaders of the attack on the Glen White mine, began on April 6.

Cushing* Says Frelinghuysen Commissioner Will Raise Price of Coal

Department of Agriculture Spends a Million a Year Ascertaining Prices—As a Result Farmers Sell at Highest Prices—Commissioner Has Powers but No Money—Financial Support Will Come Eventually

A GROUP of men in Washington believes that the Government should control the distribution of all necessaries of life. This proposal was given voice a year ago when it was suggested that we should re-form our Government to have two cabinets. One cabinet was to take care of the political matters. The other cabinet was to control the industries of the United States. This second, or industrial, cabinet would be nothing but the old War Industries Board elevated to a position of permanency by legislation, with each member in the new body being detailed to the control of some one raw material.

Some men want two Cabinets — a political and an industrial body. They want a commission for every raw product. When the price is known, no excess product reaches the market and prices rise. Why use Government funds to support such a development? Commissioner would need two millions of dollars a year to carry on work.

In Washington recently the advocates of the industrial cabinet recognized that their proposal was premature. So they are now ready to accept a compromise provided they get something which will head in the direction they want and will land them ultimately at their goal. The resultant compromise is the bill introduced by Senator Frelinghuysen in the Senate in March advocating the appointment of a Coal Commissioner.

His proposal at first seems so innocent and so good that it is easy to say that there is everything in its favor and nothing against it. It rests upon the old saying from Holy Writ: "Ye shall know the truth, and the truth shall make you free." That is, if we know what a miner earns and what he spends or must spend to live decently, we can figure what his wage ought to be. If we know what an operator's costs are and what his selling prices are, we can figure his profits and know whether it is a reasonable profit. If we know what the consumption is and what the production is and how it is distributed we can know whether there is any partiality shown to any consumer. The plan looks good.

Fortunately, it is not necessary to imagine only what this sort of program will mean to prices. We have a concrete example in the current prices of food. The Department of Agriculture conceived something like four and a half or five years ago that it would be an admirable thing for it to undertake to stabilize the prices of food. It built up an organization which now spends annually a million dollars in collecting and disseminating market information alone. It works as follows:

Shipments of vegetables begin in Florida about Jan. 15. The center of production moves north at the rate of about fifteen miles a day. As soon as this crop movement starts the Department of Agriculture sends an agent into that field. He has an office always in the center of production. He gathers facts as to the volume of production, the volume of shipment, and where these vegetables are going. At the same time the Department of Agriculture has in each of the large cities a market-reporting agency. It collects data as to the demand and the prices. The market reporters in New York, Philadelphia, Boston, Pittsburgh, Cincinnati, Cleveland, Detroit and Chicago telegraph every day their figures to the department in Washington. It in turn transmits all its data to the man who is at the center of production. The man at the center of production transmits to the market reporters in the large cities his data on shipments through exactly the same channel. If I am not mistaken, the Department of Agriculture uses on this service in disseminating this information 15,000 miles of leased wire.

Under that system of governmentally regulated distribution of food, I ask any business man to tell me how it is possible to avoid the stabilization of prices upon a higher than normal level. The high cost of food today —when you know this method—is not hard to understand. In other words, the people of the United States are paying through their Government a million dollars a year in order to have the prices of their food held up on themselves.

LARGE EVENTS GROW FROM THE SMALL

We come back now to Senator Frelinghuysen's proposal that we shall establish a Coal Commissioner presumably to do precisely the same thing in coal. The experience of every man in Washington is that everything starts out small and grows. Perfect examples of that are the Department of Agriculture and the Post Office Department. The most conspicuous example of it is the Interstate Commerce Commission. That is, everything starts out apparently without any money but overloaded with power. Rather than abandon the thing because it is unworkable, the tendency is in time to give it enough money to allow it to be workable.

The proposal for a Coal Commissioner is to give him enormous power over the coal trade. However, the first appropriation is only $50,000. Yet, if he were to do what he is supposed to do, it would cost at least

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*George H. [illegible] ing director American Wholesale Coal Association [illegible] entitled "Running in an Effort to Cur[illegible] fore the [illegible] Chamber of Commerce, April 7, 1[illegible]

$2,000,000 a year. Naturally, the Coal Commissioner, when once established, will be harmless and a joke. But his office will not be abolished because it is a joke. On the contrary, he will plead for an appropriation which will allow him to do what he is empowered to do.

When he gets the money we will have the same old process in coal that we are now having in food. That is, we will get governmental information as to where is the best market and it will be distributed to the producers. We will receive information from the market reporters as to where coal is bringing the best price. Governmentally regulated distribution, therefore, will stabilize the coal price, and stabilization always means a higher price level.

I am perfectly willing to admit that from the coal man's standpoint this prospect of sure profit is highly attractive. It gives a man a profit as the result of governmental interference which he has not the wit or the business ability to get for himself in a highly competitive market.

However, from the standpoint of the consumer it strikes me as rather amusing for the people to pay taxes to hire their own servants to sit in Washington and maneuver to put up commodity prices.

Anthracite Wage Conference Expects to Reach Agreement Soon

So rapid has been the progress of negotiating a new working agreement with the anthracite mine workers that the sub-committee of operators and miners' representatives has nearly finished its work. The sub-committee held longer sessions last week and statistics covering the cost of living and comparing the earnings of the anthracite and bituminous mine workers were considered.

At the session held on Tuesday, April 6, the operators replied to the figures heretofore read into the records by the miners, purporting to show the average full-time weekly earnings in the anthracite mines. The miners are said to have presented statistics showing $900 to be the average yearly earnings of a day worker in the hard-coal region and $1,300 to $1,600 to be the average wage each year of a contract miner.

Consideration of similar statistics occupied the time of the sub-committee on April 7, while at the conclusion of the session held on April 8 it was announced that the operators had continued the presentation of their case, offering statements of the average earnings of various classes of mine labor obtained from the payrolls of 80 per cent of the operating companies in the anthracite region during both 1916 and 1919. The operators and miners' representatives then discussed the application of these figures to the problem before the committee. The operators contend that the average yearly wage is much higher than the miners state it to be.

At the conclusion of the session held on Friday, March 9, this statement was given out:

"At the session of the Sub-Committee of Anthracite Operators and Mine Workers held today the operators read into the record data concerning anthracite operators' analysis of earnings of employees in relation to rates and opportunities for employment; a statement showing actual average earnings of employees by occupation with the increase as compared to 1914, and statements giving comparisons of these earnings with the earnings of mine workers. Following this the miners introduced statistics upon the cost of maintaining a family at the prices prevailing in March, 1920, being a summary of the most important authoritative studies of family living costs and standards of living."

The submission of statistical data seemed to have been completed at the Friday session, but on the following day, Saturday, March 10, the miners' representatives insisted on reading into the records data covering the relation between wages and production, costs, prices and profits in the anthracite coal mining industry.

There was a heated discussion before the data were allowed to go into the records of the conference, the mine workers contending that since the operators had introduced statements showing bank accounts they were justified in introducing figures showing operating costs and their relation to earnings.

Canadian Retail Coal Dealers Meet in Annual Convention

The Canadian Retail Coal Association held its sixteenth annual convention April 7 and 8 at the King Edward Hotel, Toronto, with a large attendance. Mayor Thomas L. Church, in welcoming the delegates on behalf of the City of Toronto, expressed appreciation of the good work of the National Coal Council of the United States in regulating the supply of coal during periods of shortage.

The principal feature of the convention was an address by Ellery B. Gordon, a prominent member of the National Coal Council, on "Things Worth Knowing." He dwelt on the necessity of mining coal in the most scientific and efficient manner and described the methods followed at large American mines. He also touched on the labor situation, stating that the National Coal Association was co-operating with the Government to find a solution of the labor problem, working in the interests of the coal trade not only in the United States but in Canada as well. There was at present, be said, no congestion in the shipping of coal to Canada.

Douglas Mallock, of Chicago, known as "the poet of the woods," gave an inspiring and witty address, which delighted his hearers. He made a plea for more sentiment is business and a wider appreciation of the finer things of life.

At the second day's session George H. Cushing, managing director of the American Wholesale Coal Association, gave an address on "Shippers," and John E. Lloyd, president of the National Retail Coal Merchants Association of the United States, spoke on "What Has Been Done," giving an instructive account of the activities of the association. Officers were elected as follows: John M. Daley, London, president; J. A. McLean, Wingham, vice-president; B. A. Caspell, Toronto, is permanent secretary-treasurer. A banquet at noon brought the convention to a close.

A survey of the Government's coal storage facilities is being made by the Bureau of Mines. A necessary preliminary to the early purchase of coal, as requested by the President, is the ascertainment of the maximum storage facilities available. An estimate is to be made of the facilities which it would be practical to create.

Why Do American Mine Workers Produce More Coal Than British?[*]

Questions Whether Machinery or Thick Coal Is the Cause—Regards Room-and-Pillar Mining as an Undoubted Explanation of Cheap Coal—Low Cost Is Not the Outcome of Cheap Labor

By George S. Rice[†]
Washington, D. C.

FROM time to time statements have been published comparing the coal-mining practice in the United States with that in Great Britain. A recent article in a British journal points out that the American miner produces two and a half times as much coal per shift as the British miner, at one-half the cost per ton, and then proceeds to explain the natural, industrial and engineering causes which have led to this result. Among the causes advanced is that the American coal miner has the advantage of working seams of coal the operation of which presents less difficulty owing to the fact that the coal-mining industry in the United States is of more recent date than that of Great Britain.

Great Britain has considerable disadvantages in the greater overburden of its deep coal, in the difficulties resulting from shattered roof, in the irregularities in the floor of the mine and in the cost of operating longwall. By the time the well-conditioned Appalachian, Central and Interior fields of the United States are exhausted British coal-mining history will have been ended.

The latter surmise is not correct, because where these advantages exist they will persist regardless of the time during which mining continues. The coal beds of the United States are not buried deeply, except in the remote parts of the country, as in the Uinta Basin of Utah. The article to which reference is made states that many of our miners are still employed on outcropping seams reached by "adits" (which we term drifts) or by vertical shafts of moderate depth. It is probable in fact that the great bulk of the coal of the United States is taken from a depth of less than 400 ft.

The article adds, "In either case [whether the coal comes from drift mines or from working with shallow shafts] the cost of hauling and hoisting is reduced greatly, and more coal can be extracted in a given time, with less consumption of mechanical power, than when the coal is raised from a great depth." As to hauling, this is not correct, as coal in the United States usually is mined at any given operation from only one bed, hence that bed is worked out rapidly and the average haul is far greater than in British collieries.

On the other hand, most of the coal is hauled over roads that are comparatively level and the same motive power—electricity—often hauls the coal from the rooms direct to the tipple, and the cars are not handled by a number of intermediate systems, as in the mines of Great Bitain. The relatively cheap method of hauling by trolley locomotive is one of the largest single factors tending to the production of cheap coal and in lessening the number of men employed in hauling.

In Great Britain trolley hauling is forbidden on account of the danger from electric sparks. It appears to me that, while there is danger, yet if such hauling were done only on those roads by which the air enters the mine, electric haulage could be safely introduced in many mines in Great Britain, especially if the roads were lined.

The lesser consumption of mechanical power due to the shallowness of the mines is a small item. Depth, of course, has a tendency to limit output, but that difficulty in turn can be taken care of by increasing hoisting facilities. In many mines in Great Britain a number of auxiliary underground incline hoists have to be used, and this no doubt adds in an appreciable degree to the production cost and lowers the productivity of each man.

It is stated that another natural advantage enjoyed in America is the greater proportion of thick seams of coal, which make it easy to employ mechanical coal cutters and conveyors. While no doubt there are thinner beds worked in Great Britain than in the United States, and perhaps the average is thinner, yet greater thickness of coal does not play so important a part in reducing the use of labor as does the method of mining by the room-and-pillar system, which is that usually followed in America.

In the mines of the United States the burden on the coal is so much less than in Great Britain and the geologic disturbances have in such lesser degree weakened the measures that the roof will stand well in wide places with comparatively light propping. Room-and-pillar work is far better adapted to the use of undercutting machines than longwall, particularly where the coal is at all irregular in dip and in faulty condition, as is apt to be the case in Great Britain.

The disadvantage from a national standpoint of the room-and-pillar system is that unless the pillar withdrawal is systematically done there is great loss of coal, and the top or roof seam, where any such coal is present, is apt to be lost. In Great Britain longwall is the prevailing system, and practically all the coal is recovered, whereas in the United States, owing to the fact that some pillars are lost and others, as in Illinois, intentionally left unmined in the interest of safety, the loss of pillar coal together with the loss of roof coal reaches from 30 to 40 per cent.

The writer of the article declares that conveyors greatly assist in the operation of thick beds. This is not so. Conveyors are of no advantage in the working of thick seams of level coal, for in such cases the cars can readily be taken direct to the face. Only where coal is thin are conveyors advantageous. In longwall work they are particularly useful.

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[*] Article entitled "[illegible] of British and American Coal Mining" appearing in [illegible] Report of Investigations of U. S. Bureau of Mines.

[†] Chief mining engineer, U. S. Bureau of Mines.

The article quoted states as a second cause of the American ability to produce cheap coal the fact that coal mining in this country "is regarded as a low-class industry calling for no special ability, and a large number of miners employed underground are agricultural immigrants." While the latter statement is in a measure true, the argument is unconvincing in that these immigrants receive double or triple the wages of the British miners, and therefore, in my opinion, cheapness of labor is in no sense conclusive explanation of why coal is produced more cheaply in the United States than in Great Britain.

Pick Mines Compete with Machine Plants

The third cause assigned for the cheaper mining of coal in this country is the more extended use of mechanical appliances below ground. While the use of mechanical appliances, other than mechanical haulage, does explain some part of the lower cost, it is by no means the whole cause, since one can find almost side by side with machine mines, and entering into competition with them, the so-called "pick" mining plants. Pick mines are not rightly so termed, for in them explosives and not picks are made to do the work of mining.

"Shooting off the solid," a dangerous practice, has replaced undercutting by picks, though real pick mining still survives in a few places. The difference in cost is important competitively, but is not sufficient to explain the far lower cost in the United States than in Great Britain, because it is only a difference ranging from 5c. to 15c. per ton, as shown by the scale agreements made between operators and mine workers. Mechanical undercutting machines, however, permit concentration of work and increased production. There would not be, in fact, enough miners to serve the mines if the machines were removed. A little over one-half of the coal produced in this country is undercut by machines—50 per cent of the bituminous coal in 1917 and a little thin-vein anthracite.

The article quoted says: "The introduction of machinery has been hastened and has removed the handicap imposed by the employment of unskilled labor underground." This is undoubtedly true, but of course does not account for the much lower costs in the pick mines in the United States as compared with mine costs in Great Britain.

"The thicker seams and wider working stalls and roads, or galleries, of American mines also have favored the introduction of machinery underground." This is true, as pointed out above.

Thinks American Advantages Will Cease

"The natural advantages at present enjoyed by the American coal-mining industry, however, will in time be lost, for the outcrop seams of coal and the more easily worked thick seams will in a few years be worked out, and the conditions under which the mines are operated will approach more closely those existing in our own country [Great Britain]." I think that the hope expressed in this statement will be dashed, as in the great mining districts of the country the coal, as previously stated, is shallow, and while increased costs come from attempts to lessen the waste in the mining of coal and also will result from the use of improved safety appliances, yet the natural advantages will continue at least until the time when the Appalachian, Central and Interior fields are worked out. By that time the British fields of coal will be exhausted.

Illegal Strike Cost Illinois Mine Workers $27,299

Farrington Urges Punishment of the Guilty, Declaring That Discipline Must Be Maintained if the Union Is to Last

It cost $27,299 to settle the "wildcat" strike of miners in the Belleville, Springfield and Peoria districts last summer, according to the report made at Peoria by State Treasurer Walter Nesbit to the state convention of the United Mine Workers of America in Illinois. Nesbit bitterly scored the "insurgent element of the miners," who, he said, "camouflaged themselves under the banner of democracy and free speech," while spreading reports that the funds of the state organization were being illegally spent.

"They advocated disobedience to our constitution and violation of the written terms of contract," he said. "We spent $27,299.58 to defray the expense of subduing this unwarranted and illegal strike. I believe we would have been justified in spending every dollar we have rather than to allow the organization to fall into the hands of those who were leading the rebellion."

President Frank Farrington referred to the strike as "a movement that was in positive defiance of every law and principle of our union." In his report Farrington devoted much attention to the recent strike and to the injunction suit against the officers. "Some day," he said, "we will have to resist this procedure. Our right to strike must never be forfeited, else, like serfs, we will be bound to our task. We shall have to demonstrate by resistance that we are going to sustain our freemen's right to strike, to redress wrongs if need be, no matter what the cost."

Farrington, in discussing the rebellion of some of the miners last summer, urged punishment for the guilty, declaring that discipline must be maintained in the ranks if the union is to stand. He denounced the insurgents as trying to deliver the organization over to the socialists.

The insurgents demanded that those of their number who had been discriminated against since the unauthorized strike be reinstated, with a strike as the alternative. They were voted down by 480 to 123, and by the same vote the convention adopted a resolution for a peaceful settlement of the controversy over the men who are said to have suffered from the discrimination.

Samuel French, a Socialist Labor Party leader, was refused permission to address the convention. French gathered his followers about him and held an "outlaw" meeting, at which he denounced the state officials of the United Mine Workers as "biological throw-backs, herdsmen and collie dogs." Frank Hefferly of Maryville contributed to the interest of the occasion by denouncing Farrington for defeating him at the recent election.

Operators, Shippers and Railroads Form New Tidewater Coal Exchange

New Body Will Make Prompt Reclassification—Will Protect Quality of Coal Shipped and Suspend Shipments When Quality or Preparation Falls Below Proper Standard

WHEN the Tidewater Coal Exchange passes out of existence as a Government bureau at midnight of April 30 it will be succeeded by the Tidewater Coal Exchange, Inc. About two hundred operators and shippers of bituminous coal and representatives of the tidewater railroads reached this decision at a meeting held at the Bellevue-Stratford Hotel, Philadelphia, on April 7. They also adopted a report prepared on April 6 by the committee appointed for that purpose. Charles A. Owen, of the Imperial Coal Co., of New York City, was the chairman of the committee and Charles S. Allen, secretary of the Wholesale Coal Trade Association Inc., also of New York City, was the secretary.

The new organization, which will succeed to the work now performed by the Government bureau, will be a non-stock corporation incorporated under the laws of the State of Delaware. It will have a directorate of twenty-three to be chosen from the membership of the exchange or otherwise, as may be deemed advisable. Membership in the corporation will be open to all shippers, transshippers and consignors on the same terms and conditions.

COMMISSIONER TO HAVE COMPLETE CHARGE

The meeting opened with G. N. Snider, of the New York Central Lines, presiding. After a few introductory remarks by Mr. Snider, Henry M. Payne assumed the chair and presided during the remainder of the session.

The rules of the new organization provide that any member violating them may, after due hearing, be deprived of membership in the exchange by the Executive Committee. The secretary-treasurer of the exchange is to be designated by the Executive Committee as the commissioner in charge of all its affairs and there will be a deputy commissioner at Philadelphia and one at Baltimore.

The carriers have been invited to appoint members of an advisory committee, to be composed of one person from each of the following railroads: New York Central; Pennsylvania; Philadelphia & Reading; Central R. R. of New Jersey; Buffalo, Rochester & Pittsburgh; Baltimore & Ohio; Western Maryland, Erie and such other roads as the Executive Committee shall elect, said advisory committee to meet from time to time with the Executive Committee of the exchange, but may not vote in the meetings.

The members decided to continue for the time being the classification now employed by the Tidewater Coal Exchange for bituminous coal as well as the designated pools, and directed that the work of reclassification be prosecuted with due diligence and completed as soon as possible.

The commissioner and deputy commissioners, according to the rules of the new exchange, shall at all times protect the quality of coal shipped to the exchange, through a system of inspection and analysis, if necessary in their opinion, and they may at any time suspend shipments into any pool when, in their judgment, the quality or preparation of such coal is below the proper standard.

Cars containing coal which has been rejected from any particular pool by the inspectors of the exchange, shall be designated as "unclassified" and, upon notice mailed to the registered address of the member, shall be eliminated from the records of the exchange. Responsibility for disposition of such coal shall revert, with all charges from the day following the date notice is so mailed, to the member for whose account the cars were shipped.

The rules of the exchange provide that each member make an initial deposit, not as dues but for working capital, based upon ½ c. per net ton on all tonnage shipped or dumped by him at tidewater ports in the year 1919. This deposit shall not be less than $100 and it shall be subject to revision, based upon shipments Jan. 1 and July 1 of each year, or at more frequent intervals and at any time, in the discretion of the Executive Committee.

The rules of the exchange become effective on coal shipped from the mines on and after May 1.

The headquarters of the new organization will be located in New York City. Rembrandt Peale, the well-known operator, is to be the president; C. A. Owen, vice-president, and J. W. Howe was chosen as temporary secretary and treasurer. Mr. Howe is the present Commissioner of the Tidewater Coal Exchange. Gibbs L. Baker, of Washington, was named as general counsel.

BOARD INCLUDES OPERATORS' REPRESENTATIVES

The Board of Directors is composed of C. A. Owen, W. G. Townes, E. Kelly Downey, W. S. Alden, Wilbur A. Marshall, and Le Baron S. Willard, all of New York City; G. R. Gabell, W. L. Scott, C. H. Jacobs, Medford J. Brown and Noah H. Swayne, 2d, all of Philadelphia; John C. Lewis, Howard Adams, C. F. Kerchner and C. W. Hendley, all of Baltimore; George W. Anderson and E. Russell Norton, representing New England, and the following representatives of the operators: Rembrandt Peale, W. F. Coale, George H. Francis, Senator T. L. Eyre, Henry M. Payne, J. H. Hillman, Mr. Bolton and Telford Lewis.

The Executive Committee members are C. A. Owen, W. G. Townes, E. Kelly Downey, Wilbur A. Marshall, G. R. Gabell, C. H. Jacobs, Howard Adams, C. W. Hendley, Henry M. Payne, G. H. Francis and W. L. Scott.

There will also be working committees at each port. The New York Committee will consist of Messrs. Owen, Downey, Marshall and Townes. The Philadelphia committee will be Messrs. Gabell, Scott and Jacobs and on the Baltimore committee will be Messrs. Hendley, Adams and Lewis.

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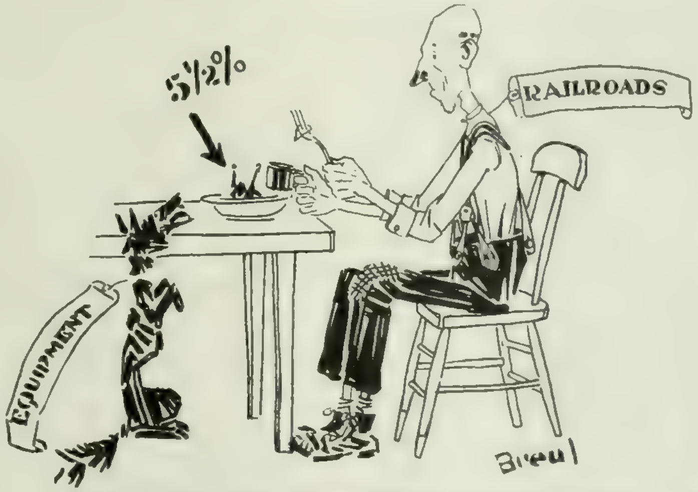
Clear the Air

THE indictment by the Government at Memphis of the American Hardwood Manufacturers' Association has brought to the fore the question of the legality of open market reports. Coal operators should realize that the question in the Memphis case is befogged by the introduction of trade letters and statements of opinions of secretaries and others on future prices and market conditions, so that the issue as to whether it is legal or illegal to report a closed transaction is still in doubt. The coal industry has never been able to get the Department of Justice to rule on this point.

Local coal operators' associations from the first have adopted an open, frank policy toward the Government and have volunteered copies of all circular matter issued to members; a standing invitation to the Department of Justice to object to or criticize any practices. Rush Butler, general counsel of the National Coal Association, has carefully schooled the secretaries of that organization in the proper way to travel and we know his method has not been to see how close to the line the operators may go and still keep within the pale of the law. Rather he has broadly interpreted the spirit of the law and has regularly and conscientiously advised the officers of locals as to their duties in this respect.

His Lenten Fare



CROW FOR THE MAN: NOTHING FOR HIS DOG

We do not believe the coal operators' associations have anything to fear in the continuation of their reports of closed transactions. The indictment and arrest at Indianapolis of R. W. Couffer, the trade reporter of the National Coal Association at Chicago, gives the national association a splendid opportunity to get a clear-cut decision on this very important question of the legality of market reports.

Mr. Couffer has never sold any coal; has never attended any wage-scale conferences, and has never, to our knowledge, written or disseminated any opinions or trade letters on market conditions. He is, therefore, on trial only because he compiles figures of quantities and values of coal sold in the past. He has prepared these reports and has given them out to the public as well as to the coal operators who are members of the association.

How the Public "Gets By"

IF ONLY Dean Swift were with us to look us over and laugh us out of those foolish notions that cause us to exalt small matters into large ones and to bring down our large matters into infinitesimal compass, he would find us just as mirth-provoking as he found his English neighbors in the reign of Queen Anne. The average community obsessed with an idea views it no longer in its proper relations but plays it up out of all proportion to its importance.

Watch a lot of copper, zinc, lead and precious-metal men gathered to stabilize the coal industry and hear these men, who complacently work their own mines only a quarter to half time, deplore the instability of the coal industry that works as much as two-thirds of a full year. Get among a crowd of department-store or hotel men and hear them denounce profits in the coal business that average less than 10 per cent per year in prosperous times and are nothing or a loss in other years which are less fortunate. Yet these men, in their own business, regard 10 per cent on a single sale too low a profit and calculate to turn over their capital many times in a year. In the hotels particularly the visitor has to pay a bribe of 10 per cent or more if he would get prompt and proper service.

The light has not been turned on the department stores and it never will be, for they advertise too liberally in the daily newspapers to make it safe to throw the spotlight on their misdoings. The proprietors of dailies have too keen a sense of business prudence to submit these, their commercial supporters, to the gratuitous misstatements of those uninformed paragraphers who earn their daily bread by attacking the coal industry. These full-page advertisers in the daily press pass easily for national benefactors. They fill places of honor in our political system and preach doctrines to others that they deftly evade applying to themselves. The people who read the public newsprints by that very act save the merchant from investigation and abuse.

If one-half as much attention were given to the profiteering in general merchandising as to the profit making, alleged and actual, in the distribution and sale of necessary products, the public would replace in its reprobation the coal man, the railroad man and the packer by the large storekeeper. The wholesale producer and the distributer have no manner of defense. Baiting them furnishes fun for the public, which likes to see the basal industries plunging in fury from side to side, prodded and pierced by the banderillas of unfriendly journalists.

The biggest offender of all, the department-store baron, quite readily escapes criticism because it is his purse which supports the daily press. All the power of daily newspaperdom is used to inveigle the public into spending itself poor in the purchase of its luxuries. So much is this true that now the people are not satisfied unless they pay a big price.

They pride themselves not on the excellence of their clothes but on the cost of them. No one is satisfied with the comment that a garment looks and fits well unless the compliment is known to be accompanied by a silent thought that the price paid was somewhat higher than others could afford. The public is hypnotized into visiting the higher-priced stores by the subtlest of suggestions. The people are as a goose that glories in its own plucking.

When restrictive legislation is passed it relates only to basal industries. This practice is justified on the ground that the people must have the product in question while other articles are merely luxuries. The real reason is that the basal industries have been made subjects of attack whereas the others have not. Furthermore the country cannot well handle such employments as the millinery or the garment trades but can to a degree manage to control simpler industries having less varied products.

There are problems in all industries and the most general are perhaps those of seasonality. Nothing is more seasonal, and more senselessly seasonal, than the garment industry, and the clothing trade is continually striving to accentuate that condition. It does not try to spread the business over the year. It endeavors rather to set seasons for buying. It likes a feverish market before Christmas and in the fall, so that high prices can be charged.

It is the people profiting by these industries who exclusively term themselves the general public and write the word with six capital letters. A goodly number of shameless profiteers hide their unconscionable identity under that title "The Public," and they find the mask covers them quite satisfactorily. After all, "the public" is, in common parlance, everybody outside of the industry in question, and the people outside utility industries are largely parasitic, and they are not entitled to have their rights considered as paramount to the rights of those in basal industries.

British Versus American Practice

GEORGE S. RICE, in an article appearing in this issue, ventures to question whether the larger production per man in the United States over that secured in Great Britain is the outcome in any large degree of the use of coal-cutting machinery. He points out that so-called "pick mines" are still running in successful competition with machine mines and that the differential in the price of coal—fixed by the unions—is only from 5 to 15c. per ton.

As a matter of fact, as he points out, coal is mined in pick mines by powder and not by pick. Consequently it may be true that one reason why coal production is so large per man in the United States is that nearly all the coal produced in the United States is mined either by machinery or is shot out of the solid, whereas in Great Britain it is mined by pick, with the powder serving merely as a secondary help.

Miners cannot be secured to mine coal at the pick rate unless they are allowed to blow their coal out of the solid, and the machine mine would have long ago displaced the pick miner if that worthy had been required to adequately undercut his coal. Blasting out of the solid made it possible for the "pick miner" to continue at his trade even after the machines increased the area undercut per man and lowered the cost of producing coal. Steadily the pick miner has contrived to induce the manager to let him do less undercutting and use more powder. The just scruples of the mine inspectors have been similarly overcome.

The coal-cutting machine has had certainly a great part in adding to the output of the American miner and has done much also to keep up the standard of the product despite the necessity for increased output and the steady indifference of many of the miners to the quality of the coal they are loading.

Mr. Rice rightly denies that American labor is cheap, but it is certain that the declaration of the British writer would be much more justified if the miner were being compelled, at the regular rate for pick mining, to undercut his coal the full depth calculated to reduce the need for powder to a minimum. Mr. Rice objects to the ascription to undercutting machinery of the large output per man. His stand should be to insist only that we give powder a similar credit. This stand he probably is loath to take because shooting out of the solid has been the cause of a multitude of accidents and is still a reprehensible practice.

Barring Lack of Cars, Conditions Are Favorable

NEVER were conditions more satisfactory in the coal business than today, barring a lack of cars. Stocks are small; buyers are disposed to stock, knowing that there will be a coal shortage the year round; mine workers are not striking and are anxious for work; the weather is reasonably favorable and industry is as active as the car shortage will allow it to be. There is no difficulty other than the car shortage and the unwillingness of the consumer to buy at excessive prices.

Clearly it is possible to sell at a fair price if only transportation can be secured, and it may be pointed out that in many places motor trucks will help to supply the deficiencies of the railroads. Around Terre Haute, which has mines in its western suburb almost within the city limits, coal is being hauled thirty miles by motor trucks. If the West Terre Haute mines were not so close, possibly the range of ship-by-truck service would not be limited to thirty miles.

There are wonderful opportunities for those who will develop motor-truck direct-from-mine-to consumer service via the public roads. During the freight congestion of 1917 435,000 motor trucks hauled 1,200,000,000 tons of materials. Why should not the congestion of 1920 be similarly met? The opportunity to fill the needs of the near-by communities during rail strikes—which are increasingly common—makes shipping by truck an extremely attractive proposition. Return cargoes will help in reducing the cost of the service. What these will be will depend upon the kind of truck used and the conditions at the mine and in the town to which the coal delivery is made.

Out of the present strike of railroad men will come further demoralization of the railroads. Conditions were bad enough before the strike started; they will be much more severe when the full effect reaches the mines.

DISCUSSION by READERS

EDITED BY JAMES T. BEARD

Are Shotfirers Harmful?

Letter No. 1—All progressive mining laws require the employment of shotfirers in gaseous mines. The Bureau of Mines recommends the same. Apparently progressive and well posted mining men would consider it an idle question to ask if the employment of shotfirers can be expected to increase the safety in mining. It is therefore strange to read in *Coal Age*, Feb. 12, p. 309, an article saying: "Of all the archaic, moss-grown, semi-modern, so-called safety ideas, that of employing shotfirers is probably one of the most harmful and dangerous." The article then concludes with the advice: "Spend just half as much money in real ventilation and make the mine really safe."

The writer wisely refrains from signing his name. If he is in any position of authority about a coal mine he'd be a fit subject for investigation by the state mine inspector or the coal company who employs him. That such advice gain no converts, it should not be allowed to pass unchallenged.

The Canadian Collieries (Ltd.) keep their board brattices, at all times, within six feet of the working face. Other mines in British Columbia are even more gaseous. Gas issues and collects in falls of the roof which occur during the working hours. Pockets and blowers of gas are frequently struck as the work advances, and these conditions occur in many places in these mines.

Conditions That Make Shotfirers Needful

The Edison electric mine lamp is now being generally adopted where any new installation of lamps is made, at a gaseous mine, or an old system is replaced by a new one. Methane can not be detected with these lamps. Under such circumstances, how can even a careful miner tell that no gas is present before he fires his shot. If no shotfirers are to be employed, what is to prevent a careless miner, who uses a flame safety lamp, from firing a shot where gas has collected in a cavity in the roof, because his brattice is broken down or not up to the working face?

Gases and lack of ventilation are not the only dangers met with in firing shots and handling explosives in a coal mine. The U. S. Coal & Coke Co. requires that all the "bugdust" from the cutting machines be loaded out of the working places, before the shotfirer shoots the coal. Some of the mines in eastern Kentucky require that the places be swept clean with a broom, so that all the dust is removed before a shot is fired.

The Pennsylvania Mining Law, under certain conditions, requires the dust to be wet down before shots are fired, and the shotfirer must see that these rules are obeyed. He superintends the loading of the hole, determines the kind and quantity of powder and tamping material used, and directs the placing of the hole and the general safety of the place, both before and after the shot is fired, looking for fire, gas or other dangers. The shotfirer must see that the coal is properly mined. Many explosions have been traced to blownout shots where no gas was found in the mine. A single mine explosion may cost the operating company more money than the wages of ten shotfirers.

The shotfirer reduces the danger of missfires or hangfire shots, by shooting with a battery and cable. He also lessens the dangers incident to loading and shooting the holes. The H. C. Frick Coke Co., mining the highly explosive coal of the Connellsville region, has greatly reduced the number of mine disasters by the employment of shotfirers, in addition to other safety measures they have adopted.

Miners Habitually Reckless and Careless

Miners work in more or less danger at all times and usually alone. It is human nature for them to, at times, take a chance and fire a shot that is not safe. No one sees it but themselves, as all traces are removed before the boss visits the place. It is somewhat different with a shotfirer. He gains no benefit whatever from an improper shot, as does the miner, and the improper shot is not fired.

Some miners, with limited experience and unfamiliar with a particular coal field, will drill holes straight into the face of the coal, without mining the coal whatever. They then charge the holes without any tamping and tell the shotfirer they are ready to shoot. They had, perhaps, been accustomed to shooting coal that had been undercut by a mining machine. The supervision of a competent shotfirer prevents such dangerous shots from being fired.

The carelessness that familiarity with handling explosives breeds in some men who are ignorant of the real danger is almost beyond belief. It is not uncommon to see men carry their sticks of powder loose in their pockets while riding into the mine in a trip pulled by an electric motor. They will take the detonating caps out of their pockets with the heads of matches sticking into them, all being carried loosely together in the same coat or vest pocket. Miners will crimp the cap onto the fuse with their teeth, cut the fuse ten or fifteen inches long, light and shove it into a six-foot hole. A few dummy cartridges previously filled with coal dust may be hastily rammed on top of the fuse, and the miner runs to a place of safety.

Bad Practices Eliminated by the Employment of Shotfirers

All these practices are done away with when a competent shotfirer is employed. He has the caps in his charge and distributes them. The powder is issued from a powderhouse, in small boxes made from nonconducting material. No fuses at all are used, as the shots are fired electrically. No caps or powder are carried into the homes of the miners, where the children can get hold of them and become possible cripples for life. Some mining towns have explosives enough stored in the homes to blow the town to kingdom come. The miners have nowhere else to store it, and the company will sell it only in unbroken packages; so that it becomes a menace not only to the miner's family but to the entire town.

The article to which I have referred, speaking of the shotfiring system, states that "with the increase of real safety departments, mine after mine is abolishing it." It would certainly be interesting to learn the names of these mines and the names of the companies operating them. All men should entertain an open mind for new ideas; but with all our past experience, reports of mining commissions, bulletins of the Bureau of Mines, methods of operation of the most up-to-date coal-mining companies advocating the employment of shotfirers, and our state laws compelling their employment, it would appear that the general consensus of opinion was that to employ shotfirers is abundantly justified. Fewer men are exposed to the dangers of a possible explosion when all the men but the shotfirers are out of the mine when the shots are fired. **Ralph W. Mayer.**

California, Pa.

Location of Regulators in a Mine

Letter No. 1—The question asked by R. W. Lightburn, *Coal Age*, Feb. 19, p. 367, having reference to the advantageous location of regulators placed in aircourses, in coal mines, is a question that mine foremen and firebosses have been studying carefully for many years.

The mine described by Mr. Lightburn, lying at a depth of 550 ft. and passing 200,000 cu.ft. of air per minute, is a mine above the average size. At so great a depth, a mine requiring so large an amount of air traveling would likely prove an unprofitable venture, unless a good sized output is obtained, say an output ranging from 2,500 to 3,000 tons of coal per day of eight hours.

To meet these requirements and hoist this tonnage from such a depth the cages would probably be in the shafts 50 per cent of the working time, which would cause the fan to operate largely against a dead-end resistance, so to speak. The movement of the cages in the shaft will add materially to the water gage that would be required to circulate this air current through an unobstructed airway.

High Pressure on Stoppings and Doors

Moreover, this mine is said to be very extensive, which means a tremendous pressure on brattices, stoppings, doors, etc., requiring skill and attention to keep them tight. No matter how well these are built, if constant inspection is not maintained, the drying and shrinking of the cement, the action of the air on the coal and roof, due to the seasonal changes in temperature and the humidity, the yielding of the pillars to the overlying weight as extraction proceeds in the immediate vicinity, and the jar and concussion caused by shots, are all agents that operate to destroy the efficiency of the circulation.

In mining practice, therefore, the highest efficiency will be attained with the smallest possible number of stoppings and keeping these stoppings absolutely tight. It follows that the nearer air-courses can be made continuous, without breakthroughs, the more efficient will be the air current. These considerations show that there is quite a material difference as to where regulators should be placed in mine airways, and mine foremen, today, are rapidly seeing that there is a choice in the location of regulators.

Suppose, for example, the regulator is placed at the intake of mouth of a split and there are say 50 brattices or stoppings on the split. The difference of pressure between the two sides of each stopping is then only the pressure caused by the split itself. None of these stoppings bare the total pressure of the current after the split is made.

But, on the other hand, if we assume that the position of the regulator is now advanced along the intake of the split to a point about midway between the mouth and the inby end of the split, the intake side of each stopping outby from the regulator will receive the full pressure, while beyond the regulator the pressure will be reduced to that caused by the remaining portion of the split. It is clear, in this case, that the difference of pressure on the two sides of the outby stoppings would increase the air leaks if any occurred.

Again, suppose the regulator was placed at the last open crosscut in the split, each of the 50 stoppings outby from the regulator would receive the full intake pressure due to the mine resistance, while the return pressure on all these stoppings would be only that due to the resistance of the return airway. This would greatly increase the difference of pressure on the two sides of the stoppings and would be responsible for very large leakage of air.

Study Conditions When Placing a Regulator

It should be said here that, in a split with live workings, which are often equipped with wooden stoppings, the vibration of shots, passing trains, roof falls, and numerous other causes make it almost impossible to keep these stoppings absolutely airtight and these causes should be anticipated in choosing the location of the regulator.

It would be impossible to prescribe the correct location for a regulator that would apply with equal results to all mines. It is a problem that needs individual treatment at each mine. The foregoing, however, are actual conditions as I have found them in my coal-mining practice.

If the regulator is placed at the return end of an air split it would have the same effect as placing it at the intake end of the same split, in so far as efficiency was concerned, but it should be placed outby from all the brattices or stoppings.

I have found it very convenient to place regulators close to overcasts, on the main roads, and have small air-tight, plate doors opening into the inside of the overcast. One inspection will then serve both purposes, that is, to ascertain the condition of the top of the overcast and the regulator. Measurements of the quantity of air passing can be made at the same time, without the necessity of traveling a good distance in a high air current, often in zero weather.

The pulsations of the current caused by the movement of the cages is quite a factor in efficient mine ventilation. It makes little difference whether the blowing or exhaust system of ventilation is employed, the results are the same. In a new mine, the chart of the pressure gage will show a very irregular line, which gradually smooths out as the development of the mine increases.

because the elasticity and compressibility of the current modifies this effect in a large mine.

In shafts from 500 to 700 ft. deep, in the process of development, the action of a force or blowing fan is to create a high pressure when the cages block the shaft. On the other hand, an exhaust fan acts to create a vacuous condition, at such times. Each of these conditions, however, is relieved suddenly, as the cages approach the landings when the shaft compartments are separated by air-tight partitions.

At times, I have seen the current so changeable in the mine, due to this cause, that it was quite difficult to split the air with any satisfaction. In a few instances, the current would be almost at a standstill, and again there would be an abnormal rush of air; and I think it can be safely said, in such cases, there is much choice in the location of a regulator. ROBERT Z. VIRGIN.

Pittsburgh, Pa.

Growing Scarcity of Mine Timber

Letter No. 1—The indirect reference to the growing scarcity of mine timber, in a recent inquiry that appeared in *Coal Age*, Feb. 12, p. 327, suggests an important subject for consideration. It is a question of concern to everyone, inasmuch as the falling off in the timber supply, in mining, will eventually increase the cost of production of coal; and that, in turn, will make the cost of living still higher.

In the study of the question so far, we have turned to the use of steel and concrete to take the place of the wooden supports so commonly used in mining. It is to be hoped that some more economical and practical means will be found that will prove equally effective and less expensive than the materials just mentioned. This is not to say that there will not be problems arising in mining practice where the use of concrete and steel will be the most practical and economical means to adopt, which is amply proved by experience.

STEEL AND CEMENT FOR PERMANENT CONSTRUCTION

Steel and cement construction is durable and must continue to be employed for the supports of the roof on main haulage roads that require to be kept open a number of years. These materials are also useful in the construction of car tracks, shaft bottoms, pumprooms and other permanent work underground. Where the scarcity of mine timber will be most felt is at the working face, in rooms and short entries, and in pillar workings. For these purposes alone, large mines require timber in carload lots, and a constant supply is necessary to insure a maximum extraction of the coal, with a maximum degree of safety.

In view, then, of the coming shortage of mine timber, it is clear that a practical and economical substitute must be found, or improved methods of working adopted, that will not require so profligate a use of timber. The longwall method of mining, with its packwalls and its complete extraction of the coal together with the use of a minimum amount of timber, suggests a solution worthy of the most careful consideration, with a view to determine the conditions under which that method of mining can be successfully employed.

In mines where conditions require the use of timber in the workings, much should be accomplished by employing experienced timbermen and making every effort to recover all the timber possible, when drawing back the pillars and abandoning rooms and entries. At times it may prove advisable to drive rooms on a yardage basis, with wide pillars between them, and drawing back the pillars on the retreating plan, with a minimum requirement for timber. In most cases, however, the real problem will be met in the matter of drawing back pillars under a frail roof that demands adequate support to insure safety. Especially is this true where the roof pressure threatens to crush the coal in the pillars, and more timber is needed for their protection.

PRESERVATION OF MINE TIMBER

Another point worthy of consideration is the treatment of mine timber for its preservation. This includes not only seasoning the timber before it is taken into the mine, by adopting proper methods of stacking props on the surface and protecting them from the weather; but suggests the advisability of chemically treating mine timber, to render it less liable to decay and less subject to destruction by insects. The life of timber is greatly prolonged by immersion in creosote, oil, or a preservative salt solution. The cement gun has also proved an effective means of prolonging the life of mine timber. It should be stated here that green timber taken into the mines is subject to dry rot and rapid decay within a year or eighteen months, while timber properly seasoned and treated will last four or five years or longer.

An interesting reference has been made to forestry and the establishment of timber preserves. While it is not a paying investment to attempt to raise timber on a small acreage, there are numerous hilly and mountainous regions that are of no value except for the growth of timber; and this should be encouraged with proper care and attention. Every precaution should be used to keep fires from destroying the young trees. At the present time, it would seem that there is not enough attention given to the cultivation of timber tracts, outside of what is done by the government in this direction. Every state should have adequate laws for the protection of its timber lands. The damage done to timber tracts, especially second growth timber, is appalling. For the purposes of mine timber, trees, according to their size, usually attain sufficient growth in from ten to twenty years. Hence, mountainous regions adjacent to coal fields should be re-forested, which would seem to be a practical solution of the problem of the impending scarcity of timber. W. H. NOONE.

Thomas, W. Va.

Health and Industry

Letter No. 2—I read with interest the letter of John Rose, *Coal Age*, Feb. 19, p. 364, and feel like him that it is an impossibility for a man to do justice to himself if he is not healthy and strong. Many times the officials of coal companies are largely responsible for the unhealthy conditions that surround the mines, and which are so much in evidence in a great number of our mining towns; although I am glad to say this is not always the case. An instance comes to my mind just now, where the company would not permit a piece of loose paper to lie about the streets and yet there was much sickness in the town because of the unsanitary conditions within the homes.

What is needed along this line is an effective effort to educate the people in respect to their habits of living. We can clean up the town and the outside of the houses;

but if the inside of the home is neglected, all our efforts are in vain. It is the same way with our bodies. We can wash and put on clean clothes; but if we neglect to eat good wholesome food, all our bathing will be of no avail. In the same way, efforts to make workers strong and healthy, by cleaning up the town, will be useless, unless families are taught right ways of living.

Observation leads one to believe that a large proportion of the foreign-speaking people, in our mining towns, think that they are doing the right thing, but they need to be taught the first prinicples of health and good living. How often do we find a man, his wife and three or four children living together in a house with as many boarders, and only four or, at the most, five rooms in the house, while the windows are closed most of the day and night. Think what the condition of those people must be after spending a night in such an atmosphere.

Before closing, I want to refer to one point mentioned in Mr. Rose's letter. He quotes R. B. Babson as saying, "The need of the hour is more religion. . . . The solving of the labor situation is wholly a question of religion." It is strange that people often think that the discussion of this side of the subject has no place in the business of life; but my idea is, if our religion will not mix with our business, it is a poor thing to have around the house. The sooner we apply its principles to our everyday life, the better it will be for all concerned. **THOMAS HOGARTH.**

McIntyre, Pa.

Shifting the Worker

Letter No. 4—Having had a similar experience to that described by "A. H," in the inquiry, *Coal Age*, Feb. 12, p. 327, I was much interested in his recital, although the circumstances connected with my own experience were somewhat different from those he describes. However, being a worker, I am proud to say that it has been my good fortune to rise, by degrees, to a position where I hire and discharge my own men and, I hope, treat them in a manner different from that which I received.

In my opinion, the mine superintendent or foreman who will allow a man to quit his employ just because he asks to better his conditions is far from being progressive and should not be retained in the employ of the company. I would fire such a man so quick that his head would swim.

The present unrest among the laboring classes, today, is owing to the high wages that are paid for different kinds of work. There are men who will quit a job for another where they can get more pay, regardless of whether or not they are fitted for the place. Others will start studying or training to prepare themselves for filling a higher position. A third class are satisfied to hang onto their jobs; and, while they envy the man that gets ahead, they have little ambition to make the attempt themselves.

The man who has too much confidence in his own ability often finds that he is not fitted for the position he would like to fill. Not infrequently, men get the notion in their heads that the company cannot do without them, only to find another man put in their place, because of their disregard of instructions.

When I hear a man boasting that he "cannot be beat," in the work he is doing, I always feel that, while the speaker may be a good man, there is a better than he, somewhere, and I have found this generally true. My own experience as a worker taught me to approach my boss with respect. I would talk to him as man to man; and I found this attitude made him trust me.

As an employer, I endeavor to treat my men with consideration, with due regard to their working conditions and wages. My motto is, Never ask a man to do anything that you would not do yourself, and I have found this is a good rule to remember when some difficult work is to be done.

THE SUPERINTENDENT NOT ALWAYS TO BLAME

It is not always a superintendent's fault that he cannot give a man everything he wants. I heartily endorse the words of the editor in reply to this question. He states that, "All cannot be firebosses, or motormen, or drivers. It is up to the worker to earn his advancement." A superintendent is unable to help a man who is too lazy to help himself. Such a one is worthless as a worker. He should lay down and let someone bury him. We must acknowledge the truth of the old saying, "Every man is the architect of his own fortune." At the foot of the ladder by which a few mount to success, there are millions of aimless, helpless ones waiting for someone to give them a hand. Many of these think that the world owes them a living.

In closing, let me say that my thought is that mine officials and their men should hold get-together meetings, for the purpose of becoming better acquainted with each other. Such meetings, if properly conducted, cannot fail to win the confidence of the men in their employers; and the response made by the men will increase the confidence of the employers in their men. Each will come to know the other better, and this will result in better and more efficient work in the mine.

In regard to shifting a worker, it is my opinion that mine officials should study the capabilities of each man in their employ and try, in every way practicable, to find the place where a man can do his best work; in other words, to find the work for which he is best fitted. Certainly, this question is one well worthy of discussion by superintendents and foremen as well as by their men.

Johnstown, Pa. **SAK.**

Dead-End in Trolley Haulage

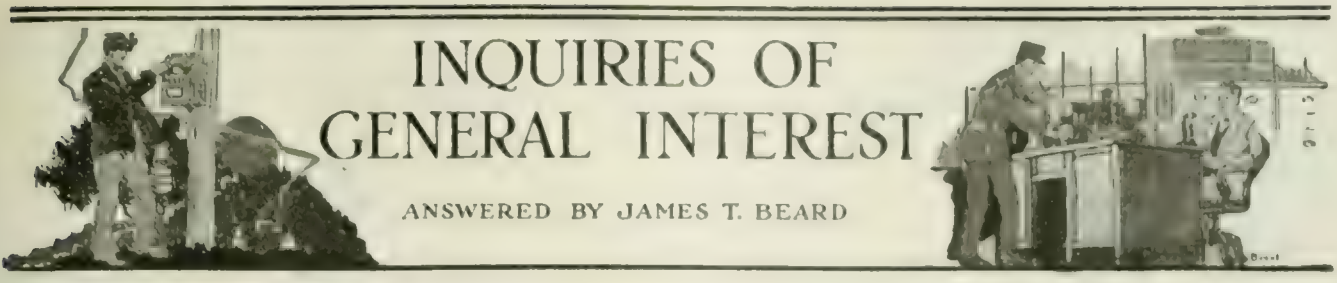
Letter No. 6—The question was asked in *Coal Age*, Feb. 19, p. 367, by an assistant foreman of Rawl, W. Va., concerning how far a trolley wire should be carried toward the face of an active entry. In reply, let me say that, in development work, it is common practice to keep the trolley wire within such distance from the face as can be conveniently covered by the cable on the reel of the gathering locomotive.

In gaseous mines, however, special care must be taken to keep the wire on the fresh intake air, and never extend it beyond the last open breakthrough in any entry, nor within fifty feet of the neck of the first room in which pillars are being drawn.

The wire terminals should be protected by guardboards, or rubber hose, for a distance of three feet from the end. Care must also be taken to cut the end off and fasten it with an insulated turn-buckle.

Pikeville, Ky. **G. E. DAUGHERTY.**

[This letter will close the discussion "Dead-End in Trolley Haulage."—EDITOR.]



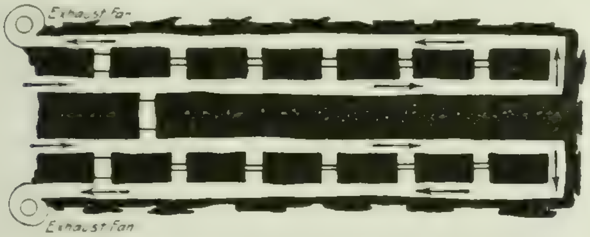
INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD

Double Fan Circulation

We are desirous of obtaining some information regarding a double-fan circulation. As shown in the sketch, herewith, we have installed two fans of the same type and dimensions, exhausting the air from the mine. The two circulations, or air currents, are separate and distinct, one of the fans ventilating the right side of the mine and the other the left side.

Assuming that the two circulations are equal and each fan is passing 100,000 cu.ft. per min., what quantity of air could be expected to be circulated in the entire mine should one of the fans break down. The doors are so arranged in the mine that they can be readily adjusted to turn the two circulations into two or more splits ventilating the entire mine.



Manifold, Pa. **George Haley.**

In replying to this question, we will assume that the arrangement is such that when one fan is thrown out of commission or disabled the current produced by the other fan can be split so that half of the air will travel each side of the mine. Assuming that the power applied to the fan shaft remains unchanged and considering but one fan is operating and circulating the air in two equal splits that ventilate the two sides of the mine, respectively, it is evident that this fan is now working against double the amount of rubbing surface, and the area of passage is also twice what it was when the fan was ventilating one side of the mine only. But, for a constant power on the air, the quantity of air in circulation varies as the mine power potential (X_u); and we have in this case,

$$X_u \text{ varies as } \frac{a}{\sqrt[3]{s}}; \quad \text{or as } \frac{2}{\sqrt[3]{2}} = \frac{2}{1.26} = 1.587$$

That is to say, if a single fan will circulate 100,000 cu.ft. per min. on one side of this mine, when charged with the circulation for both sides of the mine, in two splits, representing twice the rubbing surface and twice the sectional area, the air volume will be increased 1.587 times the original circulation, which gives, in this case, 100,000 × 1.587 = 158,700 cu.ft. per min., equally distributed between the two sides of the mine.

Another method of solution is to consider the mine potential (X_u) as constant and the power reduced to one-half the original power, by the breaking down of one fan. In this case, the quantity of air in circulation varies as the cube root of the power and we have,

$$Q \text{ varies as } \sqrt[3]{U}, \quad \text{or as } \sqrt[3]{\tfrac{1}{2}} = \sqrt[3]{0.5} = 0.7935$$

That is to say, one fan working alone and representing one-half the power will circulate 0.7935 times the quantity of air circulated by the two fans, in the same mine, which gives 200,000 × 0.7935 = 158,700 cu.ft. per min.

Powder Flask in Pillar Working

An incident occurred today that I would like to relate for the benefit of *Coal Age* readers, and learn their comments regarding the same. At present, I am engaged in drawing back a straight pillar, under a strong top that crushes the coal, throwing it from the rib for a distance of several yards ahead.

The crushing effect of the overburden resting on the pillars is so great, that, at times, cars have to be loaded a considerable distance from the end of the pillar. It has been necessary to reinforce the pillar on which I am working by extending a row of posts along the ribs, the posts being set 5 ft. apart. Other posts are then put back of these as lagging to support the coal and hold it in place until it can be taken out as the pillar is drawn back. The pillar is 16 or 18 ft. in width and is reinforced in the manner I have described, for a distance of 30 yd. from the face.

While I was at work, today, the mine foreman and an inspector came into my place and, looking around, discovered my powder flask where I had laid it on the gob. I think the inspector was an insurance inspector. They asked me why I did not keep my powder flask in a cubbyhole. I told them that I thought it was safer where it was, under the conditions in my place.

My experience in drawing pillars, in straight pickwork, has convinced me that the practice I have adopted of stowing away my powder flask in a safe place in the gob, is far better than putting it in a cubbyhole cut into the pillar. When driving a room or entry, I agree that it is all right to put your powder flask away in a cubbyhole in the rib; also, such practice is safe when the conditions in drawing pillars are such as to allow of the use of electric machines; but, under the conditions described it is safer in the gob.

Houston, Pa. **William B. Jackson.**

If we understand the conditions described by this correspondent, it would be practically impossible to find a cubbyhole, in the rib of this pillar, where a powder flask would be safe. A place well selected in the gob would probably afford better protection for the flask than any niche or cubbyhole in a pillar that was being crushed by the weight of the overburden in the manner here described. We shall be glad to learn of the opinions and practice of others in this regard.

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Miscellaneous Questions

(Answered by Request)

Ques.—How would you proceed to enter a mine, for rescuing persons, after an explosion had occurred; and would you reverse the fan?

Ans.—As quickly as possible, call for volunteers and select and equip, under competent leadership, those who are more experienced and familiar with the mine workings. Having ascertained that the ventilating apparatus is still working, enter the mine on the intake air and proceed with caution. Make no advance ahead of the air, unless with approved and reliable breathing apparatus.

Only in extreme and exceptional cases should it be allowed to reverse the fan, as the reversal of the air current would confuse the calculations and expectations of the men entombed in the mine and might prove fatal to them by driving the gas down upon them from workings where it had accumulated.

Ques.—If a water gage shows a ½-in. depression, what is the velocity of the air, in feet per minute, when a cubic foot of air weighs 0.076 lb.?

Ans.—The formula giving the theoretical velocity of air, corresponding to any given head of air column (h), is $v = 60\sqrt{2\,g\,h}$. For a water gage of ½ in. and taking the weight of air as 0.076 lb. per cu.ft., the corresponding head-of-air column is

$$h = \frac{5.2\,w.\,g.}{w} = \frac{5.2 \times 0.5}{0.076} = 33.94\,ft.$$

Then, the theoretical velocity of air corresponding to this head-of-air column is

$$v = 60\sqrt{2\,g\,h} = 60\sqrt{64.32 \times 33.94} = \text{say } 2{,}800\ ft\ per\ min.$$

Ques.—Calculate the number of tons of coal in a ten-acre block, the seam being six feet in thickness and assuming the coal to have a specific gravity of 1.4 referred to water as a standard, taking the weight of water as 62.5 lb. per cu.ft.

Ans.—Since the number of square feet in an acre is 43,560 and the seam is six feet thick, the cubic contents of this seam underlying ten acres of land is 10(6 × 43,560) = 2,613,600 cu.ft. Again, taking the weight of a cubic foot of water as 62.5 lb. the weight of a cubic foot of coal having a specific gravity of 1.4 is 1.4 × 62.5 = 87.5 lb. Then, the weight of coal in this seam underlying ten acres is (2,613,600 × 87.5) ÷ 2,000 = 114,345 short tons.

Ques.—The return airway of a mine has 1½ per cent of methane in the ventilating current, the velocity of which is 220 ft. per min. while the size of the airway is 7 x 10.8 ft. The hygrometric reading gives the temperature of the dry bulb 50 deg. and that of the wet bulb 48 deg. F., while the barometer reads 25.7 in. If the output of coal is 150 tons in eight hours, what is the quantity of methane given off: (a) in cubic feet per minute; (b) per day; and (c) per ton of coal mined. (d) What is the weight of methane, in pounds and tons, per day?

Ans.—The sectional area of this airway is 7 × 10.8 = 75.6 sq.ft., and the volume of air passing is, therefore, 220 × 75.6 = 16,632 cu.ft. per min. Assuming that all the readings are taken in the return airway at the point where the percentage of gas is measured, the volume of methane in the air current is: (a) 0.015 × 16,632 = 249.48, say 250 cu.ft. per min.; or (b) 250 (24 × 60) = 360,000 cu.ft. in a day of 24 hours. (c) The output of the mine being 150 tons per day, the volume of methane given off per ton of coal mined is 360,000 ÷ 150 = 2,400 cu.ft.

(d) At a temperature of 50 deg. F. and a barometric pressure of 25.7 in., the weight of a cubic foot of air is

$$w = \frac{1.3273 \times 25.7}{460 + 50} = 0.0669\ \text{lb.}$$

Taking the specific gravity of methane as 0.559, the weight of this gas produced in 24 hours is 360,000 (0.559 × 0.0669) = 13,460 lb., or 6.73 short tons. The reading of the wet and dry bulb of the hygrometer do not enter the calculation of the required data, as the moisture in the air does not materially affect its weight.

Ques.—If a weight of one-half ton is to be lifted by applying a force of 75 lb. to the end of a lever 4½ ft. long, how far must the fulcrum be from the point of application of the load, assuming it is between the load and the force applied?

Ans.—By a principle of mechanics, the moment of the load is equal to the moment of the applied force. Therefore, calling the distance from the load to the fulcrum x, the distance from the fulcrum to the applied force is 54 — x; and the length of the lever being 4½ ft. (54 in.), we have, for the equality of moments:

$$1{,}000x = 75(54 - x)$$
$$1{,}000x + 75x = 75 \times 54 = 4{,}050$$
$$x = \frac{4{,}050}{1{,}075} = 3.76,\ \text{say } 3\tfrac{3}{4}\ \text{in.}$$

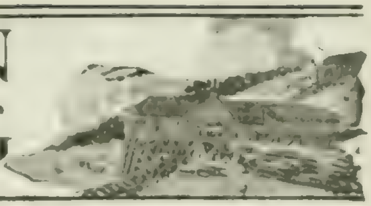
Ques.—What is the weight of 125 cu.ft. of carbon dioxide, at a temperature of 35 deg. F., at an atmospheric pressure of 13¾ lb. per sq.in.?

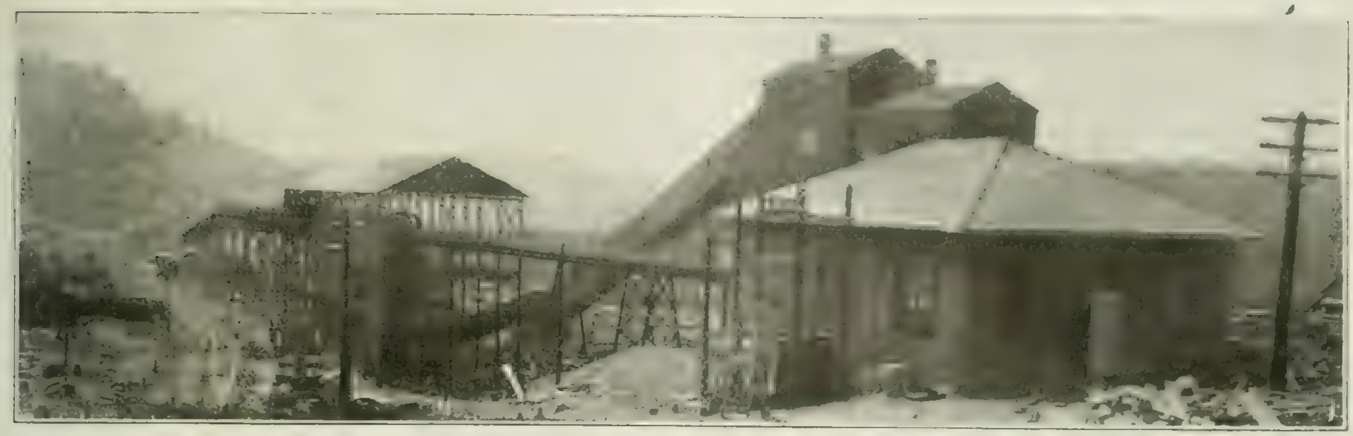
Ans.—In this case, the atmospheric pressure being given in pounds per square inch, the weight of a cubic foot of air is calculated as follows:

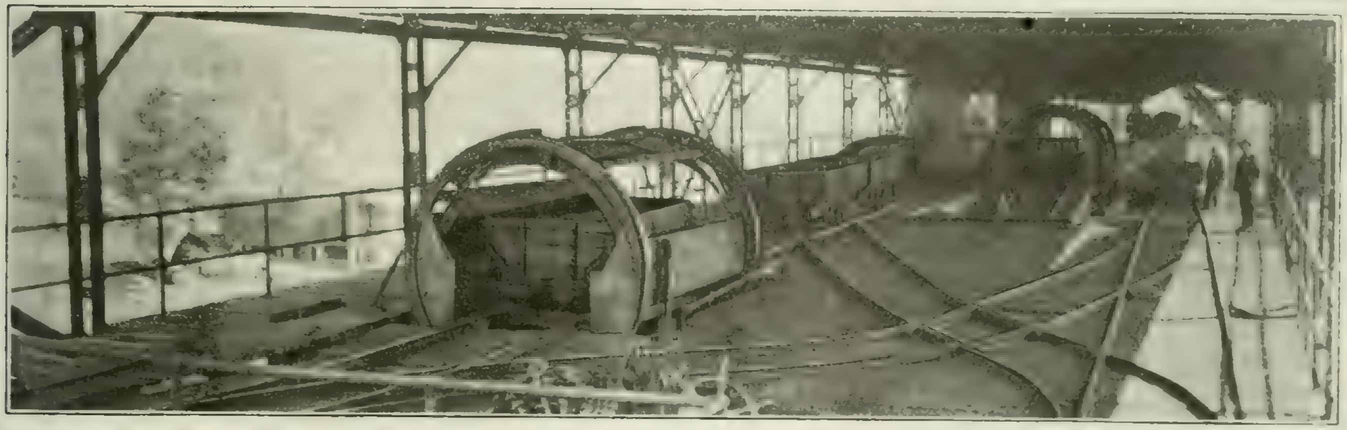
$$w = \frac{p}{0.37T} = \frac{13.75}{0.37\,(460 + 35)} = 0.07507\ \text{lb.}$$

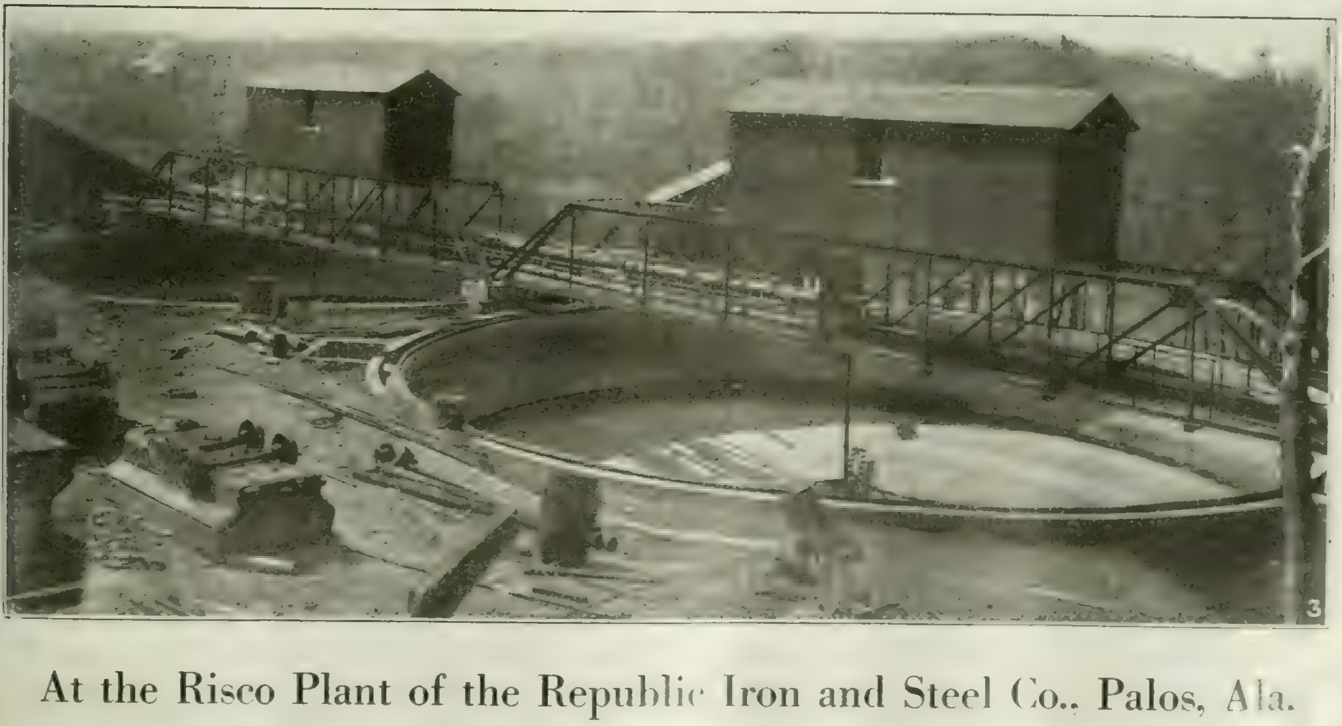
Now, taking the specific gravity of carbon dioxide, referred to air as unity, as 1.529, the weight of 125 cu.ft. of carbon dioxide, at the given temperature and pressure, is 125(1.529 × 0.07507) = 14.35 lb.

SNAPSHOTS IN COAL MINING









At the Risco Plant of the Republic Iron and Steel Co., Palos, Ala.

(1) General view of the plant. (2) Tipple floor showing two rotary dumps. (3) Dorr fine-coal settling tanks.

Kansas Mine Leaders Defy Industrial Relations Court

Alexander Howat, president of District No. 14, with others of his staff refused on April 6 to obey a summons to appear before the Industrial Relations Court upon an order issued by Judge Andrew J. Curren of the district court.

The other persons ordered to appear and refusing to obey were August Dorchy, vice-president, Thomas Harvey, secretary, Thomas Cunningham, traveling auditor and R. B. Foster, auditor. Mr. Howat made the following statement of his attitude:

"We officials of the United Mine Workers of District No. 14 do not recognize this Industrial Court. Let its members go down into the mines and dig coal and learn the business the same as we did. If they do not know the coal-mining business they are unfitted for the position and are wholly incompetent.

"Instead of a court composed of politicians and corporation lawyers, drawing a salary of $5,000 a year, the men should have been chosen from the industrial ranks as the judges who are competent to deal with the question in hand. We may be dragged into court, but we will absolutely refuse to answer any questions, as we do not recognize the court's authority or existence."

Mr. Howat estimated the strike involved between 1,500 and 2,000 workmen and declared that they had struck not under orders but "of their own volition." As a result of this contempt of court Alexander Howat and his associates were arrested and sent to Crawford County Jail, April 9, by the judge to stay there until they consent to appear as witnesses before the court and answer questions or until they are released on bond if an appeal is made to the Kansas Supreme Court.

Mr. Howat stated when arrested:

"Our position is unchanged. We stand where we stood. We refuse to testify before this court because we do not recognize the court. It is an institution founded to enslave the workingman."

Logan Operators Make 27-Per Cent Wage Increase Immediately Effective

The Logan Operators' Association of West Virginia is said to have been the first to put into effect the increase in wages recommended by the U. S. Bituminous Coal Commission. The association did not even await the result of the deliberations of the scale committees at New York. The Logan operators promptly adopted the wage increase though, not being in a union field, they are under no obligation to increase wages.

No announcement as to the increase made by the Logan association will be made pending action by the associations of other fields, such as the Kanawha, Big Sandy and those on the Norfolk & Western, the Logan association being in doubt as to the meaning of some of the recommendations in the coal commission's report and desiring to see how the operators of other districts will interpret them.

As soon as it was announced that the operators and miners of the Central Competitive Field had reached an agreement as to the 27-per cent wage increase, representatives of the operators of West Virginia and Kentucky announced that they also would put into effect the new contract in their territory. It is stated that in the Logan field wage increases granted since before the war aggregate 115 per cent, so that it is probable that the scale already paid is in excess of the 27 per cent increase recommended by the commission.

The only cessation of work on the part of miners in any organized field of West Virginia on or about April 1 was that occasioned by a celebration of Mitchell Day on April 1 in all union fields. The suspension of work, however, lasted only one day, miners returning to work on April 2.

Hines Quickly Settles Claims for Diversion of Coal

Director General Hines is taking an active part in the work of clearing up all outstanding obligations of the Railroad Administration to shippers of coal. With the ruling that the Director General could pay the 14 per cent increase pending, accounts for railroad fuel are being paid rapidly, and claims arising from the diversion of coal are being met much more rapidly than had been expected. In fact, settlements have been made for all the diverted coal with the exception of some 10,000 cars.

The great majority of the remaining claims present no unusual difficulties and prompt payments are promised. No coal was delivered, it is believed, before adequate arrangements had been made for payment. In a large number of cases railroad-station agents demanded certified checks.

It is known that the Federal Trade Commission is watching the situation with particular interest. Some operators fear that the present situation may furnish new arguments to those who look with favor on Governmental regulation or even the nationalization of the coal industry.

Strikers in Eastern Ohio Field Refuse to Return to Work

Contrary to general expectations, 3,000 miners out of the 14,000 in sub-district 5 of the eastern Ohio field, after being on strike since April 1, failed to report for work on Monday, April 5, though urged to do so by William J. Ray, president of the sub-district. The strike of the 3,000 mine workers, mostly foreigners, was not authorized by officials, who characterized it as an expression of the miners' dissatisfaction with the size of the wage advance which became effective on April 1. Miners in Belmont County, Ohio, on the Ohio River and on the line of the C. L. W. division of the Baltimore & Ohio R.R., were affected most by the refusal of the foreigners to return to the mines.

As soon as it became apparent that the foreign miners did not propose to return to work on Monday, April 5, as had been anticipated by President W. J. Ray of the sub-district, officials of the mine workers organization set to work to try to induce the men to report for duty. Owing to the fact that so large a percentage of the striking miners were foreigners the services of many interpreters were required. Officials of sub-district 5 hoped to have the miners back in the mines before the end of the week. Many operators believe that dissastifaction among the miners was due as much to the limited car supply, restricting working time to about half a week, as to disappointment over the size of the wage increase.

Herbert Hoover Addresses New York Section, A. I. M. E.

Attributes High Standard of Living to Engineers—Urges Collective Bargaining with All Workmen Represented

ADDRESSING the New York Section of the American Institute of Mining and Metallurgical Engineers on Wednesday last, April 7, Herbert Hoover said that he pinned his faith on engineers because they were as he expressed it idealists soaked with realism, and were not idealists of the impractical type who disconnected their ideas from the facts that had to be faced.

Asked like the other speakers to condemn the lack of civic responsibility in engineers he said he was unable to join with those who thought engineers neglected the duty they owed to the nation. The application of science to industry which was the work of the engineer had done more to advance the standard of living than any of the idealisms of political dreamers.

Troubles in the close of the eighteenth century arose from the demand for a better distribution of land, while our troubles in this, the early part of the twentieth century, were the outcome of the demand for a better distribution of the profits of industry. The worst way to meet those demands was by a complete refusal. We must admit of trade unions and of the collective bargain, but that bargain should be not with a part only of the operatives but with all of them whether union or non-union. Labor must be fully and not partially represented. While there is an obligation on the part of the employer to enter into a bargain there is at least an equal obligation for the employee to keep the bargain when made. As Mr. Hoover saw it, there was no disposition on the part of the workman to take over the plant, for the employee recognizes quite clearly that there are worries involved that he would avoid and abilities and experience needed that he questions his power to supply.

As for industrial courts, Mr. Hoover declared he did not favor them. Lawyers believed that law was the panacea for all human ills, but he was of the opinion that economic relationships could not be regulated by legislation. The mind of a lawyer is qualitative only.

The quantitative-qualitative mind of the engineer-manager is needed to solve such difficulties. The best kind of settlement is one made by employer and employee in council. Nine states have brought forward or passed bills for compulsory arbitration of disputes between workmen and their employers but in Mr. Hoover's opinion they will have no more success than Australia and other countries have had when experimenting with such legislation.

A guaranteed wage leads to guaranteed profit and this inevitably ends in a nationalization of industry. Commissions stifle capital and are usually more militant to labor than they are to the capitalist. The important consideration with any measure is: "Does it preserve initiative?" Only a few of us can be moved to action by a desire to afford a social service, and consequently an award for effort must be provided. This must be the touchstone by which we determine the value of any form of legislation: "Does it leave the desire of the individual to produce unimpaired?"

Other speakers were Thomas F. Darlington, secretary of the Welfare Department of the Iron and Steel Institute and former Commissioner of Health of New York City; Eugene Meyer, Jr., of the Department of Foreign Trade in the War Finance Corporation; Cornelius Kelley, president, Anaconda Copper Mining Co.; and W. L. Saunders, past president of the Institute and president of the Ingersoll-Rand Co.

Mine Workers Secure Hughes As Counsel in Conspiracy Case

CHARLES E. HUGHES, a former Supreme Court Justice, has been engaged by the United Mine Workers of America to defend the indicted officials who, with certain operators, are charged with having been guilty of a conspiracy in restraint of trade. One of the charges is that the "check-off" system of collecting union dues was established.

Most of the indictment charges are so general that it is of no advantage to refer to them. They allege violations of those parts of the Lever Act and its amendments which condemn the limiting of facilities for transporting, producing, manufacturing, supplying, storing or dealing in any necessaries; forbid the preventing or limiting of the supply or distribution of any necessaries; prohibit the preventing, limiting or lessening of the manufacture or production of any necessaries or the exacting of excessive prices therefor or the aiding or abetting the doing of any of the acts specified.

The eleventh count states that John L. Lewis and William Green prepared, issued, mailed and distributed a strike order and held a conference with other defendants concerning the cessation of the work of mining coal in Indiana and elsewhere, that from January to August of 1919 certain defendants refused to sell coal and demanded a price higher than the current price of that commodity, that a certain mine at Hymera, Ind., was closed down by J. C. Kolsem, that a copy of an agreement between the Clinton Coal Co. and the Fallenz Coal and Dock Co. was sent to H. M. Ferguson and distributed by Jonas Waffle, that Walter D. Talley made a contract with the Citizens Mutual Heating Co., Terre Haute, for 10,000 tons of coal at a price of $2.05 at the mines, the following proviso being contained in the contract: "This condition means that if there is a reduction of any of the items mentioned during the term of this contract, the buyer is to have the benefit of them, and if there is an increase in any of them, the buyer is to pay such increase, but it should be fully understood that during such times as prices are fixed by the U. S. Government, nothing contained in this condition shall be construed on the one hand to authorize the exaction of any price in excess of the Government's maximum price, nor on the other hand to require delivery by the seller at a price below the cost of production of coal, as shown in the required report to the Federal Trade Commission, plus a reasonable profit . . ."; that the defendant caused to be shipped and delivered to the said company under the contract coal for which $2.30 per ton was charged; that Walter D. Talley refused to sell or ship coal to the Citizens Mutual Heating Co. for storage purposes; that Warren J. Smith charged 25c. per ton in addition to a contract price; that the "check-off" system of collection and payment of dues, assessments and benefits of miners to their separate unions was put in force.

Governor Allen May Seize Mines

With 11,000 mine workers idle as a protest against the incarceration of Alexander Howat for contempt of court, Governor Allen is meditating the taking over the mines of Kansas, the public of Kansas being wholly unfavorable to the mine workers of that state who have been guilty of continued violation of contracts and have had a disposition to strike for every cause and no cause.

Mr. Howat does not spare the head of the state, whom he describes as "a skunk of a governor," and he declares that "we [the mine workers] won't recognize this court," meaning the new court of Industrial Relations. Governor Allen is, however, determined to get the mines back into operation. On April 12 he said: "In the event that it should be necessary [for the state] to operate the mines I believe at least 40 or 50 per cent of the workers in the district would be loyal to the state and would work for us. I do not want to talk before I act but the industrial court law is going to be enforced. The man or woman who violates it will be prosecuted."

The officials of the state expect that wholesale arrests will precede the seizure of the mines, officials who are to blame for the suspension of the work at the mines being charged with felony and those who have quit work being charged with a misdemeanor. The industrial court on April 12 issued subpoenas for men whom they desired to question and the court will put in jail all those who mistakenly follow the lead of Alexander Howat.

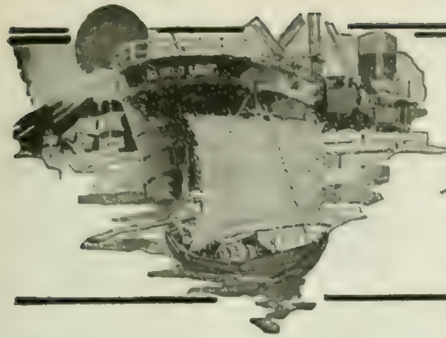
It seems from evidence that Howat has been using union funds to spread Communist propaganda. Certain it is that the mine workers include many men who have I. W. W. affiliations. As there is risk of violence if the mines are operated by the state it will be necessary to protect the workers by troops, and these will be called out.

It is estimated that 90 per cent of the mine workers in Kansas are on strike. Sheriff Webb allowed Howat to speak for an hour to the assembled crowd who thronged around the entrance to the jail and cheered his utterances. The men were orderly and carried American flags and even went so far as to pass a vote of thanks to Sheriff Webb for the courtesies shown to them and to Alexander Howat in allowing the latter to address them from the balcony of the Crawford County jail. The mine workers of Kansas cannot believe a conspiracy in restraint of trade to be a crime.

Many Are the Woes of the Mine Foreman

HANDS UP! ALL YOU FACE BOSSES!!
WE HAVE A HUNDRED AND FIFTY HOURS COMING THIS WEEK!
WELL I'LL BE * * ?!!
ONE MAN PIT COMMITTEE
MINE MGR.
GANG NO. TWO
I GOT FOURTEEN HOURS ONE DAY FOR TAKING UP BOTTOMS!
YOU'LL PLAY H— GETTING IT!
MACHINE BOSS
I'VE GOT 13 HOURS COMING FOR SPLICING CABLE.
MACHINE MAN

[illegible] THIS IS HOW THE JOB OF MINE MANAGER LOOKS TO THE LAMPMAN



FOREIGN MARKETS AND EXPORT NEWS

France's Coal Supply Awaits New Pumping Machinery

Trade Commissioner Charles P. Wood reports that it has been estimated that 60 per cent of the French pre-war production of coal came from the territories that were invaded by the Germans. If these coal mines had not been damaged by actual fighting, they were worked as long as possible by the Germans and deliberately wrecked before being given up. To compensate for this loss, the Peace Conference awarded to France the output of the Saar Basin in Germany, but this is not enough and the annual deficit in France is estimated at 20,000,000 tons.

As the consumption of iron ore in France and Germany is controlled by the coal supply, which for some time will be short, the necessity for the earliest possible rehabilitation of French coal mines is evident. This will be pushed to completion with all possible speed, but much remains to be done before it will be necessary to place orders for new mining machinery.

The destruction of coal mines occurred in the departments of Nord and Pas-de-Calais. The center of this mining district is Lens, which was the scene of terrific fighting. This city, which had originally 30,000 inhabitants, was leveled to the ground and flooded. It was part of the German front line until 1918 and was constantly under fire long before the decisive battles that resulted in its capture by the Allies.

Many mines around Lens suffered the same fate as the city, in that all equipment above ground was demolished by artillery fire, but every mine that could possibly be operated on either side of the line was kept in operation. When it became necessary for the Germans to retreat, they put the remaining mines out of service with the same thoroughness and scientific efficiency that characterized their operations generally.

From the surface it can be seen that all the mines are flooded and all superstructure has been wrecked. Further observation will be impossible until after the water is out of the way. It is thought that these mines were not flooded entirely from the surface but that the shaft casings were wrecked from below by demolition charges cleverly placed, and that pumping out will have to proceed at a rate beyond the rate of inflow until after the wrecked portion of the casing has been exposed for repairs. This greatly increases the magnitude of the pumping problem. Hydro-electric power not being available in the Lens area, pumping equipment must include large power plants.

Plans for pumping out the mines have proceeded with celerity, and pumping equipment has been ordered. It is estimated that at least two years will be required for pumping out mines so that the installation of machinery can begin. This will give French machinery manufacturers the opportunity to build the machinery required.

There may be emergency orders for mining machinery in other mining districts which are being worked intensely to supply the present shortage. There have been reports of badly worn cables and demand for new haulage ' equipment. Inquiries for pneumatic locomotives also have been in evidence.

American engineers have commented on the excellence of French mine hoists. This machinery is built in France, and probably all the new hoists for the wrecked mines will be built in France, except for such purchases as the French may consider it advantageous to make in Germany.

The tonnage of French coal mines seems low compared with corresponding results obtained in America, and this may have been misleading to some who thought that the comparatively low French tonnage could be increased by the installation of American equipment. The French problem is to take out all of the coal from a thin seam. American methods would result in too much waste both under ground and above ground. Economy is the primary consideration in French practice. Thin seams (some of them at great depth), refilling and other conditions peculiar to French coal mines prevent extensive blasting, the use of undercutting tools and other American methods designed primarily to increase tonnage.

Government Control of Mines Instituted by Belgium

A Belgian royal decree is published instituting a commission of 10 persons, under the direction of the State Department of Mines, to study the methods to be applied to the available coal beds—that is to say, those not yet conceded—and the status of the mines to be operated by the Government. The latter are known as the Wandre coal mines, which are at present being operated under sequestration.

An experiment in Government direction is to be made with these first, and will take place as soon as the Government's bill regulating sequestered property is passed. The decree points out the necessity of having a well-established program regarding mines, in view of their importance to the country. The question of nationalization and other problems of operation will be considered.

Two groups of mining lands are actually available for Government control—reserves in the basin of Campine and a new basin in Hainaut—for which there are numerous demands for concessions. The commission is composed of two engineers and a jurist of the mining administration, two representatives of the mine owners, two of workers' associations, and a delegate from each of the ministries interested, i. e., Finance, Railroads, and Economic Affairs.

Fuel Situation in South China Continues To Be Acute

There seems to be little prospect of any easing of the South China fuel situation, Consul General George E. Anderson, Hongkong, reports, although during the past year the supplies of coal from Japan, which controlled the trade entirely before the war, were again brought up to something like their former comparative proportion of the trade of the port and imports of fuel oil increased greatly. However, prices continue very high and many industries in Hongkong and South China continue crippled by a lack of fuel at a reasonable price.

The total imports of coal for the year 1919 amounted to 920,107 tons, valued at $15,162,758 (at normal exchange of the pound sterling), as compared with 678,852 tons, valued at $12,163,190, in 1918. The exports amounted to 214,968 tons, valued at $2,969,670, as compared with 196,291 tons, valued at $3,240,595, the year before. The imports were derived from the various producing countries as follows:

Country of Origin	1918 Long Tons	1919 Long Tons
North and Middle China	269,780	128,360
Japan	360,754	658,572
Indo-China	48,118	120,806
Other Countries	200	12,369
Total	678,852	920,107

Of the exports in 1918, amounting to 196,291 tons, South China took 142,270 tons, while in 1919 South China took 209,609 out of the 214,968 tons exported. The rest of the imports went into local industries or ship's bunkers, by far the larger portion going into ships.

At present the local situation is improved so far as supplies are concerned, for there is a freer movement of coal from the Japanese mines and there is plenty of tonnage to move it at current rates of freight, which, of course, are very high. Cheap, soft Japanese coal, little better than "slack"—retails for from $26 to $32 gold per ton.

Imports of fuel oil during the year amounted to about 85,000 tons compared with 38,596 tons of the year before. The much larger portion of the imports of liquid fuel was for bunkering vessels, and of the imports during the past year about 21,000 tons were imported from the United States almost exclusively for American vessels, which have to depend upon supplies of oil from Sumatra and Borneo, whence most of the Hongkong supply now comes.

Larger imports have been prevented by a lack of tank tonnage available for bringing supplies from Sumatra and the United States and by a shortage of tank capacity in Hongkong compared with the demands of the trade. It is understood that important developments in storage facilities for liquid fuel in the plants of the large concerns importing fuel oil in Hongkong are to be made during the current year, and it is anticipated that the situation will materially change before 1921.

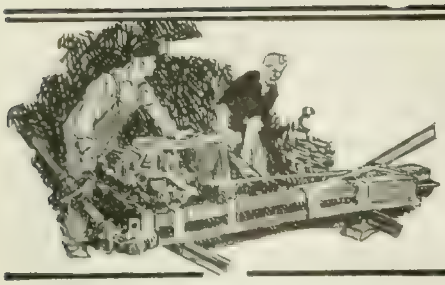
Panama Canal Quotes Prices on Coal and Fuel Oil

At the Panama Canal coal is being supplied to steamships, including warships of all nations, delivered and trimmed in bunkers, at $13.50 per ton of 2,240 pounds at Cristobal and $15.50 at Balboa. For ships in transit through the Canal, which are directed to take coal at Balboa, for the convenience of the Panama Canal, the quotation is $13.50 per ton at Balboa. For ships taking less than carload lots from plants or less than 25 tons from lighters, the price is $15 per ton at Cristobal, $17 at Balboa. Crude fuel oil is delivered to vessels at either Cristobal or Balboa for $1.50 per barrel of 42 gallons. Diesel oil is not sold by The Panama Canal, but may be obtained from private concerns at approximately $3 per barrel. Cable arrangement should be made in advance of arrival of vessel.

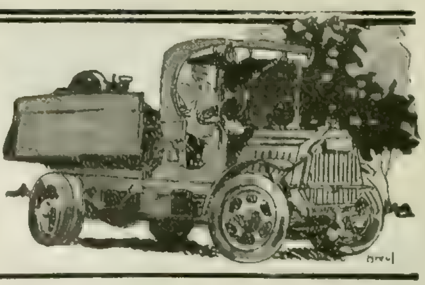
Europe Imports Alcohol for Fuel Owing to Coal Shortage

Scarcity and high prices of coal and petrol in European countries, and incidentally enforcement of the Eighteenth Amendment, were responsible for large exports from the United States of alcohol for fuel and industrial uses during January, 1920. Exports for the month, mostly to Europe, were 6,467,728 proof gallons, valued at $2,065,539, an average of 32c. per gallon. The countries of destination are shown below:

Exported to—	Proof Gallons	Value
Belgium	218,427	$79,650
Denmark	167,527	59,293
France	10,450	5,500
Greece	285,107	91,777
Italy	2,483,078	605,060
Malta	32,815	13,160
Netherlands	2,026,524	655,952
Norway	37,816	18,251
Switzerland	34,042	24,400
Turkey in Europe	215,270	85,241
United Kingdom	35,366	36,728
Canada	208,520	103,437
Costa Rica	38,988	17,000
British West Indies	28,128	32,204
Dutch West Indies	5,408	2,660
Dominican Republic	9,361	5,593
Aden	3,500	3,300
China	19,400	8,830
Japan	10,216	11,285
Russia in Asia	18,392	7,000
Turkey in Asia	221,985	95,271
New Zealand	41,236	[illegible]
French Africa	37,700	[illegible]
Italian Africa	9,663	[illegible]
Morocco	4,280	2,200
Egypt	251,02	[illegible]
All other countries	13,506	5,269
Total	6,467,728	$2,065,539



COAL AND COKE NEWS



What Happened in March

March 1—Franklin K. Lane resigns as Secretary of the Interior. He is succeeded by John Barton Payne, chairman of the Shipping Board, and formerly general counsel of the Railroad Administration [XVII, 362]—Federal control of railroads comes to an end with their return to the owners.

March 3—The New York section of the American Institute of Mining and Metallurgical Engineers meets and hears paper by E. A. Holbrook on "Coal Versus Ore Concentration" and discussion by members [XVII, 495]. Shipping Board drops fleet operation. Turns over all its vessels to private operators as agents; cancels all its tariffs. Managers will be allowed to fix own rates to meet conditions—Frank C. Smither dies at his home in Reading, Pa. He was president of the Reading Iron Co. and a director of several coal companies [XVII, 627].

March 5—Walker D. Hines outlines a new distribution policy in a statement which says that coal is to be diverted in the future only in cases of the most absolute necessity. New regional committees are appointed to look after diversions in the different regions. The Central Coal Committee, at Washington, continues general control through committees [XVII, 509].

March 6—Mining men of McDowell County, W. Va., organize the McDowell County Mining Institute with charter membership of 51 [XVII, 571].

March 8—Twenty-second Annual General Meeting of Canadian Mining Institute assembles at Toronto, Can., and plans to continue in session on two following days. Papers read and discussions following, commented upon [XVII, 545-550].

March 9—United Mine Workers of America makes statement that nothing short of substantial increase in wages and working conditions will be acceptable [XVII, 564]—Anthracite operators and miners meet in New York City for consideration of new wage agreement to become effective April 1. Demands are referred to a subcommittee [XVII, 561-562].

March 10—President's Bituminous Coal Commission makes report and dissolves. Chairman Robinson and Rembrandt Peale hand majority report to President Wilson. John P. White still working on his minority report [XVII, 563].

March 11—President Wilson appoints Walker D. Hines, an agent for service in lawsuits growing out of Federal control of railroads—Indictments are brought against 125 bituminous operators and [illegible] at [illegible], Ind., charging [illegible] Act [XVII, 564].

March 11-12—Important meeting of the Smokeless Coal Operators' Association of West Virginia is held in Washington, at [illegible] opinion relative to Federal control of the coal industry is [illegible]

March 12—William D. Owens dies at his home in West Pittston, Pa. He was an official of the Lehigh Valley Coal Co. for [illegible]

March [illegible] [XVII, [illegible]] Hearing [illegible] West Virginia [illegible] probe conditions [illegible] coal [illegible] and to investigate [illegible] Logan County [illegible] [XVII, 611]

March 16—At session of Anthracite Wage Conference in subcommittee of operators and miners, in New York City, earnings of miners and 60 per cent wage increase are discussed [XVII, 620-621].

March 17—New York Wholesale Coal Trade Association holds luncheon in New York to discuss various phases of the Lever Act [XVII, 616-617].

March 18—Coal operators of West Virginia and Kentucky and the directors of the Chesapeake & Ohio R.R. fail to agree on plans for better handling of tonnage along line of this road [XVII, 681]—Senator Frelinghuysen introduces three bills in the Senate, one of which provides for a Federal coal commissioner to control organization, administration, transportation and mining of coal.

March 19—President Wilson issues an order suspending price regulation under the Lever Act, but continuing in force the rules relating to the operation of the Tidewater Coal Exchange [XVII, 654]—President Wilson transmits a statement to operators' association and union officials, approving report of his Coal Commission [XVII, 657]—Upper Potomac Coal Association organizes, being a reorganization of old Upper Potomac Coal Operators' Association [XVII, 681].

March 20—Representative Kendall, of Somerset County, Pa., denounces, on the floor of the House, the continuation of Government prices on coal [XVII, 655-656].

March 24—Anthracite operators' wage conferees in New York agree to make the settlement operative from April 1. Miners agree to remain at work pending settlement of negotiations. Efforts to establish the closed shop and the "check-off" are defeated [XVII, 669-670]—New England retail coal men favor price control in meeting at Springfield, Mass. Papers are read [XVII, 672-673].

March 29—President Wilson orders control of coal by Governmenetal agencies to cease, on and after April 1, 1920—Bituminous operators' and miners' representatives at New York, agree to accept the majority report of the President's Coal Commission. The miners agree to remain at work pending adoption of a new wage agreement [XVII, 672½].

Charleston, W. Va.

Production Hampered by Mitchell Day—Also by Car Shortage—Bulk of Smokeless Goes East—High Volatile West.

The principal factor, aside from a continued car shortage, in lowering production in this area, in the weekly period ended April 3, was the celebration of Mitchell Day. That cost virtually an entire day's production in the union fields tapped by the Chesapeake & Ohio R.R., since there was little work done by any union miners on April 1. The first of April was the only day on which the miners did fail to work despite the fact that the old wage scale had expired and no new wage scale had been agreed upon by the operators and miners of the organized fields in this section of the state.

There was, of course, the usual shortage of cars, but even car-shortage conditions were reversed in this respect; for although the supply at the advent of the week was somewhat under the supply for the early part of the previous week, on the other hand the supply for the remainder of the week was fairly well sustained.

Even with the improved supply, mines were hardly able to work more than 60 per cent of full-time capacity, owing to the shortage of cars. On the first day of the week the output was only 154,600 tons, nearly 3,100 cars being furnished mines on the Chesapeake & Ohio system. When the number of cars furnished dropped to around two-thirds of Monday's car supply, then production fell in proportion. A large supply of cars was not necessary on Thursday, the first, but of course April 1 made no difference in non-union fields nor even in the "open-shop" section of the organized New River field.

Two-Thirds of High Volatile Goes West

While there was a reasonably large movement of high-volatile coal eastward, principally to tidewater, it is estimated that fully 70 per cent of the output of high-volatile coal was going to inland western markets during the week ended the third. There was a slight increase, in the actual export of coal produced in this area, during the first three days of April, but the Chesapeake & Ohio did not appear to be able to dump its tidewater coal with any degree of promptness.

While it is true that the Lake season, which it is believed will be ushered in by the fifteenth unless weather conditions delay the opening of the season, may increase the demand somewhat for coal in this section, nevertheless many operators incline to the belief that under the present large output, there is not as much of a scarcity of coal as is generally pictured and that, therefore, export restrictions should be removed.

Until April 1, contract negotiations were being held up principally by producers. After the first and during the first three days of April, contracts were consummated on a somewhat larger scale. While producers had been holding up the consummation of contracts, in order to stabilize the market and prevent speculation, the general belief expressed was that the best way to avoid speculation and sky-high prices was to contract their coal, so that a large volume of free coal might not be left with which to speculate just as soon as the new wage agreements would make it possible to figure costs.

New River Output Increases

Dents were made in production, to some extent, both by a shortage of cars and by a general suspension of mining activities on April 1 in the New River field. It might have been possible, but for the holiday on the first, however, to have increased production slightly over that of the weekly period ending the twenty-seventh, since after Monday the car supply was holding up better than it had been during previous weeks. With many open-top cars being utilized on the Chesapeake & Ohio, in handling army trucks, slag and cinders, the supply of empties for the mines was of course reduced.

Of the coal moved from the New River field, the bulk of it was shipped eastward, principally to tidewater; yet with the permit system still in force as to exports, overseas shipments were still limited and moreover inefficiency in dumping at Newport News, also hampered the exporting of coal to a certain extent. After the first of the coal year, there was a somewhat larger volume of contract business, and it is now believed that little smokeless coal will remain for the open market.

Although the car supply in the Kanawha field at the outset of April was far below normal, it was fairly well sustained throughout the week and it might have been possible to increase production somewhat over the week ended the twenty-seventh if there had not been an almost total suspension of mining operations for the day April 1.

Slow Dumping at Tide Delays Loading

Fully 70 per cent of Kanawha coal was consigned, during the week ended the third, to markets in the West. Of the coal shipped eastward, most of it was for tidewater, and it was said that export permits were being somewhat more freely issued, yet slow dumping at tide was retarding the loading of vessels to some extent.

In the last three days of the week more

coal from the Kanawha field was disposed of under contracts covering the yearly period. The prevailing price for mine-run in the Kanawha field, it was stated, was about $4.00 a ton for coal for the domestic market, export coal averaging about 50c. a ton more.

Bluefield, W. Va.

Norfolk & Western Strike Halts Output—Mines Lose Half Week—Miners Go to Farms—Other Roads Improve Service—Exports Larger.

Production almost reached the zero point in such southern West Virginia coal fields as were dependent upon the Norfolk & Western R.R. as the new coal year was ushered in, owing to a strike involving about 12,000 men. Approximately 3,000 clerks have gone on strike, and various shop crafts on the system declared a sympathetic strike about April 1; the strike of the clerks began on Friday, March 26, and the disturbance soon spread over the whole system.

At first the checking of baggage was abandoned. For a few days temporary clerks made it possible to weigh coal passing over the various scales on the system, but by the middle of the week, it had become almost impossible to even handle coal, so that during the last three days of the week, there was a decided lull in production throughout all the southern West Virginia regions. From Wednesday until Saturday virtually no eastbound coal was moved. In fact all freight traffic to the east after Wednesday was suspended.

The road was partly successful in moving freight from Bluefield and points west of Bluefield for a day or so, but on Friday it became necessary to annul all freight service. While a few empties were moved into the various districts Thursday night, the supply was extremely meager, and it was found impossible on Friday, the second, even to move such coal as had been loaded. Between Thursday night and Saturday morning no empties were furnished any of the fields and of course it was impossible to load any of the cars furnished on Saturday.

General Disturbance Due to Railway Strike

Thus it will be seen that virtually a full half week was lost just at a time when transportation facilities seemed to be gradually undergoing improvement. But for the strike, it is believed it would have been possible to eclipse the output of the week ended March, 27, that is if the improvement in the car supply for that week could have been taken as a criterion of what might have been expected; there having been about a 60 per cent output during the earlier week in question with evidence of further improvement up until the time the strike made it impossible to operate at all.

While losses from a labor shortage have not so far been apparent to any appreciable extent, yet on April first miners owning farms began to desert the mines for their farms, and as the car supply underwent improvement then the labor shortage was felt, and it began to be apparent that the most serious problem a little later in the season would be a serious shortage of miners, unless it is possible to recruit additional miners from other occupations.

If one may judge from their activities in southern West Virginia, speculators have more to do with advancing prices than producers as the latter are not encouraging fancy prices and are continuing to handle coal through former selling agencies, instead of taking contracts from speculators and jobbers who offer a premium. It is pointed out by operators that it is the buyers of coal and not the producers who are responsible for hoisting prices. After the first of April there was a rather marked increase in the volume of 1920 tonnage placed under contract but prices governing such contracts were along conservative lines. The export business has attained a somewhat larger volume insofar as southern West Virginia mines are concerned, though still restricted by permits.

Pronounced Improvement on the Gulf

A pronounced improvement in the car supply on both the Virginian and the Chesapeake & Ohio railroads in the Winding Gulf field, during the week ended April 3 was observed. Mines on the Virginian during the period mentioned were able, on an average, to operate five out of the six days or about 80 per cent of the time. Transportation facilities afforded by the Chesapeake & Ohio made it possible for the mines on that road to operate about four days out of the six. With exports running somewhat heavier in volume and with prices commensurate with increased production costs obtaining, conditions were extremely satisfactory in the Winding Gulf Region at the beginning of the coal year.

Coal loaded in the Tug River field during the week ended April 3 totalled 68,000 net tons, a drop of 14,000 tons below the loading of the previous tie-up of the Norfolk & Western due to the strike initiated by railway clerks. From a close-to-normal loading of 330 50-ton cars on Monday, March 29, the loading dropped to 38 cars by the following Saturday, and on Monday, April 5, only 17 cars were loaded in all the mines of the Tug River field.

Although the strikers were all to be reinstated by Sunday, the condition they had created will take a number of days to untangle. The trouble on the Norfolk & Western progressed just far enough and involved a sufficient number of shop-men and yard men at important points and terminals, to halt the movement of coal and hold up incoming empties. Empties that would ordinarily have come into the Pocahontas region were diverted elsewhere, and normal relations had not been restored with connecting lines.

Pocahontas Heavy Loser from Railway Strike

The loading of the first full week of April was certain to be even lower than that for the week ended the third, although it was hoped that by the tenth conditions might have again been somewhat normal. No empty cars were delivered in the Tug River field on April 1 and 2, and by the second of April freight movement of all kinds had been entirely suspended on the Norfolk & Western, so that no coal to speak of was loaded in the field during the last three days of the week

Being a larger field, losses suffered in the Pocahontas region, in the week ended April 3, were even of larger proportions than those in the Tug River field; the strike of clerks and of shop crafts on the Norfolk & Western, crippling production for several days and completely wiping out the gains made toward the end of March.

Increases in the export tonnage have been observed since April 1, but export shipments are still far below the insistent demand. Progress is being made in completing contracts for the year's tonnage although a large tonnage is being reserved for the open market.

There was a decided decrease in the production of mines in the Kenova-Thacker district, during the period ended the third, owing to the interruption to Norfolk & Western operations through the strike of railroad clerks. In the week previous to that ended the third, the Kenova-Thacker field had a production of nearly 140,000 tons, or about 60 per cent of capacity. So far as can be learned the output of that week was cut in two because of the strike. Such a marked decrease was unfortunate in view of the heavy demand and the increased price being paid for coal. Even though the exporting of coal was limited, it was impossible for producers to fully meet the demand for overseas shipment.

Huntington, W. Va.

Logan Output 40 Per Cent—Few Cars—Coal Demand Insistent—Coal Goes to Inland West and to Tide.

The beginning of the new coal year brought no relief to operators of the Logan field through any increase in the car supply; the output in the region reaching only about 165,000 tons, as against 172,000 tons for the previous week; losses from railroad disability alone being not far from 250,000 tons for the week. In other words production was not much more than 40 per cent, in the face of what may be termed an insistent demand, and during the first three days of the second week of the month, still further losses in production through a limited car supply, were observed.

While inland west markets were securing more than half the output of the Logan field, there was still a steady movement of Logan fuel to tidewater, much of it for export, with restrictions as to export shipments much less rigid than they had been.

Pending definite action by scale committees in other non-union fields, it had been impossible for producers to arrive at any definite conclusion as to the actual cost of production. For that reason many producers, up until April 3, had held aloft from making contracts, desiring to determine exact production cost before contracts for delivery over the period of a year at any certain price.

With the opening of the Lake season about April 15 Logan producers will look forward to the movement (during the season) of a large tonnage to Lake ports and an effort was being made through a conference of Lake shippers, held at Cincinnati on April 8, to devise ways and means for the pooling of coal at Lake points in order to avoid holding coal at the docks.

While operations in the Logan field were not affected on April 1 by the observance of Mitchell Day, nevertheless, production was on a lower level than during the previous week, the supply of cars from the very beginning of the week being leaner than had previously been the case. On April 5, 6 and 7, the supply was even worse. Logan loadings on the fifth, for instance, totaled less than 40,000 tons as against normal Monday loadings of 52,000 tons.

A compilation of loading figures for all fields reached by the Chesapeake & Ohio, for the week ended April 3, discloses the fact that during that period 572 cars less were handled than for the week ended the twenty-seventh, the loss in tonnage moved amounting to 28,600.

Fairmont, W. Va.

Output Drops in Northern West Virginia—Coal Confiscation Continues—Export Shipments Increase.

Mines of northern West Virginia did not get away to a very auspicious start on the new coal year, from a transportation standpoint, as a scarcity of cars made it impossible to equal the output for the week ended the twenty-seventh, when, with a production in the Fairmont region alone of 308,550 tons of coal, the best week in two months was enjoyed. What also contributed to bring production to a lower level, was almost complete idleness at the mines on April 1, observed by union miners as Mitchell Day.

The car supply at various times in the week fluctuated from 30 to 85 per cent. The quota never reached the last named maximum except on Monday when for instance there were in excess of 1,500 cars available for loading on the Monongah division of the Baltimore & Ohio R.R. However, even that supply was somewhat reduced by late placements. On the same date the Monongahela R.R., had only a 44 per cent car supply for its mines. In other northern West Virginia regions the supply averaged anywhere from 50 to 80 per cent on Monday

Coal Seized at Tidewater

That the confiscation of coal had not been altogether abandoned, became apparent when instances of seizure of fuel by the Baltimore & Ohio, at both Brunswick and Curtis Bay, were reported at Fairmont, confiscations being made of export shipments. Of course such confiscation was not on as large a scale as had been the case during the early part of March, yet it was apparent that railroads were helping themselves to coal at least to some extent before the end of Government distribution of coal, though of course it will be impossible to tell just how coal was confiscated during the last few days of Government control.

There was a noticeable increase in the eastern movement of coal from northern West Virginia points, the increase being due largely to increased tidewater shipments. Likewise with the increase in tidewater shipments, there was an increase in exports, it is believed.

While the number of cars sent to Curtis Bay from the Monongah division, during the week ended the twenty-seventh was slightly in excess of 1,000, during the following week at least 200 more cars of coal were consigned to tidewater. With a growth in the tidewater movement, there was a decrease in the western movement, Ohio and Michigan points getting less northern West Virginia coal. When the Lake season opens, however, there will be a material increase in westbound coal.

Railroad-fuel shipments were rather heavy, especially during the early part of the week ended the third. Northern West Virginia operators are endeavoring to work out a plan, under which railroads may be able to secure an adequate fuel supply. However, price may prove to be a stumbling block.

Prices advanced somewhat in northern West Virginia fields, as was natural, after the first of the coal year, not through any special effort on the part of producers but because of the heavy demand for coal. Following the agreement on a wage scale, contract negotiations were in many instances consummated, buyers having been exceedingly thick in the Fairmont and other northern West Virginia regions for several days previous to the end of the coal year.

There was produced in the Fairmont region, during the month of March, a total of 1,345,100 tons of coal and 432 cars of coke.

Ashland, Ky.

Output Half of Capacity—Normal Conditions in a Month — Preferential Car Supply Continues.

Production in the northeast Kentucky field, for the week ended April 3, was 51 per cent of potential capacity; the output being 133,840 tons, out of a possible 262,000 tons, the total production loss amounting to 128,085 tons, or 49 per cent of capacity, 120,195 tons of such total being attributable to car shortage. The output of 133.840 tons represents an increase of 11,000 tons over the preceding week, the result of a betterment in the car supply on the Louisville & Nashville, the above production surpassing the output for the corresponding week of 1919, by 30,000 tons.

Production for the entire month of March was 585,000 tons, which, compared with a total of 408.000 tons in February and 517,000 tons in January, indicates that the railroads are gradually returning to an improved condition. By the end of another month they should find themselves practically normal, especially if the Lake shipments reach such proportions that a much better average movement will immediately result.

Satisfactory Outlook for Next Six Months

Eastern Kentucky operators, therefore, contemplate that unless the plowing season results in no unusual depletion of their forces, that the long drawn-out period of excessive car shortage will end; and with demand and orders sufficient to cover a full year's work at the mines, they are making complete plans for the year. At this time the outlook for the next six months at least is quite satisfactory.

A quite limited number of contracts for the ensuing coal year have been so far accepted, some of which carry with them the recent wage increase. The disposition to reject such offers is not due so much to a desire to receive a better figure, as it is due to the desire on the part of the operators to tie up permanently with those industries only which will insure them full running time.

The export demand is having a distinct bearing upon the prices offered in this field, as large exporters have found themselves short of sufficient tonnage to complete cargoes and are forced to offer a premium on the necessary spot shipments.

The practice of preferential supply of equipment to railroad fuel-contract mines continues intermittently, and it is understood that the railroads have appealed to the Interstate Commerce Commission for the privilege to continue this practice, pending satisfactory arrangements being made to assure them an adequate supply of fuel.

Benton, Ill.

Diamond Drill Proves Coal in Hamilton County—Old Ben Activities—Ambitious Plans of Southern Gem Corporation

In the March 4, 1920, issue of *Coal Age*, an account was published in the "News" department under "Benton," in which was noted the proposed proving of a large territory in Hamilton County. Some of the results of this examination are now made available in the following report:

One of the test holes has just been completed on the large acreage recently optioned in Hamilton County, just east of here, and the drillers have begun sinking another hole on a different portion of the property. It is said the showing of the [illegible] was found. The quality of the coal has not been fully [illegible] At least two [illegible] down [illegible] should [illegible] factory, the first mine [illegible] be sunk.

There is great activity in southern Illinois at pr[illegible] with new [illegible] coal [illegible] mines. This is evidenced by the following account of improvements [illegible] Corporation.

"The Benton Commercial Club has requested the Illinois Central R.R. to put on a miners' train to run from Benton to Buckner, to accommodate miners who work at Buckner and live in Benton. This was done at the request of the Old Ben Coal Corporation, which owns the Buckner mine.

The Old Ben company also notified the club that it would gladly entertain any housing plan which the club might foster, for the purpose of securing more housing facilities for miners wishing to come to work in the mines. The club has housing plans now under consideration, in an effort to secure sufficient men to properly operate the mines.

Furthermore the Old Ben Coal Corporation, which operates eight mines in Franklin County, with a daily capacity of from forty to fifty thousand tons, is considering a storage yard of large capacity, in which to store coal during the summer months, when orders are scarce. Full details have not been made public, nor has the location been disclosed, but it is supposed it will be located convenient to the large coal consuming centers in the northern part of the state

Southern Gem Buys Railroad

When coal development is contemplated, one of the first considerations is an adequate outlet for the mines. This problem apparently has been solved in the purchase of the Wabash, Chester & Western R.R., by the Southern Gem Coal Corporation, which operates mines in Franklin County, and has large coal holdings in Jefferson County. This company had in mind not only the added advantage of having this line already in operation running through its properties, but also an outlet for its product to a water route.

This road runs to Chester, which is on the Mississippi River, and the company expects to be able to secure a more extensive field thereby for its output, by being able to ship by water. The Wabash, Chester & Western also crosses ten other roads and branch roads, and the company contemplates erecting rescreening plants at junctions, thus securing a greater car supply.

Southern Gem people can carry the coal to these plants in their own cars, and by this means they expect to maintain continuous operation, as a rescreening plant is entitled to the same car supply on its daily capacity as the mine where the coal is hoisted.

PENNSYLVANIA

Anthracite

Scranton—On Saturday night, March 27. the official and employees of the Pennsylvania Coal Co. and the Hillside Coal & Iron Co. held their second annual banquet at the hotel Casey About 500 men were present. Joseph P. Jennings, general superintendent, acted as toast master.

Pottsville—The mine fire in the Wadesville colliery of the Philadelphia & Reading Coal & Iron Co., which started last January, has been successfully extinguished and operations in that part of the mine affected will probably be resumed shortly.

Lansford—Owing to the tremendous amount of work that has been placed upon the nurses attached to the main medical office of the Lehigh Coal & Navigation Co., at this place, the company has been compelled to employ another nurse therefore increasing its staff of nurses at this office to four. The new nurse is Mary Mulhearn.

Hazleton — Owing to breakage of machinery in the breaker, the Hazleton Shaft colliery of the Lehigh Valley Coal Co. has been forced to shut down temporarily.

It is reported that the Sandy Run colliery of M. S. Kemmerer & Co. will probably resume operation within the next two weeks.

Harrisburg—Members of the City Council recently approved the suggestion that this city should get some material return from the local river coal industry. The form the ordinance should take has not been determined, but it may include a tax on the coal recovered or a wharf rental; some 170,000 tons are produced annually. One of the city commissioners stated that the proposition should receive attention.

Wilkes-Barre—The output of coal in the whole anthracite field will be greatly restricted for the seven days ending April 7, due to the number of holidays. Thursday. being April 1, the miners will lay off due to it being the anniversary of the Eight-Hour Day; Friday, April 2, being Good Friday, is a church holiday, and Saturday [illegible] men [illegible] have to rest due to their hard work in celebrating the previous two days Monday also being a church holiday, there will be no work. So no material output of coal can be looked for before Tuesday April 6, and probably not before Wednesday will the full output be reached again

Carbondale—The Birkett Hill Coal Co. is ceasing operations in the mine-fire zone. where coal was being removed in the hope of checking further spread of the fire under the residential section. Some of the property owners thereabouts have sent in a plea to council to take action and compel the company to continue its work or fill the excavations made. For nearly a month there has been no work done, and the trench which was dug in the center of the street remains open. This trench is the entire width of the street and runs as deep as 30 ft. Cave-ins have occurred in the trench and are responsible for the suspension of work, according to G. W. Giles, manager of the coal company. Until the frost is out of the ground and the danger of the sides caving is passed there will be nothing done, he says. The Langan Construction Co., whose machinery is being used in the excavating, is preparing to remove its shovels and other machinery from the ground, and this leads the property owners and residents in that section to believe that there will be nothing further done. The permit to open the streets and do surface mining was granted by council, and it is expected that it will take action at its next meeting.

Bituminous

Charleroi — Another block of over 600 acres of coal lands, located in Independence and Hopewell townships, in the western part of Washington County, was transferred recently to Avella coal operators. The prices paid for the coal are $150 to $175 per acre.

Waynesburg—More than 1,110 acres of coal land in Whiteley, Perry, Cumberland Morris and Green townships, Green County. were conveyed to the Greene Improvement Co., of Pittsburgh, recently. Prices ranged from $250 to $500 an acre. Most of the land sold for $500 an acre, is near the Monongahela River.

Waynesburg—Deals were closed recently for the coal underlying two Greene County farms. Elizabeth J. Stephens, of Waynesburg, conveyed to John D. C. Miller, of Pittsburgh the coal underlying a tract of 192 acres in Whitely Township. The purchase price was $200 per acre. Lewis L Haney, of Monongahela Township, conveyed the coal underlying his farm of 88 acres in Monongahela Township to George B. Vance The price in this deal was $100 per acre.

Albion—The mine of the Albion Coal Mine Co., located north of this city, was reopened recently after a shutdown since Nov. 1. when the mine filled with water after the men walked out on the nation-wide strike New pumps and boilers have been added and the mine enlarged so that 150 tons will be turned out daily. The force of miners will be increased to 75.

Tarentum—The Pittsburgh Coal Exchange recently held a special meeting at this place in Allegheny County, at which Captain W B. Rodgers, presided. Captain J. Frank Tilley notified the members that a number of improvements are being contemplated on the rivers in the Pittsburgh district, among them the building of a new boat yard by the Eichlesy company at Hays station, also ice breakers, coal tipple and abutments for the Diamond Coal & Coke Co., at Barking station. Plans for these improvements were approved.

Uniontown—One of the most important coal deals in the southern Connellsville field in many months was completed recently when the Southern Connellsville Coke Co. purchased 100 acres of coal from Altha Moser, of Uniontown (the trustees in bankruptcy of J. V. Thompson), the coal lying near Cheat Haven. The purchasing company will pay $100,000, or $1,000 an acre Charles Detwiler, president of the purchasing company, negotiated the deal, and it is probable that this means further development in that section of Fayette County.

Waynesburg—The sale of 1,170 acres of coal land in Cumberland Township for $700 an acre, a total of $819,000, became known here recently when the deed consummating the deal was placed on record in the Greene County court house. The coal was sold by the Prospect Coal & Coke Co. of Uniontown. William A. Stone, A. Plumer Austin, Theodore D. Bliss, Richard W Austin and the executors of the estate of John Gilmore. The purchaser was the Buckeye Coal Co. The Buckeye company already owned a large acreage in Cumberland Township and is operating at Nemacolin.

Pittsburgh—The Tri-State Coal Stripping Association, W. J. Sampson, of Youngstown, Ohio, president, representing 25 coal companies in western Pennsylvania and eastern Ohio, with an annual production of about 5,000,000 tons, held a special meeting here recently in the William Penn Hotel. Reports showed production during the year ending April 1, has been greatly hampered by shortage of cars, but that production was fair. The companies have orders for coal booked that will keep plants running full during the summer and fall. Prices were discussed, but no definite schedule was adopted, it being considered advisable to let the market values of coal regulate the prices. It was stated that the supply of coal cars is becoming more plentiful and that by May 1, it was believed, the supply would be almost normal.

Benezett—This old town in the Bennett's Valley of Elk County is about to take on new life as coal operations of some importance will be opened here during the coming summer. Parties from Ridgway, Brockwayville and Reynoldsville are making plans for the opening of a large mine around the Winslow estate one mile above Benezett on Trout Run. Plans are now perfected for a tipple and for an extension of the Buffalo & Susquehanna R.R. to that point. This operation will eventually be one of the chief industries of Elk County, it is said, as the company has purchased or leased the 6,000 acres included in the Winslow estate. The company has already contracted for the removal of 50 houses from Pardus, Jefferson County, to Benezett and for their construction at the last named place. The Ridgway parties connected with this enterprise are R. A. Cartwright and H. S. Thayer.

Uniontown—It is reported in local coal and coke circles that an appropriation will be made soon for the erection and completion of a huge underground carrier system, whereby coal mined from Colonial mines Nos. 3 and 4, of the H. C. Frick Coke Co., will be conveyed to the Monongahela River, where it will be taken by barges to the byproduct ovens of the Carnegie Steel Co., at Clairton, Pa. It is proposed to carry the coal on a series of great 1,000-ft. belt lines, through the old Alice mines, formerly owned by the Pittsburgh Coal Co., for a distance of about 4½ miles. G. W. Mathews, of Kentucky, who at present is temporarily assigned as assistant superintendent at the Bridgeport mines of the Frick interests, will superintendent the operations and the erection of the carrier system through the Alice mines. The underground carrier system through the old mines is one of the most pretentious plans undertaken in this section of the coke region, it is declared, and will entail the expenditure of a considerable sum of money.

WEST VIRGINIA

Grafton — Fire totally destroyed the power house, machinery and tipple of the Sterling Coal Co. at Cecil, near this place. The fire originated in the power house. The loss is placed at $50,000. A large number of men will be kept out of employment until the buildings can be replaced.

Huntington—At a meeting of the Logan Coal Operators' Association, held in this city on March 31, John A. Kelly, one of the operators of the Logan field, was elected secretary of the association, succeeding W. P. Ellis, who resigned a month or more ago. Mr. Kelly is one of the executives of the Main Island Creek Coal Co., his headquarters being at Omar, W. Va. J. W. Colley was chosen at the same meeting as assistant secretary of the association, being in charge of the asociation offices recently moved to Huntington.

Wheeling—The Wheeling District Motor Coal Association has been organized by operators and owners of mines in Wheeling and vicinity, who deliver their coal by motor from the mines to nearby consumers. There are about 35 motor coal mines in the Wheeling district, the daily output of such mines being about 3,000 tons, in the production of which about 800 men are employed. These mines represent an investment of about $1,000,000. Officers of the new association are: J. F. Gebbart, president; R. J. Cotts, vice president; C. H. Ebberts, treasurer; George A. Blackford, secretary. The above officers and James Ralston, M. E. Cartwright, R. W. Hall and Frank Hailstone constitute the board of directors.

Macdonald—All miners in the vicinity of Fayette County are invited to attend the meetings of the Fayette County Mining Institute, and they are especially recommended by R. M. Lambie, Chief of the State Department of Mines, to those who contemplate taking the state examinations inasmuch as subjects of benefit are brought up at these [illegible] About [illegible] were present at the meeting held recently in the school building at Macdonald.

Those taking part in the discussions were Edward Graff, J. M. [illegible] Robert Lilly, Thomas Cochran, John Mallabone, George Lohman, Ben Wakefield and others. Owen Fitzpatrick read a paper upon the subject of "Pure Air Is Essential to Good Health," and William Ward, a paper upon the subject "Dangerous Practices in Mining."

Morgantown—An important meeting of the Northern West Virginia Coal Operators' Association was held in this city on April 1 and largely attended by members from various sections of the state, the meeting having been called largely to stimulate interest in the activities of the association. The principal address was made by J. D. A. Morrow, executive vice-president of the National Coal Association. Other speakers were President Brooks Fleming of the association, executive vice-president G. T. Bell and F. C. H. Jenkins, former president of the association. Mr. Morrow in his address told of the work of the National Coal Association, at Washington, emphasizing the results accomplished which would have been impossible had coal men not had a strong organization to speak through.

Charleston—Representatives of the West Virginia Department of Mines having made a thorough examination of the No. 1 mine of the Buffalo Thacker Coal Co. at Ottawa in the Coal River field, which caught fire on Jan. 26, and which has been out of commission since then and have found the fire extinguished, the department about the first of April gave its approval to the reopening of the mine which is now in commission once again. Inspectors Mason and Lilly and H. M. Black, Director of Mine Rescue Stations, represented the department in making an inspection. The fire at the No. 1 mine was extinguished after every other means had been resorted to by sealing four entries to the mine, shutting off all oxygen and leaving the mine sealed until the inspection was made during the week ended April 3.

MARYLAND

Cumberland—The discovery of a virgin coal field, a southward continuation of the Georges Creek and Elk Garden fields of Maryland and West Virginia, has just been announced by the U. S. Geological Survey. It is known as the Abram Creek-Stoney River field and it is estimated that the recoverable coal of the field amounts to 422,000,000 tons.

It contains low-volatile, semi-bituminous coal and is nearer tidewater than any other Appalachian field except the Georges Creek and Upper Potomac. The coal is at present entirely undeveloped and the area is without railroads, but it would require only a few miles of branch roads to reach lines running to Baltimore or Newport News. Interest has been aroused in this area because of the advancing exhaustion of neighboring districts.

ALABAMA

Birmingham—The byproduct coke ovens of the Birmingham Coke & By-Products Corporation at Boyles, near here, are now in operation. The first coke made at this plant was ready for delivery the last of March. The byproduct plant consists of 50 Koppers ovens, with a daily capacity of 700 tons of coke. The construction of these ovens began in the fall of 1918. In addition to the coke large quantities of ammonia and byproduct gas will be produced, the former sold in the market and the latter utilized in the operation of the plant and in generating power for other industries in the vicinity. The Dixiana mines at Bradford and the Majestic mines coal is being shipped in steadily to the plant and it is understood that some of the Woodward coal will also be used at the plant. The byproduct coke-oven plant at Boyles is the largest of the independent development of the district in years. It is a plant erected without any direct connection with another industry. Industrial circles are informed that the Woodward Iron Co., in taking coke from this plant, will shut down some of its bee-hive ovens and also take up repairing of a portion of its byproduct plant.

ILLINOIS

Edwardsville—The surface works of the Henrietta coal mine at Edwardsville, owned by the I. X. L. Coal Co., of St. Louis, and operated under lease of the Beck-White Coal Co., also of St. Louis, collapsed a few days [illegible] after having been [illegible] by a wind storm. The tipple had been idle for some time. The tower carried down with it the shakers and loading chutes. The shaker engine plunged to the bottom of the shaft. The damage is [illegible] at between $20,000 and $[illegible]

Belleville—Fire of undetermined origin caused approximately $30,000 damage at the Senior mine just outside of this place recently. The fire was discovered in the engine room near the mine shaft, by the night watchman. The Belleville fire department responded but lack of water prevented its giving much assistance; the flames had extended to the boiler room and the tipple over the shaft. The three structures were completely destroyed, but the shaft escaped much injury. Some 150 miners were thrown out of work. L. Senior, of Belleville, owner of the mine stated that the property had a daily capacity of 700 tons, and that efforts would be made to rebuild at once.

Duquoin—Recent reports from the Kathleen mine, at Dowell, five miles south of here, indicate that a marked improvement has been shown in tonnage during the last two months. The local management of the plant is held by Superintendent Robert Medill, who recently succeeded Edward Bottomley. The development is shown by the daily tonnage which has jumped from 1,100 to around 1,800 tons. The mine will operate steady all the coming summer as the owners, the Union Colliery Co., have a ready use for the coal which will be used in St. Louis to furnish power for their numerous power plants.

The new washhouse and office building at the Kanawha Fuel Co's mine at this city was recently completely destroyed by fire. The fire which is said to have originated in the lockers of the wash house became uncontrollable before anything could be done toward saving the contents of the office. Besides the loss in the office, practically every miner working at the mine lost a complete set of clothing.

Duquoin—One of the largest and most disastrous fires in the mining history of southern Illinois occurred on March 30 when the tipple of the Jackson Coal Co., at Hallidayboro, six miles south of here, was burned to the ground. The fire was discovered about 12:45 a.m. and burned until long after daylight. The cause of the fire has not been determined. The mine has been in operation for over 25 years and was one of the oldest in this part of the state. The tipple, which was of wood, a large coal washer and rescreening plant, coal bins, which were used to coal railroad engines, the blacksmith and machine shops together with other buildings around the mine were completely destroyed. The only remaining structures around the plant are the engine and boiler rooms and the fan house which is about one half mile away from the rest of the main surface plant. Plans were at once announced, by the officials of the company, for the erection of a new and modern steel tipple to replace the one which was destroyed and the inauguration of other improvements in and around the mine. The burning of this mine destroys what has recently become an old land mark throughout southern Illinois; at one time it ranked high among the big producers of coal. At the present time its capacity is in the neghborhood of 2,000 tons daily. The main offices of the company are at Chicago. The estimated loss of the fire is over $150,000.

SOUTH DAKOTA

Aberdeen—Dr. S. M. Darling, of Washington, D. C., fuel engineer of the United States Bureau of Mines, was a business visitor in this city, conferring with the officers of a coal company, whose headquarters are in Aberdeen. He is a Government representative in North and South Dakota relative to the development of the lignite fields of the sister states by the Government. Dr. Darling stated in an interview: "The Bureau of Mines proposes to co-operate with one of the lignite coal mining companies of the West in extensive work in a large, specially devised carbonizing and briquetting plant, to clearly demonstrate to private capital the commercial practicability of carbonizing and briquetting lignite coal, and to make clear the handsome profits that can be made on capital invested in such an industry. It is planned to build at one of the larger coal mining centers, a carbonizing and briquetting plant to cost $150,000 to carry on the demonstrations determined upon. The plan to be followed will be to briquette and carbonize lignite coal, each briquette to have a fuel value equal to the best anthracite coal and to be marketed for all purposes that antracite coal is now used."

Personals

W. S. Walker, of St. Louis, has succeeded George A. Miller, former sales manager of the Peabody Coal Co., St. Louis, Mo.

Jacob M. Holt, formerly superintendent of the Kehley's Run colliery of the Madeira Hill Co. has been assigned to other duties on account of ill health.

T. J. Lewis has been appointed mining engineer of the anthracite operations of the Madeira Hill Co. at Frackville, Pa. His appointment became effective April 1.

George Lovell has been appointed superintendent at the Kehley's Run colliery of the Madeira Hill Co. The appointment took effect on April 1.

Harry Smith, superintendent of the Archibald colliery of the Delaware, Lackawanna & Western company, is transferred to the Bliss colliery of this company, near Scranton, Pa.

Starr J. Murphy has been elected a director of the Consolidation Coal Co. to succeed the late Jere H. Wheelwright, and **A. W. Calloway** was elected a director to succeed Carl R. Gray, resigned.

Charles D. Barry, of Fairmont, has been named as chief clerk of the West Virginia Division of the Consolidation Coal Co, succeeding Chester C. Shinn, promoted. Mr. Barry was the division shipping clerk.

E. J. Buegler, formerly consulting engineer of the Westinghouse, Church, Kerr Co., has been elected a vice president of The Foundation Co. and will be in charge of the engineering department of the company.

Roscoe Crozier, of Bluefield, has been appointed field agent for the Lake & Export Corporation, of Huntington, and will be in charge of the Bluefield office of that company. He has been connected with the Pocahontas Fuel Co.

A. E. Brachny, assistant purchasing agent for the Lehigh Valley Coal Co., has resigned. He is going into business for himself in New York. His fellow employees presented him with a handsome travelling bag.

Newton Bayless, formerly of Harrisburg, Ill., has accepted the position as mine manager for the large Kathleen mine at Dowell, Ill. The vacancy was recently made by the resignation of William Stevenson, who has departed for England.

Howard W. Perrin, formerly manager of anthracite sales of M. A. Hanna & Co., Commercial Trust Building, Philadelphia, Pa., has been elected vice president of the Susquehanna Collieries Co., controlled by the Hanna interests.

E. T. Miller, district superintendent of the Greenwood division of the Lehigh Coal & Navigation Co., in Schuylkill County, Pa., resigned on March 15 to take the position of chief engineer of the Woodward Coal & Iron Co. at Woodward, Ala.

J. K. Voshell, of Baltimore, Md., has been elected a member of the board of directors of the Davis Coal & Coke Co., Baltimore, at the annual meeting held on March 21. Mr Voshell succeeds E. R. Stewart, recently resigned.

Joseph Koerner, formerly with the Illinois Sixth Vein Coal Co., has accepted the position as payroll clerk for the Equitable Coal & Coke Co., of Duquoin, Ill., operating two mines, one at Duquoin and the other at Johnston City.

Joseph H. O'Brien, formerly vice president and chief engineer of the Central Construction Corporation and before that for 15 years with the Westinghouse, Church, Kerr Co., has been appointed chief engineer of The Foundation Co.

E. J. Jones, formerly assistant to Mr. [illegible] dent of the Lehigh Coal & Navigation Co., has been appointed district superintendent of the Greenwood district, in the Southern anthracite region of Pennsylvania. C. D. [illegible] of strippings of the Lehigh Coal & Navigation Co., [illegible]

[illegible] sales office in Pittsburgh, Pa., was the [illegible] U. S. [illegible] He was also at one time the secretary of the Northwestern Pennsylvania Coal Operators' [illegible]

David Lloyd, [illegible] superintendent of the Auchincloss colliery of the Delaware, Lackawanna & Western company, has been [illegible] the Scranton district and will be in charge of the Archibald, Hyde Park and other operations in the Northern anthracite field of Pennsylvania.

Archibald Hamilton, transit man in the St. Clair division of the Philadelphia & Reading Coal & Iron Co., at Pottsville, Pa., has resigned to take a position as traveling salesman with the Williamsport Leather Goods Co., Williamsport, Pa., manufacturers of leather belting.

Wayne Carruthers, superintendent of the Bliss colliery of the Delaware, Lackawanna and Western company, has been transferred to the same position in charge of the Auchincloss, Loomis anod Avondale anthracite collieries in the Wyoming Valley of Pennsylvania.

Chester C. Shinn, of Fairmont, has been appointed chief clerk to Vice President Brooks Fleming, Jr., of the Consolidation Coal Co. Mr. Shinn was formerly chief clerk of the West Virginia division of the Consolidation company. Mr. Shinn has been in the service of the company for 22 years.

John Blizard, formerly of the mines branch of the Canadian Department of Mines, has recently been appointed as a fuel engineer at the Pittsburgh Station of the United States Bureau of Mines. Mr. Blizard has done a great amount of work on fuel testing, having published recently an elaborate report of the results of steaming tests conducted at the fuel testing station, Ottawa. This is report No 496, of the Canadian Department of Mines. He has quite recently assumed his duties in the new position.

Albert L. Gately, for several years master mechanic at the Klein mine of the Republic Coal Co., near Roundup, Mont., has been appointed superintendent of the property to succeed **William Redshaw**. The announcement was made by **James H. Needham**, general manager. Mr. Gately has spent his entire life in the vicinity of and associated with the coal industry. Mr. Redshaw has left for Rock Springs, Wyo., where he will take charge of coal properties for the Megeath interests.

John D. Rockefeller, Jr., retired as a member of the board of directors of the Colorado Fuel & Iron Co. when the annual stockholders' meeting chose John C. Mitchell, a Denver banker, to succeed him on the board. Mr. Rockefeller had served on the board for 17 years. In the letter in which Mr. Rockefeller requested that he be not elected he asked it in pursuance of his policy of retiring from the directorates of all concerns with which the Rockefeller interests are connected The majority control of the stock of the corporation is retained by the Rockefeller interests.

Obituary

Colonel William W. Coe, a prominent railroad official and coal operator, died at his home in Charleston, W. Va., recently aged 73 years. For a number of years he was chief engineer at the Shenandoah Valley R.R. and later became general manager of the Pocahontas Coal & Coke Co.

Coming Meetings

The Rocky Mountain Coal Mining Institute will hold its annual meeting in Denver, Col., in conjunction with the National First-Aid Meet, on August 20 and 21. Secretary, F. W. Whiteside, Denver, Col.

National Coal Association will hold its annual meeting May 25, 26 and 27 at the Traymore Hotel, Atlantic City, N. J. Secretary, W. B. Reed, Commercial Bank Building, Washington, D. C.

The American Association of Engineers will hold its annual convention at the Planters Hotel, St. Louis, Mo., May 10 and 11. C. E. Drayer, secretary, Chicago, Ill.

National Foreign Trade Convention to be held in San Francisco, Cal., May 12, 13, 14 and 15.

National Conference of Business Paper Editors will hold its next meeting June 4 at the Congress Hotel, Chicago, Ill. Secretary, R. Dawson Hall, 36th St. and 10th Ave., New York City.

M. O. I. Coal Association will hold its annual convention June 16, 17 and 18 at Cedar Point, Ohio. Secretary, B. F. Nigh, Columbus, Ohio.

National Retail Coal Merchants' Association will hold its annual meeting June 10, 11 and 12 at Detroit, Mich. Secretary-manager, Ellery Gordon, Philadelphia, Pa.

Kentucky Mining Institute will hold its annual meeting June 4 and 5 at Lexington, Ky. Secretary, C. W. Strickland, Huntington, W. Va.

American Society of Mechanical Engineers will hold its spring meeting May 24, 25, 26 and 27 at St. Louis, Mo. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

Chamber of Commerce of the United States of America will hold its eighth annual meeting April 26, 27, 28 and 29 at Atlantic City, N. J. Assistant Secretary, D. A. Skinner, Washington, D. C.

West Virginia Coal Mining Institute will hold its annual meeting June 7 and 8, at White Sulphur Springs, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

American Wholesale Coal Association will hold its annual meeting June 1 and 2 at Pittsburgh, Pa. Secretary, G. H. Merryweather, Washington, D. C.

Retail Coal Dealers' Association will hold its annual meeting April 19 and 20 at McAlester, Okla. Secretary, C. R. Goldman, Dallas, Tex.

Southwestern Interstate Coal Operators' Association will hold its annual meeting June 8 at Kansas City, Mo. Secretary, W. L. A. Johnson, Kansas City, Mo.

Mine Inspectors' Institute of America. Annual meeting July 13, 14 and 15 at Cleveland, Ohio. Secretary, J. W. Paul, Pittsburgh, Pa.

Coal and Coke Patents

Byproduct Condenser. Arthur Roberts, Evanston, Ill., 1,333,631. March 16, 1920. Filed April 17, 1915; serial No. 22,146. Renewed Jan. 7, 1918; serial No. 210,772.

Rail Bond. Edward M. Deems, Forest Hills, N. Y., 1,333,904. March 16, 1920. Filed Jan. 8, 1919; serial No. 270,149.

Mine-Shaft Safety Device. George M. Johnson, McDonald, Pa., 1,333,921. March 16, 1920. Filed July 23, 1918; serial No. 246,367.

Safety Device for Mine Cages. Slave Peskulich, Butte, Mont., 1,334,116. March 16, 1920. Filed Aug. 7, 1919; serial No. 315,943.

Treating of Lignite. Walter Runge, Orange, N. J., assignor to International Coal Products Corporation, Richmond, Va., 1,334,170. March 16, 1920. Filed April 30, 1919; serial No. 293,829.

Method of Manufacturing Briquets. Charles Howard Smith, Short Hills, N. J., assignor to International Coal Products Corporation, Richmond, Va., 1,334,180. March 16, 1920. Filed Feb. 18, 1918; serial No. 217,758.

Hoisting Apparatus. Henry Kenyon Burch, 1,334,220. March 16, 1920. Filed Nov. 8, 1916; serial No. 130,242.

Apparatus for Mining Purposes. Edmund C. Morgan, New York, N. Y., 1,333,627. March 16, 1920. Filed April 28, 1913; serial No. 763,962. Renewed Nov. 7, 1919; serial No. 336,470.

Light-Coke Product and Method of Making Same. Hugh Rodman, Edgewood, Pa., assignor to Rodman Chemical Co., East Pittsburgh, Pa., a corporation of Pennsylvania, 1,334,404. March 23, 1920. Filed June 22, 1915. Serial No. 35,592.

Method of Utilizing Fuel. Hugh Rodman, Edgewood, Pa., assignor to Rodman Chemical Co., East Pittsburgh, Pa., a corporation of Pennsylvania, 1,334,405. March 23, 1920. Filed June 22, 1915. Serial No. 35,594.

Centrifugal Pump. Charles V. Kerr, Aurora, Ill., assignor to the American Well Works, Aurora, Ill., a corporation of Illinois, 1,334,461. March 23, 1920. Filed Oct. 29, 1917. Serial No. 198,981.

Peat Drier. William S. Jackson, Toronto, Ont., Canada, 1,334,495. March 23, 1920. Filed May 6, 1918. Serial No. 232,833.

Concentrating Apparatus. Emil Diester, Fort Wayne, Ind., assignor to Diester Machine Co., Fort Wayne, Ind., a corporation of Indiana, 1,334,524. March 23, 1920. Filed April 21, 1917. Serial No. 163,609.

Pipe Joint. William H. Flint, Birmingham, Ala., 1,334,530. March 23, 1920. Filed Aug 15, 1918 Serial No 219,993

Carbide Lamp. Thomas Thompson, Howe, Okla., 1,334,570. March 23, 1920. Filed May 13, 1918. Serial No. 234,154.

Rail Joint. John C. Elkins, Santa Rosa, Cal., 1,334,602. March 23, 1920. Filed Sept. 20, 1919. Serial No 325,240.

Air-Lift Pump. Ralph H. Tucker, Los Angeles, Cal., assignor of one-third to Edgar S Cameron and one-third to Charles M. Tucker, Los Angeles, Cal., 1,334,638. March 23, 1920. Filed Feb. 24, 1919. Serial No. 278,804.

Industrial News

Moundsville, W. Va.—Twelve hundred acres of coal land in Green County, Pa., was purchased 13 years ago at $300 per acre. This property was sold recently for $1,000,000, or an average of $833⅓ an acre.

Laurel Creek, W. Va.—The Pen-Mar Realty Co. has acquired a total of about 175 acres of coal lands in the vicinity of Laurel Creek, and is arranging plans for the immediate development of the property.

Habersham, Tenn.—T. P. Witherspoon, of Knoxville, and G. G. Crowley, of Jellico, have completed negotiations for the purchase of mining properties at Habersham, and are arranging plans to increase the present capacity to a total of 300 tons daily.

Blackey, Ky.—The Woodburn Coal Co. is understood to be having plans prepared for the immediate construction of a new tipple at its plant for increased operations. Arrangements are also being made, it is understood, for the erection of about 30 dwellings for miners' service.

Henryetta, Okla.—The Creek Coal & Mining Co., of this place, is sinking a new shaft and installing equipment, at what is to be known as No. 2 Creek, between mine No. 1 and Victoria mine. An entry is being driven to meet mine No. 1 which has only about 80 ft. to go.

Winchester, Ky.—R. D. Baker, J. M. McLemore, and associates have acquired a large local coal and timber tract and will arrange for immediate development. Complete equipment for all features of operation will be installed.

Pittsburgh, Pa.—The Iron Trade Products Co., of this place, has been appointed exclusive sales agent for the Connellsville-Fairmont Coal Co.'s mines at Worthington, W. Va. The property is located on the Baltimore & Ohio R.R. and produces a steam coal.

Welch, W. Va.—Coal will be mined by the Vauclare Coal Co., organized about the first of April by Welch business men, with a capitalization of $25,000. Instrumental in organizing the company were: W. W. Hughes, I. J. Rhoades, L A. Osborn and T. F. Henritze, all of Welch; R. R. Fairfax, of Roanoke, Va.

Logan, W. Va.—The general headquarters of the Lundale Coal Co. and of the Amherst Fuel Co. are to be moved from Huntington, W. Va., to Lundale, W. Va. George M. Jones is the president of each of the above companies. The Amherst Coal Co, of which H. R. Jones is president, is to move its general office from Huntington to Amherstdale.

Morgantown, W. Va.—Plans have been formulated by the Dellslow Coal Co., of this city, to mine coal in the Morgan district of Monongalia County, the capital stock of the new company being $50,000. Leading figures in organizing the company were: Thomas J. Watring, J. M. Wood, F. E. Sapp, Nick Patt, Pietro Fantucci, all of Morgantown, W. Va.

Philadelphia, Pa.—Coal operators, shippers and carriers, at a meeting held here recently, appointed a committee of 15 to draw up rules and regulations, with a view of continuing the soft coal pools at the various Atlantic ports north of Baltimore after April 30. The present arrangement for the transshipments of the fuel expire by proclamation of President Wilson.

Huntington, W. Va.—The Lake & Export Coal Corporation, of this city, has just consummated a contract for the delivery of 960,000 tons of coal from the West Virginia fields to one of the large shipping concerns in the United States, the coal to be delivered during the present coal year, presumably at the rate of 80,000 tons of coal a month.

St. Clairsville, O.—The Goodyear Tire & Rubber Co. has completed negotiations for the purchase of the coal property of the Somers Coal Co., located in Harrison and Belmont counties, for a consideration of about $385,587.96. It is understood that the Goodyear company is planning for the opening of a new mine and the construction of a mining town in the vicinity of New Athens.

Huntington, W. Va.—Arrangements have been completed by the W. E. Deegan Coal Co., of this city, for the delivery to European markets within the next 12 months of 1,000,000 tons of coal. While heretofore the company has sold coal for the export trade, it has not undertaken delivery of such coal. In the present instance the company has chartered vessels and will make its own deliveries.

Mt. Vernon, Ill.—It is reported here that the Wabash, Chester & Western R.R. has been sold to Henry Dimond, a Franklin County coal operator. Mr. Dimond is said to have had an option on the road for $500,000 and recently made a trip of inspection over it The road runs from Mt. Vernon to Chester, 66 miles, and is an outlet for a considerabe coal territory. The Dimond interests have recently bought several thousand acres of coal lands in the territory served by the road.

Sheridan, Wyo.—The Sheridan-Wyoming Coal Co., Inc., a subsidiary of the United States Distributing Corporation, has just completed a lease of (with an option to buy) all of the coal lands near this place, owned by the Kendrick-Irvine Corporation. United States Senator John B. Kendrick is president of the Kendrick-Irvine Corporation. The lands involved embrace approximately 1,420 acres bearing coal deposits operated through the Acme mine of the Sheridan-Wyoming Coal Co., Inc.

Wheeling, W. Va.—A coal deal involving considerably more than a million dollars was consummated here recently, when the Elm Grove Mining Co., in Ohio County, W. Va., became the owner of the Glendale mine of the Hitchman Coal & Coke Co., of Benwood, near Wheeling, and the Security mine, at St. Clairsville, of the Security Coal Co. The latter mine was owned by David Thomas and Judge John C., Nichols, both of St. Clairsville. The company making the purchase is said to be associated with the Valley Camp Coal Company, of Cleveland, Ohio.

Williamson, W. Va.—It is understood that the Norfolk & Western R. R. owns about 5,000 acres of coal land in addition to going mines, and will in the near future undertake the development of the acreage alluded to in order to increase its fuel supply. With the full development of this acreage owned by the railroad, through the operation of about ten mines, it will be possible for the Norfolk & Western to increase its fuel output about 1,500,000 tons per year. Mines now operated by this railroad are located at Mohawk, in the McDowell County; and Vulcan and Chattaroy, in Mingo County.

McAlester, Okla.—One of the results of the demands of coal miners for increased wages was the announcement by the Missouri, Kansas & Texas R.R that practically all of its locomotives will be changed from coal to oil burners. In this change the Oklahoma mining industry, and also that of Texas, will lose a standing order of a tonnage that amounts to millions of dollars a year. This is a blow to the coal industry of Oklahoma, operators here say, as the railroad's order for coal was for every day in the year. Many mines, not yet recovered from the effects of the recent strike, will become stagnant, it is said.

Thacker, W. Va.—The Buffalo-Thacker Coal Co. is having plans prepared for extensive increased operations to develop an ultimate capacity of approximately 600,000 tons per year. The company holds a total of 1005 acres of coal properties as well as leases on 2580 acres in the Kanawha field, with six complete mining operations, including electric power plants for works service, miners' houses, townsites, and so on, located on the Norfolk & Western and Chesapeake & Ohio roads. It is proposed to issue bonds for $550,000, the proceeds to be used for the proposed expansion. L. R. Reese is president.

Beachley, Pa.—The Beachley Coal Co., operating four mines at this place in Somerset County, has contracted for the building of 20 new, fireproof houses on the company's property. The work on these houses will start at once so that they will be ready for occupancy about the middle of summer or perhaps earlier. The dwellings will be of a size sufficient to comfortably house the miners. The company has recently secured the services of John Auld (formerly superintendent of the Thermal Smokeless Coal Co.), as superintendent of the Beachley mines and he will assist in pushing the work of the construction of the houses so that they may soon be ready for occupancy.

Bluefield, W. Va.—In opening a branch office in this city the West Virginia Coal Co. has selected Arch S. Booker of this city as its local manager. The general office of the West Virginia company is at Richmond, Va., although the company maintains a large branch office at Huntington, W. Va. Mr. Booker was at one time associated with the firm of Castner & Curran.

Huntington, W. Va.—The West Virginia & Kentucky Coal Co., of Letcher County, Ky., the Acup Creek Coal Co., of Perry County, Ky., and the R. J. Jones & Sons Coal Co., of Jonesville, Ky., have been sold to the Consolidated Fuel Co., of Pittsburgh, Pa. The purchase price for the properties, it is understood, was $525,000, the deal having been consummated on April 1 by H. P. Jones, of Huntington. The purchasing company is headed by Isaac J. Jenkins of Pittsburgh. The Consolidated operations will be under the direction of Charles A. Miller, of Pittsburgh, as general manager. In addition to the above, James R. Jones is to be assistant general manager; Harry P. Jones, Jr., auditor, and William A. Phillips, manager of stores. The total acreage owned by the companies which were sold, aggregated 5,200 acres, all of which are now under development.

Baltimore, Md.—Action has been taken by the board of directors of the Pittsburgh & West Virginia Ry. (the stocks of which are largely held in Baltimore), looking to the separation of the West Side Belt R.R. from the Pittsburgh Terminal R.R. & Coal Co., which controls and operates bituminous properties. This merger of the West Side Belt R.R. with /the Pittsburgh & West Virginia Ry. Co. will put all the railroad properties and operations under one corporate organization. The question of merging these properties will come before the stockholders at their annual meeting in May. The planned rearrangement of the Pittsburgh & West Virginia properties will put all the railways in one company, which will in turn own the coal properties through ownership of all the capital stock and consolidated mortgage bonds of the coal company. It is understood that the action now taken is preliminary to a further step to separate the railway from the coal properties.

Charleston, W. Va.—With the awarding of a contract for the building of the Greenbrier & Eastern R. R. (10½ miles in length) from Rainelle, along Meadow Creek, penetrating the coal lands of Greenbrier County. an impetus will be given the development of large tracts of coal land. In a number of instances companies have not waited for the construction of the railroad before beginning development work, having already started the driving of entries. The new railroad will open up for development about 10,000 acres of coal land, eight companies having much of that acreage under lease. Eventually the new railroad will be 50 miles in length and will penetrate a coal area containing about 175,000 acres of smokeless coal, much of which contains the Sewell, Fire Creek, Beckley and Pocahontas No. 3 seams. Construction work on the first ten miles of the railroad will be completed by Dec. 1, 1920, and by Jan. 1, 1921, several companies expect to be in a position to begin the shipment of coal.

Great Falls, Mont.—Rapid development of the coal properties it owns in Spring Creek is planned by the Anaconda Copper Mining Co. As soon as the railroad situation will permit of extensions being made, the company will ask the Great Northern Railroad to build a track of some six miles from the road to the Spring Creek Mines. The new operation will be about 4½ miles from the present Tracy mines, but the branch which will reach the Spring Creek property will be a different one from the line which goes to Tracy, Sand Coulee and Stockett. The coal of the new property is said to be substantially the same in quality and the seam is about the same in thickness. as the one which has been so successfully worked by the company at Tracy and Sand Coulee. It is not expected that the mine will be opened to any great extent for several months, as it is thought probable that it will take 18 months to bring the railroad to the proper development to handle the output of the mine. The Spring Creek properties are made up of the acreage secured by purchase several months ago by Dan Tracy, who acted as the agent for the company. They embrace something like 1,400 acres. F. W. C. Whyte [illegible] charge of the coal properties of the company as general manager, and John Gillie is superintendent of mines. The general office is at Butte, Mont.

MARKET DEPARTMENT

Weekly Review

Strike of "Outlaw" Railway Employees Interrupts Coal Industry—Midwest Operators Forced to Shut Down—Tidewater Exchange to Be Continued After May 1 as Voluntary Organization.

BECAUSE of the "outlaw" strike of switchmen and other railway employees, shipments from the mines to tidewater were greatly interfered with, and though output continued to improve the product could not be moved to market.

During the early part of the strike embargoes were ordered by some of the coal-carrying roads in the Mid-west, but now the strike has spread virtually throughout the East. Coal-mine operators in Illinois and Indiana feared the possibility of being forced to shut down because of lack of cars. The shortage of cars became even more acute than in the preceding week, and in southern Illinois some mines have been closed since April 9. On that day 94 mines in Indiana, with a total daily production of close to 100,000 tons, closed, which caused nine furnaces at Gary, Ind., to go out of blast because their fuel supply was cut off.

For other reasons cars were in short supply in other sections of the country. In New England, for instance, some of the roads found themselves lacking motive power. Locomotives which were borrowed from one railroad for use on another had to be returned after the discontinuance of Government control, and these railroads will be unable to procure new locomotives from the manufacturers for some time to come.

Bunkering hampered by the permit system found itself beset with many other difficulties. Not only were shipments from the mines held back by the inadequate service of the railroads but also by reason of the strike of marine engineers and pilots. The ports on the Atlantic Coast are only moderately supplied with fuel.

Threats—direct and implied—from Washington that a campaign is to be waged against fuel-price extortioners is apparently not being heeded by some coal concerns as is evidenced by the fact that the prices of certain coals which under Government control had been selling for $2.95 have reached $8, as was the case with West Virginia splints, a high-grade gas coal.

There is still a considerable difference of opinion in all districts regarding the actual effect of increased costs on prices. In the Pittsburgh district there has been a marked shortage of slack due to the increased call for mine-run for railroad and other steam purposes. This is a temporary condition, however, which will be corrected as soon as normal supplies for steam purposes have been received and Lake shipments of screen coal have begun.

Central Pennsylvania prices have been running from $3.50@$4.75 at the mines, Pool 10 running about $4, Pools 1 and 9, $4.10@$4.50, while the poorer grades have in some instances been contracted for at $3.50.

In the export market a few orders of low sulphur gas coal have been placed for April shipment as high as $7 at the mines, but these are exceptional cases. The average price for April, May and June shipments through 33 and 37, has been $4.70 at the mines with mine-run 20c. less. Very little central Pennsylvania smokeless has been exported, mine prices being $5.35@$5.40.

The continuance of the Tidewater Coal Exchange as an incorporated body after May 1, with the continuance of the present pool numbers and the gradual reclassification of certain mines, in co-operation with the advisory committee of the railroads, will tend to stabilize the market and make possible firm quotations at established rates within the next few weeks.

WEEKLY PRODUCTION

The weekly report on the production of bituminous coal, anthracite, and beehive coke, compiled by the Geological Survey Department of the Interior, April 10, 1920, states that the year 1920 proved no exception to the rule that production falls off during the first week of the new coal year. As far back as the weekly production records extend the transition from the old to the new coal year has been registered by a downward jog in the production curve. The depression this year was less marked than usual, however, and for the first time since January the 1920 production has passed all three of its pre-[illegible]

Preliminary estimates place the output [illegible] ended April [illegible] rease of 11 5 per cent when compared with the preceding [illegible] was [illegible] the beginning of [illegible] year [illegible] forced, as in 1917 and 1918 also, by the observance of Good Friday and other holidays.

The total production of bituminous coal during the [illegible] ended is estimated at [illegible] compared with [illegible]4,100 [illegible] pre-war year 1916-1917. The [illegible] of course caused by the great [illegible] last November. Production [illegible] 1920, however, compares [illegible] the record of [illegible] the war [illegible] to 140,600,000 tons and is 29,400,000 tons ahead of 1919; 900,000 tons ahead of 1918, and within 1,850,000 tons of the record of 1917.

The production of Pennsylvania anthracite during the week ended April 3 fell off sharply. Shipments by the nine principal carriers—in part estimated—were 24,786 cars, indicating a total production of 1,273,000 net tons. This was a decrease, when compared with the preceding week, of 596,000 tons, or 32 per cent. The decline is attributed to the observance of Good Friday and other holidays of the Easter season.

Preliminary estimates place the production of anthracite during the coal year just closed at 89,434,000 net tons. The output in recent years has been as follows (in net tons): Coal year April 1 to March 31—1916-1917, 87,947,000; 1917-1918, 100,372,000; 1918-1919, 92,402,000; 1919-1920, 89,434,000.

Although much smaller than its two immediate predecessors, the output for 1919-20 was thus greater than that for 1916-17.

The production of beehive coke declined slightly during the week ended April 3. The total output is estimated from railroad shipments as 493,000 net tons, a decrease when compared with the preceding week of 8,000 tons, or 1.6 per cent. All districts except West Virginia reported a decrease. Production in the Connellsville region, as reported by the Connellsville *Courier*, declined from 254,562 to 248,005 tons.

The cause of the decrease is believed to be the observance of Good Friday. At many plants the absence of workers was more important in curtailing production than car shortage.

For the third week in succession the current production was greater than that for the corresponding period a year ago, 493,000 tons during the week of April 3, 1920, as compared with 350,000 tons in 1919. The cumulative output since Jan. 1, 1920, is thus rapidly overtaking the lead of last year. It now amounts to 5,987,000 tons, or only 249,000 tons behind the record of the corresponding period in 1919.

Atlantic Seaboard

BOSTON

Rail movement still hampered by embargoes.—Lack of motive power a factor in New England.—Prices strong but conservative operators try to prevent high figures.—Tidewater Coal Exchange to continue.—Hampton Roads despatch continues poor.—Pressure to get anthracite forward.—Outcome of negotiations in doubt.

Bituminous—Since March 25 practically all of New England has been bottled up by embargoes. In April, the New York City embargo against shipments via West Albany was modified, but at this writing deliveries for Boston & Maine R. R. destinations are still under the ban. The accumulation of freight cars at or en route to the Boston & Maine gateways had been diminished only one-half in two weeks and it is easy to see that with the coal season starting out in this fashion the outlook for the next 60 days is none too favorable.

Car supply is improving in most parts of Central Pennsylvania and if soon these New England embargoes can be raised there will be much better volume than was really looked for a month ago. Local labor troubles are gradually being smoothed over as the mine-workers come to understand the bearing of the recent wage settlement.

An important element in the Northeast is the poor shape in which some of the roads find themselves on motive power, 450 cars daily, all kinds of freight, are about all the Boston & Maine is able to take away from the New York City under present conditions and it is doubtful if this can be materially increased until more engines can be had. Certain locomotives borrowed from the New Haven during Government operation have now been returned, and certainly the New Haven needs all the power it can get if it is to serve industries on its line. The harbor strike in New York has had the effect of shutting off shipments via Harlem River, thereby closing that important gateway. For most of the past fortnight therefore there has been but one all-rail avenue open, that via Maybrook, and even there much congestion is in evidence.

Meanwhile, those steam-users dependent upon the all-rail channel are fast depleting their reserves. Steam anthracite taken during March has served to extend stocks of bituminous measurably, but there will be an acute situation if receipts continue light another three or four weeks. For a time, Hampton Roads shipments, in a sense, came to the rescue, but delays at the Virginia terminals have made such shipments of rather doubtful dependence. Demurrage has raised the delivered cost to such high levels that buyers, many of them, prefer to take their chance of getting coal all-rail.

The rush for rail coals of acceptable grade continues insistent; both New York and Philadelphia agencies are beset with New England would-be purchasers and it is a matter for serious thought what will be the outcome. The railroads, themselves, are distressed about the difficulty of securing contracts and it is persistently rumored that the old custom of assigned cars will be reinstated. Operators say they will sell railroad fuel at "the market," but prices on their present range are not attractive to railroad purchasing agents.

Quotations continue very firm. The more reasonable operators are trying hard to prevent anything like a runaway market. It is realized this is a political year and that on very small provocation some kind of drastic control could be exercised. The result is that several producers have set for themselves a top price both for contract and for spot sales and the many smaller shippers are being counselled not to attempt pyramiding on coal.

It is understood that the Tidewater Coal Exchange will be continued as a voluntary association of shippers, the expense to be shared by the railroads. Railroad management is by no means a unit on the advantages of such an arrangement, but enough factors have agreed to a program to warrant putting the plan into operation at all the piers except at Hampton Roads.

The New York piers are only comfortably supplied with coal, mostly for bunkering and New York requirements. Port Reading piers are embargoed temporarily because of the harbor strike, only a comparatively few barges and floats having been delivered alongside the dumping facilities.

On Pocahontas and New River the Hampton Roads situation has improved very little. Several bottoms destined for New England have earned from $1 @ $2 demurrage and delivered prices have had to be marked up. Car supply is improving and movement is more regular, but it will take several days to catch up and restore normal loading. Contracts are being taken for Pocahontas agencies on the basis of $4 per net ton f.o.b. mines, plus charges.

Quotations at wholesale, for spot shipment, range about as follows, at the points indicated:

	Cambrias and Somersets	Clearfields
F. o. b. mines, net tons......	$4.25 @ $4.85	$3.75 @ $4.50
F. o. b. Phila., gross tons....	6.60 @ 7.25	6.05 @ 6.85
F. o. b. New York, grs. tons	7.00 @ 7.60	6.40 @ 7.20
Deliv'd alongside Boston..	9.00 @ 9.85	8.55 @ 9.45
All-rail, delivered at Lawrence, Mass...	8.90 @ 9.55	8.32 @ 9.16

Pocahontas and New River are quoted at $6.40@6.90 f.o.b. Hampton Roads, and at $9.40@9.85 delivered alongside Boston. On cars Pocahontas has been sold as high as $11.50, demurrage included.

Anthracite—Unremitting pressure is exerted to get forward domestic sizes. The dealers have very light stocks and the public is buying as freely as allowed. Retail prices have been generally advanced, due partly to increased rates on water coal and partly to new wage scales for teamsters and coal handlers. There is much criticism, and investigations are both rumored and in progress, but the retailers can show mounting costs that justify the prices made.

The trade is keenly interested in developments between mine-workers and operators. There have been rumors that an agreement would be reached April 15, but it is only clear that the mine-workers want to be restored to the pre-war differential they enjoyed over the bituminous miners.

NEW YORK

Anthracite continues short at tidewater with demand strong.—Line dealers receiving prompt shipments.—The West is in need of fuel and dealers send many inquiries to local dealers.—Situation in New England reported as serious.—Bituminous deliveries affected by so-called "outlaw" strike.—Railroads place embargoes on shipments.—Producers expect several months of active business.

Anthracite—The efforts of buyers to place orders has resulted in some spirited bidding for coal at the mines, and the result has been that some high prices have been heard of. All the companies and many of the independent producers, especially the largest adhere closely to the regular schedule but it is reported that some of the smaller operators are receiving around $9 for the domestic sizes.

Production is reported as being well maintained but receipts at tidewater are far from normal. Dealers, dependent upon deliveries here, say that coal is arriving slower than for many weeks back. They claim that line shipments are being kept up in better shape.

There is a decided lack of coal as far West as Minnesota and many inquiries are being received here for prices and prospects for early deliveries. Similar inquiries are being received from the Canadian trade. Wholesale dealers are sending the information wanted but are not making any promises of quick shipments.

Most shippers look for a shortage of cars this summer which with the expected constant heavy demand for the domestic coals makes the outlook anything but rosy for the consumer. Another factor in the situation will be the increase in the use of anthracite by the railroads covering the hard-coal fields. This is made necessary by the continued shortage of bituminous. Some railroads have already issued a circular letter to their engineers and firemen calling attention to the lack of bituminous and requesting them to use anthracite more freely by increasing the quantity in the mixture with bituminous. The trade looks for a change in conditions as soon as a new working agreement between the operators and miners is reached.

New England continues to be badly in need of coal and considerable is being sent to the dealers in those states. In the Metropolitan district the demand continues heavy while supplies are short. Retail dealers complain of slow deliveries and predict an active summer season. Their books are filled with unfilled orders, some dealers telling their customers they may receive their coal about the middle of May or July 1.

The call for the steam coals is easier. There has not been so active a market and quotations are slightly easier. Buckwheat has been quoted during the week from $3.65@$4., grade and quality entering into conditions. Rice and barley are easy but there is no surplus coal lying about.

Current quotations for company coal per gross ton at mine and f.o.b., tidewater, at the lower ports are as follows:

	Mine	Tidewater
Broken.................	$5.95	$7.80
Egg...................	6.35	8.20
Stove ...	6.60	6.45
Chestnut .	6.70	8.55
Pea .	5.30	7.05
Buckwheat .	3.40@3.75	5.15@5.50
Rice. ..	2.75@3.25	4.50@5.00
Barley	2.25@2.50	4.00@4.25
Boiler	2.50	4.25

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—While the trade has been upset because of the lack of coal and the uncertainty confronting the market, dealers are optimistic and expect steadier conditions as soon as all of the mining regions have come to some agreement regarding working conditions.

The so-called "outlaw" strike of switchmen and other railroad workmen has resulted in a set-back for the market. Embargoes were ordered by some of the coal-carrying roads in the bituminous fields the first day of the trouble in the East and it was expected that similar action would be taken by other companies. The continuance of the coastwise strike has cut a big gap in the bunker tonnage, but it is now expected that with the trouble petering out, conditions will soon become normal as far as this port is involved, unless the strike of the switchmen affords encouragement to the striking unions to prolong the conflict.

Producers look for several months of active business. Supplies are short, most large consumers having been forced to use their reserve stocks during the past few weeks. With weather conditions becoming seasonable there will be a reduction in consumption with an increase in stocks, enabling a quicker distribution of coal.

Buyers are finding it harder to pick up free coal. On account of the poor car supply and the resultant cut in production available coal is becoming scarcer. Contract coals continue to be mined freely.

The demand has been such that many operators and shippers are booked ahead for some time to come. The making of contracts has about been completed with running from about $3.50@$4.50 for the good grades. Gas coal is in good demand and short. Producers and shippers are not making promises as to deliveries and quotations range from $4.50@$5 for good Pittsburgh coal. Quotations on the various grades range from $3.75 to $5.00 according to quality

PHILADELPHIA

Anthracite trade stirred by return of cold weather.—Dealers have small tonnage on hand except pea.—Price question still undecided by some shippers. — Wage-scale adoption hoped for soon.—Steam coals all taken. — Bituminous deliveries do not increase.—Active spot market.—Price climb slightly halted.

Anthracite—There has been a week of unusually cold weather prevailing in this district and the result has been a heavy call upon the dealers for immediate deliveries in small lots to tide their customers over to warmer weather. For four days in succession the temperature dropped below freezing and this with windy days has caused the consumption of much coal. Outside of pea there has been very little coal to deliver, as the tonnage of large sizes arriving in the city has been extremely light.

The stocks of pea coal are fast dwindling and at the present rate there will soon be little of this size left in the yards. Due to the lack of the larger sizes the dealers are in position to make deliveries of pea in good volume to such of their customers who want to put it for the next winter.

Despite the action of the larger companies in making their sales to date at the old schedule, the dealers are in some instances badly upset, especially those getting a large proportion of their supplies from certain individual shippers. These latter concerns are delivering their coal on the retroactive basis as to price and as a consequence those dealers receiving this coal are put to a great deal of annoyance. Usually they deliver the coal to their choice trade with the understanding that no bill will be sent until they know definitely what the coal is to cost them.

As yet there are no signs of a greatly-increased tonnage from the mines. While the car supply is all that could be desired, still the men are slow to take up their work after the holiday season, which is usual at this time of the year. Taking advantage of this situation many of the breakers in the region are undergoing repair now, and running as they have for an entire year almost without stoppage, it becomes necessary to make an overhauling. This also has cut into the tonnage.

The dealers have all ceased to advertise for business, the only announcements recently being those from the more progressive concerns endeavoring to explain to the public the present conditions and their inability to make deliveries of all summer orders as soon as placed. As a matter of fact all dealers have adopted the practice of delivering small tonnages where coal is urgently needed for immediate use, and apportioning the balance of their tonnage on the summer orders in the same rotation as adopted last year.

The demand for steam sizes goes merrily on. All sizes are in strong demand and it seems to be the desire of all users to lay aside as heavy a tonnage as possible before the prices become increased following the adoption of a new wage schedule. There are practically no contracts in effect on the steam sizes and the consumer considers any excess stock that he may get now as just so much of a bargain.

Bituminous—At this time there seems some indication of a checking in the high price tendency of the market. Spot coal, of course, remains quite high, but the upward movement has not continued at the pace of the last week. It is believed a good bit of this effect is due to the stand taken by the larger shippers to keep the market from becoming a runaway, with the resultant adverse criticism following the release of Government control. Many buyers also refused to take on additional tonnage at the top prices, quite a few going almost to the point of suspension in their refusal to pay limit figures.

We do not think the tonnage of coal coming into the market has appreciably increased, but there are no plants that are suffering for the lack of fuel. The scarcest coal this time is high volatile, particularly the Fairmont coals. The steel mills are short of gas coals and have come into the market and are taking many grades that ordinarily they could not use on account of high sulphur content, but in their stress for fuel they are overlooking this factor. Added to this, the railways, always large users of high volatile fuel, are sharing with the manufacturers the limited production. As a result of this the spot market on Fairmont coal is running from $4.95 to $5.40 and this class of coal for the time holds the unusual distinction of being higher in price than many of the high grade Penn steam coals. On ordinary high volatile Penn coals similar to Greensburg, the prices quoted have run $4.40@$4.65, while good qualities of steam coal such as Pools 10 and 11 have been quoted $4.65@$5.

Contracting has almost ceased. On the part of the sellers it would seem they have come to the conclusion that they were too quick to close as much tonnage as they did at the contract prices running at $3.50 @ $4, with the bulk nearer the latter price. In the face of the good prices realized in the spot market very few are willing to consider contracts, yet it is a mutual feeling, for the consumer who is not under contract is inclined to take his chance with coal at the market for a while, with the idea of being able to contract to a better advantage later in the season. Even with those concerns who have contracts there is an inclination to complain of the light shipments being received by them.

BALTIMORE

Great inducements for export shipping have sent a flood of coal to tide beyond capacity of quick handling and piers are embargoed.—Line conditions easier despite poor car supply reported.—Market remains excited.—Hard-coal men in state of uncertainty.

Bituminous—The great inducements of- [illegible] a flood of coal to the piers here beyond the capacity of absorption of vessel supply with per- [illegible]

The general car supply on the Baltimore [illegible] situation here is improved as to supply, although some consumers are still more or less feverishly [illegible]

The car [illegible] Maryland has [illegible] thus [illegible] The situation seems [illegible] in at high [illegible] market has [illegible] coals of good grade [illegible] from $4.50 @ $5 [illegible] for steam varieties, and around [illegible] for gas coals.

As predicted in these letters there is a tendency to shade down prices from first contracting figures. Contracting is not even now general, but some closings are being made all the way from $3 @ $4.50 for from fair to best coals. There is a wide range, however, even for coals of the same grade, and no schedule of prices can be set within a reasonable range of surety.

Anthracite—The hard-coal situation still hangs over awaiting final action along wholesale lines. Very little coal of any size is now coming through. This makes it necessary for cautious acceptance of orders for delivery at any other price than that to be fixed at the time of delivery.

Up to April 1 there was some acceptance of orders on the basis of existing prices irrespective of the time of delivery of the fuel, but the light receipts and the fact that yards here are but meagrely supplied in most cases caused a general change in the method of dealing.

Eastern-Inland

PITTSBURGH

Wage matters practically settled.—Leading operators favor holding prices down.—Gas coal brings high prices.—Prices to vary with quality.

At this writing the operators and miners of the Pittsburgh district have not reached a complete agreement on wages and conditions but there is every prospect that a full agreement will be reached very shortly.

All wage rates are agreed upon, on the basis of a general 27 per cent advance from the war time scale, the disagreement being only upon rents. The miners contend that there should be no rent advances at all, while the operators wish to advance rents, and at the same stating that there are repairs and improvements to be made, which should be taken into consideration.

Taking account of both pick-and-machine mining in the proportions in which they obtain in the Pittsburgh district, it is computed that the 27 per cent advance over the original scale means about 40c. per ton in direct labor cost, not counting advances to foremen, clerks and various minor officials, the labor cost having averaged about $1.40 under the old scale. Attention is directed to the fact that the cost of day labor per ton of coal mined has increased in the past few years in considerably greater ratio than that by which the tonnage rate has gone up, by reason of day men working less assiduously, and for other reasons.

There are rumors that leading operators of the district, with some co-operation on the part of operators in nearby districts, are endeavoring to formulate plans whereby coal prices can be held down to a moderate level, the idea that this should be done originating with banking interests. The market itself has not yet become clearly defined. It is reported that contracts for the twelvemonth have been made at $3.25, $3.50 and perhaps slightly higher figures for steam coal, while there are reports of some gas coal contracts made at much higher figures, up to $4 and in one case, for a period of a few months, at $5 or thereabouts. The Pittsburgh Coal Co. is seriously considering what would be a great departure from previous practice in the Pittsburgh district market involving the establishment of a differential between its [illegible] and its up river coal.

Throughout the market there is seen a marked tendency to make price distinctions according to quality, distinctions which, operators say, ought to have been established long ago. As for prompt coal, it has brought a wide range of prices according to [illegible]. Operators assert that considerable tonnages have been sold at less than $4 but buyers of $4.50 and even higher [illegible] to be paid. Only a rough generalization can be made as to the market now, [illegible] being clearly defined as follows: [illegible] steam, $3.25@$3.50; contract gas, $3.75@$4; prompt coal, $4@4.50, per net ton at mine, Pittsburgh district.

COLUMBUS

Question of price is still unsettled, although some regularity in quotations has appeared.—Some of the jobbers are still asking higher prices.—Active bidding for the available supply of coal.—Car shortage still hampers production.

With the lifting of Federal restriction on [illegible] some confusion appeared in the coal [illegible] in Ohio. Operators and jobbers were at a loss to estimate the new price list and accounting departments were put on figuring up the increased costs of production. Some of the companies have not yet finished this work, so the price question is still up in the air to a certain extent. But a number of prices were quoted, showing a wide range.

As most of the larger producers have their tonnage tied up for some time, they are not concerning themselves about quotations to any great extent. The usual prices prevailing in the Hocking Valley are $3.65@$3.80 for lump, $3.40@$3.60 for mine-run, and $3.15@$3.30 for nut, pea and slack. Pomeroy Bend prices are about the same as Hocking.

Eastern Ohio prices are slightly higher with lump selling in the neighborhood of $3.85@$4 and mine-run around $3.50@$3.75. West Virginia prices are higher than those prevailing in Ohio with splints around $5 and possibly higher and Pocahontas about $6 for lump and $5.50 for mine-run.

Demand from all sources is extra good. Retailers are buying briskly as many of the householders are laying in their supply of fuel for the coming winter. Retail stocks are not heavy, especially in the northern and western parts of Ohio. Michigan dealers are also buying actively. Dealers are selling at a margin of about $2 over the cost at the mines plus the freight charges. There is a good demand for Pocahontas and West Virginia splints, with the former rather scarce.

Demand for steam sizes is also strong in every locality. Manufacturing concerns are trying to secure some surplus stocks but have not been successful in that direction. Railroads are taking a fair tonnage, some of which is confiscated which reduces the tonnage shipped to commercial users.

There is a general movement for cities, public instiutions and schools to secure their fuel supply early and that is visibly stiffening the market. Practically no steam contracts have been made as costs have not yet been figured to the satisfaction of producers.

Lake shippers are strong after tonnage but very few agreements are reported. Some coal is being loaded at Huron from eastern Ohio mines for shipment to Lake Michigan points, but the upper passages will not be opened for some time. May 10 is the date now set for resumption of Lake traffic in Lake Superior. Stocks in the Northwest have been largely used and the Lake season promises to be unusually active.

Car shortage on all Ohio coal-carrying roads still continues and consequently production is still held down to a rather low point. In the eastern Ohio field the output has been less than 40 per cent of capacity. Hocking operators had to be content with a 50 per cent or less supply and the same is true of Pomeroy Bend and Crooksville. Recent orders on the part of the Interstate Commerce Commission for the return of 825 coal cars daily from the Northwest are expected to help the situation in Ohio.

Retail prices per ton in Columbus are:

Hocking lump	$7.50
Hocking mine-run	7.25
Pomeroy lump	7.50
Pomeroy mine-run	7.25
West Virginia splints, lump	8.50
West Virginia splints, mine-run	8.25
Pocahontas lump	10.50
Pocahontas mine-run	10.00

CINCINNATI

Retail coal prices were $1 and $1.50 a ton higher last week than they were the week before.—Variation in the increase depended on the dealer quoting and the kind of coal quoted on.—Advance followed giving up of government coal control.

Operators first announced increases and these immediately were passed on to the [illegible] by retailers here and in other cities. The worst is yet to come, however. Bituminous lump coal was selling at $8.50 and some delivered on the hilltops with prices about 25c. less for downtown deliveries. Quotations on smokeless coal were difficult to obtain because there is little smokeless available, and it is believed that smokeless coal probably will become more abundant now, because operators will be able with removal of government restrictions to fix a price on it for domestic American consumption.

Dealers are not tying themselves up with contract prices until they see how the situation shapes up, and now that government restrictions are the thing of the past, dealers believe that operators will sell to them more readily than for export trade, as a better price will be paid. Dealers are buying all the coal they can lay their hands on without binding themselves to contract. They believe it is a good time to buy under present price condition, as higher prices are a certainty.

The situation in this territory is easier, due largely to the return of mild weather Some coal is being delivered by river and the railroads have delivered sufficient for the period here, although the big demand outside the territory has not yet been relieved. Although domestic demand is very slow, dealers say there is every indication that the public will do more spring and summer buying than during any previous year.

The car supply was satisfactory and ran as high as 70 per cent the first half of the week, but fell off a little toward the end. Operators here are hoping that continued warm weather will help the roads bring their motive power back to a point where it will be able to handle 50 per cent more traffic.

The familiar procession of buyers from outlying districts has begun and they are trying in every way to get contracts formulated and signed. Operators and distributors do not care to enter contract with them because of the uncertainties of the market.

Southern

LOUISVILLE

Prices rising rapidly as a result of continued car shortage, and high cost of low production.—Demand fading somewhat as result of high quotations.

Kentucky operators after shipping on existing contracts have very little surplus coal to offer as a result of a very low car supply, and prices are advancing rapidly on such supplies as are available. Demand is not quite so keen for domestic sizes, nor is steam being bought except for immediate demand. Railroads are buying emergency coal, and demand from gas and byproduct plants continues heavy.

Car supply for the month ending March 31, was the worst ever known in the state, or in most any section, the Louisville & Nashville system showing only a 46.85 per cent of car supply, out of which the Hazard district had but 40 per cent, and Cumberland Valley but 42 per cent supply, neither reaching the general average of the road.

Prices have jumped about $2 a ton on eastern Kentucky grades as a result of the scarcity of all grades. Harlan operators are opposed to allowing block coal to go over $4.50 a ton, claiming that it is not fair to the domestic consumer, but mine-run is selling at $4.50 and up, and indications are that very little block will be produced for the time being. Reports are being received of Straight Creek quotations at $5.25, and of some other eastern Kentucky grades at similar figures.

Quotations in the Harlan field are on a par with Hazard field quotations at the present time, lump being quoted at prices ranging from $4.50 to $5 a ton; mine run, $4@4 50; and nut and slack at $3.50. Westtern Kentucky is asking $3.25 for lump; $2.85@$3 for mine-run; $2.50@2 60 for nut and slack, and $2.25@$2.40 for fine screenings. In some cases quotations are running above these figures and some operators are getting less. Although demand is not heavy, production is so light that what little coal is available can command a fancy figure.

Operators claim that in event of a good car supply prices will drop fast, as competition will force prices down. A 75 per cent car supply would force lump coal down anywhere from one to two dollars a ton. Small mines and wagon mines are springing up fast again as a result of high prices and control having been lifted. That coal mining hasn't been profitable for months past has been shown in the absence of these small mines. However, they will still further scatter labor and car supply, and do no good.

Retail prices are out of sight, with eastern Kentucky lump at $8.50@$8.75; mine-run, $8; nut and slack, $7.50; western Kentucky $7, $6.50 and $6. These prices are somewhat lower than prices will be when retailers begin receiving $5 per ton of coal, which will be sold on the $2.75 margin for block and $1.75 margin for steam, just the same as if low prices prevailed.

BIRMINGHAM

Market remains strong, with inquiry very active and insistent.—Car shortage holds production to a figure very much below the news of the trade.—Heavy rains have also flooded mines and handicapped output to some extent.

All energies of operators and sales agencies are now being directed toward an increased coal production and an acceleration in the movement of coal to the consumers. There is no need for activity in the selling line, the demand being almost unprecedented for all grades. The problem is securing a supply to meet the trade requirements.

There has been little if any improvement in the amount of [illegible] had the past week [illegible] about 60 per cent of the [illegible] needed. [illegible] consumers who have [illegible] on current receipts to keep [illegible] as a consequence [illegible] which can- ing for more liberal [illegible] not be made without an improvement in the transportation facilities. [illegible]

If the [illegible] coal. Rail- labor to produce the [illegible] roads are very short on fuel and continue to confiscate or order [illegible] to fall to them such of their output as is needed. Discrimination in the allotment of cars to mines on the Southern railway is charged, claim being made that contract [illegible] and a subsidiary operation of the company are receiving a 100 per cent supply, other operations getting their pro rata share of the remaining equipment, and temporary injunctions have been obtained by two coal companies to restrain this practice.

Quotations have not yet become stable under the increased mine cost, due to 27 per cent increase awarded to mine workers and granted by operators effective April 1, ranging about as follows, per net ton mines for the month of April:

	Mine-Run	Prepared
Big Seam	2.95@3.25	3.75
Black Creek	4.00	4.15@4.50
Cahaba	4.00@4.35	4.35
Carbon Hill	3.35@3.50	3.50
Nickle Plate	3.35@3.50	

Domestic quotations range about as follows:

	Lump
Big Seam	3.25@3.50
Black Creek	5.00@5.50
Cahaba	4.50@6.00
Carbon Hill	3.50@3.75
Montevallo	7.00
Montevallo Straven	6.75
Corona	4.50

Production for the week ending March 27 totaled about 333,000 net tons as per figures tabulated by the Alabama Coal Operators' Association. Heavy, incessant rains and labor shortage affected production slightly.

Lake Region

BUFFALO

Not much further change in bituminous.—Supply only fair. Speculation over the car supply.—Light mining lately. Coal movement unsteady.—No anthracite surplus.

Bituminous—The situation is about as it was last week, and the supply of coal also is much the same. Shippers will get a big consignment one day and then none for awhile. Every effort is being made to keep the ordinary run of the business, but with so many uncertain elements in it the task is a hard one.

The principal difficulty is lack of cars. They are about as scarce as they were, but the trade is afraid they will before long upset everything by becoming too plentiful, just as they have for so long by being scarce. A leading shipper said yesterday that the reports gave figures for a large output last month, so that the miners are ready to dig the coal if the cars will move it. No new cars are building of account, but repairing is said to be general, so that a prompt delivery of coal mined would be quite possible at almost any time and then coal would soon be begging for a market.

But it is all conjecture. So many elements of doubt come into the count. The Lakes are soon to open and then there is a hungry West to supply for a year in only eight months. The export lists are crowded with coal and that trade alone may take all the surplus. But for the terrible rates and prices it surely would, so all that the shipper can do now is to exercise great caution. He must mostly sell his coal before he buys it and he must know his customers. Sometimes a car is refused for the apparent reason that a reduction is looked for. The jobber's margin is small yet for the most part and he cannot afford to risk many losses. There are those who look for an early decline in prices and their guess is as good as anyone's.

A comparison of individual process at present evolves the following as the best average quotations: Allegheny Valley (all mine-run at present), $5 75@$6; Pittsburgh and No. 8 lump and three-quarter, $6 25@$$6.50; mine-run and slack, $6@$6.25; smokeless, $6.50; Pennsylvania smithing, $6.75 per net ton, f.o.b. Buffalo. These prices are exceedingly flexible and will be governed by the car supply mostly. At present the trade is affected by light [illegible] mining and a switchmen's strike that may last sometime.

Anthracite—The receipts are held up at present by the switchmen's strike and to [illegible]. This [illegible] the existing shortage so visibly that all the coal offices in the city are beset by a host of consumers. The telephones are [illegible] of [illegible] some of [illegible]. When the actual shortage is [illegible] all that the [illegible] in winter coal [illegible] dealers are trying to supply are those who are out of coal.

Nothing is said yet of prices beyond the general promise that all prices are [illegible] and there will be no back charges. The failure to fix the mining scale is costing the operators much money. Speculations as to what the new prices will be look to an increase of $1.50 a ton or so. Just now a cold April requires much coal. The natural gas [illegible] at every cold snap, which is a great hardship to all consumers. For five days up to the present the temperature has not been above freezing, and this after the hardest winter on record.

The Lake trade is waiting for coal There may be some bituminous to go when the ice is gone, but there is no anthracite in sight. The city would complain bitterly if any coal were shipped West with the local supply as short as it is. So the shippers do not even talk of Lake shipments, though they are usually loading briskly at this time. Still, with the report of severe shortage in mining last season it is remarkable that the severe winter, with less natural than for a long time, was gone through safely.

CLEVELAND

Fair-sized contracting has been done in No. 8 mine-run and slack at $3.25—For No. 8 coal for the Lake trade $3.50 has been done.—Retail dealers are paying $4 for spot tonnages of No. 8 slack and mine-run.—Excepting anthracite, all prices have been marked up.—An increasing volume of No. 8 coal is moving to Lake Erie ports.

Bituminous—Definite contracting is known to have been done in No. 8 slack and the mine-run at $3.25, f.o.b. mine. Two No. 8 district operators have named this figure in quotation-making business with a northern Ohio steam coal consumer. Other operators, still holding off from contracting, are reported in favor of pegging the market at $3.25, an advance of 90c. over the government maximum. Well-informed operators believe $3.25 will rule for the spring and early summer at least. Whether it will hold for late summer and early fall, when production is near normal, is a question with some operators. Every effort is to be made to prevent a runaway market. That is the word being passed along "coal row," and an investigation of profits accruing from a $3.25 price is welcome.

With No. 8 slack and mine-run at $3.25 for lower Lake trade, the usual differention of 25c. brings the Lake trade figure up to $3.50. Some business is known to have been done at this price. On a basis of $3.25 for the lower Lake trade, No. 8 ¾-in. coal will bring $3.50 and 1¼-in. $3.65. Most of the business being done by retail coal dealers in No. 8 slack and mine-run is at $4. This is not contract business, but represents mostly spot sale. A break is looked for and dealers expect to pay not over $3.50 within a month. This is 25c. higher than operators say they will ask.

Dealers have marked up all of their domestic prices with the exception of Cannel lump, which remains at $11, delivered. West Virginia splint has been advanced from $8.30 to $8.75. No. 8 Pittsburgh lump has been increased from $7@$7.50 to $7.75. Coshocton lump, formerly $7.35, now is placed under the No. 8 Pittsburgh lump classification and will take the $7.75 price for the present. Massillon lump, now called Millfield lump, goes from $7.40@$7.65 to $8.50. On steam coal the new price schedule still is indefinite because dealers average their sales at the close of the month. They say, however, they are paying $4 for most of their No. 8 slack and mine-run. Adding $1.40 freight and $2.08 for margin (the margin allowed by the Fuel Administration) and the retail delivered price is brought up to $7.48. No. 8 slack has been bringing $6@$6.25, and mine-run $6.45@$6.60. Probably, No. 8 slack and mine-run will settle around $7, delivered.

Demand for all steam-coal grades continues abnormal. The past week has been the worst of the year, so far as production is concerned, with the Easter holidays cutting working time to a minimum. Even so, car supply for the past week has been increased only a trifle. Labor is reported extremely short. Railroads are not well supplied and much coal consigned to Lake Erie ports has been diverted to railroad use.

DETROIT

Competition of domestic consumers attempting to buy coal at the mines is credited with being a price-advancing factor.

Bituminous—Despite the attempts of reputable jobbers and producers to maintain a price equilibrium that will be in harmony with the increases in production costs, the bituminous market is in a more or less unsettled condition while prices display a rising tendency that is viewed with disapproval by men prominent in the local trade.

The unrestrained eagerness of many consumers of steam coal to stock up early is said to be the influence back of the rising prices. Buyers representing these consumers are reported to have gone into the producing districts, where they are bidding against each other for the limited supply that is to be had. The shortage of car supply and consequent restriction of production creates a situation that renders the market very susceptible to price-advancing influences.

Jobbers and wholesalers say it is not reasonable to criticise the operators who accept the highest price offered for their coal, but believe the consumers who have thus undertaken to interfere with the regular system of distribution are the ones at fault. Had these consumers placed their orders with jobbers, the latter, with a better knowledge of the trade, would have been able, they say, to obtain the coal, without creating a situation so unsettling to the market.

Middle West

MIDWEST REVIEW

Buying mania on the part of the public is continuing strong and will continue until the car supply is large enough to take care of the demand to some extent.—In Michigan, West Virginia operators who last year were glad to get from $1.60@$1.75 for their screenings, are now asking $4.25.

Illinois and Indiana operators, in our opinion, are to be commended in the highest terms for the stand they have taken in regard to their April prices. These operators have set a flat price running from $3 @ $3.40 for their prepared coals, and are sticking closely to this price scale, when, as a matter of fact, the demand for coal is so great that they could get at least a dollar per ton more, should they desire to do so. In taking the stand mentioned above, these men are endeavoring to show the public that they are worthy of trust, and are not taking advantage of the temporary situation, to increase the price of coal beyond all reason. Operators in the East, especially in the West Virginia, Ohio, and Pennsylvania fields, could well afford to follow their example.

CHICAGO

Within a short time, Chicago, for the second or third time this year, will be on the ragged edge of a coal famine.—Cause of present predicament is the strike on the part of the switchmen.

While this outlaw strike situation has hurt Chicago, it has helped other portions of the territory, as all coal shipments for Chicago are embargoed, and this means that operators with business in Chicago will have to apply their coal elsewhere in the state. The strike will have its sunny side in that it will give the retail dealers, as well as manufacturers in Illinois, outside of Chicago, an excellent opportunity to accumulate a little surplus.

Of course the demand for all kinds of [illegible] keeping up [illegible] exceptions. When the local trade saw the prices which [illegible] grades of Eastern coal, and we have in mind particularly some Pocahontas and New River [illegible] that prices [illegible] be impossible [illegible] city. There [illegible] to handle [illegible] a result, the [illegible] nty coal from [illegible] coal from [illegible] nand, and will probably [illegible] Eastern fuels.

Prices of coal per ton are as follows:

		Freight rate Chicago
Illinois		
Southern Illinois		
Franklin, Saline and Williamson Counties		
Prepared Sizes	$[illegible]	$1 [illegible]
Mine-Run	[illegible]	[illegible]
Screenings	[illegible]	[illegible]
Central Illinois		
Springfield District		
Prepared Sizes	$3 00 @ $3 25	$1 32
Mine-Run	2 75 @ 3 00	1 32
Screenings..	2 50 @ 2 60	1 32
Northern Illinois		
Prepared Sizes	$4 00 @ $4 50	$1 24
Mine Run	3 50 @ 3 75	1 24
Screenings	3 00 @ 3 25	1 24
Indiana		
Clinton and Linton Fourth Vein		
Prepared Sizes	$3 00 @ $3 25	$1 27
Mine-Run	2 75 @ 2 90	1 27
Screenings...	2 50 @ 2 65	1 27
Knox County Field Fifth Vein		
Prepared Sizes .	$3 00 @ $3 15	$1 37
Mine-Run........	2 75 @ 2 90	1.37
Screenings	2 50 @ 2 60	1.37
Brazil Block	$4 25 @ $4 50	$1 27
Eastern coals		
Pocahontas and New River Coals		
Prepared Sizes	$5 00 @ $6 00	$2.65
Mine-Run	4 00 @ 4 50	2 65
West Virginia Splint and Gas Coals		
Prepared Sizes	$4 25 @ $4 75	$2 65
Mine-Run	3 75 @ 4 25	2 65
Southeastern Kentucky Hazard, Harlan and Big Sandy Fields		
Prepared Sizes..	$4 50 @ $4 75	$2 45
Mine-Run	3.75 @ 4.25	2.45
Smithing Coal........	$4.50 @ $5 25	$2 60

ST. LOUIS

An improvement in car supply the first time in many months.—Some little dissatisfaction among miners.—Switchmen's strike has demoralized conditions and everything is uncertain.—Demand has been good on everything, especially steam.

At some mines in the Standard district there was dissatisfaction to the extent that some of he miners refused to work and some of the mines were idle for a few days, but eventually it seemed to be settled. The drivers in many places were not contented with their arrangements and they were some other little coal differences that have been pretty well adjusted. Other than that the Standard field showed improvement.

Cars were more plentiful, some mines working five days straight and the tonnage was heavy, especially for railroads. The steam call has been good and there was a demand that the supply could not take care of, both in the city and outside. A heavy tonnage of coal has been moving north to the Chicago market from this field.

The same conditions apply to the Mt. Olive district, although the car supply has not been as good there as in the Standard field.

The Missouri Pacific is still up against it as far as fuel is concerned. It is beyond the understanding of anyone in this part of the country, either the railroad man or the coal man, why a road like the Missouri Pacific is always short of coal and obliged to confiscate several hundred cars a month to keep its trains moving. Several operators in the field are refusing to sell coal to the Missouri Pacific and others are asking as high as $3.15 for Carterville mine-run.

Conditions in St. Louis are quiet. There is a little demand for domestic storage coal. Steam coal is good on account of the industrial activities. There is no anthracite coal coming in to speak of and no smokeless. There is no change in retail prices, and the wholesale prices are as follows:

Carterville and Franklin County lump, egg and nut sizes	$3 35@3 40
Carterville mine-run	3 00
Carterville screenings	2 75
Mt. Olive lump, egg and nut for outside shipments	3 00
Mt. Olive lump, egg and nut for local shipments	2 75
Standard lump, egg and nut	2 75@2 90
Mt. Olive mine-run and Standard mine-run	2 75@2 85
Mt. Olive screenings and Standard screenings	2 50@2 60

The price conditions here started off fairly well, but the Mt. Olive and Staunton Coal Co. broke up the Mt. Olive price of $3 when they made their price for St. Louis customers $2 75.

MILWAUKEE

Coal market continues active, owing to prevalence of cold weather.—All kinds of soft coal advanced 50c. per ton.—Anthracite unaffected.

The anticipated advance in coal prices materialized at Milwaukee since last week's report, the entire bituminous list being marked up 50c. per ton. Anthracite was not disturbed, however. The market is active owing to the prevalence of raw, spring weather. Coal is scarce, because of bad transportation conditions and dealers are parceling out the meager supply as judiciously as is possible. This condition must prevail until the opening of lake navigation and the consequent arrival of supplies in large quantities. All bituminous coal, domestic and steam, are 50c. higher per ton. Anthracite remains unchanged. Coke cost $13.25 for large sizes and $10.75 for smaller sizes.

Pacific Coast

SEATTLE

Quotations at the present time are as follows:

Seattle—$6.75 per ton 2,000 lb., f.o.b bunker tips.

Tacoma—$6.75 per ton 2,000 lb., f.o.b bunker tips.

Portland—$8.75 per ton 2,000 lb., f.o.b. bunker tips.

Portland—$9.50 per ton 2,000 lb., in the stream over the ship's rail.

The above rates apply to the standard grades of Black Diamond and South Prairie coal.

Quotations on British Columbia coal in Seattle Harbor are as follows:

Comox Lump—$10 per ton of 2,240 lb., f.a.s.

Comox Marine Mixture $9.85 per ton 2,240 lb., f.a.s.

SAN FRANCISCO

The increase in wages of miners, in accordance with report of President Wilson's commission, has had no effect on coal coming here from Utah and Wyoming.

Notification has been sent to dealers of the price remaining the same for April as for last month. As to the future, following April, the situation is a problem, but on account of the summer slump impending, opinion prevails there will be no increase, and if any, but slight. Coals from Utah and Wyoming, f.o.b., net ton, wholesale, stove and lump, $3.65.

Some of the supply for the San Francisco market comes from New Mexico. One company has ordered increase in price to $5. Dealers say this isolated raise will have tendency to reduce demand for this variety and increase demand for Utah and Wyoming, which virtually control the market.

Coke

CONNELLSVILLE

Prices substantially unchanged, with market quiet except in contract foundry coke.—Full car supplies would only slightly increase coke production.

Market prices are about the same as at the time of last week's report. There is very little activity in furnace coke, substantially all the available tonnage for April being applicable on regular contracts or being tied up on sales for the month. The market in general is quotable at $11@$12 for furnace coke and $13@$14 for foundry coke, per net ton at ovens. There are various exceptions, however.

The new wage scale for the region has not been published, but notices were posted some time ago that a general revision would be made on the 27 per cent basis settled upon for the union bituminous fields. The *Courier* reports production in the Connellsville and Lower Connellsville regions in the week ended April 3 at 248,005 tons, a decrease of 6,547 tons.

BUFFALO

Coke supply is still short and prices are high.

Jobbers get but little business, for sales are mostly on contract. Quotations are $12 at the ovens for 72-hr. Connellsville foundry, and $10 for 48-hr furnace, to which add $2.60 for freight for the Buffalo prices. Domestic-size coke is not moving to any extent at present. The Lake fleet is eager to resume the iron-ore trade, but the ice has not disappeared much lately. It promises to be a late opening.

BIRMINGHAM

Coke market here is very active and inquiry good, but there is very little foundry or furnace coke available above contract needs.

High-grade foundry coke is quoted at $10 @ $11 per net ton ovens, though the prices have not become stable and thoroughly adjusted to the increased cost of production account advance in wages at mines and coking plants. The output is curtailed to some extent by car shortage where coal has to be transported to the ovens in railroad cars.

COAL AGE

New York, April 22, 1920

Volume 17 *Number* 17

More Trouble for Coal

NO sooner do we begin to feel confident that the relief from Government interference with coal shipments and the problems of bad winter weather are well past, than the coal industry finds itself confronted with a new and perhaps equally serious situation through the unwarranted strike of railroad workers. Just where it will all end we would not venture to prophesy. We know the immediate result has been increasing difficulty in the movement of coal which cannot be entirely obviated for several weeks, even though the strike situation is promptly and completely cleared up. We are beginning to believe that Job had an easy time of it as compared with the traffic man dealing with the present season's coal problems.

THERE is one element in this present coal situation, however, over which the producer has control, and that is the price. We trust that this present complication will not tempt the operators to increase prices beyond reason. The industry clearly owes it to itself to have the prices adequate to provide fair and generous returns upon invested capital. However, it is the equal responsibility of the industry to refrain from exacting excessive profit in time of emergencies or complication as thereby a permanent disadvantage to the industry results which really far outweighs the temporary financial profit. A run-a-way market is one of the things likely to be most disastrous and we trust that the present railroad crisis will not serve to aggravate the condition in this direction.

A PUBLIC clamor is easily roused and when the public mind is disturbed, the demands become loud and insistent. Moreover the President still has legal authority to step in and regulate the affairs of the coal men. Certainly the spirit of our national as well as state and local legislators is not any too friendly to the coal industry just now.

WE are confident that the producer has in general not been the one primarily at fault in these matters. However the producer is the one most seriously affected if the brakes are not put upon these wild wheels of the industry at once. Fortunately the operators have the leverage whereby they can readily and immediately apply these brakes. However, if this adjustment is attempted in one single stroke, we can see only evil consequences in store. It is necessary that we should "keep our feet on the ground," and not be stampeded into a period of wild price fluctuation.

A SANE, rational movement of prices to a suitable normal level will aid all good substantial properties, but the sudden irrational jumps which seem to have prevailed thus far this month can cause only harm to these interests. The speculator will thrive and grow rich on a run-a-way market but not so the conservative producer or dealer.

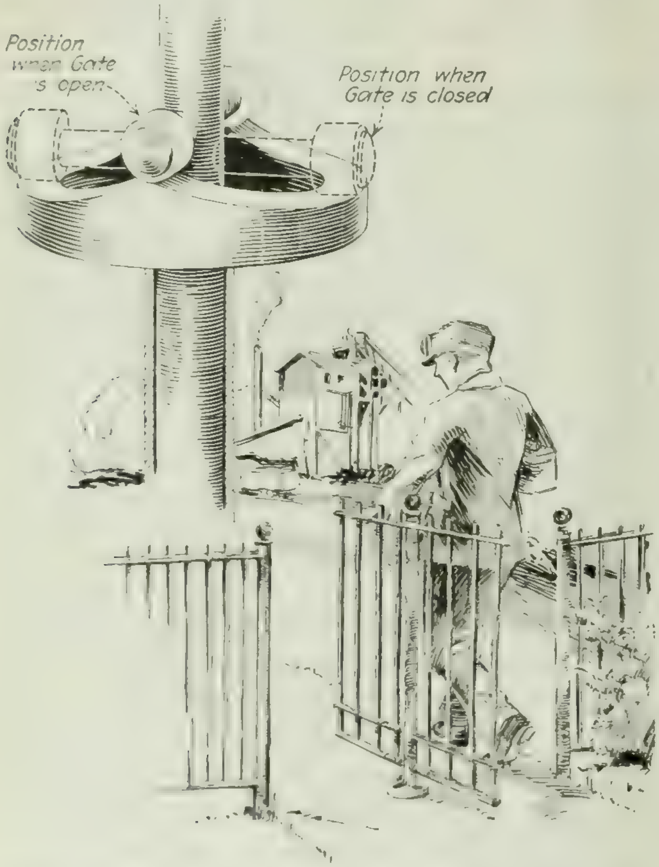
IT is essential in view of the present situation that the producers not only be conservative in their own price adjustments but that they see to it that their customers are also in the proper spirit. If you can not hold the jobbers and wholesalers with whom you deal to a reasonable basis, it is up to you to tie up with someone else who will consider the permanent good of the industry and not seek to take undue advantage of the great public need for coal and of the shortage of coal in the market.

IDEAS AND SUGGESTIONS

PRACTICAL SCHEMES THAT MAKE THE DAY'S WORK EASIER

Self-Closing Gates

The Philadelphia & Reading Coal & Iron Co. has a custom of sending foremen and others holding supervisory positions upon trips from their mine to other operations of the company, whereby they may acquire ideas for changes in their own mine that will be conducive to efficiency, safety and convenience. Such observation tours also have a tendency to keep the men keyed up to the mark, for they are continually alert to secure and perfect new ideas that they may develop to their own and the company's advantage. As a result probably no other mines have so many special devices worked out as are to be seen at the operations of this company.



THE GATE IN OPERATION AND DETAILS OF ITS SUPPORT

An excellent example of this enterprise is a self-closing gate devised by the blacksmith at the Silver Creek Colliery. The gate operates by gravity. Fastened to the ground is an iron shoe through the center of which is fastened permanently a post or guide, over which the center post of the gate fits. To the bottom of this post are fastened two rollers which fit and roll upon the shoe. When the gate opens these rollers run up on the high part of the shoe, lifting the gate with them. When anyone passes through the gate and releases it the rollers naturally roll down hill again, automatically closing the gate.

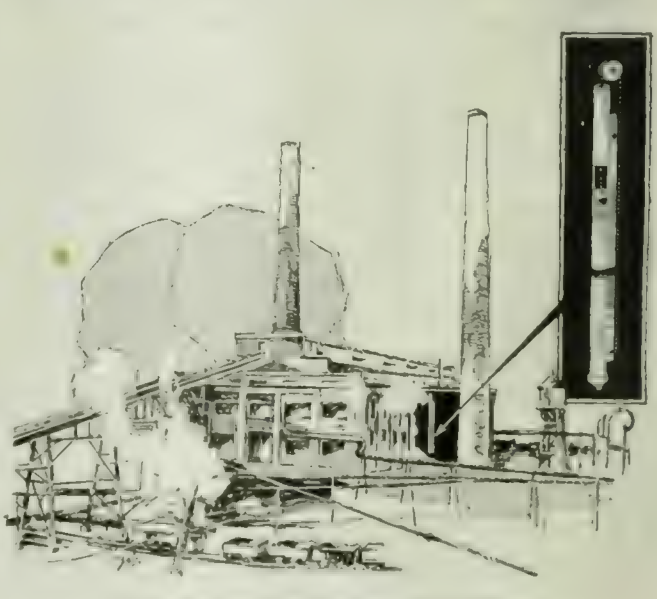
Water Gage in the Power House

A convenient method has been devised by the boiler-house foreman at No. 14 mine of the Pennsylvania Coal Co., near Wilkes-Barre, Pa., to show the level of the water in the supply tank. This tank is located about 1,000 ft. away from the boiler house, consequently it is rather inconvenient to traverse this distance in order to ascertain the condition of the water supply.

As a result the foreman tapped the water main and connected it to a 4-in. standpipe made sufficiently high to be above the top of the water tank. In this stand pipe a float is placed to which is attached a string that passes over a pulley as shown in the accompanying diagram and is attached to an indicator that works on a scale. As the water rises and falls in the tank it also moves correspondingly in the standpipe and therefore actuates the indicator in a similar manner.

An indicator of this kind is cheap and easy to install. Placing it within the boiler room permits the man in charge to have a visual indication of the water conditions before him at all times.

To those familiar with power plant work the advantage of placing an indicator in such a position is readily apparent. It saves the man in charge innumerable steps since it is then unnecessary to make periodic trips to the tank or even go to the door of the boiler room and strain the eyes to read a distant indicator.



TANK GAGE AND ITS INSTALLATION

Transportation and Preparation System at Nanty Glo

Cars Are Hauled from a Slope by a Hoisting Engine, Brought to the Foot House by a Locomotive, and Elevated to the Tipple by a Chain Haul—The Cars Are Discharged One by One by a Revolving Dump and the Coal Is Picked on Ring-Shaped or We Might Say "Doughnut" Picking Tables

By Donald J. Baker
Pittsburgh, Pa.

ONE of the most interesting coal-mine plants in western Pennsylvania is that of the Nanty Glo Coal Mining Co. at Nanty Glo, in Cambria County. The interest lies rather in the method of handling the coal on the surface than in the general layout of the buildings or in the equipment they contain, though these compare favorably even with the newer mines of the Pittsburgh district.

At the ordinary shaft, drift or slope mine the transportation of coal from the face to the railroad car is of a more or less stereotyped character, every installation being almost identical with the others except for a few variations arising naturally from local topography and the seam level.

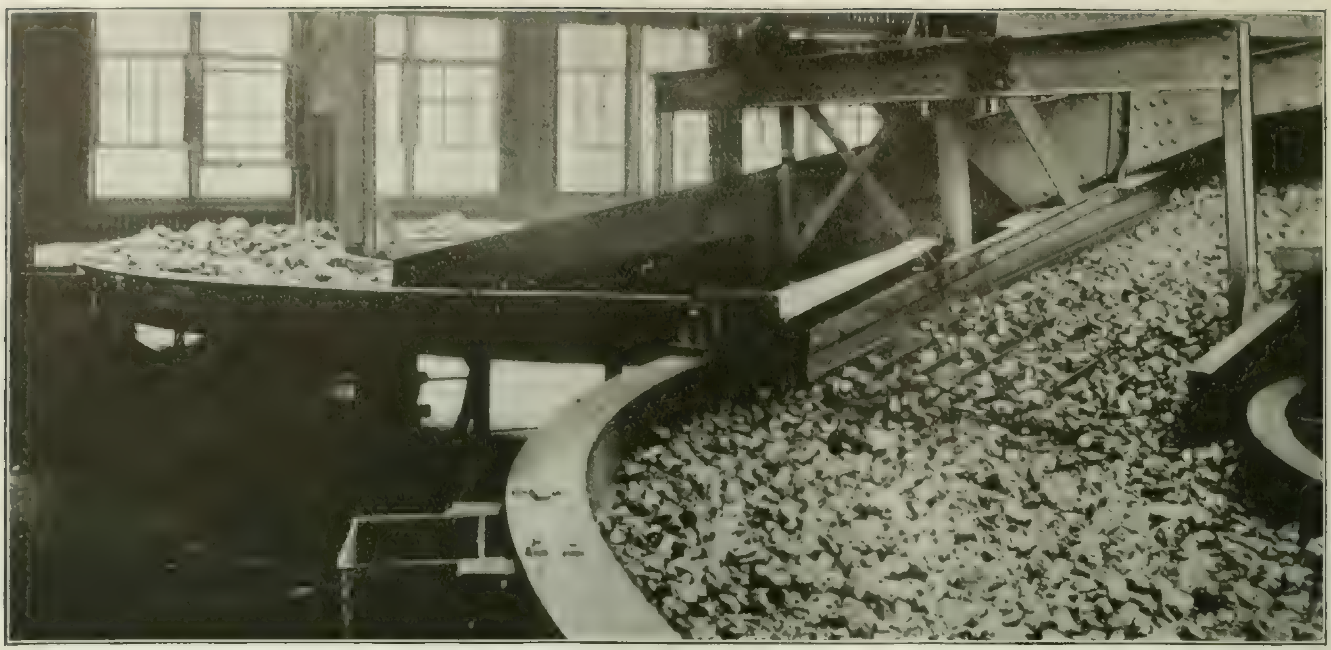
At Nanty Glo the opening to the slope lies at the foot of a hillside, along which run the railroad tracks that lead to the tipple. The slope passes under the tracks, and the mine cars must be elevated to tipple height before they can be dumped. The conditions that have been responsible for the surface layout have been in the main topographic, for the time has not yet arrived when surface contours may be artificially altered to suit the economic conceptions of the mining engineer.

A tract of coal of over 3,500 acres is being developed at the Nanty Glo mine. This coal is the "B" or Miller Bed, which is the main stand-by in the Somerset and Cambria county fields. The tract lies in nearly rectangular form with the main haulage entries, which run as butt headings, lying parallel with the shorter side of the rectangle. Thus the main face entries are at right angles to them or parallel with the longer sides of the same quadrilateral.

It has been proved by numerous drill holes on the property that the coal lies in a small basin, the bottom of which is approximately 8,000 ft. from the slope mouth, the coal at this point being under a cover of about 500 ft. From thence the coal rises, but after following it a distance of 4,000 ft. the property lines of the company are reached.

One might question why, in developing a tract of coal that lies in a formation such as this, a shaft was not sunk to the lowest point of the basin and the mine developed from both sides of the shaft bottom. Numerous factors enter into the selection of a plant site, and Nanty Glo was chosen as the best location for the following reasons: First, if the coal was to be developed from a shaft located over the bottom of the basin the plant would have been situated in a hilly section of country well removed from railroad connections. Also such a shaft would have been about 500 ft. deep. Second, the town of Nanty Glo is relatively old and well established and over 40 per cent of the men employed by the coal operator could be, and are now, housed in dwellings other than those owned by the company. House construction is a big factor in initial cost and in this case by suitably choosing the location of the mine much of the cost could be avoided.

Initial construction of this plant began in February



COAL REACHING THE REVOLVING TABLES FROM THE SCREEN

Although the coal from this operation is sold as run-of-mine it is nevertheless sized and picked, then remixed for shipment.

of 1916. It was estimated that the life of the mine would be approximately fifty years. Because the approach to the mine is from the side and not at the center of the territory the main haulage entries will some day be over two miles long. The main face entries will be driven off these on either side and will extend between 8,000 and 10,000 ft. Thus, at the time when the mine reaches its period of greatest development, the cars will have to be transported underground a distance of over four miles.

The coal dips about 5 per cent much of the way from the entrance of the main slope to the bottom of the basin. Present data indicate that it rises at the same grade from that point to the property line toward which the main slope is directed. Eight headings have been driven from the foot of a hillside toward the basin, these being driven, as stated, parallel with the shorter side of the tract. Four of these entries are used for haulage. The two outer entries are utilized as air courses. These passages were not driven from the outcrop but from a point well above it. In consequence they had to be driven through rock for a distance of 1,000 ft. before coal was encountered. They slope, where they pass through the rock, on a grade of 10 per cent.

From the point where the coal is reached the entries follow the bed and in consequence dip thereafter on a grade of 5 per cent. The underground workings are now in a decidedly undeveloped state as compared to what they will be after a period of, say, 20 years. To date few pillars have been removed. So far the work underground has been confined principally to opening up the development system that has been planned for the future.

The main haulage entries are 4,000 ft. in length, 3,000 ft. of which distance is on a slope of 5 per cent. This is the distance over which the hoist engine now operates. However, the entries have been driven another 3,500 ft. A little over 500 ft. is yet to be driven before the bottom of the basin will be reached. Thirteen-ton Westinghouse barsteel locomotives are used on such sections of the main haulageways as are not reached by the cable. These must, of course, haul the loaded cars on the upgrade.

When the bottom of the basin has finally been reached the loaded cars will be hauled from this point to the surface by the hoist engine. Trolley locomotives will bring the loaded cars to the bottom from the opposite side of the basin and they will be able to haul back an equal number of empty cars up the same grade.

Trolley locomotives will haul the cars along the main face entries as well as on the extension of the slope up the opposite side of the basin, while Ironton, Mancha and Goodman storage-battery locomotives will be employed in the butt entries and within the rooms. Hockensmith Wheel and Mine Car Co. "solid" or gateless cars of 2-ton capacity are in use.

The power plant is located in the building on the left of the slope and about 200 ft. from the slope portal. One room in the building is utilized in housing the 800-hp. Vulcan twin-cylinder steam-driven hoist engine. The cylinders measure 30 x 24 in. and the drum is 6 ft. in diameter and capable of holding 8,000 ft. of 1¼-in. cable. Trips of empties averaging 35 cars each are dropped down the slope at a speed of 1,800 ft. per minute. The loaded trips are brought out at a speed of 950 to 1,000 ft. per minute. The hoist is designed to handle 200 tons per trip, but at present the trips rarely exceed 150 tons each, as a heavier car train is not yet needed.

From the drum on the hoist engine the cable passes to a bullwheel located 500 ft. away and on a projection of the main haulage slope. Thus there is a distance of approximately 600 ft. from the top of the knuckle at the slope opening to the bullwheel. The loaded trips are brought to the landing above the knuckle, where the cable is disconnected. A 15-ton Westinghouse trolley locomotive takes the trip from this point to a foot-house which is the bottom approach to the tipple. The distance to the foot-house from the landing above the knuckle is about 1,500 ft., most of which is on a slight grade in favor of the loads. The storage yards adjacent to the foot-house will accommodate 125 loaded cars. After the locomotive has hauled a trip to the foot-house it switches off to parallel tracks that serve to hold the empty cars. Then a trip of empties is made up and the locomotive returns to the landing near the slope opening.

The foot-house is of simple steel construction, as can be noticed in one of the illustrations, and serves merely to cover the trip-making and car-feeding mechanism and protect the man in charge of its operation from inclement weather. As the first car of a loaded trip enters the foot-house it is engaged by one of the dogs on the chain-haul and the entire trip is moved forward one car length, after which the operation of the car-haul is suspended by the operator in charge.

The first car is now clear of the car-haul mechanism and is in the opposite entrance of the foot-hoose. It is uncoupled from the trip at this point, and proceeds by gravity for a distance of 75 ft. into a check rail at the foot of the incline which forms the approach to the tipple. This check rail is so adjusted that the loaded car is held by it and does not pass through. A 15-hp. Westinghouse motor operating on a 440-volt alternating current drives the trip-making and car-feeding devices.

The loaded car is now in position in the check rail, where it remains until the next dog in the uphaul chain engages it and starts it up the incline. The head sprockets of both up haul and down haul are placed upon a shaft which is driven through a geared connection by a 75-hp. Westinghouse motor. Both chains are operated by the same motor and are controlled by the man in charge of the car dump at the head of the tipple.

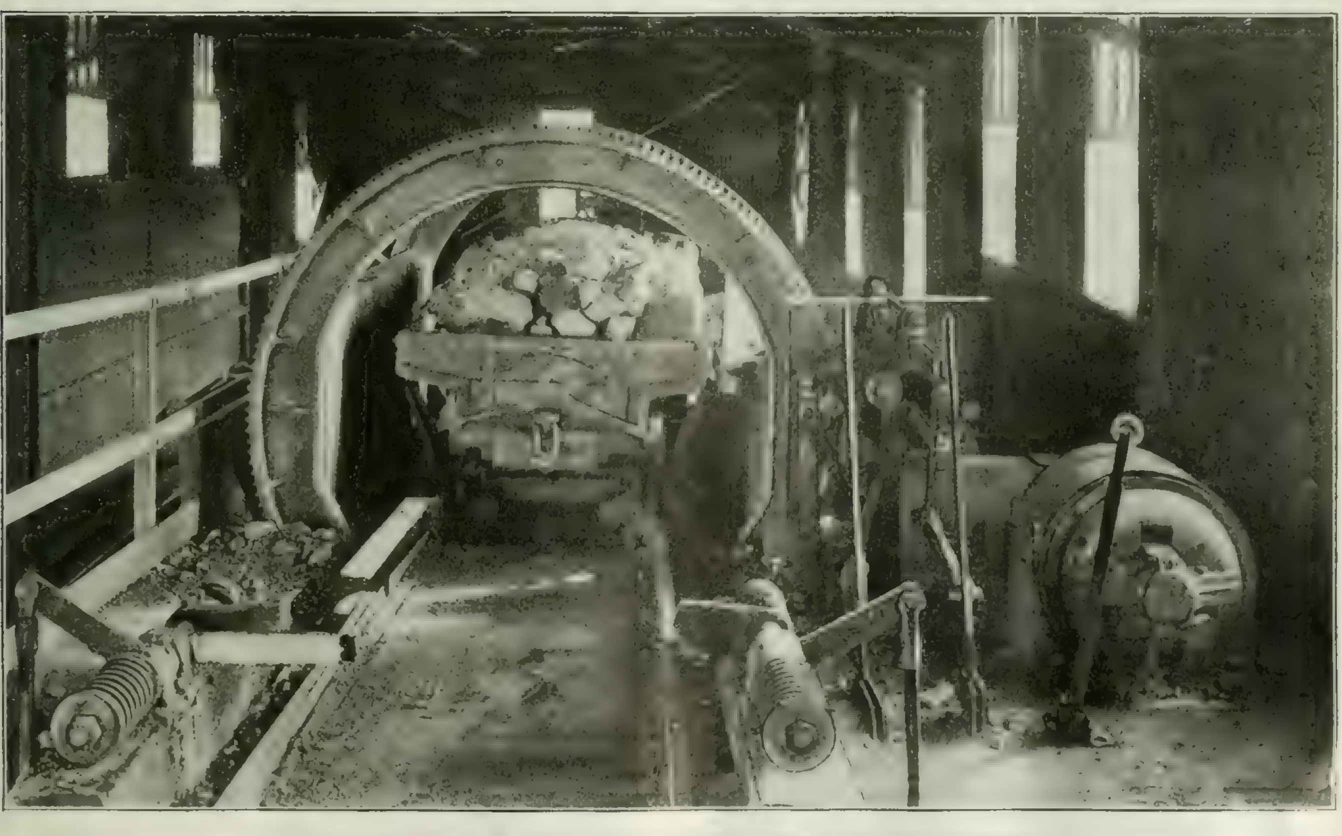
The raising of the loaded cars from a point that is lower than the railroad tracks beneath the tipple to a position at the top of this structure by means of an endless chain over an inclined plane gives this tipple somewhat the appearance of an anthracite breaker—a design that is quite uncommon in the Pittsburgh district. The incline is constructed on a 27-per cent slope and is 220 ft. long, which makes the distance from the bottom to the tipple about 212 ft. in a horizontal direction.

Fifteen loaded cars can be accommodated on the uphaul chain, each car weighing about 6,100 lb. This chain has a speed of 74 ft., thus feeding the loads into the tipple at the rate of four per minute.

The downhaul and the uphaul chains, while driven by the same motor, are connected by different gears so that the speed of the downhaul chain is greater than that of the uphaul. This arrangement causes the empty cars to be handled with greater dispatch than the loaded ones and so prevents congestion within the tipple. About 76½ ft. per minute is the speed of the downhaul chain, which allows six empty cars to be returned each minute if need be. The incline itself is constructed with a wooden platform which is supported by steel bents.

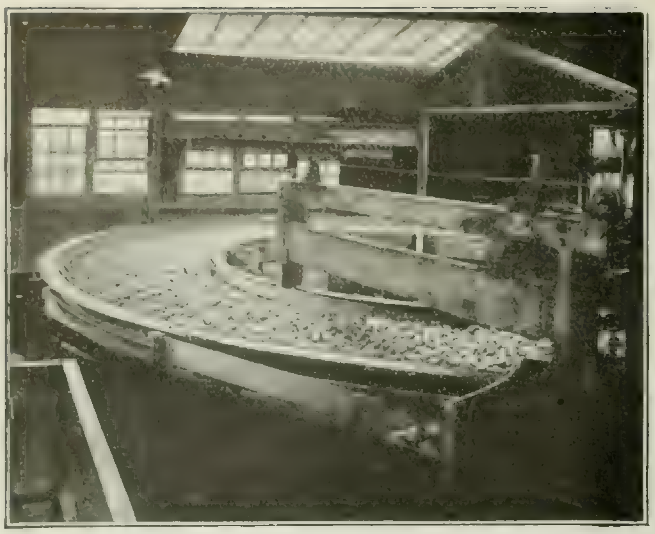
As the loaded cars reach the top of the incline they are disengaged from the dogs of the chain, which passes over the sprocket to return to the bottom on the under side of the plane. The cars drop by gravity into two horns which are located at the front end of a rotary dump. This dump is operated by a separate 15-hp. motor. The horns over the track within the dump are released automatically as the operator throws to one side the horns that lead to the dump. The loaded car then assumes the position in the dumping mechanism that was occupied by the last empty car. The horns holding the car within the dump are, of course, returned to their vertical position after the empty car has passed out.

The new or loaded car is then inverted by a com-



ROTARY DUMP IN THE TIPPLE AT THE HEAD OF THE INCLINE

This power-driven dump has made possible the use of solid or gateless cars, thus not only simplifying car construction but preventing waste and spillage from loose or ill-fitting end gates.



A PORTION OF THE NUT TABLE

One of the plows used for removing carloads of slate or refuse may be seen in the foreground.

plete revolution of the dumping mechanism, which has a speed of 9.5 r.p.m. This type of dump is operated by a pinion engaging in the geared circumference of the revolving portion. The rotary dump has made permissible the use of solid mine cars, and this has resulted in a considerable saving in their first cost. It has also reduced the cost of their maintenance to a low figure. Certain economies have been effected through a reduction in the coal spilled on the haulage roads, since cars of the old type allow the contained material to leak out around the end gates.

When the empty car is released from the dump it travels down grade to a kick-back in the rear of the tipple, and thence by gravity to the head of the incline, where it runs into a check rail and is held until the next dog in the downhaul chain pulls it out, when it starts down the incline.

The empty cars on the downhaul chain are released at the lower end of the incline and drift into the foot-house by gravity. At this point the car is engaged by the trip-making mechanism. The dogs on this haul are of solid construction and serve to push all the empty cars in the storage yard ahead one car length by forcing the last empty from the incline through the foot-house. In this manner both empty and loaded trips are made up as well as broken up at the foot-house. The empty cars, however, are not coupled together until they reach the storage yard.

This system of handling the loaded cars from the slope portal to the tipple has given entire satisfaction. By it 2,500 tons of coal are dumped daily at this tipple, which incidentally is its capacity.

The tipple, which is of steel framework with corrugated-iron siding, in the arrangements adopted for preparing coal is vastly different from similar buildings encountered in this district. Although practically all of the coal loaded is shipped as run-of-mine, it is first thoroughly sized into lump, egg, nut and slack in order to insure efficient picking. After being picked the various sizes are collected upon one loading boom.

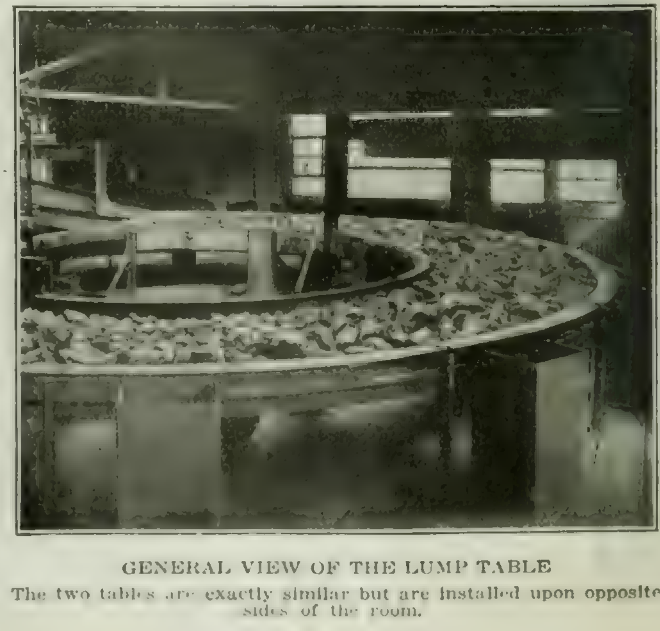
This is the first tipple to be equipped with circular picking tables for preparing the coal. The complete structure was designed, fabricated and erected by Heyl & Patterson, Inc., of Pittsburgh.

To descend to details, the coal from the rotary dump is passed to a reciprocating feeder that delivers it at a uniform rate to a double-decked balanced shaking screen, which causes the lump and egg sizes to be delivered to opposite sides of one picking table. The nut size passes to a separate picking table while the slack goes to a chute and thence by gravity direct to the loading boom. Both feeder and shaking screens are driven by a 25-hp. Westinghouse motor, while the screen has a 6-in. stroke, and the eccentric shaft makes 110 r.p.m.

The circular or "doughnut" picking tables are built up of structural steel shapes and plates. Each has an outside diameter of 25 ft. and an inside diameter of 15 ft. and each is mounted on 70-lb. rails that move upon 12-in. double-flanged car wheels carried by shafts supported directly from the tipple frame. Both tables are driven by a 20-hp. motor through a vertical shaft pinion and segmental gear. The rotating speed of the tables at the center is 40 ft. per minute. Should a car of rock or inferior coal accidentally be delivered to either picking table, a plow is lowered which directs the undesirable material direct to the refuse hoppers.

The arrangement within this tipple—providing as it does for the thorough preparation of the coal—immediately impresses one. There is but little machinery and an entire absence of conveyors. These details lessen the chance for delay to operation that might arise from breakdowns in machinery. The resultant economy in upkeep is noteworthy. Compactness also is apparent and leads to efficient supervision by a picking boss who is able to see the work of the pickers and the condition of the tables at all times. Intelligent supervision in the preparation processes is a highly important factor if the equipment is to serve the purpose for which it was built.

To take care of cars containing rock—and many such cars must be handled at any mine that is working the Miller bed—a hinged gate that is operated by compressed air is provided. When rock is dumped this gate is reversed so that the contents of the car are dropped directly into a rock bin. Slate and other foreign matter are removed from the coal by men stationed around the tables, who toss the extraneous material into steel chutes which lead to one general hopper, from which point it is removed by car to a dump on a hill-



GENERAL VIEW OF THE LUMP TABLE

The two tables are exactly similar but are installed upon opposite sides of the room.

side to the rear of the tipple. The capacity of the rock bin is 20 tons. The rock is removed to the dump by the same car that handles the slate pickings.

An emergency run-of-mine chute has been provided which may be utilized in the event of the picking tables being temporarily out of order. After the large lump sizes and the nut have been cleaned they are united with the slack on the loading boom as cleaned run-of-mine. Most of the output from the Nanty Glo mine goes to tidewater to be used on steamships and little of the product is loaded as separate sizes.

As has already been mentioned, the surface equipment at this plant is all high class. Other units must be passed over at this time, with the exception of a power plant that imperatively demands a short description. Interest in this building centers in the boiler room, where three 446-hp. Badenhausen boilers have been installed. These were manufactured by the Combustion Engineering Corp. Each boiler is equipped with a type "E" automatic stoker and forced draft. Entering water is heated to a temperature of 208 deg. F. Overhead bunkers with a capacity of 180 tons feed directly to the stokers. The bunkers are supplied by cars from the tipple for which track is provided over the rock dump to the rear of the tipple and thence to the boiler room over a trestle.

The officials at Nanty Glo speak highly of the Badenhausen boiler as a quick producer of steam. While only clean coal is used for firing at present, it is probable that the near future will see the installation of crushing apparatus and the utilization of cleanings from the picking tables. In the dynamo and engine room direct current at 250 volts is generated which is used within the mine. Alternating current at 2,300 volts is reduced to 440 by transformers and used in general around the surface plant.

The officials at Nanty Glo include John W. Harrison, superintendent, and Roy Sharpless, chief engineer. Both these men were connected with Berwind-White interests before taking up the supervision of the Nanty Glo Coal Mining Co.'s plant. Both are well known in the Cambria and Somerset County fields. I wish to acknowledge their generous assistance in preparing this article on the Nanty Glo operation.

Can Coal Be Cleaned by Flotation?

THE flotation process consists in the forming of an emulsion of oil and water by agitation and the floating of certain mineral bodies away on the surface of the liquid thus produced, leaving the impurities to sink to the bottom. It has been used hitherto only to separate metallic minerals from their earthy impurities, or "gangue."

Some time ago J. R. Campbell, chief chemist of the H. C. Frick Coke Co., in an article read before the American Institute of Mining and Metallurgical Engineers spoke of flotation in the cleaning of coal as a remote possibility. Now word comes from the London Stock Exchange to the effect that investors are all agog over the remarkable advance of the shares in the Minerals Separation, Ltd., which holds, here and in Great Britain, the most important patents relating to flotation. It is said that a few weeks ago the stock sold for £9 and is valued now at £200.

With the value of the stock *Coal Age* readers are not concerned, but they will be interested to know that by this process the total cost of recovering a ton of coal for conversion into briquets is said to be only about 5s. ($1.21 at normal exchange, or about 99c. at present rates). The briquets can be sold at 30s. ($7.30 at normal or $5.94 at present rate). It is said that while the mine owners are not permitted to make more than 1s. 2d. per ton (28c. normal exchange and 23c. at present) for coal newly mined, they are permitted to make all they can on coal rescued from the dump. The company has, it is said, purchased large quantities of coal waste, while numerous collieries are contracting for the right to use the process, which has proved so valuable in the extraction of copper. Report adds that the specific gravity of coal being low, the quantity of flotation oil needed is small compared with the amount that is used in the process when metallic ores are being prepared.

Export of Coal from Scotland Shows Increase

Output During 1919 in Fifeshire Was Nearly 10 Per Cent Greater Than in 1918—Greater Promise Shown for 1920

COAL output during 1919 in Dunfermline, Scotland, according to a report by Consul Howard D. Van Sant, has shown an increase, with prospects that extensions in the coal fields of Fifeshire will make for further improvement in 1920. At Methil, the largest coal shipping docks in the Dunfermline district, the coal exports for January amounted to 52,000 tons, while in December of 1919 the monthly export totaled 169,000 tons. The total coal exports for the year 1919 from Fifeshire ports amounted to 2,567,400 tons, an increase of 215,700 tons over 1918.

In pre-war days a 100,000-ton shipment of coal was the usual weekly average but during the war the total fell to about 40,000 tons weekly. There appears to have been a shortage of coal wagons, making frequent the stoppage of work at the collieries of several hours daily, yet from 5,000 to 8,000 more men have been employed in coal mining in the district than during 1918.

A new pit has been sunk at Lochore to provide better ventilation for the more important Mary pit close by, and when in full working order this improvement should largely increase the output of that pit. Early in the summer the surface buildings of the Lindsay pits at Kelty were destroyed by fire. Now the proprietors, the Fife Coal Co., are constructing the most up-to-date plant, much of it on the American concrete construction plan.

The Saline Valley coal district, comparatively non-productive to any extent for many years, has again changed hands and promises are made that the northwest corner of Fife will again become a large and busy coal field. Retail coal of the best quality has been selling in Dunfermline at the rate of $10 per ton, including cost of cartage, during the past year, being rationed according to the need of the householder. At times it has been difficult to obtain at any price.

It is said the war, the loss of tonnage resulting from the coal strike, the shortage of men and coal wagons, and the increased demand of shipping, both foreign and domestic, are the principal causes of the coal shortage. Dunfermline adjoins some of the finest and most important coal fields of Scotland, yet frequently coal has been almost unobtainable during the past few years.

Correct Method of Trolley-Wiring Mines[*]—I

How, Under the Various Conditions in the Mines, to Plan Dead-Ends and Suspensions so as to Reduce Maintenance Charges and Secure Satisfaction

By M. W. Beddow
Lundale, W. Va.

IN compiling the following instructions covering the installation of trolley wire within the mines, the various fixtures are described one at a time. Under the description of each fixture is a discussion of the reasons for standardizing that particular fixture. The separate parts making up these fixtures are numbered and by referring to Table I it can be easily seen what materials go to complete each unit. The instructions here given deal only with the hanging of trolley wire in the mines and have no reference to its support above ground, the construction of feeder lines, telephone lines or bonding.

(1) The dead-end fixture (Fig. 1) is used at the end of the trolley wire and is made up of materials Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 31.

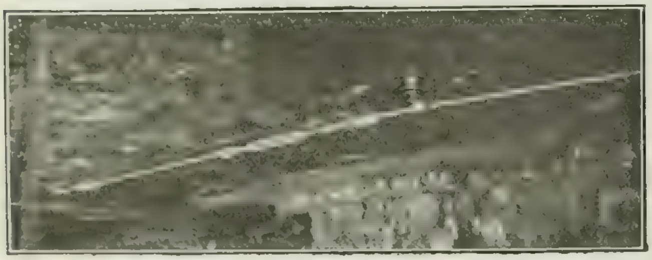


FIG. 1. PREFERABLE DEAD-END FIXTURE

In this fixture the various elements are so arranged that when it becomes necessary to extend the trolley line the whole combination may be moved bodily to its new location.

The wedge grip fastens onto the trolley wire itself and does away with the necessity of putting a bend or kink in this conductor and fastening it with wire-rope clips. When it is necessary to extend the wire, the wedge grip is easily knocked loose and the entire dead-end fixture is carried ahead to the new termination of the trolley wire, where it is again used in dead ending. Thus the end of the wire is always left in good shape so that the splicer may be slipped on quickly and easily. Waste and kinks, which are common when the trolley wire is bent and fastened with clips, are thus avoided.

In purchasing the strain insulators (3) care must be taken that the eye of the insulator will fit into the clevis on the wedge grip and that the eye of the turnbuckle will fit into the clevis on the strain insulator. Several different kinds of 3-bolt guy-wire clamps are upon the market, but the one that has a square hole in one piece and uses a carriage bolt is the easiest to work with and should be specified.

The expansion bolt (8) should be put in so as to slant slightly forward or away from the end of the wire. The hole should be drilled at least 9 in. deep for an expansion bolt 6 in. long. Then in case it is desired to take the expansion plug out, there is room to knock the bolt, together with the expansion plug, up into the hole, thus loosening the expansion shell in the hole and permitting it to be withdrawn without difficulty. The shoulder of the eyenut (7) should be screwed up to or even into the hole so that the outside diameter of the eyenut rests firmly against the roof. Otherwise when stress comes on the eyenut the expansion bolt probably will bend.

As the wire is extended this dead-end fixture may be used repeatedly. This necessitates the use of a thimble. Otherwise the strand would be kinked and when moved ahead it would be kinked at another point, and after a few moves it would quite possibly break at one of the kinks.

About 10 ft. of ⅜-in. galvanized steel-wire strand (5) is used in this fixture—enough so that if the end of the wire reaches just past an expansion bolt regularly spaced, the eyenut can be screwed on the next expansion bolt and the ⅜-in. steel strand will be long enough to go through the eyenut, thus eliminating the necessity for placing another expansion bolt half way. One end of the ⅜-in. steel strand is spliced into the eye of the uninsulated turnbuckle; the other end passes through the eyenut and is fastened back on itself with the 3-bolt guy-wire clamp (6).

These dead-end fixtures are made up in the wireman's shop, which may well be conveniently located within the mine itself.

There are no sufficient reasons why figure-8 wire should be used instead of grooved wire or vice versa. Most of the reasons advanced, now for figure-8 and now in favor of grooved wire, are "office chair" arguments and do not amount to much in the mines.

It is claimed that 4/0 grooved wire offers a larger bearing surface to the trolley wheel than the same size of figure-8 wire. But put a trolley wheel in its harp

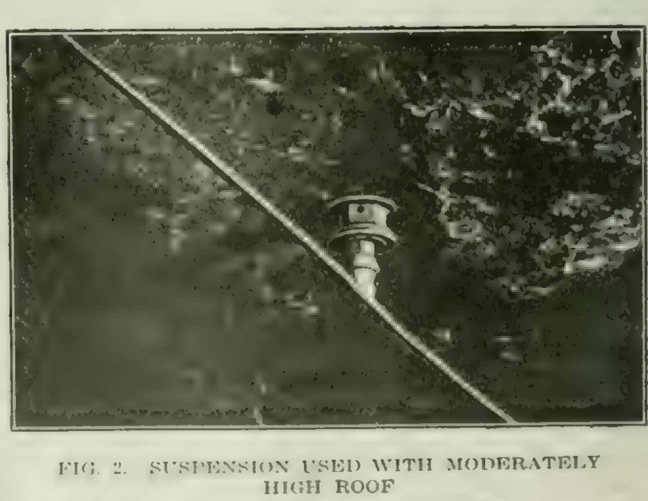


FIG. 2. SUSPENSION USED WITH MODERATELY HIGH ROOF

A single wooden plug driven into a hole drilled in the roof serves to support this fixture.

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[*] In the preparation of this article I have been greatly assisted by D. M. [illegible] and John Peck, inside wire chief, of the Lundale mine, whose [illegible] and experience were of great value in the work and [illegible] led to the adoption of the standard fixtures described.

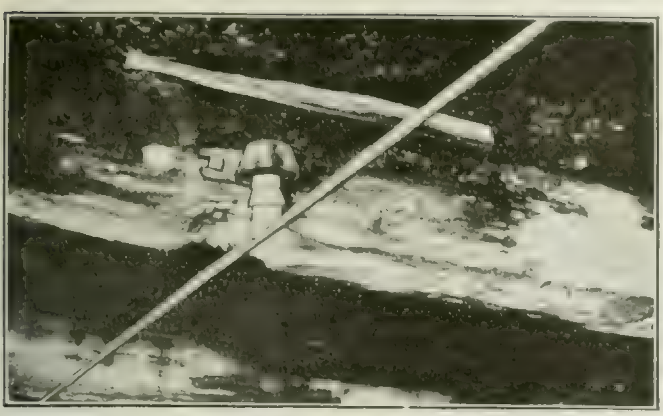


FIG. 3. SUPPORT ATTACHED TO TIMBER
Where timber sets are employed to hold up the roof the trolley support here shown is simple and effective.

and fit it against a piece of 4/0 grooved wire, sight between the trolley wheel and the wire and notice the arc of contact. Do the same with a piece of figure-8 wire of the same size, and it will be immediately apparent that this argument does not mean anything. It is claimed that the figure-8 wire keeps the trolley wheel away from the clamps better than the grooved wire and there is not so much arcing at the suspensions when this shape of wire is used as when grooved wire is employed. Give this the same test with the trolley wheel and you will see that this is not entirely true.

Arcing at the suspensions frequently arises from the trolley spring being too weak, the trolley pole being crooked or the harp bent, a bad wheel or bushing or perhaps from the trolley clamp being out of alignment with the wire. Figure-8 wire can be held more firmly in the clamps than grooved wire, consequently it is not so easily jarred loose or forced out of the clamps when a small scale of slate falls upon it. There is no possibility of figure-8 wire being placed in the clamps wrong, while it frequently happens that grooved wire, especially when it has been knocked down a few times by slate falls, gets so badly twisted that it has to be placed in the clamps in the same manner as round wire—that is, the jaws of the clamp are not placed in the grooves. With figure-8 wire, notice how the groove comes out of the jaws of the clamp.

This discussion covers 4/0 grooved and figure-8 wire only; 2/0 grooved wire should not be used at all in the mines. It soon gets so badly twisted that the grooves cannot be put in the clamps properly and it is hung similarly to round wire but of course not as efficiently as round wire can be suspended.

If a new mine is being opened nothing but 4/0 grooved trolley wire should be used. If a mine has been opened for some time and an appreciable amount of 4/0 figure-8 wire is in place, its use should be continued without change. I do not believe that anything smaller than 4/0 trolley wire should be used, and in these instructions it is understood that all fittings and material are for 4/0 grooved wire.

(2) Suspensions are used to hold the wire in place. There are different types, depending on the height of the coal and whether they are fastened in the roof or to timber.

(a) In high coal 5 to 7 ft. in thickness, and where the roof is used to support the wire, the fixture (see Fig. 2) composed of parts 8, 9 and 10 is used.

(b) In low coal 3 to 4½ ft. thick, where support is from the roof, the fixture composed of parts 8, 10 and 11 is used.

(c) In high coal where timber is installed as a support the fixture composed of materials 9, 10 and 12 is used.

(d) In high coal where support is from the roof and where a cheaper suspension is desired a fixture composed of materials 9, 10, 12 and 13 may be employed.

(e) In low coal where timber is used as a support the fixture (see Fig. 3) is composed of materials 10, 14 and 15.

(f) In extremely high coal or where the top is taken down or falls, leaving a distance between the top of rail and the roof of over 8 ft., or where more than two hangers are necessary to bring the wire into vertical alignment on account of inequalities of the roof, the fixture composed of materials 9, 10, 16, 17 and 18 is used.

Remarks.—The holes for the expansion bolt must be drilled the correct size, i.e., 1¼ in. in diameter and 9 in. long. If the holes are drilled too large the plug will be drawn down in forcing out the expansion case and therefore will have but little holding power.

The hole should be driven at least 9 in. long so that when it becomes necessary to reclaim the expansion bolt it can be driven upward into the hole, thus loosening the expansion case, which can then be easily extracted. The diameter of the drill bits used should be checked up daily so that holes of the proper size will be drilled for the expansion bolts.

The universal mine hanger (9) is a strong, substantial and easily installed device. Its broad, hexagonal surface affords room for a wireman to use his wrench without risk that it will slip off and cause him to scrape his fingers against the top. The hanger is screwed onto the expansion bolt until the expansion case is sufficiently swelled to fasten it into the roof. With many hangers it is difficult to tighten the expansion cases. There is not enough square or hexagonal surface upon them to afford a secure hold for a wrench. With some hangers I have seen it is necessary to screw

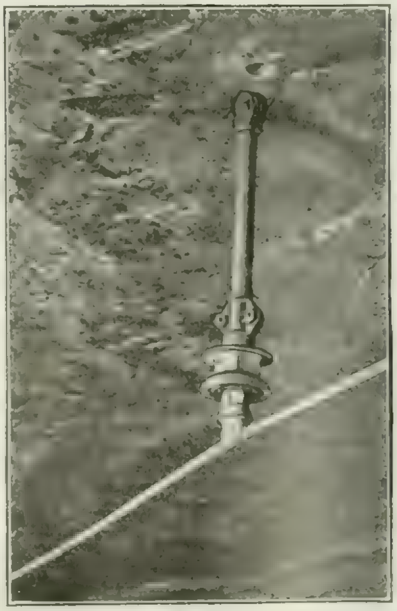


FIG. 4.

Trolley Support Used with High Roof

Where the roof is high pipe extensions are employed to bring the trolley clamp to its proper elevation above the rail.

upon them another hanger with a broad surface where the wrench can be applied in order to secure them upon the stud of the expansion bolt and tighten the expansion case securely.

The "Sure Grip" clamp is strong, possesses tremendous holding power and is easy to apply. In place of the expansion bolt (8) a wooden plug (13) 1½ x 4 in. can be used, as indicated in suspension (d). This plug requires a hole 1½ x 5 in. It does not make as good a job as the expansion bolt, for under stress the lag-screw support will pull out or give to one side. The material cost, however, is less.

Where the lag-screw support is used a hole is drilled either in the timber or in the wooden plug, whichever the case may be, with a brace and a ½-in. auger bit. In fastening the type "P" mine hanger (14) to the timber it is better to drill these holes also for the lag screws. A ⅜-in. bit is used in this case. Fetter-drive lag screws are used because they do not tear the wood when driven, and if they are given a few turns of the wrench at the finish they will have a greater holding power than the other types of lag screws that have been screwed up with a wrench from the start.

TABLE I. MATERIALS USED IN HANGING TROLLEY WIRES IN MINES

1 410 Grooved trolley wire
2 Wedge grip. O.B. No. 12,634, opening in clevis 11/16 in., diameter of clevis bolt ⅝ in. Will take 410 grooved or ½ in. round strand
3. Giant strain insulator, 2¾ in. diameter with large eye and clevis
4. Uninsulated turnbuckle, O.B. No. 7,554, 12 in. opening; ⅝ in. eyebolts with 1 in. eyes
5. ⅜ in. galvanized steel wire strand
6. 3-bolt guy wire clamp, O.B. No. 3,206, length 4 in. with square hole and square head on bolt
7. Hubbard eye-nut, drop forged, to screw on ⅝ in. bolt; inside diameter of the eye is 1 in.
8. Expansion bolt. O.B. No. 10,073, 6 in. long
9. Universal mine hanger, O. B. No. 11,309, form 1, 2 in. high
10. Sure grip trolley clamp, C.W. No. 7,039
11. Type K mine hanger, O B. No. 11,554, form 3, 1-5116 in. high
12. Lag screw support, O.B. No. 8,771
13. Wood plug, japanned, O.B. No. 8,770; diameter 1½ in., length 4 in.
14. Type "P" mine hanger, O.B. No. 11,032, 1⅞ in. high
15. ½ in. fetter drive thread lag screw, 4 in. long
16. Expansion case, G.E. No. 125,328
17. ¾ in. galvanized iron pipe
18. Pipe clamp, G.E. No. 125,332
19. Type N hanger, O.B. No. 11,650, single curve, complete with separable arm
20. Wooden plug, diameter 1½ in., length 12 in.; to be split out of ash or other soft wood
21. Detroit trolley clamp, O.B. No. 10,972; 4-screw clamp
22. Type N hanger, double curve, O.B. No. 11,651, complete with separable arm
23. Clevis attachment, O.B. No. 11,104
24. Single Brooklyn strain insulator, O.B. No. 9,995; ⅝ in. eyebolt
25. Type D trolley frog, malleable iron with renewable bronze tips, 8 degree, 410 grooved; right hand O.B. No. 11,892; left hand O.B. No. 11,897
26. Type M mine section insulator switch, O.B. No. 11,600
27. Detroit double strain clamp, O.B. No. 10,370
28. Wooden plug, 1½ in. x 18 in., split at end with a wedge fitting in the split; to be made out of ash or other soft wood
29 Boards, 1 in. x 4 in. x 14 ft.
30 8d nails
31 ⅜ in. rope thimble
32. K-I splice, 15 in. long, O.B. No. 8,573
33. ¼ in. galvanized steel wire strand
34. No. 6 galvanized iron wire.
35. Dogs for K-I splice, O.B. No. 5,700
36 Renewable bronze cam tips, O B. No. 11,277, for type D frogs.

The ¾-in. pipe extension with the G. E. expansion case and pipe clamps is easy and inexpensive to install and is as strong and enduring as any other type.

The expansion case (16) requires the same size of hole as the expansion bolt (8), that is, 1½ x 9 in. The expansion case is first inserted into this hole and the pipe driven into place, expanding it against the sides of the hole. The bolts are then tightened, the expansion case gripping the pipe securely. If the pipe is too long and would bring the wire down too far out of alignment, it can be sawed off with a hacksaw to the proper length.

The pipe clamp is then bolted on the lower end of the pipe, the hanger screwed upon it and the clamp screwed on the hanger, thus forming an extension support or extended suspension that is hard to surpass. If the pipe becomes bent or if, for some other reason, it becomes necessary to take it out, this is easy to do. Loosen the bolts in the expansion case and the pipe clamp and the pipe is released and the whole thing can be taken down.

Where two hangers would bring the wire down into alignment a pipe suspension is not used, but where more than two hangers are necessary a pipe suspension (Fig. 4) should be provided. When, in an emergency such as a slate fall or the right material not being on hand, it is necessary to use three or more hangers to bring the wire down into alignment, these hangers should be promptly replaced with a pipe suspension.

In mines where the roof is extraordinarily high, so that suspensions of this sort cannot be used satisfactorily, the wire can be supported by means of cross spans of ¼-in. galvanized steel-wire strand fastened to the rib on each side with straight-line hangers such as are used to support trolley lines on surface tram roads.

Large Gas Plants Planned

In the western part of Chicago, on the site where the People's Gas, Light & Coke Co. had planned to erect its large byproduct plant, the Koppers Co. has perfected plans for the construction of a coke oven and water-gas plant. The output of the proposed works will be 12,000,000 cu.ft. of coke oven gas and 30,000,000 cu.ft. of water gas each day. This gas will be sold to the People's Gas, Light & Coke Co. for the city supply of Chicago. The plant will be built by the Koppers Co. itself and its subsidiary, the Western Gas Construction Co.

The byproduct works will be built according to a new plan which provides for 100 ovens with a new type of triangular flue. Each oven will be 16 in. wide and considerably higher than the normal. It is expected that the plant will burn 20 tons of coal per oven per day, making the total plant capacity 2,000 tons of coal.

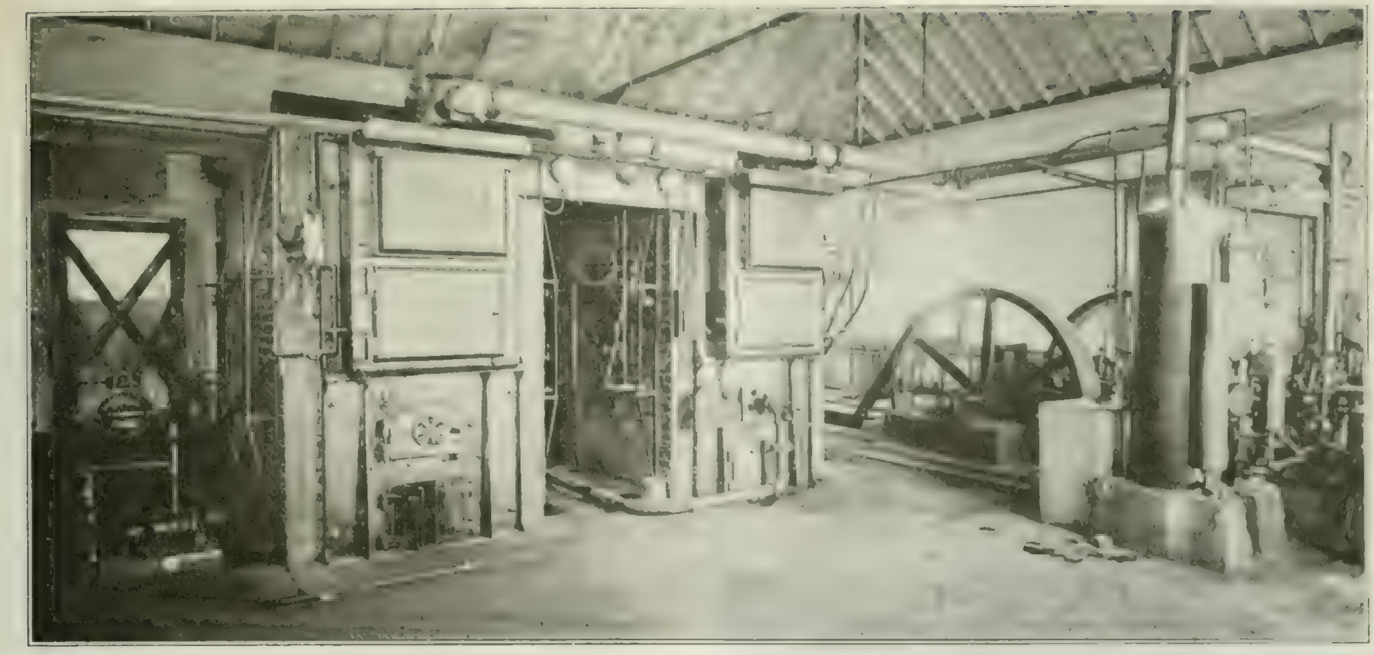
The kind of coal to be used has not been definitely determined as yet. The larger part of the coke which is of suitable size will be used in the production of water gas. However, it is planned to build in the future a number of producers which will supply the gas for heating the ovens, and then a considerable portion of the coke produced in the byproduct plant will be available for sale.

Fusible Plugs in Air Lines

G. Chester Brown, Chief Mining Engineer of California, recommends in the *California Safety News* that a fusible plug be placed in the air line between the compressor and the air-receiving tank as a means of avoiding a serious disaster.

"The fusible plug should be filled with a fusible metal which should melt when the temperature of the air in the space in which the plug is located reaches 500 deg. F. The plug should be of such construction as to give warning when the fusible metal melts, and when such warning is given the compressor should be stopped immediately, and a thorough correction made of the dangerous condition.

"The operator should ascertain that the safety valves are in good condition and are tested daily, that proper lubricating oil is used for the compressor, and that each tank is thoroughly drained of all accumulations of oil and water, at least once in each working day."



When Pulverized, Even Lignite Can Be Satisfactorily Burned*

Lignites, Especially Those Having Large Ash Content, Are Difficult to Burn on Grates — Pulverizing Provides Not Only for Excellent Burning but for Easy and Accurate Control

By Roy N. Buell
Battle Creek, Mich.

IN ORDER to carry California over the period of excessive need of fuel in 1918 the U. S. Fuel Administrator organized a corps of engineers and inspectors to see that every possible source of supply was surveyed and that every pound of oil, coal or wood consumed was burned with a maximum of efficiency. The consumption of fuel oil was exceeding production by over 5,000 bbl. per day, and notwithstanding the fact that many non-essential plants had been entirely cut off, the shortage threatened to become more and more acute as time went on, unless some new source of fuel supply could be discovered.

With a view of finding some practical auxiliary for oil it was decided to make a general state survey of all fuels and among the many possibilities to receive serious attention was California lignite. Large deposits of this material were known to exist in the Priest Valley, in which the Stone Canyon mine is situated; at Corral Hollow, where the Tesla mine is located; near Mount Diablo, at the old Black Diamond mine; in Dos Rios County, which was merely a good prospect, and in Amador County at the Ione coal mine. Experts from the U. S. Bureau of Mines and the technical staff of the State Fuel Administration were sent to examine these properties and report the possibility of using their output as an immediate source of domestic and commercial fuel.

The report submitted by these engineers was thorough and complete, but hardly as reassuring in respect to the available fuel supply as had been anticipated. The Stone Canyon mine, while it contained by far the best coal in the state, could not be put in a workable condition for several months, and then at great expense. The Tesla mine, which has been worked many years before to a depth of about 900 ft. at three different levels, was found to be filled with water to within 300 ft. of the top, and aside from this a large amount of money would be required to replace tracks, elevators, tipples, etc., that had previously been either removed or destroyed. Other small deposits around Livermore, in the Mount Diablo district, were either undeveloped or completely worked out.

In Dos Rios County several test holes were drilled and much preliminary work was accomplished, but no large veins were discovered that would warrant further continuation of the work on a large scale. It was proved, however, that this patricular deposit in Dos Rios County was a high grade variety of semi-bituminous coal, equal in B.t.u. content to the Stone Canyon product. Private parties have continued to explore this field and some well-known geologists have ventured the opinion that a large coal deposit will eventually be located.

One of the last mines to be explored was that at Ione, and here the engineers found that coal was actually being mined and that the plant was prepared to turn out about 500 tons per day. In the old days, before the advent of fuel oil and the discovery of bet-

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*Article published under the title "Pulverized Lignite Fuel in California" in *Chemical and Metallurgical Engineering.*

ter coal in Wyoming and Utah, a large portion of the fuel consumed by the locomotives of the Southern Pacific R. R. was obtained from this mine. Many an old locomotive fireman can still be found in California who can tell you many interesting incidents concerning his experience with Ione coal.

After much discussion and careful consideration of the final report submitted by the engineers, the Fuel Administration decided that the lignite from the Ione mine, although of inferior quality, offered the best possibilities for immediate service. The next step was to determine the best method to be pursued in burning the lignite. The consensus of opinion seemed to be that the best efficiency in combustion could be obtained by drying, crushing and afterward burning the lignite in a pulverized state, properly mixed with air.

Among the advantages of burning the lignite in pulverized form, the one that stood out above all others was the fact that no matter how much ash the fuel contained it could be burned efficiently. Coal and lignites, having a large ash content, are difficult to burn on grates, owing to the fact that as soon as combustion commences the ash collects all around the carbon and completely shuts off the air. Besides this, the high volatile content of the lignite does not thoroughly mix with the air, so that the combustion of the gases is not complete without admitting a large amount of excess air, and even then the efficiency is poor. When the lignite is pulverized, however, the particles are so fine that approximately the proper amount of air to insure complete combustion surrounds each little atom of fuel, which condition not only guarantees high efficiency in the burning but permits of easy and accurate control.

VIEW WITHIN THE LIGNITE MINE AT IONE, CAL.

TRIAL PLANT ERECTED IN SAN FRANCISCO

To carry on the necessary experimental work preliminary to installing the process in large commercial power plants it was decided to construct a small demonstration plant in San Francisco. Accordingly, a 50-hp. "Kewanee" return-tubular boiler was equipped with the Buell-Santmyer pulverized-coal system, which was considered best to burn the California lignite. Ione lignite, containing an average moisture of 40 per cent, as mined, was allowed to air-dry for seven days in shallow piles at the top of the mine shaft, when it was shipped to San Francisco, in open cars, for treatment.

As received at the plant, the analysis was as follows:

	Per cent As received	Dry Per cent
Moisture	22.41	00.00
Volatile	43.37	54.60
Fixed Carbon	20.41	26.32
Ash	14.78	19.08
	100.00	100.00
B.t.u. per lb.	9,322	12,016

The fuel, as unloaded from the cars, was first crushed to about one-half inch. It was then dried in a semi-direct, artificially fired drier until the moisture content was reduced to approximately 6 per cent. One of the most important operations in the preparation of pulverized lignite is the drying process. At the San Francisco plant about one-sixth of the weight of the raw material was carried off as vaporized moisture, and to accomplish this, 50 lb. of pulverized lignite was consumed as drier fuel to every ton of dried product.

The average temperature maintained inside the drier was 250 deg. F., and great care had to be taken that the heat did not rise above this point, which is apt to cause spontaneous combustion or perhaps explosions. After the lignite had been dried as described, it was pulverized to about 175 mesh, separated by air and stored in a concrete bunker, ready for use.

One of the big bugaboos always brought forward in every argument against the use of pulverized lignite is that it is impossible to keep this material in storage for more than a few days without danger from spontaneous combustion. My experience, however, seems to refute this claim, as I have known of one particular instance in California where several tons of powdered lignite was stored in a *metal* hopper for six months with apparently no ill effects whatsoever.

The general layout of the combustion equipment used at the San Francisco plant is shown herewith. The pulverized lignite drops by gravity from the bunker into the feeder, where a screw conveyor, driven by a variable speed electric motor, carries the fuel to the mixer chamber. Between the feeder and mixing chamber is situated a cross, with the upper connection left open, through which induced air may be drawn, aiding materially in stabilizing the pressure. An air compressor of the rotary type furnishes the necessary energy to transport the powdered lignite from the mixer to the combustion chamber, and supplies about 40 per cent of the air required for proper combustion, the other 60 per cent being obtained by induction.

The average air pressure employed at this plant was 3 lb. at the compressor and about 12 oz. at the burner. The powdered lignite, after meeting the compressed air at the mixer, is carried along through a 3-in. pipe to the burner, the most sensitive piece of apparatus in the whole plant, although very simple in construction. The focusing sleeve, on the end of the burner, is so arranged that the flame zone can be lengthened or shortened, as desired.

A secondary air line, taken off the main line near the compressor, extends completely through the burner, with orifices near the extreme end looking back toward the front of the boiler, which acts as a brake on the main body of forced air and lignite. In actual combustion this secondary air brake causes the flame corona within the furnace to expand or contract, as desired. A half-inch steam jet was used to deflect the cutting flame away from the under side of the boiler plates.

The burner was lighted instantaneously with a torch through an opening in the boiler front. These openings were used also to allow more secondary air to enter the combustion chamber if required. About 15 per cent excess air was generally employed in combustion, although when the boiler was under peak load, this amount might be slightly increased. No changes worthy of note were made in the settings of the boiler, the object being to demonstrate how readily this system could be adapted to any ordinary boiler at small expense. The grate bars were removed, and later on an inclined fill was placed in front of the bridge wall to reduce back pressure.

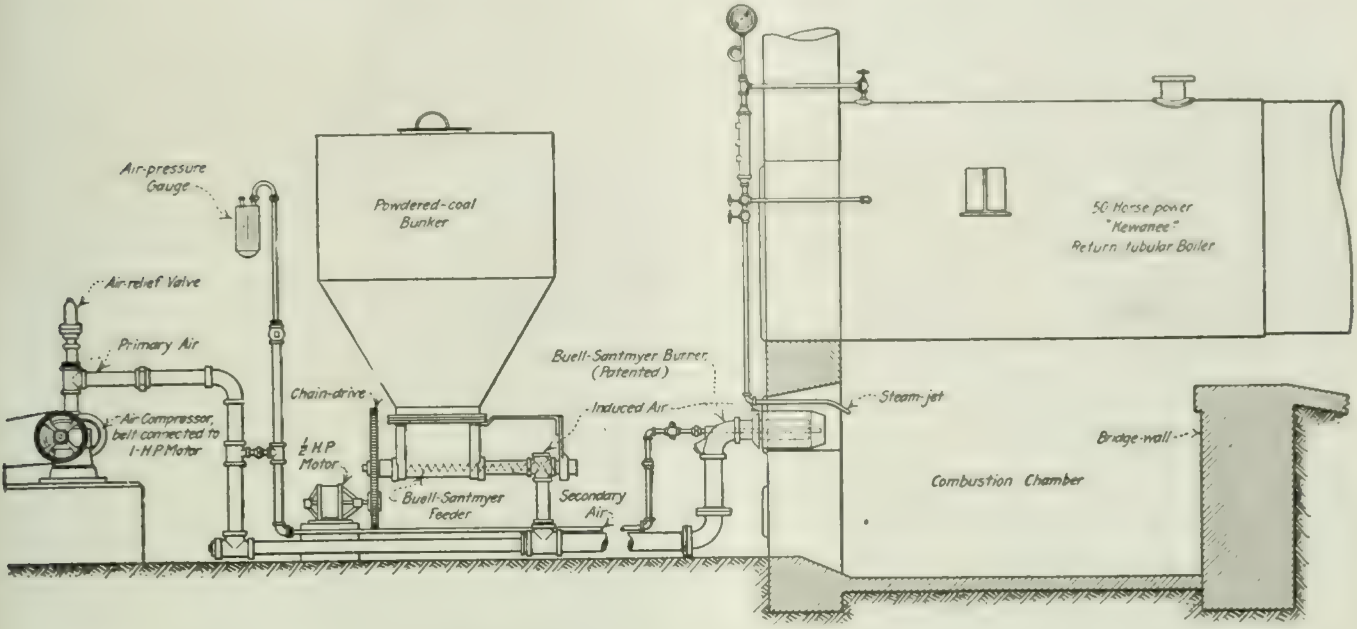

DIAGRAM OF THE EXPERIMENTAL PULVERIZED-LIGNITE PLANT IN SAN FRANCISCO

By burning pulverized lignite under an ordinary horizontal multitubular boiler rated at 50 hp. an evaporation of 9 lb. of steam from and at 212 deg. F. per pound of fuel was secured.

To remove and collect the ash a permanent soot blower was installed in the front end of the tubes and an ash trap constructed under the rear end of the boiler, near the clean-out door. A complete set of instruments was installed to record the temperatures of the feed water, the live steam, the combustion chamber and the waste gases, to determine the vacuum of the stack draft, to weigh the feed water and to measure the steam flow.

Although the conditions for efficiency at the plant were far from ideal, some good results were obtained, both as to combustion and boiler efficiency. The average evaporation per pound of dry fuel burned was 9 lb. of water from and at 212 deg. F. The average temperature in the combustion chamber was around 2,300 deg. F. and that of the waste gases in the breeching above the boiler about 550 deg. F. The CO_2 content in the waste gases averaged 14.5 per cent. The stack dampers were so adjusted that the vacuum in the rear of the combustion chamber was 0.02 in.

Fifty per cent of the ashes was carried out of the stack in suspension with the waste gases, 3 per cent lodged in the tubes and was removed by the soot blower and 47 per cent dropped either into the ash trap in the rear of the setting or onto the floor of the ash-pit in front. The latter portion of the ash proved upon analysis to be largely silica and to contain about 0.005 per cent unconsumed carbon.

Many tests were carried out at this experimental plant for the benefit of California fuel engineers, and as a result of these successful demonstrations with lignite fuel plans were drawn early in 1919 for a large steam electric generating plant at the site of the old Tesla lignite mine and three industrial power plants at Stockton to use lignite from the Ione field. A small plant has been completed at Stockton, where gratifying results have been obtained, the powdered lignite being burned under Heine boilers equipped like those at the initial plants at San Francisco.

When the plants now under construction in California are in actual operation and the efficiency experts have noted the great economy that will result in the generation of steam and for metallurgical purposes as well, the production of California pulverized lignite as an auxiliary to fuel oil and hydro-electric power will have received a great impetus and will without doubt soon take its proper place as a recognized and valuable California industry.

Postpone Opening of Bids on Army Coal

The War Department announces a postponement of the opening of bids on coal for army requirements during 1921. The proposals provided that bids be opened April 30, 1920. Owing to the car shortage and failure to adjust wages, however, it is deemed advisable to defer opening of bids until May 14, 1920.

New Uses Found for the Geophone*

Geophone Is a Small Seismograph—Works Better on the Rib Than on the Roof—Sounds Will Not Travel Along Pipes or Rails if They Are Covered

By Alan Leighton

THE GEOPHONE is an instrument invented by the French during the war to detect, through the earth, the sapping and underground mining operations of the enemy. It was improved by the United States engineers, and more recently has been further improved by the engineers of the U. S. Bureau of Mines, and its use in connection with special sounds has been developed.

Sledge pounding can be detected in mined-out areas at least 1,500 ft., through solid coal 2,000 ft., and through solid rock about one-half mile. Blows of a pick, tamping bar or heavy rock can be detected at two-thirds of those distances. Talking can be understood fairly well through a 50-ft. coal pillar and can be detected about 150 ft. away.

The instrument, though small, works on the same principle as the seismograph, the ponderous apparatus by which earthquake tremors are recorded. It consists of an iron ring about 3½ in. in diameter, within the center of which is suspended a lead weight that is fastened by a single bolt passing through two metal disks (pure nickel disks 0.025 in. thick are used), one of which covers the top and the other the bottom of the ring.

There are two brass cap pieces, the top one having an opening in the center to which is fastened a rubber tube leading to a stethoscopic ear-piece. These cap pieces are fastened with bolts to the iron ring and serve also to hold the metal disks in place.

We then have really nothing but a lead weight suspended between two thin disks that extend across a small airtight box. If the instrument is placed on the ground and anyone is pounding or digging in the vicinity, energy is transmitted in wave motion through the earth, and the earth waves shake the geophone case.

The lead weight, on account of its mass and because it is suspended between the disks, remains comparatively motionless. There is thus produced a relative motion between the instrument case and the lead weight. The result is that in the thin space over the disk a compression and rarefication of the air alternately takes place which is magnified at the small outlet.

Since the rubber tube leading to the stethoscopic ear-piece is connected with this space in the geophone, the vibrations are transmitted to the ear drum and, like other rapid air waves, produce sound effects. Usually two instruments are used, one for each ear.

When the observer is so equipped it is found that the sound is apparently louder from the instrument that is nearer the source of sound, even though the geophones are placed not more than two feet apart. It is evident that by moving the instruments a point can be found where the sound will be of the same apparent intensity in both ears. The direction of the point of origin of the sound is then on a perpendicular to the line connecting the centers of the two instruments, either in front of or behind the observer. Further observation will show which side. Direction is quite accurately determined in this way.

The sound is not actually louder in one ear than in the other, but the ear is capable of distinguishing the slight differences in time at which the sounds arrive in the two instruments. Since this is the case persons who are slightly deaf in one ear are able to determine direction with the instruments.

The Bureau of Mines has conducted an investigation to determine the conditions of operation under which the geophone will give the best results when used for rescue and survey work in both metal and coal mines.

In coal mines it has been determined that the geophones should rest on a solid shelf of coal or on the floor of a niche cut into the coal. The floor of the mine is likely to be covered with dirt, and is seldom solid enough to transmit sound well. In metal mines the geophones will, of course, be held against or placed upon the natural rock.

If the geophones are held with the hands against the coal, vibrations are set up by the circulation of the blood within the hands, which greatly interfere with successful observations. On the other hand, rock appears to withstand these vibrations, and successful results can be obtained by simply holding the instruments in place upon the rock.

Aid to Those Hoping To Be Located

If a man is pounding in the hope that he may be located by means of geophones, he should strike heavy and slow blows upon the coal or rock. The best results are obtained with a sledge or heavy stick of timber. This is true even if the man expects to be located by a party operating upon the surface. There is no advantage in pounding upon the mine roof. The sound transmission is not so good and the process is more fatiguing.

It is of course known that sounds are transmitted clearly along rails and pipe lines. The investigation has shown that while sounds may be transmitted great distances if the rails are laid upon ties or the pipes are suspended, on the other hand if they are buried in loose dirt for even a distance as short as 15 ft. the sound vibrations may be completely damped. For this reason a man should never pound a pipe line or the rails unless he is certain that they are entirely free from any covering. Since the sounds are so well transmitted through rock or coal, pounding on pipes would seldom be advisable.

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*[illegible] Geophone [illegible] from Monthly Reports of [illegible]

In making observations from the surface above a mine the geophones must be pressed firmly into place upon the earth after the sod has been removed. Experiments were conducted with the geophones placed upon stakes driven into the earth, but this method was found not to possess any advantage.

In regard to the distances that sounds can be detected through the earth, sledge pounding can be heard in a mined-out area of a coal mine at least 1,500 ft., through the solid coal 2,000 ft. and through solid rock about one-half mile. Blows from a pick, tamping bar or heavy rock can be detected about two-thirds as far.

The geophone is of great value for rescue work in mines. It frequently happens that after a disaster men barricade themselves in some portion of the mine where the air is still good and await rescue parties. In such a case if they keep up a continuous pounding it may easily be possible to locate them by means of the geophones. Otherwise it is possible that the rescue party may come near them without discovering their place of refuge. The same is true of metal mines, where men may be imprisoned behind falls or even be barricaded in some portion of the mine to which they have retreated in order to protect themselves from the fumes of a fire.

The geophone also has been proved of value for rough survey work in both coal and metal mines, for purposes of checking, positions of headings, winzes or raises, being driven, sunk or raised to make a connection. It is perhaps of more value under the conditions usually prevailing in metal mines since direction has been found to be more easily determined through rock than through coal.

DATA RELIABLE IF STRATA ARE HOMOGENEOUS

It is easily seen that geophones are of value when the headings of tunnels difficult to survey are coming together. Direction determinations should be made from each tunnel, and if the results are consistent the operator can be sure of his data. The results may not agree if the strata between the two tunnel heads are not homogeneous, and of course in this case little reliance can be placed upon them.

That the instruments are of practical value in this connection can be seen from the following instances. The Bureau of Mines engineers were present in a metal mine at the time when a drift and a raise had "missed." A few minutes' observation in the drift and of pounding in the raise showed that the raise had gone up past the drift about 6 ft. in from the face and to the right. Observations made from the raise upon the sounds of the drill operating in the drift showed that the raise extended to a point 6 ft. above the drift and that the drift was in the direction indicated by the first set of observations. A survey showed these conclusions to be correct.

Again, observations were made of another raise which was being driven to the side of a drift, six to eight feet from it. Observations were made of the sounds from the drill, and a point located on the side of the drift behind which the drill in the raise was apparently operating. The survey mark was then ascertained to be from two to three feet to the right of this mark. A drill set up and operated into the survey mark did not hole through into the raise. A hole drilled at the point indicated by the geophones reached the raise, and proved the geophones to be correct within a few inches.

This instance also illustrates another application of the geophone. The surveyors had given the miners the location of the raise with regard to the drift in order to prevent accident in case a blast broke through. The geophone could have located the point easily, and frequent observations, if necessary, would have shown the progress of the work within the raise and before a blast was to be fired.

INSTRUMENT REPRODUCES SOUND WELL

One of the advantages of the instrument is that it reproduces sound so well. Talking can be understood fairly well through 50 ft. of solid coal and can be detected 150 ft. away. The sounds from mining machines are all characteristic. In fact, a bureau engineer through 300 ft. of coal was able to name nine out of ten tools which were being operated upon the coal.

In one mine where observations were being made from a tunnel heading the mine foreman heard the workmen in another tunnel preparing to blast, and ordered the bureau engineers to retire until the blast was fired. The sounds were so clear that he did not realize at the time that the tunnel headings were then over 300 ft. apart.

Observations have been made at two mine fires, where it was found that the fire made noise enough to be heard some distance, either because of its drawing air or the breaking off of bits of coal and slate. At one fire burning about 40 ft. below the surface all of these sounds could be heard, and an area was located within which they were audible. The fire could not be approached from within the mine, but the one point inside at which similar sounds could be heard was found to be the nearest point to the fire area.

Later observations made around the base of a large burning culm pile were of interest because the same kinds of sounds were audible there. At the second fire, which was burning 300 ft. below the surface, only the sounds from dropping rock could be heard.

It is the custom in some localities to put down churn-drill holes from the surface to ventilate blind stopes and to carry pipe lines. These holes often come down in the solid, and much expense is incurred in locating them and driving tunnels to them. Geophones will be of great value here, and there would be no question of faintness of sound as churn-drilling can be detected nearly a mile away.

MAY REVEAL COURSE OF DIAMOND DRILLS

It is a well known fact that when the bit of a diamond drill has drilled a considerable distance below the surface there is no simple method for determining the course it may have taken, although there are survey methods used that give approximate results. As these bits nearly always drift away from a straight course, it is evident that any instrument making it easily possible to determine their course will be valuable. There is some possibility that the geophone may be useful for this purpose. To date, however, this possible use of the geophone has not been thoroughly studied.

Observations have been made upon but two vertical drill holes. These holes, about a quarter of a mile apart, were penetrating strata consisting of alternate layers of gneiss and "black rock," pitching at an angle of approximately 45 deg. One hole has reached a depth of approximately 1,000 ft., the other 600 ft. At each hole it was found possible to hear the bits cutting when the geophones were placed upon the rock surface.

The observations were somewhat disappointing in that the sound of the bits could be heard within but a limited area, a circle whose radius was approximately 100 ft., with its center at the drill. Since the area was so small, and presumably directly above the bit, no direction determinations could be made in the usual manner. It is believed, however, that had the bit drifted this area of audibility would have been directly above the bit and away from the drilling machinery. Observations must be made on inclined holes in order to prove this point. It is certain that should a drill-hole be put down ahead of mine workings there would be no difficulty in locating it from the workings.

Very satisfactory results have been obtained also in attempts made to locate leaks in water mains. The water circulating in the ordinary city main can be heard with the geophones when they are placed on the surface, 10 to 12 ft. above the pipe. In the business district of Pittsburgh one leak was located within a few minutes although the water department had been trying to find it for two weeks. The leak could be heard from the surface from any point within a circle 60 ft. in diameter, and was located in the joint of a "T" connecting a 10-in. with a 15-in. main. The geophones were also used successfully to locate a leak in a one-inch pipe serving a residence.

Who Can Beat This Sinking Record?

Illinois Shaft 263 Ft. Deep Is Completed and Timbered by the Johnson City Coal Co. in 35 Days

THIRTY-FIVE days for the complete sinking and timbering a 263-ft. shaft is a recent achievement of the Johnson City Coal Co., at its No. 2 mine at Johnson City, Ill. The speed and economy attained is believed by those who did the sinking to be a record for the state. A description of the work and method of procedure are therefore here given.

The shaft is 10 ft. 6 in. x 15 ft. 6 in. inside and is divided into two compartments. Of these the manway is 4 ft. wide and the air shaft proper is 11 ft. wide. A 6-in. wall is placed between these compartments.

A concrete lining extends down the shaft for a distance of 22 ft. from the surface and rests upon solid rock. This lining is 12 in. thick and is reinforced vertically with ½ in. rods on 12-in. centers and horizontally on 8-in. centers. The foot of the shaft also is concrete lined for a distance of 30 ft. upward from the top of the coal bed. Footing is made upon the limestone underlying the coal. The lining here also is 12 in. thick and is reinforced in exactly the same way as the lining at the top.

The shaft timbers are 6 x 6 in. long leaf yellow pine treated with carbolineum. Bearing sets are 12 x 12 in. yellow pine resting on a 5-in. ledge of rock throughout their entire length and set into the rock for 2 ft. at their ends. The partition between the manway and air shaft is of 4-in. yellow pine extending between 4 x 6-in. wall plates. The shaft walls between top and bottom concrete linings are covered with expanded metal lath upon which has been placed 2 in. of gunite.

On Aug. 5, 1919, surveys were made to locate the top and bottom of the shaft, the transference of tools and equipment to the shaft site was begun and work on the headframe, the setting of the hoisting engine and the laying of the steam line was started. On Aug. 16, 1919, shaft sinking was commenced and three shifts per day were kept at work continuously thereafter. Work was also begun from underground in driving the shaft upward, a few men being kept steadily at this work. This upward driving finally attained a height of 60 ft.

On Sept. 17 the two portions of the shaft (upper and lower) were joined by sump shots in the upper section. On Sept. 20 the two places were completely connected and timbered. The total distance sunk was 263 ft. and the time consumed was 35 days.

The manway is now completed and equipped with a steel stairway in compliance with the Illinois state law. It should be noted also that in spite of the speed attained in sinking this shaft not a man was injured throughout the entire operation.

The work of sinking and completing the shaft was in charge of J. L. S. Dowell of De Soto, Ill., while the engineering work was done under the direction of Willard J. Reintjes, chief engineer of the Johnson City Coal Co.

Coal Shortage Halts German Industries

INSUFFICIENT coal supply is greatly hampering the rejuvenation of Germany's industries that was expected to follow the cessation of hostilities. All the largest cement works have been closed for some time. The iron industry suffers above all, on account of the entire lack of grade coke and coal. Particularly bad are the conditions at Schweinfurt.

The glass industry, because of the insufficient supply of coal from Bohemia, has been forced to close its works for the greater part of a month, and the ceramic industry will come to a complete standstill if the Bohemian coal does not arrive soon. The situation of the textile industry at Hof likewise is very bad.

It is due only to the comparatively mild winter weather that the adverse conditions as regards the coal supply for heating purposes have been less felt. In Munich the conditions have become very much worse in this respect. The Bavarian State Government, according to the *Muenchener Zeitung*, is giving this question of the coal supply its most careful attention, and is endeavoring, with all the means at its disposal, to meet the situation.

One must not believe, however, that the conditions above noted prevail only in Bavaria. Discouraging reports are coming from all parts of Germany. In the Rhineland and Westphalia the heavy industries are, in a large measure, at a standstill; even such works as formerly depended upon their own coal mines for their requirements. In Hamburg the fishing steamers are ready to put to sea, but cannot do so because they have no bunker coal. Similar conditions prevail in the nitrogen and potash industries, whose products are particularly necessary in agriculture.

In Westphalia the following factories, whose products are of especial importance to the mining industry, have been obliged to close for lack of coal: Westphalia Explosive Co., in Sinsen, since Jan. 10; Schlebusch Dynamite Factory, since Jan. 12; Witten Cast Steel Works, which manufactures hauling cables for mining purposes, and Jacoby Rolling Mill, since Dec. 1, 1919.

If this stoppage of work is not speedily checked by an increased supply of coal, it is only a question of time when the working of the mines themselves must cease for want of operating materials.

COAL AGE

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Operators Lose Fight on Assigned Cars

RAILROAD fuel supply has been cut by the Interstate Commerce Commission as a Gordian knot in its order of April 16, re-establishing assigned cars. For weeks the National Coal Association has been struggling with the problem of giving railroads the coal they need and will take, whether or no, without giving in on the question of assigned cars. The fight which began, with the support of Mr. Garfield, in 1918, has been carried on past the period of government control. But a few weeks ago it appeared that the operators would be able to develop sufficient co-operation among themselves to give the railroads the protection they require. The action of the Interstate Commerce Commission in setting aside a rule of two years' standing in order to permit the carriers to buy their fuel coal with cars must be due to pressure from the roads themselves.

Technically the operators have lost, but it remains to be seen whether they have not after all achieved more than they realize. It will be good policy for the roads to use their regained power with care, avoiding the abuses of the past, for the operators no doubt will renew their pressure for equal running time for all mines at the first opportunity.

Why Costs Are Higher

A STRIKING point demonstrated by the figures of the Federal Trade Commission for January, 1920, on the operation of coal mines reported this week in our Washington correspondence is the relationship between the rate of production and the f.o.b. mine costs. It is clear from the comparisons set forth in this first monthly summary that the decreased rate of coal production has been an important factor in this matter and in part has been the cause of an alarming decrease in the so-called "margin per ton" from which the operators are expected to get their profits as well as return upon the investments.

From the report we are led to conclude that the cost to the operators of the 14 per cent wage increase was about 25 cents per ton on the average. This figure is about what would be expected from the fact that the labor item is in total $1.49 for 1918. The costs reported for supplies and general expenses and the sales realization for January do not differ materially from the results of the year 1918, during much of which the same government prices were in vogue as in January. As a consequence the margin per ton is about the same or decidedly smaller in all districts except the Rocky Mountain field, where a bare 10 per cent increase is noted.

On the average of all the territory covered the margin is 42 cents per ton. Those who have looked for the reason of the increases in price that followed the removal of Government restriction April 1 can look at this low figure for their answer.

The influence of the lowered rate of output in some mines on the increase in costs is shown in these figures. On the average there is an increase of 23 cents per ton, which is, it happens, exactly the figure found for the group of plants which report within 5 per cent of the same rate of production for the month as their average for 1918. Other plants with increases in rate of production show somewhat smaller increases in cost, as would be expected as the result of the possibilities of greater efficiency at greater rates of output. When the rate of output is 25 per cent or more below that of 1918 we find a tremendous increase in costs, which is reported as $1.17 per ton for this group. The penalty of low production is thus most strikingly set forth.

Such cost studies cannot be other than interesting and valuable. We lose them almost as soon as they start, for the Federal Trade Commission has been enjoined their further collection.

Inquisitors Curbed

THE decision rendered by Justice Bailey of the District of Columbia Supreme Court grants a temporary injunction which restrains the Federal Trade Commission from requiring monthly reports of costs of production from the coal operators. It thus in the very first round registers victory for the National Coal Association. A permanent injunction is yet to be sought and finally the Supreme Court will be called upon to pass judgment. It is expected that in the course of two or three months the permanent injunction will issue, the Federal Trade Commission preferring to renew its fight before the court of last resort.

It is more than significant that Justice Bailey based his decision on constitutional grounds. He appears to differentiate between the producing of coal and its selling and shipping, and holds that producing is always intrastate business and therefore not subject to such investigation by the Government as has been attempted by the Federal Trade Commission. Such an opinion, if sustained, will seriously curtail the activities of the commission, which result, of course, is just what the coal operators desire.

What is more noteworthy perhaps is the change of heart on the part of the coal industry made evident by its purpose to trim the wings of the commission. But a few short years ago, when Edward Hurley was chairman of the Federal Trade Commission, the mine operators met with open arms his propaganda on cost accounting and as late as 1916 the operators willingly gave these same monthly cost reports to the commission.

The fall from grace can be blamed on none other than the Federal Trade Commission itself. This government body, first a star of hope, is now in sad disfavor with American business generally. In this particular instance the coal industry does not so much object to being singled out for investigation of costs and profits as to the arbitrary manner in which it has been ordered about and to the doubt whether it will receive fair treatment afterward, a distrust bred of experience with the publicity given by the commission to its previous cost investigations.

Wrong Time to Urge Storage

THE COUNCIL of National Defense recently issued a statement, which is reprinted elsewhere in this issue, severely criticizing the bituminous coal operators for recent increases in prices. Comment on this utterance seems called for. In the first place we doubt much that the Council of Defense has actual evidence that prices have made any considerable advance. The Attorney General issued a broadcast warning, but he has accused no one in particular. Here and there, it is true, operators and jobbers are asking, and consumers are offering, absurdly high prices for special grades of coal or for exceedingly prompt delivery, but it is more than doubtful whether the practice is general.

But these relatively few cases must be singled out from the general advance in price made on April 1 to offset the wage increase of 27 per cent. Based entirely on that advance costs of production were augmented about 20 per cent over those current last year, and no one has any right to expect the coal operators to absorb all or any part of this increase in production costs.

So long as the operator does not have the right to discuss prices the producer who would be reasonable has no control over those operators who are disposed to call for and accept all the market will stand. In one Eastern field a policy has been adopted of preventing the spread of news or gossip about "$5 coal" on the theory that if such a story spreads many will be incited by example to boost prices unduly.

It will be remembered that the Bituminous Coal Commission urged a "buy-early" campaign. Mr. Shenton now says that he meant that consumers should not buy until May 15, the date on which he concludes prices will go down of their own accord. Some *attachés* of the commission, Mr. Reynolds in particular, were so enamoured of the "buy-early-and-store" plan that they tried to get the coal operators behind it.

The National Coal Association, having tried it last summer, when the market was poor, is wise enough to keep hands off this spring, when demand is at a peak. The Council of Defense, in urging buying, seriously erred in its judgment of conditions and now apparently does not wish to be held to blame for any rise in prices that may well be charged to that unfortunate advice.

Portage Protests

A COAL OPERATOR in Portage protests against the editorial entitled "What Other Earnings Do Miners Make?" that appeared in *Coal Age* some little while back. He objected to the statement that mine workers worked on farms and elsewhere during idle periods.

Probably he is not the only one who felt in the same way about the matter. There are some sections, of course, where the mine workers do not farm when their mines are idle, and operators in those sections who care more for the truth than for winning the strike—and many of them really do though they get little credit for it—are apt to think that the editorial exaggerated, if it did not misrepresent, the facts.

However, it is true that there are many localities, especially those in which mining is a newly entered craft and where the operation is mainly by American-born citizens—whether intelligent citizens or mere "sagers"—where there is a disposition to leave mining for the plow. In some sections the men are sons of farmers who were bred on the farm and have relatives still cultivating the soil. This may not be true of Portage, and it cannot be asserted of foreigners whose failure to understand English makes them undesirable farm operatives, for on the farm they cannot be placed under immediate supervision, and furthermore they cannot be paid on the basis of the work they actually perform.

But it is true that mine workers do quite a little farming in many of the central Pennsylvania fields. Mines in such regions have frequent strikes in the summer. The men like to strike, for then they can go a-harvesting and sometimes draw strike pay besides. One year an operator near Foxburg, Pa., shut down his mine altogether because the men were constantly laying off for one excuse and another, the real animating cause being a desire to help the Brousiuses and Kellermans gather in the grain or hoe the corn.

At another mine a strike lasted for months, the dispute having a clearly defined day for settlement—namely, Harvest Home. Many a strike has a direct connection with the twin occupation of mining—namely, farming. The fields stretch down almost to the mine mouth and on an idle day the men are up and away fixing their fences, building a pen for the hog or scalding him in the yard, plowing, seeding and doing other chores at home or in the house of a relative, a friend or a neighbor.

"Doughnut" Picking Tables

WE PRINT on page 791 of this issue a description of the surface works at Nanty Glo, Pa. To many coal operators more than ordinary interest attaches to the preparation appliances here installed. Here for the first time revolving circular, annular, ring-shaped or what might from their form be termed "doughnut" picking tables have been tried.

A revolving doughnut-picking table unquestionably possesses some interesting possibilities. In the first place the construction is extremely simple. The plate ring, suitably stiffened and reinforced with structural shapes, is supported upon double-flanged wheels and is driven through a large segmented level gear and pinion from a motor. Thus with the table set level the only power required for driving will be that necessary to overcome friction and that consumed in removing the coal from the table platform.

This type of picking table, aside from the motor and gearing that drives it, has in its simplest form a minimum of moving parts, these being confined to the bed and the requisite supporting rollers. The simplicity of construction is immediately apparent.

On the other hand, this type of table requires a somewhat different arrangement and shape of picking room than does the ordinary apron. Naturally the building must be wider in order to accommodate the circular table. Obviously also the picking room need not be as long as would be necessary for the installation of a traveling apron.

For loading the larger sizes of prepared coal from such picking tables as these either the traveling-apron loading boom or the shaking chute could doubtless be used to advantage. In all probability either of these devices might be so arranged as to give only a small drop and consequently a minimum of degradation.

Secretary Payne Denies Government Liability for Diversion of Coal

In Letter to the Graff Mining Co. Secretary of the Interior Cites Opinion of Attorney General That the United States Is Not Liable to Pay for Diverted Fuel

An important opinion in connection with the adjudication of claims against the Fuel Administration has been expressed by the Secretary of the Interior in a letter to the Graff Mining Co. at Blairsville, Pa. In a letter dated April 14, Secretary Payne says:

"Your letter of March 20, 1920, addressed to the Bureau of Adjustments, Fuel Administration, Washington, D. C., has been referred to this department for consideration.

"It relates to your claim in the amount of $151.93, for a car of coal, C. & O. No. 55,545, shipped on Sept. 28, 1918, to the American Mills Co., Waterbury, Conn., and diverted by order of the U. S. Fuel Administrator for the State of Connecticut to the Barnum-Richardson Co. of East Canaan, Conn., which is now in the hands of a receiver. You state that on Feb. 14 you received a check for $6.44 from the receiver in full payment for this car, and that you refused to accept it.

"The records show that you were in correspondence with the Fuel Administration with respect to this claim, and that on May 13, 1919, you were advised that nothing could be done for you in the matter, pending further advice from the Department of Justice, and that the Fuel Administration had no funds which could be legally disbursed for the payment of such claims.

Consumer Is Liable for Payment

"All shipments of coal, whether f.o.b. mines or otherwise, and all shipments of coke f.o.b. ovens or at place of storage or otherwise shall be made subject to the diversion of such coal or coke by the U. S. Fuel Administrator or any persons acting under his authority, to any persons or consumers, and for any of the purposes heretofore or hereafter authorized by him. The title of the purchaser, consignee or consumer, in the case of any such shipments of coal or coke, which by custom or law might become vested at the time and place of such shipment, shall from and after the effective date hereof be subject to the condition that the coal or coke so shipped may be diverted as aforesaid, and that in case of any such diversion, the title and interest of such purchaser, consignee or consumer with respect to any coal or coke so diverted shall be completely divested and terminated and his liability to pay therefor shall cease.

"The person or consumer to whom any such coal or coke is diverted shall become liable as of the time of such diversion to pay to the shipper thereof the price in force at the date of shipment as fixed therefor by or under authority of the President of the United States, plus transportation charges thereon and plus a handling charge of 15c. a net ton to cover costs of rebilling, collection and replacement. If such handling charge is made, no jobber's commission shall be added to the mine's price. If the coal or coke so diverted was shipped under a valid and enforcible contract, the quantity thereof so diverted shall not be charged against the amount to which the contract applied.

"The Fuel Administration is no longer in existence and by Executive order of March 20, 1920, the Secretary of the Interior was authorized and directed to adjust, liquidate and pay claims against the Administration. Under this order the authority of the Secretary of the Interior is limited to the allowance of claims for which the United States is legally liable, and for which appropriations have been provided by Congress. No such appropriations have been made for losses arising from the diversion of coal under the orders of the Fuel Administration, and the Attorney General has rendered an opinion that in cases of this character the United States is under no legal liability to pay for the coal.

Department Has No Authority or Funds

"From the foregoing you will see that this department is without legal authority or funds to adjudicate or pay your claim. Authority to so adjudicate and pay can only be had by act of Congress."

In connection with the letter to the Graff Mining Co. the ruling of the Attorney General on this subject is of interest. In a letter to the Fuel Administration dated June 6, 1919, the Attorney General says:

"This will acknowledge receipt of your letter of May 29, relative to the liability of the United States for coal diverted by order of the Federal Fuel Administration.

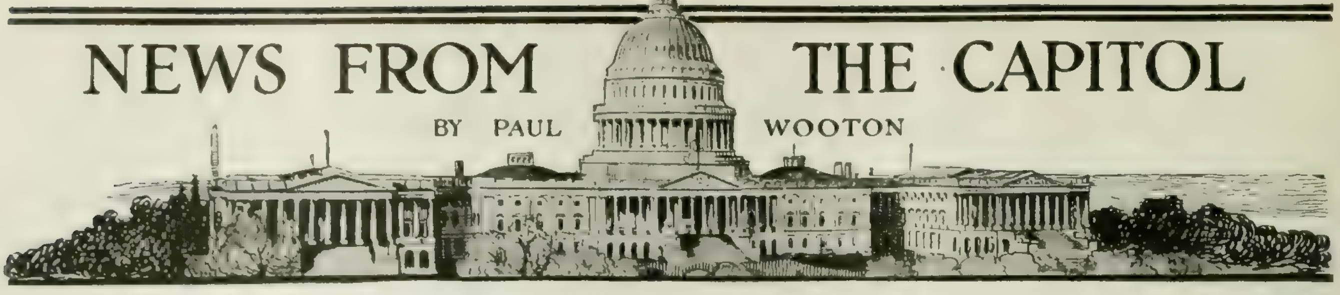
"The only question discussed in your letter which seems to require answer is what course should be taken in those cases in which bankruptcy or other judicial proceedings are known to be pending against the person to whom the coal was diverted. This involves the question of the liability of the Government for coal diverted by order of the Fuel Administration under Publication No. 14 of Jan. 14, 1918. This publication is as follows:

"This was issued, as we understand, pursuant to the first paragraph of Section 25 of the Food and Fuel Control Act, which confers upon the President authority to establish rules for the regulation of and to regulate the method of production, sale, shipment, distribution, apportionment or storage of coal.

"By this regulation it is apparent that the Government assumed no liability for the purchase price of the coal but was merely acting as an agency to secure the proper distribution as between consumers.

"As this was a valid regulation the liability of the Government must be measured by its terms. It being clear from the terms of the regulation that there is no liability assumed by the Government, we think none arises.

"If the regulation is beyond the power of the Fuel Administration, it, of course, could not impose any liability upon the Government; and we therefore suggest that in the cases under consideration you should deny the existence of any legal liability."



NEWS FROM THE CAPITOL

BY PAUL WOOTON

Commission Authorizes Assigned Cars

ASSIGNED cars became a reality again on April 16, when the Interstate Commerce Commission issued the following notice:

"The supply of cars available for the transportation of coal continues insufficient to meet the demand. In view of the cessation of Government control of coal production and distribution, effective April 1, 1920, and in order that railroad fuel requirements may be reasonably met without the necessity of carriers resorting to confiscation of commercial coal, it becomes necessary to amend our notice to carriers and shippers dated March 2, 1920, and our recommendation therein to read as follows:

The Commission recommends that until experience and careful study demonstrate that other rules will be more effective and beneficial, the uniform rules as contained in the Railroad Administration's Car Service Section Circular CS 31 (revised) be continued in effect, except that rule 8 as contained in said circular should be amended to read:

8. Private cars and cars placed for railroad fuel loading in accordance with the decisions of the Interstate Commerce Commission in *R.R. Com. of Ohio, et al., v. H. V. Ry. Co.*, 12 I.C.C. 398, and *Traer v. Chicago & Alton R.R. Co., et al.*, 13 I.C.C., 451, will be designated as "assigned" cars. All other cars will be designated as "unassigned" cars.

"The commission is of opinion that an emergency exists requiring immediate action, and in exercise of the authority conferred by paragraph 15 of Section 1 of the Interstate Commerce Act, as amended by Section 402 of the Transportation Act, 1920, hereby suspends the operation of the existing rule 8 and directs the observance by all carriers by railroad subject to the Interstate Commerce Act of rule 8 modified as above, effective April 16, 1920, and until the further direction or order of the commission."

Federal Trade Commission Begins Series of Monthly Coal Costs

Returns of Operators Taken, Without Revision of Figures, Accentuate Increased Production Cost

VARIOUS statistical deductions compiled from the monthly reports made to the Federal Trade Commission by bituminous coal operators appeared under date of April 20 in bulletin form, issued by the commission. This bulletin is to appear monthly in the future. In addition, final and more comprehensive figures will be issued quarterly. In bringing out its first bulletin the Trade Commission states its object is to "make public the essential facts concerning changes of cost with the least possible delay."

The commission calls attention to the fact that the figures are taken from the operators' returns, without having been subjected to any critical analysis or revision. It was stated, however, that the experience of the commission indicates that the revision will reduce by not more than a few cents per ton the costs claimed.

An interesting portion of the report is as follows:

The average increase here shown for the United States for January, 1920, was 23c. per ton, or an average increase of 11 per cent over the 1918 total f.o.b. mine cost. This increase is attributable to two chief causes: (1) The higher wage scale put into effect November, 1919, as a result of the Fuel Administrator's recommendation of 14 per cent increase in the wages of mining labor, and (2) the small decrease in the January, 1920, output from the average monthly output of 1918. The changes in the supplies and general expense costs were of minor importance.

The great diversity in mining conditions between the different districts, both in regard to thicknesses of seam mined and the relative use of machinery in mining the coal, caused the wage increase to affect to a different degree the labor costs of the various districts. In the Federal Trade Commission's coal cost reports for 1918 much detailed information on these diverse conditions is available.

To throw light on the effect which a diminished production has in increasing the costs, the following tabulation for 1,272 operators has been carefully made. Taking their average monthly production in 1918 as a base, they have been grouped according to the relative decrease or increase of their production in January, 1920; and their total f.o.b. mine cost increases are thus shown in relation to changes in production. A 14 per cent increase (the Garfield recommendation) over the wage scale in effect throughout 1918 was made in November, 1919, and was in general effect during January, 1920.

DISTRIBUTION OF TOTAL F.O.B. MINE COST INCREASES ACCORDING TO CHANGES IN PRODUCTION TONNAGE OF 1,272 OPERATORS, JANUARY, 1920, FROM AVERAGE MONTHLY PRODUCTION, 1918

Change of January, 1920, Production from 1918 Average Monthly Production	No. of Operators	Production January, 1920 Tons	Increase of Jan., 1920, Claimed Cost Over 1918 Annual Claimed F.O.B. Mine Cost	Per Cent
Decrease over 25 per cent	3	8,114	$1.17	33
Decrease 16-25 per cent	132	2,270,419	.29	15
Decrease 6-15 per cent	410	7,374,005	.28	14
Decrease 0- 5 per cent Increase 0- 5 per cent	312	4,546,242	.23	10
Increase 6-15 per cent	210	2,784,344	.19	9
Increase 16-25 per cent	127	2,651,976	.15	7
Increase over 25 per cent	78	996,127	.12	5
Total	1,272	20,631,227	$0.23	11

As far as can be judged, therefore, from the returns at present available, the increased cost attributable to the increased wage scale is about 23 cents per ton, or 10 per cent (the increased cost shown in above table for the group where production changed least—5 per cent or less—and where the effect of the wage agreement is consequently best seen). For the total—1,272 operators—the average decrease in tonnage was 2 per cent and their average increase in cost 23 cents per ton, or 11 per cent. This increase of about 23 cents per ton, or 11 per cent, was the result in January, 1920, of the "Garfield" 14 per cent wage increase, which it should be noted is about one-half of the total increase (27 per cent) recently recommended by the United States Bituminous Coal Commission.

The figures of the Trade Commission accentuate the influence of increased production on costs. For instance, there were 86 operators in eleven districts whose increase in production was so great as to more than absorb the wage increase. Their costs in January, 1920, were lower. The figures cannot be regarded as typical because the amount mined was less than 750,000 tons. These instances were as follows:

Field	Operators	Tonnage
No. 1, Ohio	3	10,920
No. 3, Ohio	16	84,336
Pittsburgh seam, W. Va.	8	150,616
No. 2, Ohio	14	47,770
3a, Ohio	5	16,375
No. 7, Ohio	6	49,519
No. 2, Illinois	21	219,361
Michigan	4	73,398
M-M-P, Iowa	4	73,036
Ex Logan, Arkansas	3	5,020
Anthracite, Arkansas	2	5,635
	86	735,986

Federal Trade Commission's Cost Order Held Unconstitutional

Decision of Justice Bailey of District Supreme Court Sets Aside on Constitutional Grounds the Right of Government to Compel Coal Operators to Make Cost Reports Federal Trade Commission Will Appeal to Supreme Court.

JUSTICE Bailey, in the Supreme Court of the District of Columbia, in a decision handed down April 19, in the case of Maynard Coal Company against the Federal Trade Commission, held that the Commission had no authority to require from coal operators reports concerning cost of production, amount of tonnage, and financial condition as prescribed by the order of the Federal Trade Commission and the accompanying form of reports and detailed instructions which were sent coal operators throughout the country in January of this year.

In this litigation, which was instituted by the National Coal Association as a test case about a month ago, it was contended by the Federal Trade Commission that they had the power to require such detailed reports concerning all of the business of any coal operator—both that portion of its business which had to do with the mining of coal and its intrastate shipments as well as its interstate shipments, provided such coal company shipped any portion of its coal to points in States other than the State of its production.

Decision Has Far-Reaching Effect

If the contention of the Commission had been sustained it would have necessarily followed that the Commission had the right to require such detailed reports not only from coal operators but from all manufacturing and commercial concerns throughout the country which ship any portion of their product in interstate commerce. Justice Bailey's decision affects the interests of practically every mining, manufacturing and commercial house in the United States.

In this decision Justice Bailey held that the effect of the Commission's order would be to force the coal operators to change their bookkeeping methods and to report in detail not merely concerning their interstate commerce transactions but concerning their intrastate sales as well, and their purely intrastate business of producing coal. Justice Bailey held that it was beyond the power of the Commission to require reports of that character, and that it was beyond the power of Congress to authorize the Commission to require such reports.

He held that under the commerce clause of the Constitution of the United States, Congress might authorize the Commission to require such reports with reference to the interstate business of the coal operators and that the Federal Trade Commission Act must be construed as limiting the power of the Commission in this regard to such interstate commerce transactions in order to render it constitutional. In this opinion he said: "And the information required in this case is such as would apply as well to a corporation whose business was wholly intrastate as to the plaintiff—that defendent unquestionably is demanding information as to intrastate commerce and as to coal production, and frankly asserts the right to do so."

He then asserts: "That there is radical distinction between production and commerce is clear," and cites in support of this proposition a long line of decisions of the Supreme Court of the United States: "In order for the Federal Trade Commission to have the power to require the plaintiff to make reports as to the mining of coal and as to its intrastate shipments, it must appear that this information is necessary to or connected with some object over which the general Government has power. There is no claim made that there is any proceeding pending involving the Anti-Trust Act or unfair methods of competition, or under the Clayton Act, but in its order defendant demands reports in all the business of the plaintiff."

In concluding that portion of his opinion dealing with the fundamental constitutional questions involved Justice Bailey said: "But did Congress undertake to vest such power in the Commission? It is the duty of the courts, if possible, to give the statute a construction which would not conflict with the Constitution. The corporations referred to in the Act are, by its terms, limited to those engaged in 'commerce' as defined in the Act, and all the powers vested in the Commission should be and it seems may be construed with this limitation. *But the Commission has undertaken to construe the Act otherwise, and to take steps under its construction of the Act to require information and reports not relating to interstate commerce, but relating chiefly or wholly to production, and under its order the information which it has the power to demand cannot be separated from that over which it has no control.* While as to other matters Congress may authorize the Commission to obtain information upon any subject which in its judgement it may be important for it to possess, it may not *compel* the production of such information in respect to matters over which the Federal Government has no control."

No Decision on Transfer of Power

With reference to the contention made on the part of the plaintiff that any powers that the Federal Trade Commission may have at any time possessed to require reports from coal operators was transferred to the Fuel Administration by the Executive order of the President of July 3, 1918, made under the provisions of the Overman Act, Justice Bailey said that it was unnecessary for him to pass upon that question in view of his conclusion as to the lack of power on the part of the Commission.

Justice Bailey held that a temporary injunction should issue in accordance with the prayer of the bill, and such order is now being drafted by counsel and will shortly be submitted to the Court for entry.

Text of Injunction Decision Against Trade Commission

THIS is an application for an injunction to restrain the Federal Trade Commission from taking steps to collect a penalty for failure on the part of the plaintiff, The Maynard Coal Company, to make certain reports called for by the Commission. The bill is supported by several affidavits of expert accountants. The defendant Commission has filed its answer, but on account of insufficient verification, it cannot be treated as an affidavit. It has also filed with its answer several affidavits, which will be noticed hereafter.

The plaintiff is a corporation engaged in the mining, production and sale of bituminous coal. It owns and operates mines in Kentucky and Ohio. Practically all of the coal mined in Kentucky and about one-half of the coal mined in Ohio is shipped to points without those states, and the remainder of that mined in Ohio to points in that state.

On Jan. 31, 1920, the defendant Commission served upon a large number of coal mining corporations, including the plaintiff, an order requiring them to report "monthly cost of production and other data," as set out in specification accompanying the order, for each calendar month of the year 1920 and until further notice. The information and reports required are very full and detailed as to production, sales, management, financial condition, depreciation, etc., and all to be calculated as prescribed in the specifications. The plaintiff claims, and from the affidavits filed such appears to be the fact, these reports cannot be made without a large change in the plaintiff's method of bookkeeping and accounting, and at a very considerable expense.

The Commission claims that it may require these reports under the authority placed in it by the Act of Congress creating the Commission approved Sept. 26, 1914, and that Congress has the authority to so empower the defendant under the clause, known as the Commerce Clause of the Constitution of the United States.

"Congress shall have power * * * * * to regulate commerce with foreign nations and among the several states with the Indian Tribes."

The part of the Federal Trade Commission Act pertinent to this inquiry are substantially as follows:

Commerce is defined, Section 4, as "commerce among the several states or with foreign nations, or in any Territory of the United States or with foreign nations, or between any such territory and another, or between any such territory and any state or foreign nation, or between the District of Columbia and any state or territory or foreign nation."

Section 5 provides that unfair methods of competition in commerce shall be unlawful, and empowers the Commission to take steps to prevent such unfair methods and prescribes the procedure for carrying out such purpose.

Section 6 of the Act provides: "That the Commission shall have power—

a. To gather and compile information concerning, and to in- [illegible] the organization, business, conduct, [illegible] of the corporation engaged in com- [illegible] common carriers subject to the Act [illegible] relations to other corporations and [illegible] partnerships

b. To require, by general or special orders, corporations engaged in commerce, excepting banks, and common carriers sub- [illegible] of any class of them, or [illegible] with the Commission in such [illegible] prescribe [illegible] or special, or [illegible] writing to specific [illegible] information as it [illegible] conduct, practices, [illegible] partnerships and corporations filing such reports or [illegible] shall be made [illegible] prescribe, and [illegible] time [illegible]

[illegible] decree [illegible] the Anti-Trust [illegible] decree is being [illegible]

[illegible] direction of the [illegible] alleged vio- [illegible]

[illegible] portions of the [illegible] and [illegible] to the Congress and to submit therewith recommendations for additional legislation; and to provide for the publication of its reports and decisions in such form and manner as may be best for public information and use."

g "From time to time to classify corporations and to make rules and regulations for the purpose of carrying out the provisions of this Act."

h "To investigate, from time to time, trade conditions in and with foreign countries where associations, combinations or practices of manufacturers, merchants, or traders, or other conditions, may affect the foreign trade of the United States, and to report to Congress thereon, with such recommendations as it deems advisable."

The defendant in its answer admits "that no complaint had been filed by or before it charging the plaintiff with unfair methods of competition or with the violation of the Federal Trade Commission Act or the Anti-Trust Acts and admits that the information sought to be secured from the plaintiff may not throw any light or have any bearing upon any possible violation of any of the acts aforesaid, but asserts that such information is sought for the lawful purpose within the scope of the powers conferred upon the defendant by Section 6 of the said Commission Act.

The authority of Congress to enact this legislation is claimed under the power to regulate commerce above set out. The reports demanded of the plaintiff are not limited to questions connected with the shipment of coal in interstate commerce or the contracts in reference to, or the prices of coal so shipped, but relates almost entirely to the mining of coal and the price at which it is sold, and the financial condition and operations of the company, and all without any attempt to limit the inquiry to matters pertaining to the coal shipped in interstate commerce.

In fact the Commission in its answer "denies that the plaintiff has the right to segregate its business and to say that part of its business is interstate and part is intrastate, but in order to ascertain if defendant is engaged in commerce, the Courts will look to the entire business transactions of the plaintiff, and if any part of its business is intrastate and a part interstate and the whole business is conducted under one organization as is set forth and admitted in the plaintiff's bill, then the defendant insists that the plaintiff, considering its business as a whole (is engaged in) interstate commerce and the defendant has the right to ask the information sought.

And the information sought in this case is such as would apply as well to a corporation whose business was wholly intrastate as to the plaintiff. The defendant unquestionably is demanding information as to intrastate commerce and as to coal production, and frankly asserts the right to do so.

That there is a radical distinction between production and commerce is clear.

In Kidd vs. Pearson: 128 U. S. 1, Mr. Justice Lamar said, p. 20.

"Manufacture is transformation—the fashioning of raw materials into a change of form for use. The functions of commerce are different, the having and selling and the transportation incident thereto constitute commerce; and the regulation of commerce in the constitutional sense embraces the regulation at least of such transportation. The legal definition of the term, as given by this court in County of Mobile vs. Kimball, 102 U. S. 691, 702, is as follows: 'Commerce with foreign countries and among the States, strictly considered, consists in intercourse and traffic, including in these terms navigation, and the transportation and transit of persons and property, as well as purchase, sale, and exchange of commodities." If it be held that the term includes the regulation of all such manufactures as are intended to be the subject of commercial transactions in the future, it is impossible to deny that it would include all productive industries that contemplate the same thing. The result would be that Congress would be invested, to the exclusion of the states, with the power to regulate, not only manufactures, but also agriculture., horticulture, stock raising, domestic fisheries, mining—in short, every branch of human industry. For is there one of them that does not contemplate, more or less clearly, an interstate or foreign market? Does not the wheat grower of the North-west, and the cotton planter of the South, plant, cultivate, and harvest his crop with an eye on the prices at Liverpool, New York, and Chicago? The power being vested in Congress and denied to the States, it would follow as an inevitable result that the duty would devolve on Congress to regulate all of these delicate, multiform, and vital interests—interests which in their nature are and must be, local in all the details of their successful management."

In United States vs. Knight: 156 U. S. 1, page 12, Mr. Chief Justice Fuller said:

'Doubtless the power to control the manufacture of a given thing involves in a certain sense the control of its disposition, but this is a secondary and not the primary sense; and although the exercise of that power may result in bringing the operation of commerce into play, it does not control it, and affects it only incidentally and indirectly. Commerce succeeds to manufacture and is not a part of it.

In Addyston Pipe & Steel Co. vs. United States, 175 U. S. 211, which involves the Anti-Trust Act of July 2, 1890; Mr. Justice Peckham, after holding that Congress had the power to regulate interstate commerce could regulate any agreement or combination that operated upon the sale, transportation and delivery of an article of interstate commerce, on page 27, said:

> Although the jurisdiction of Congress over commerce among the States is full and complete, it is not questioned that it has none over that which is wholly within a State, and therefore none over combinations or agreements so far as they relate to a restraint of such trade or commerce. It does not acquire any jurisdiction over that part of a combination or agreement which relates to commerce wholly within a State, by reason of the fact that the combination also covers, and regulates commerce which is interstate. The latter it can regulate, while the former is subject alone to the jurisdiction of the State. The combination herein described covers both commerce, which is wholly within a State and also that which is interstate.
>
> "In regard to such of these defendants as might reside and carry on business in the same State where the pipe provided for in any particular contract was to be delivered, the sale, transportation and delivery of the pipe by them under that contract would be a transaction wholly within the State, and the statute would not be applicable to them in that case. They might make any combination they chose with reference to the proposed contract, although it should happen that some non-resident of the State eventually obtained it."

In Delaware, Lackawanna & Western Railroad Co. vs. Yrukonis, 258 U. S., 439, a case involving the Federal Employers' Liability Act, Mr. Justice Day, page 444, said:

> "The averments of the complaint as to the manner of the receiving of the injury by plaintiff showed conclusively that it did not occur in interstate commerce. The mere fact that the coal might be or was intended to be used in the conduct of interstate commerce after the same was mined and transported did not make the injury one received by the plaintiff while he was engaged in interstate commerce. The injury happening when the plaintiff was preparing to mine the coal was not an injury happening in interstate commerce, and the defendant was not then carrying on interstate commerce facts essential to recovery under the Employers' Liability Act."

In Coe vs. Errol, 116 U. S. 517, it was held that logs out in New Hampshire and hauled to Errol, N. H., to be transported to Maine were not in interstate commerce, Mr. Justice Bradley, page 525, said:

> "When the products of the farms or forest are collected and brought in from the surrounding country to a town or station serving as an entrance for that particular region, whether on a river or a line of railroad, such products are not yet exports, nor are they in process of exportation, nor is exportation begun until they are committed to the common carrier for transportation out of the State to the State of their destination, or have started on their ultimate passage to that State. Until then it is reasonable to regard them as not only within the State of their origin, but as part of the general mass of property of that State, subject to its jurisdiction, and liable to taxation there, if not taxed by reason of their being intended for transportation, but taxed without any discrimination, in the usual way and manner in which such property is taxed in the State."

On page 528, he said:

> "It is true, it was said in the case of the Daniel Ball, 10 Wall. 557, 565: Whenever a commodity has begun to move as an article of trade from one State to another, commerce in that commodity between the States has commenced. But this movement does not begin until the articles have been shipped or started for transportation from the one State to the other. The carrying of them in carts or other vehicles, or even floating them, to the depot where the journey is to commence is no part of the journey. That is all preliminary work, performed for the purpose of placing the property in a state of preparation and readiness for transportation. Until actually launched on its way to another State, or committed to a common carrier for transportation to such State, its destination is not fixed and certain. It may be sold or otherwise disposed of within the State, and never put in course of transportation out of the State. Carrying from the farm or forest, to the depot, is only an interior movement of the property, entirely within the State, for the purpose, it is true, but only for the purpose, of putting it into a course of exportation; it is no part of the exportation itself. Until shipped or started on its final journey out of the State it is a matter altogether *in fieri*, and not at all a fixed and certain thing."

In order for the Federal State Commission to have the power to require the plaintiff to make reports as to the mining of coal and as to its intrastate shipments, it must appear that this information is necessary to or connected with some object over which the general government has power. There is no claim made that there is any proceeding pending, involving the Anti-Trust Act, or unfair methods of competition, or under the Clayton Act, but in its order defendant demands reports on all the business of the plaintiff.

The defendant relies upon the visitorial powers of Congress over corporations. In this connection it must be borne in mind that the power of Congress over an instrumentality of commerce, such as a common carrier, is far different from its powers over an ordinary business corporation which merely ships its products or a portion of its products over such carrier.

In fact, as said by Mr. Justice Holmes in Smith vs. Interstate Commerce Commission, 245 U. S. 33, on page 45, "It is not far from true—it may be it is entirely true, as said by the Commission (referring to the Interstate Commerce Commission)—that there can be nothing private or confidential in the activities and expenditures of a carrier engaged in interstate commerce."

Apart from the fact that plaintiff is a corporation, it is clear that Congress could not compel the production of the private books and papers of a citizen, except in the progress of judicial proceedings:

Filbourne vs. Thompson, 103 U. S., 168;

Harriman vs. Interstate Commerce Commission, U. S. 211; U. S., 407.

Mr. Justice Field, then sitting on the Circuit Court, in the case re Pacific Railway Commission, 32 Federal Reporter, 241, said: (page 250)

> "And in addition to the inquiries usually accompanying the taking of a census, there is no doubt that Congress may authorize a commission to obtain information upon any subject which, in its judgment, it may be important to possess. It may inquire into the extent of the productions of the country of every kind, natural and artificial, and seek information as to the habits, business, and even amusements of the people. But in its inquiries it is controlled by the same guards against the invasion of private rights which limit the investigations of private parties into similar matters. In the pursuit of knowledge it cannot compel the production of the private books and papers of the citizen for its inspection, except in the progress of judicial proceedings, or in suits instituted for that purpose, and in both cases only upon averments that its rights in some way dependent for enforcement upon the evidence these books and papers contain."

(And again on page 254)

> "But in accordance with the principles declared in the case of Filbourne vs. Thompson, and the equally important doctrines announced in Boyd vs. U. S., the commission is limited in its inquiries as to the interest of these directors, officers, and employes in any other business, company, or corporation to such matters as these persons may choose to disclose. They cannot be compelled to open their books, and expose such other business to the inspection and examination of the commission. They were not prohibited from engaging in any other lawful business because of their interest in and connection with the Central Pacific Railway Company, and that other business might as well be the construction and management of other railroads as the planting of vines, or the raising of fruit, in which some of these directors and officers and employes have been in fact engaged. And they are entitled to the same protection and exemption from inquisitorial investigation into such business as any other citizen engaged in like business."

But the commission claims that, inasmuch as the plaintiff is a corporation, it has the authority claimed under the visitorial power of Congress. That the power sought is visitorial in its nature is clear. For in order to give the information and make the reports required, it will be necessary (that it is, so appears from the affidavits on file) for the plaintiff to keep records and books in addition to those now kept by it and by other corporations engaged in a like business, at a considerable expense, and to make monthly reports based on calculations made from such records.

This is not the simple obligation of a witness under a subpoena *duces tocum*, to answer questions and to produce books and records for inspection, but in addition to keep records and make calculations and reports. Such a burden cannot be imposed upon an ordinary witness:

Northern Pacific Railway Co. vs. Keyes, 91 Federal Reporter 47; 4 Wigmore No. 2203, page 2989.

The Commission contends that the order served upon the plaintiff does not undertake to prescribe methods of bookkeeping, nor to keep additional records, but under the allegations of the bill and the affidavits filed, I am of the opinion that this contention cannot be sustained.

The plaintiff cannot comply with its orders of the Commission without changing its methods of bookkeeping. That the Act undertakes to vest such powers (certainly as to matters connected with interstate commerce) in the Commission is clear from Section 10 of the Act which provides penalties for any person who shall wilfully. "neglect or fail to make or cause to be made, any false entry in any account, records or memorandum kept by any corporation subject to this act, or who shall wilfully neglect or fail to make full, true and correct entries in such accounts, records or memoranda of all facts and transactions appertaining to the business of such corporation." These powers could only be justified under visitorial power.

It has been held that Congress has such visitorial power over corporations engaged in interstate commerce in Wilson vs. U. S. 221 U. S., 361, and in Ellis vs. Interstate Commerce Commission, 237 U. S., 434, but in these cases the power was limited to that portion of the business which was under the control of the Federal Government.

No such power would seem to exist however as to other matters, and the two cases referred were cases in which subpoena *duces tocum* has been issued, requiring the production of a corporation's books in the one case before a grand jury investigating charges of fraudulent use of the mail and in the other before the Interstate Commerce Commission. And in the latter case the Court, through Mr. Justice Holmes, on page 444 (237 U. S.) said:

> "If the price paid to the Armour Car Lines was made the cover for a rebate to Armour & Co., or if better cars were given to Armour & Co. than to others, or if, in short, the act was violated, the railroads are responsible on proof of the act. But the only relation that is subject to the Commission is that between the railroads and the shippers. It does not matter to the responsibility of the roads whether they own or simply control the facilities, or whether they pay a greater or less price to their lessor. It was argued that the Commission might look into the profits and losses of the Armour Car Lines (one of the matters inquired about) in order to avoid fixing allowances to it at a confiscatory rate, but the Commission fixes nothing as to the Armour Car Lines except under No. 15 in the event of which we shall speak."
>
> "The appellant's refusal to answer the series of questions put was not based upon any objection to giving much of the information sought, but on the ground that the counsel who put them avowed that they were the beginning of an attempt to go into the whole business of the Armour Car Lines—a fishing expedition into the affairs of a stranger for the chance that something discreditable might turn up. This was beyond the powers of the Commission. In re Pacific Railway Commission, 32 Federal Reporter 241. Interstate Commerce Commission vs. Brimson, 154 U. S. 447, 478, 479. Harriman vs. Interstate Commerce Commission, 211 U. S. 407. The Armour Car Lines not being subject to regulation by the Commission its position was simply that of a witness interested in but a stranger to the inquiry, and the Commission could not enlarge its powers by making the Company a party to the proceedings and serving it with notice. Therefore the matter to be considered here, subject to the qualification that we are about to state, is how far an ordinary witness could be required to answer the questions that are before the court."

In the case of a corporation doing a wholly intrastate business, could it be said that Congress had any visitorial power under the Commerce Clause of the Constitution of the United States? Clearly it has not. The fact that it happens to be the same corporation in this instance which mines and ships the coal does not give Congress any greater powers to regulation production and the intrastate commerce of such corporation. The visitorial power of Congress is limited to that part of the business over which it has control, and which under the Constitution it has the power to regulate.

In Hammer vs. Dagenhart, 247 U. S. 251, it is said (page 260):

> "While the power to regulate commerce among the several States is in the same grant and in the same terms with the power over foreign commerce, yet there is a difference with respect to the extent of that power growing out of the difference in the relation of the United States to the two kinds of commerce, and the difference in the right of the citizen of the United States and the foreigner to engage therein. As to foreign commerce, the United States possesses and exercises all the attributes of sovereignty. As to the interstate commerce, it exercises only that portion of sovereignty delegated to it."

(And again, page 261.)

> "However much the Knight Case, 156 U. S. 1, may be weakened by later decisions, its distinction between production and commerce is still effective to prevent direct Congressional regulation of production as distinguished from sale and transportation."

The power claimed by the Commission is vast and unprecedented. The mere fact that a corporation engaged in mining ships a portion of its product to other States does not subject its business of production or its intrastate commerce to the powers of Congress. Doubtless the business of every coal mining corporation, whether engaged in interstate business or not, to some extent affects interstate prices and commerce, but, as stated in U. S. vs. King 156 U. S. 1 (above.)

> [illegible] the manufacture of a given thing in- [illegible] control of its disposition, but this [illegible] ordinary sense.

No sound reason is given why there is any difference in the business of coal mining of a corporation which ships its coal to another State and that of a corporation which does not. Interstate commerce is not affected any more in the one case than in the other.

In the case of United States vs. Basic Products Co., 260 Federal Reporter, 472, in which it was urged that Section 6 of this Act was unconstitutional, not only in so far as it authorized investigation and compulsory disclosure of matters which are beyond the commercial powers of Congress, but also in so far as it attempted to authorize a search or seizure by an administrative agency of the Government without charge or suspicion, Justice Orr of the District Court of the Western District, Pennsylvania, said:

> "While the contention of counsel is probably sound, this Court does not deem it necessary to go further than to hold that the Commission has not the power to carry on investigations which it has assumed in the present case."

In the same decision he also said:

> "Imagination, if not experience, can suggest that persons, partnerships, and corporations may be engaged in interstate commerce by the transportation of merchandise solely by water; that their activities may give them their income from lighterage; or they may be engaged in the sole business of forwarding goods, with no interest in the vessels or wagons on which they are transported. The foregoing are merely the illustrations of activities which may perhaps be within the scope of the powers granted to the commission by the act as found in the fifth section thereof."
>
> "Imagination, however, cannot suggest such an extension of constitutional limitation as may justify the investigation undertaken by the commission in this case. Indeed, so far as it has been brought to the attention of the court, no such assertion of power has ever been made to the courts. Investigation under Subdivision A, Section 6, is limited to corporations engaged in interstate commerce. The defendant is engaged in manufacture."

I am of the opinion, therefore, that no such visitorial power as that claimed by the Commission in the instant case has been vested in Congress by the Constitution, nor could Congress delegate such power to the Commission.

But did Congress undertake to vest such power in the Commission? It is the duty of the courts, if possible, to give the statute a construction which would not conflict with the Constitution.

Knight Templar Co. vs. Jarman, 187 U. S., 197, 205.

The corporations referred to in the Act are, by its terms, limited to those engaged in "commerce" as defined, the Act, and all the powers vested in the Commission should be and it seems may be construed with this limitation. But the Commission has undertaken to construe the Act otherwise, and to take steps under its construction of the Act to require information and reports not relating to interstate commerce, but relating chiefly or wholly to production, and under its order the information which it has the power to demand cannot be separated from that over which it has no control.

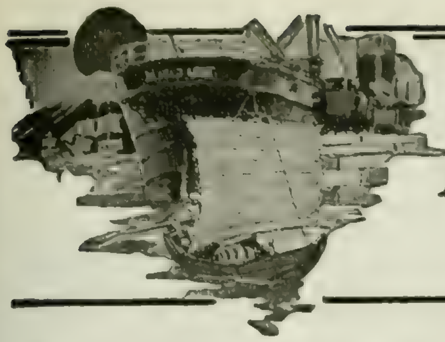
While as to other matters, as stated in re Pacific Railway Commission, supra, Congress may authorize the Commission to obtain information upon any subject, which, in its judgment it may be important for it to possess, it may not compel the production of such information in respect to matters over which the Federal Government has no control. It follows, therefore, that the Commission cannot compel the making of reports it has demanded of plaintiff.

The plaintiff further contends that this power of the Commission has been taken away by Presidential order. Much proof, in the form of affidavits, has been introduced by the defendant to show contemperaneous constructions of this order, and that the power claimed by the Commission in this case was not taken from it. The order is ambiguous, but, in view of my opinion as to the power of the Commission, it is not necessary to decide this question in passing upon application for a preliminary injunction.

Section 10 of the Act provides that "if any corporation is required by this Act to file any annual or special report shall fail to do so within the time fixed by the Commission for filing the same, and such failure shall continue for thirty days after notice of such default, the corporation shall forfeit to the United States the sum of $100 for each and every day of the continuance of such failure, which forfeiture shall be payable into the Treasury of the United States, and shall be recoverable in a civil suit in the name of the United States brought in the district where the corporation has its principal office or in any district in which it shall do business."

The plaintiff has failed to file the report demanded and the Commission has notified it that steps will be taken to recover the penalty prescribed above. The jurisdiction of a court of Equity is not questioned by the defendants, and as I am of the opinion that the commission has not the power to exact the reports and information sought, the injunction prayed for will issue upon plaintiff executing bond with surety to be approved by the Court in the penalty of $5,000.

Sgd. JENNINGS BAILEY,
Justice.



FOREIGN MARKETS AND EXPORT NEWS

Finland Neither Produces Nor Exports Coal

Commenting on the coal situation in Finland, Consul Leslie A. Davis, Helsingfors, states that that country produces no coal, lignite, nor coke, and exports none. The amount of coal and coke consumed in Finland during the period from 1913 to November, 1919, corresponded with the amount imported into the country during the same period.

The principal consumers are electrical and gas works, shipyards, and steamers. The factories have consumed some, but most of them, although equipped for burning coal or coke, have been obliged to use wood. Practically no coal has been used by private persons for heating purposes since 1913, as it has not been obtainable in sufficient quantities. Peat is used more or less for heating houses, especially in the northern part of the country; but wood is the kind of fuel in general use throughout Finland.

All the coal and coke imported comes from England. The greater part has come to Helsingfors, but some has been brought to Hango, Abo, and Viborg. The only special discharging facilities are those of the gas works at Sornas (Helsingfors), which can discharge about 500 tons a day. Coal is unloaded elsewhere by wheelbarrows. All the coal and coke brought to Finland is consumed in the ports of entry. Consequently, there is no transportation of coal by land.

Imports of coal and coke from 1913 to November, 1919, were as follows:

	Coal		Coke	
Years	Long Tons	Value in Finnish Marks a	Long Tons	Value in Finnish Marks a
1913	528,518	13,424,381	4,787	1,459,154
1914	212,916	5,422,150	12,243	373,187
1915	4,490	684,609	2,843	742,151
1916	17,357	3,526,971	11,980	6,085,948
1917	8,988	734,350	7,130	3,622,152
1918	24,846	10,057,562	1,263	663,059
Jan.-Nov., 1919	29,401	14,423,591	5,060	1,885,631

a The normal exchange value of the Finnish mark is 19.3 cents. It is greatly depreciated at present.

Owing to the non-production of coal in Finland, and to the limited amount imported, there are no questions of capital and labor. Coal consumption and trade will be considerably increased by the resumption of normal shipping, as there is a persistent demand for coal at almost any price.

Coal Exports for February Show Large Increase

Exports of bituminous coal totaled 1,168,806 tons during February; of anthracite, 272,368, a noteworthy increase compared with the same month of 1919. The classification of February exports as well as figures for February, 1919, have been compiled by the Bureau of Foreign and Domestic Commerce. They are as follows:

	Feb., 1919 Tons	Feb., 1920 Tons
Coal:		
Anthracite	216,018	272,368
Bituminous	683,708	1,168,806
Exported to (in part)		
Italy	4,933	81,739
Netherlands	15,076	49,634
Canada	446,429	541,270
British West Indies	13,756	17,906
Cuba	40,644	130,846
Argentina	38,993	70,902
Brazil	67,825	47,241
Coke	48,806	59,866

The following tables show exports of domestic coal and coke from the United States by countries, as well as by customs districts, and also bunker coal supplied to vessels in the foreign trade at specified districts during February, 1920:

COUNTRIES TO WHICH U. S. COAL WAS EXPORTED

	Coal		
	Anthracite Tons	Bituminous Tons	Coke Tons
Azores and Madeira Islands		1,501	
Belgium			510
Denmark		5,878	
France	7	72,649	
Greece	5	18,669	
Italy	192	81,739	
Netherlands	520	49,634	
Norway			35
Poland and Danzig		6,762	
Roumania		2	2
Russia in Europe		6,470	
Spain		3,351	3
Sweden		8,886	
Switzerland	7,651	17,123	
Bermuda		5,340	
British Honduras		53	
Canada	254,958	541,270	34,119
Guatemala	50	50	3
Honduras	300	750	6
Nicaragua		150	
Panama	289	30,692	
Mexico	339	11,263	17,297
Jamaica		5,436	
Trinidad and Tobago		3,567	
Other British West Indies		8,903	
Cuba	7,366	130,846	87
Danish West Indies		2,212	
Dutch West Indies		8,617	
French West Indies		831	
Dominican Republic	688	1,919	3
Argentina		70,902	
Brazil		47,241	
Chile		18,353	2,919
Colombia	3		
Ecuador			10
Peru		10	4,862
Venezuela		1,800	10
China		10	
Egypt		5,927	
Totals	272,368	1,168,806	59,866

COAL EXPORTS BY CUSTOMS DISTRICTS

	Coal		
	Anthracite Tons	Bituminous Tons	Coke Tons
Maine and New Hampshire	5	1,961	100
Vermont	[illegible]	82,609	272
St. Lawrence	85,9[illegible]3		1,070
Rochester	[illegible]	44,762	
Buffalo	164,519	291,795	20,898
New York	2,933	2,858	1,926
Philadelphia	13,717	49,622	
Maryland		67,462	6,429
Virginia		423,841	86
South Carolina		62,222	
Georgia		6,557	
Florida	1,300	189	
Mobile		52	
New Orleans	390	5,181	177
Sabine			42
San Antonio	106	575	
El Paso	190	6,998	6,927
Arizona		1,750	10,149
Southern California	3	38	
San Francisco		1	11
Washington	46	307	54
Dakota	110	2,209	301
Duluth and Superior	558	13,320	93
Michigan	49	104,317	11,331
Porto Rico		180	
Totals	272,368	1,168,806	59,866

BUNKER COAL

Districts:	Tons
Maryland	29,157
New York	191,128
Philadelphia	38,960
Virginia	140,891

Freight Rates to Europe Advance

Freight rates to Europe, according to W. W. Battle & Co.'s coal trade freight report, are higher than a week ago but to other destinations they are unchanged.

Rates by steamer are as follows:

	Rate	Tons Displaced
Stockholm	About $23 00 —	800
Gothenburg	22 00 22 50 —	1,000
Antwerp/Rotterdam	19.50/20 00 —	1,000
Hamburg	21 50 22 00 -	1,000
French Atlantic excluding Rouen	19 50/20 00 —	800
Lisbon	18 00 19 00 —	1,000
Barcelona	21.50/22 00 —	1,000
Algiers	21.50/22 00 —	800
Genoa/Leghorn	22 50/23.00 —	1,000
Spezia Savona	22 50 23 00 -	1,000
Piraeus	24 00/25 00 —	1,000
Trieste Venice	About 24 00 —	1,000
Port Said	About 26.00 —	1,000
Constantinople	About 26.00 —	500
Pernambuco	About 15.50 —	500
Bahia	About 15.50 —	500
Rio	14 25 14 50 —	1,000
Santos	15.00/16.00 —	600
Buenos Aires or La Plata or Montevideo	13.00/13.50 —	1,000
Para	About 14 50 —	500
Rosario	15.50/16.50 —	750
Bahia Blanca	About 16.00 —	1,000
To Nitrate Range	9.00/10.00 —	750
Havana	6 00 6 50 -	600
Sagua or Cardenas	8.00/ 8.50 —	300
Cienfuegos	About 8.00 —	500
Caibarien	8 00/ 8.50 —	300
Guantanamo	About 8.00 —	500
Manzanillo	About 9.00 —	300
Bermuda	7 00 7 50 —	300
Bermuda p. c. and dis. free		
Kingston	About 9 00 —	400
St. Lucia	About 9 50 —	500
Barbados	About 9.50 —	500
Santiago	About 8.00 —	500
Port of Spain, Trin.	9.50/10.00 —	500
Curacao	8 50 9 00 —	500
Free p.c. Curacao		
Demerara	13 00 —	400
St. Thomas	8.50 9 00 -	500

All above rates gross form charter.

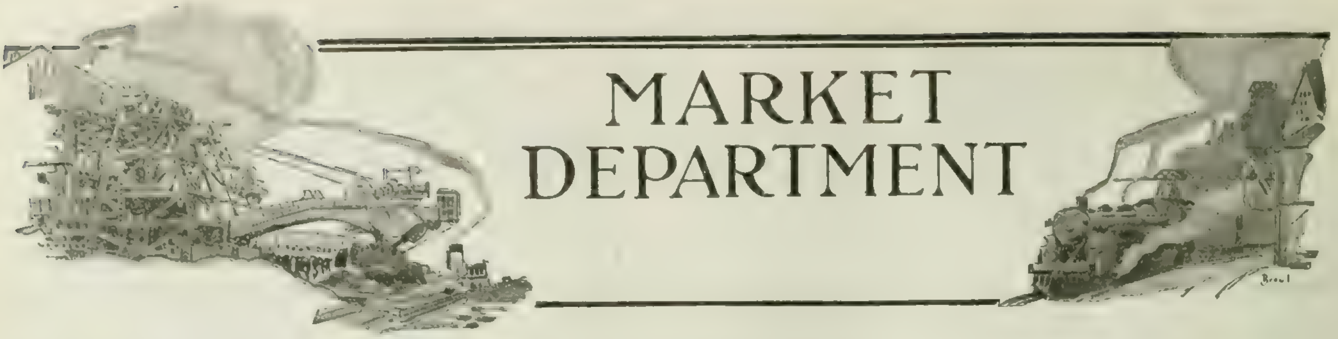
Turkey Plans to Increase Production of Lignite

Turkey's lignite mines are a striking illustration of that country's mismanagement of coal matters, according to the *Tasfiri Efkiar*, a Turkish newspaper. During the war these were exploited by the Government and the people, but after the armistice was signed work at the mines almost ceased.

The president of the "Commission d'Approvisionment" declares that the lignite mines of Agatchli are in bad condition and that the Ayazma mines alone are being exploited by the "Direction des Usines de Guerre 'Imalati Harbié." The commission has studied this matter and has decided to employ all possible methods to increase production. For this purpose it has been decided to employ about two hundred Chinese laborers in the mines. The Ayazma mines are producing forty metric tons daily, but efforts will be made to increase this output.

British Guiana Imports Coal

All coal consumed in British Guiana, states Consul McCunn, has to be imported, as none is produced in the colony. The quantity imported from the United States and Great Britain in 1918 was 86,600 tons, whereas in 1919 only 11,090 tons were received because of the lack of coal importations from the United States and and the curtailment of those from Great Britain. In February the market was bare of all supplies. Georgetown is not a coaling station, and ships expecting to bunker there will generally meet with disappointment [illegible] be obliged to pay very high prices [illegible] coal procurable.



MARKET DEPARTMENT

Weekly Review

Demand for Coal Is Keen Everywhere—Western Conditions Are Improving—Hampton Roads Handles Cars More Speedily Than Before—Assignment of Cars for Railroad Use Seems Certain—Runaway Market in Evidence—Hard-Coal Situation Is Alarming

WHEN the railroad strike is at an end, and from present indications it soon will be, many operators foresee the danger of a wild opening of the coal market and much speculation, together with fancy prices. It is hoped that this may be avoided, for if it is not the Government probably will resume price control.

Conditions in the West have improved in the past week. A better car supply has been reported, the "outlaw railroaders" having returned to work in that region. However, the effects of the acute shortage can still be seen in the cities, some of the large manufacturing plants having been forced to close, thus causing many men to be laid idle. Few dealers have been fortunate enough to renew last year's contracts for Eastern coal, and as a result these coals have practically disappeared from the Western market.

At Hampton Roads car supply has improved to such an extent that bottoms for which coal has been arranged are being loaded with almost normal dispatch, and coal continues to be in active demand. In that locality more than a few signs are seen of a runaway market, $9 having been paid for spot coal.

In New England the situation is possibly worse than in any other part of the East, and coal traffic is almost at a standstill. For quite some time the railroads have been operating on narrow margins and, no relief being in sight, a large portion of coal moving on the lines of the New York, New Haven & Hartford R.R. was confiscated by that road, thus leaving those plants to which the coal was destined in a serious plight.

Because of the tactless methods used by the railroads last year many of the operators in the coal industry have refused to renew last year's contracts, even though the purchasing agents are willing to pay higher prices. With conditions such as now rule furnishing an excuse, the practice of "assigning cars" for railroad service will undoubtedly be restored, but even at that the railroads will have much difficulty accumulating reserves.

With the continuance of the boatmen's strike and embargoes still effective as a result of the switchmen's strike, conditions in the hard-coal industry are becoming alarming. Barges and tugs are tied up at the loading ports, and because of the few destinations to which shipments are permitted the tonnage shipped has been small.

The railroad strike has hit both the byproduct and beehive coke industry. On account of the unusual car shortage the byproduct ovens have been unable to secure stocks of coal such as they usually carry when conditions are normal, and these ovens are now suffering from an extremely severe shortage. Some fancy prices were paid for foundry coke, some reaching $15 a ton, but most of the operators are resisting such increases and regard $15 as a limit that should not be exceeded.

WEEKLY PRODUCTION

The weekly report on the production of bituminous coal, anthracite, and beehive coke compiled by the Geological Survey, Department of the Interior, April 17, 1920, states that the rate of production during the week ended April 10 was almost exactly the same as that of the preceding week. The total output of soft coal, including lignite and coal made into coke, is estimated on the basis of railroad shipments at 9,773,000 net tons. The line of 1920 production continued its course above the years 1917 and 1919 but failed to recover from the depression attending the advent of the new coal year as promptly as did the 1918 line.

The cumulative production in tons since the beginning of the calendar year follows with comparative figures for the three years preceding:

	Production [illegible] working [illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

[illegible] tons.

[illegible] the depression of the preceding week but failed to reach the level recorded in the [illegible] week of [illegible] Coal [illegible] rially reduced the output. It was, however, 26 per cent less that that of the week of March 27.

The cumulative production since Jan. 1, 1920, now amounts to 23,043,000 net tons, an increase of 2,680,000 tons over the corresponding period last year, when the dull market prevailed which affected the coal after the armistice.

Production of beehive coke during the week ended April 10 is estimated at 477,000 tons, an increase of 1,000 tons over the revised figures for the preceding week. These estimates are based upon shipments reported by the principal carriers. Because of changes in organization attending the transfer of the railroads to private operation, the returns have in some instances been delayed and the figures presented are therefore subject to revision.

Compared with the corresponding week last year, when the post-war slump in demand had set in, the week's production showed a substantial increase. The cumulative production from Jan. 1, 1920, to April 10, amounted to 6,427,000 tons, as against 6,554,000 tons during the corresponding period last year.

Atlantic Seaboard

BOSTON

Coal traffic almost at a standstill.—Railroads in need of fuel.—Industrial consumers anxious.—Dumping at New York and Philadelphia piers much curtailed.—Hampton Roads dispatch improved.—High prices prevail at rehandling points for inland delivery.—Anthracite receipts extremely light.

Bituminous—Except [illegible] the Boston & Albany and [illegible] the New Haven there is only a very light volume of coal moving. The New York Central embargo against the Boston & Maine is still in effect, with no material improvement in sight. The New England roads are short of motive power and it will probably be several weeks before they can catch up. The fact that the railroads in this territory in themselves have been practically unaffected by the switchmen's strike is favorable for an earlier clearing up than would otherwise have been the case.

It develops that the railroads here are operating on very narrow margins of supply. Certain of them are removed to be down to 10 days, in any case, they have renewed wholesale confiscation of commercial coal in transit. On some of the railroads practically all of this coal was shipped prior to April 1, either on last year's contracts or on the recent Government price. The result is that a large number of consumers who have been deprived of their low-priced coal are irate over the necessity of now replacing this fuel at much higher prices.

The railroads are naturally finding it very difficult to arrange new contracts. Operators, many of them, are inclined to resent the tactless methods used a year ago and while some railroad purchasing agents are intimating their willingness to pay market prices they are at their wits' ends to know what to do to secure coal. "Assigned cars" are certain to be restored under present conditions, but even at that there is every prospect that railroads will have a lot of difficulty accumulating their reserves.

Steam users are so well aware of the general fuel situation that the trade is hearing very little from them. It is realized that shippers are helpless for the most part and that until traffic is again being handled by the roads to and about

New York there will be very little chance of relief. Those who took advantage of opportunities a month ago to get steam anthracite are in that much better position.

At New York and Philadelphia dumping practically ceased on April 12. One of the New York piers has been worked spasmodically, but the Philadelphia and Reading piers at Philadelphia were out of commission the whole week. Coastwise tugs that ordinarily bunker at New York have been held at New London or Providence awaiting adjustment of present difficulties.

Hampton Roads coals are in active demand. Car supply and movement have improved to such extent that bottoms for which coal has been arranged are meeting with almost normal despatch. Very high prices are reported for spot coal. No. 9 has been realized per gross ton f.o.b. vessel and this nets very close to $7 at the mines. At the piers there are more than a few signs of a runaway market. Retail dealers here with important requirements dependent upon them and not enough Pocahontas or New River due them on contract are at a loss which way to turn.

Correspondingly high prices are being realized at this end. $10.50@11.50 is still quoted on Pocahontas and New River on cars Providence and sales have been made at $12 per gross ton f.o.b. Portsmouth, N. H.

Pocahontas and New River on contract are being sold at $4.@$4.25 per net ton f.o.b. mines plus the 13 per cent wage increase. Spot coal is quoted f.o.b. mines at $5@$6.75.

Anthracite—Because of embargoes and the switchmen's strike at the piers the volume of domestic sizes headed for this territory is extremely light. Barges and tugs are tied up at the loading ports and all-rail there are so few destinations to which shipments are permitted to be made that the aggregate tonnage is small.

Another week of such conditions and the public will be getting alarmed. Not in years has the first half of April passed with so meagre a record of shipments.

NEW YORK

Railroad strike depletes coal stocks at the New York Tidewater.—Anthracite situation is serious.—Local yards are nearly bare of coal.—Steam sizes scarce.—Government and railroads confiscating coals.—New England situation improves.—Towboat owners get high rates for towing boats.—Local public utility corporations receive supplies.

Anthracite—Receipts at New York Tidewater have been seriously affected by the railroad strike. The loading piers are nearly bare of coal and what remains cannot be moved because of the refusal of the loaders to work while the railroad employees are idle. Another factor in the situation was the strike among the towboat men. This seriously interfered with deliveries and the few who remained at work were not willing to take the chances necessary to get the loaded boats from the loading piers to the retailers' dock.

The local situation is quiet. Coal is wanted but dealers cannot get it, although it is said there are many cars on sidings between here and mines. Retail dealers are in a serious condition. The smaller yards are nearly bare of coal and a continuance of present conditions for another week would find the city yards almost, without an exception, bare of supplies.

The smaller sizes are extremely short. Because of the strike of the railway employees no coal has been coming forward and the yard stocks have been reduced considerably because of the heavy consumption due to the unseasonable weather conditions. Buckwheat and rice are practically out of the market while the only available of the smaller sizes were barley and birdseye.

Current quotations for company coal per gross ton at mine and f.o.b., Tidewater, at the lower ports are as follows:

	Mine.	Tidewater.
Broken	$5.95	$7.80
Egg	6.35	8.20
Stove	6.60	8.45
Chestnut	6.70	8.55
Pea	5.30	7.05
Buckwheat	3.40@3.75	5.15@5.50
Rice	2.75@3.25	4.50@5.00
Barley	2.25@2.50	4.00@4.25
Boiler	2.50	4.25

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—The local bituminous market is upset because of the railroad troubles and the scarcity of coal at this Tidewater. Supplies at the loading piers are down to rock bottom, with no prospects of betterment until the labor troubles are at [illegible] which is a [illegible].

Although there are several hundred thousand tons of coal on the railroad sidings between the docks and the mines the railroads cannot move it because of the strike of the switchmen. Then conditions have suffered from the refusal of the loaders at the piers to load the boats waiting [illegible]. Another difficulty [illegible] failure to secure tugs to bring loaded docks to the city at reasonable rates. In some instances it is said that buyers have been quoted as high as $250 to have a loaded boat towed to this city from the lower docks. Because of these high rates many of the ordinary consumers have run short of fuel and are on the verge of being forced to close their plants.

Supplies at the loading docks have become so small that the Federal Government is reported to have decided to confiscate what remains for its own use or for the use of public utilities. The coaling of tugs was also stopped at some of the docks. The railroads are also confiscating coal.

Reports from the Lake ports indicate a serious lack of coal due to the railroad strike. The situation in New England has improved considerably the past week and a general industrial shut down was averted. The harbor strike shut off shipments to New England points by water routes and via the Harlem River.

Local stocks are low, the receiver of coal on contracts being in no better position than the buyer of free coals. Because of conditions there are many shippers who refuse to quote prices on the ground that it would be impossible to make deliveries.

Of 81 boats at the lower ports the early part of last week, 61 had been taken away up to Friday. Quotations on loaded boats ranged from $10@$15, depending upon the quality of the coal, while those who had coal at the docks made quotations ranging from $4.25@$5.25, according to grade and quality.

Production slowed down because of the lack of cars and mine quotations were hard to obtain. Local public utility corporations are well supplied with fuel and are receiving their daily allotment.

PHILADELPHIA

Anthracite trade upset by rail strike.—Retail stocks soon depleted. — Embargo against shipments into city.—Consignments to line points, but deliveries few.—Plants running short of fuel.—Bituminous trade almost at standstill.— Orders taken subject to delivery by railroads.—Little price change.

Anthracite—The railroad strike has badly crippled the anthracite industry. At this writing the yards in the city after one week of the strike are practically empty and even should the strike be settled at once, it will take the biggest part of another week before they will get enough coal to keep them going. The dealers who have had some sort of stock on hand are doing their best to parcel it out to the utmost advantage of their trade.

Inasmuch as April to date has been unusually cool, coal burning continues and there is a strong demand for small lots of coal for immediate use. Retail dealers are almost a unit in deciding not to let any one customer have more than a ton of coal at a time, and are of course giving special preference to consumers with illness in the home. Even under these conditions the people, still beset by the fear of high prices, are endeavoring to accumulate stocks of coal.

With the oncoming of the strike the city proper was soon embargoed against receiving consignments from the mines and the only coal that has gotten on the market has been a few stray cars that had reached the freight yards before the trouble began. In a few instances volunteer switching crews have made deliveries of such shipments to the dealers, until at this time there is very little fuel near the city.

During the first few days of the strike its effects were not nearly so noticeable in the mining region and the movement of cars was continued there with a fair degree of certainty.

This condition also gave the dealers an opportunity to move the accumulation of screenings which usually reached the top at this time of the year and which ordinarily the coal man is glad to have moved at a nominal price. There was also a good tonnage of steam sizes in transit, but this is fast being diverted to the public utility plants, such as city water works, and also is being taken by the railway companies for engine fuel.

The bituminous trade is almost at a standstill. Many of the houses still continue to solicit orders at prices ranging from $4.75@$5.25 f.o.b. mines for Pennsylvania steam, [illegible] with gas coals around $5.50 f.o.b. mines, both Pennsylvania and Fairmont. However, all orders are taken subject to the ability of the railroads to make delivery. As is natural under present conditions the car supply at the mines is quite meagre and it is only a question of [illegible] before they will be compelled to close entirely, as with no supply [illegible] of the region this can be the only result.

There are just a few lines of railroad in this vicinity that are not entirely embargoed and manufacturers able to receive [illegible] f.o.b. mines regardless of quality, and usually it is not difficult to make a sale, as no concern wants to shut down and is willing to take a chance on what offers. With the market in its present state no shipper is anxious to make contract, although some consumers who have been slow in this respect are still seeking to cover themselves.

BALTIMORE

Strike tie-up on railroads makes fuel situation desperate.—Curtailment of plants but no big closings at time of writing.—Movement and car supply dwindle steadily.— Most firms here stop open selling.—Hard-coal men can afford to drift.

Bituminous—With Baltimore and vicinity in the grip of an almost complete suspension of railroad movement because of the strike the fuel situation here this week has been desperate. Up to this writing no big closings have been noted of industrial plants, but a number have been near the danger line and some curtailments have been noted. In one case a big water company which supplies a large part of the suburban territory of Baltimore had but a few hours supply of coal but got relief when the Baltimore & Ohio apportioned some of its own fuel to keep the public utility running.

This railroad at this time reports a car supply at the mines of only 12 per cent and on the Eastern lines, only 10 per cent. The number of cars loaded daily now is below the thousand mark, while the supply at the Baltimore & Ohio and Western Maryland pool at Curtis Bay has dropped to 2,015 cars. There are less than 500 cars at the Canton pier of the Pennsylvania, and the line points near the city have been swept clear of reserve fuel. With twenty-one steamers in the stream here waiting to take on about 98,000 tons of coal the issuance of permits is being tightened, and another tie-up of export movement is in sight unless the relief comes quickly.

A conference in Baltimore this week to adjust wages, etc., as between the Northern West Virginia Coal Operators' Association and the officials of District 17, United Mine Workers of America, worked out a plan of adjustment which promises to settle any chance of controversy in that section.

There is not much talk of stable prices in this section just at present. Contracting is going on at rates ranging from $4.50@$5.25 f.o.b. mines for various grades of both steam and gas coals. The spot market is some 50c. higher in most cases, where there are any sales at all at present. Most of the big concerns here are refusing to sell in the open market and are devoting their attention to getting the meagre supplies received into the hands of old consumers on old or new contracts.

Anthracite—The hard-coal men are mainly lying back and waiting in the present crisis. The fact that deliveries have practically ceased does not worry as it would in days of cold weather. There is practically no urgent demand here for immediate delivery and what is in evidence can be cared for from stocks in the city, although they are by no means liberal.

Eastern-Inland

PITTSBURGH

There was full production last week by the river mines of the Pittsburgh district while there was very little production by the rail mines, on account of the railroad strike.

Monday there was rather light placement of empties, but the mines had considerable numbers left over from the preceding week, and the day's production was but little below normal, and there was some production Tuesday, but in the rest of the week, and up to this writing, there has been practically no operation of the rail mines. The coal loaded early in the week was moved by railroads to sidings or to scales at yards and did not get any farther.

As the rail strike ends the railroad man-agencies will devote their first attention to the movement of foodstuffs and perishables, coal probably coming next. Quick return of empties is improbable, and for perhaps two or three weeks after the rail strike is really over car supplies may be poorer than they were just before the strike.

Eventually an inadequate car supply is expected, of course, and while that will uncover a labor shortage leading operators of the district predict that there will be enough coal for all regular requirements, including current demand and lake demand, with probably a little for stocking at the rates previously observed by large consumers, but the common feeling is that there will be no coal for the extra stocking that is being urged.

Operators admit the principle may be good, in general, but hold it is not applicable to the Pittsburgh district, on account of the lake business of the district. Not infrequently the district has shipped more coal in summer than in winter.

There has been practically no market the past week, but prices may be regarded as nominal on the same level as last quoted: Contract steam, $3.25@$3.50; contract gas, $3.75@$4; prompt coal, $4@4.50, per net ton at mine, Pittsburgh district.

COLUMBUS

With the switchmen's strike on, practically no coal is being mined in Ohio.—Car supply has been gradually reduced to a point where none are available.—There is a good demand for all grades and prices continue strong.

Just at the time when details of the new wage scale were being worked out and some betterment in the car supply was noted, the switchmen's strike occurred, and, as a result, production in Ohio fields is almost nil. The strike did not have its full effect until early in the week of April 12, when empties stopped coming into the mines. By the middle of the week every mine in Ohio was completely tied up and will remain so until the strike is settled and the trainmen resume work.

The cutting off of the fuel supply is already affecting many industries, more especially public service concerns. Their reserves were small, because of continued car shortage and many were operating with less than two weeks' supply. Hospitals were also rather short of fuel and some special effort was necessary to supply them. Manufacturing concerns were not very well stocked with the exception of rubber factories which were not affected. Some factories were compelled to go on a half-time basis to conserve fuel.

The domestic trade is also active, as dealers are in the market for stocks to take care of householders who desire to lay in stocks early. All coals are in strong demand with Pocahontas the strongest feature. With only 50 per cent of former Pocahontas tonnage allotted to this territory there is a scramble for available tonnage.

Retail prices are strong at the levels which have prevailed for several weeks. Most of the Columbus dealers have small stocks to take care of current business. Hocking lump sells at $7.50, delivered with mine-run at $7.25; Pomeroy lump and mine-run are quoted at the same figures. West Virginia splints sell at $8.50 for lump, and $8.25 for mine-run while Pocahontas is about $10@$10.50 delivered.

Prices at the mines of the principal coals sold in Ohio are:

Hocking lump	$3.75
Hocking mine-run	3.50
Hocking screenings	3.25
Pomeroy lump	4.00
Pomeroy mine-run	3.75
Pomeroy screenings	3.50
West Virginia splints, lump	4.50
West Virginia mine-run	4.25
West Virginia screenings	4.00
Pocahontas lump	5.75@6.00
Pocahontas mine-run	5.50@5.75
Kentucky lump	4.75
Kentucky mine-run	4.50

CINCINNATI

Railroad strike has had little effect on the situation here. Enough fuel is arriving daily from the fields in Kentucky and West Virginia by way of the Ohio River to keep the domestic and industrial consumers supplied.

Had not the industrial plants purchased [illegible]

[illegible]

More than 100 shippers of lake coal from Kentucky and West Virginia representing the output of many mines, assembled last week for a conference with H. M. Griggs of Cleveland, Chairman of the Ore and Coal Exchange Commission, and the heads of seven railroads in an effort to arrange better traffic and shipping conditions between the fields and ports of the great lakes.

Southern

LOUISVILLE

Production very light, with car shortage chronic.—Retailers buying practically no coal except for immediate use; and industrial consumers buying only where they have to.

Due to continued car shortage production continues very light, and due to the switchmen's strikes in various cities, movements of cars has been further checked. Embargoes have been numerous, and this has probably aided somewhat such districts as are not suffering from strikes or embargoes.

While general demand for coal at present prices is comparatively light, even a light demand is more than operators can expect to fill and at the same time fill contract orders under existing condition. The result is that such new business as it taken must carry a price to offset the present heavy operating costs.

Contracts are not wanted and not even discussed to any extent as neither retailer nor industrial consumer has any idea of stocking coal at present markets. Everyone feels that a near normal value will be re-established in event of a 75 per cent car supply. However, there is no real reason for expecting a good car supply for some time to come under existing conditions.

Prices of industrial coal are too high for buying except of needed coal by byproduct and utility plants, and manufacturers and users who are close to the bottom of their supply. Many of these still have contracts.

There really is not much of a market as prices are not at all standardized, and it is merely a question of how much coal an operator has to offer, and how badly the buyer needs it. Very few operators have much surplus production at best.

Prices show practically no change other than that some individual operators are getting even more money, than they were last week. Quotations at mines show that Eastern Kentucky is quoting around $4.50@$5.25 for lump; mine-run, $4.00@$5; Natchez & Southern, $3.50@$4. Western Kentucky, lump, $3.25 a ton; mine-run, 2.85@$3.00; Natchez & Southern $2.50@$2.60, fine screenings, $2.25@$2.40.

BIRMINGHAM

With transportation facilities slightly improved, coal is moving more satisfactorily and production is showing some increase.—Market continues to show great strength for all grades coal.—Some contracts have been executed with domestic dealers, but contracting for steam coal has not assumed any proportions as yet.

The movement of coal is slightly smoother and more satisfactory than last week, some improvement being made in the car supply furnished by the coal-carrying lines. Following the institution of injunction proceedings against the Southern Ry. for preferential car supply to contract mines on its lines an amicable adjustment of the trouble has been reached whereby non-contract operations are to furnish the railway company the deficiency in tonnage received from mines holding contracts for fuel coal at an advance of 50c. per ton above government prices for the respective grades, which will about equal present quotations.

Proposals furnished on fuel requirements of the Louisville & Nashville, and Frisco RR. for the year ending April 1, 1921, have not yet been acted upon by these lines, the price of fuel furnished since April 1, being subject to adjustment on basis of figures agreed upon when contracts are executed. Contracting for steam coal has not made much progress as yet, awaiting stability in mine prices. Spot demand strong. Quotations are as follows per net ton mines:

Coal District	Lump	Prepared
Big Seam	$2.95@3.35	$3.45
Black Creek	4.00	4.45@4.50
Cahaba	4.00@4.35	4.35@4.50
Carbon Hill	3.35@3.50	3.50
Pratt	3.35@3.50	

Some domestic contracts are being made [illegible] April 1 [illegible] price providing for [illegible] per ton through September and in some instances a maximum price has been fixed for deliveries after September, there being a desire on the part of the larger representative distributors and producers to throw some safeguard about a runaway market, which is a natural probability account of the strong demand and short supply, which conditions will likely exist throughout the year, both as to domestic and steam coal. April quotations are as follows per net ton mines:

Coal District	Lump
Big Seam	$3.25@3.50
Black Creek	4.50@5.50
Cahaba	4.50@6.00
Carbon Hill	3.50@3.75
Montevallo	6.75@7.00
Corona	4.50

Lake Region

BUFFALO

No coal of account moving.—Striking switchmen are cutting out all traffic—Promise of an early return to work—Pittsburgh standing still.—Next to no anthracite.

Bituminous—It seems that the coal trade is beset by either one thing or another continually. If it is not car or price complications, it is something worse. At present scarcely a wheel is turning in the freight lines of the railroads from the switchmen's strike which came this way from Chicago, and at present is tying this city up worse even than the centers further West. It is said that Buffalo and Pittsburgh are now the center of the difficulty, which means that it will not last much longer.

So far there has not been much real distress from the lack of coal. Quite a good many factories have had to shut down, but there is still coal for public use and it is likely to hold out to the end of the strike. If the failure of the strike, as seems to be certain now, would lessen the evil and menace of that sort of thing it would be worth all it has cost.

In a time like this prices mean little, so that the following list will have to be taken as mostly a reminder of what coal did sell for when we had any to sell: Allegheny Valley, all as mine-run, $5.75@$6; Pittsburgh and No. 8, lump, $6.25@$6.50; same, mine-run, $6@$6.25; Youghiogheny gas, $6.50@$6.75; Smokeless, $6.50@$6.75, Pennsylvania smithing, $6.75@$7, per net ton, f.o.b. here.

Anthracite—The trade is at a standstill, or pretty nearly, for all supplies are side-tracked somewhere outside, where it will remain till the strike is over. At the same time shippers and retailers have managed to keep some business going and are even delivering some coal. The weather has not been up to normal warmth, so that natural gas gave out, much as it used to do in zero weather. Some furnaces that were refitted for gas when the prohibited period passed, had to be restored to coal-burning.

TORONTO

Receipts very light owing to railroad strike.—Dealers refusing orders.—Bituminous increasingly scarce.—Industrial plants facing crisis.

Owing to the railroad strikes in the United States coal has only been received in very small quantities since April 7. The domestic demand was largely increased by the unseasonably cold weather, but dealers owing to the shortage were unable to accept orders except in cases of emergency.

Bituminous is increasingly scarce but so far the industrial plants have been kept in operation though unless a speedy improvement takes place it is feared that many will have to close down, as a crisis is rapidly being reached.

Quotations for short tons are as follows:

Retail

Anthracite egg, stove, nut and grate	$14.00
Pea	12.50
Bituminous steam	12.50
Domestic lump	12.00
Cannel	[illegible]

CLEVELAND

Movement of coal into Cleveland virtually stopped on April 10, the two chief coal roads of Cleveland being the hardest hit by the strike.—Biggest stock piles in the district, at the outset of the strike, promised only two weeks' operations. Spot coal prices appear ready to soar.—First lake coal cargo of the season is on its way to Lake Michigan.

Bituminous—Practically no No. 8 coal has moved into Cleveland or northern Ohio since April 10. Although some improvement is noted in the strike situation on the Pennsylvania, New York Central and Erie railroads, no wheels are turning on the Baltimore & Ohio while the Wheeling & Lake Erie's sole crew is composed of other employees. Since the last two roads are the city's chief coal roads, the movement has practically ceased. A fair tonnage of No. 8 coal, estimated from a week's to ten days' supply, is on track between southern Ohio and Cleveland, and will be moved into the district once railroads again operate.

But the real pinch is looked for about ten days after the strike has been ended. Movement of empties toward the mines has come to a dead stop. The result is No. 6 and No. 8 district mines are operating at from 10 to 15 per cent of capacity. Were the strike to come to an end immediately—and the outlook for a long or short strike is about equal—operations at the mines for the remainder of April will be dangerously low, operators fear. Industrially, coal is the chief factor in the strike, and when present supplies are exhausted operations will cease.

Contracting has been almost completely checked by the strike, as operators are more uncertain than ever of their production over the remainder of the year. The longer the strike lasts the fewer are the chances that the present contract levels of \$3.25@\$3.50 f.o.b. mine, will sag in the latter part of the summer, operators declare. To date most of the contracting has been done at around \$3.25, f.o.b. mine, for No. 8 slack and mine-run. In one instance \$4 is reported done on contract.

Anthracite and Pocahontas—These grades, like bituminous, have been shut off by the strike, but the effect is scarcely noticeable. Slightly better demand is reported for anthracite, with which dealers' yards are heavily stocked. On Pocahontas, dealers are about three weeks' behind in deliveries.

Lake Trade—Two Great Lakes freighters, one laden with bituminous coal and the other with anthracite, are forcing their way through the ice at Mackinaw, bound for Lake Michigan ports. The anthracite cargo will go to Milwaukee; the bituminous cargo will be split among Green Bay, Sheboygan and Manitowoc. Bituminous coal is acutely short at Lake Michigan ports and some lake freighters wintering at Manitowoc cannot move until they are coaled.

Prices of coal per net ton delivered in Cleveland by dealers are:

Anthracite—Egg, \$12.20@\$12.40; grate, \$12.20@12.40; chestnut, \$12.50@\$12.70; and stove, \$12.50.

Pocahontas—Shoveled lump, \$10.50; and mine-run, \$9.25.

Domestic bituminous—West Virginia splint, \$8.75; No. 8 Pittsburgh, \$7.75; Millfield lump (formerly Coshocton lump), \$8.50; Cannel lump, \$11.00.

Steam coal—No. 6 and No. 8 slack, \$7.50; No. 6 and No. 8 mine-run, \$7.50; and No. 8 ¾-inch lump, \$7.75.

DETROIT

With shipments cut off by the railway strike, Detroit experiences serious coal shortage.

Bituminous—Once again, Detroit is being subjected to a policy of rigorous conservation of fuel. This situation is brought about by the strike of railway switchmen, which has cut off practically all shipments of coal into the city, as well as other freight. The cutting off of railroad transportation facilities came at a time when neither the steam-coal users nor the retail dealers had much stock on hand, as shipments since termination of the mine strike had lacked sufficient volume to make possible the restoration of depleted reserves, and at times were scarcely adequate to meet requirements for current consumption.

With a shortage virtually existing, the railway strike quickly brought the city into difficulty. The Detroit Edison Co. found it necessary to discontinue power service to all industrial plants, April 12, with the exception of those manufacturing food products, to conserve its current as far as possible for the use of homes. The company has only a few days supply of coal. The Detroit City Gas Co., also was caught with short supply and has appealed to customers to avoid unnecessary use of its product, warning them also against using gas for household heating purposes.

Anthracite—Few of the retail yards have been able to fill orders for anthracite. Shipments prior to the railway strike were light and stocks on hand are about exhausted. Though still uncertain as to the prices for the year, some of the dealers are placing orders to make sure their customers requirements will be safeguarded.

Lake Trade—Owing to the railway strike, loading of coal for the lake trade is virtually at a standstill. The steamer "William A. Reiss," leaving Huron, Ohio, April 15 for Lake Michigan ports carries the season's second cargo.

Middle West

MIDWEST REVIEW

Stories are beginning to come in from some of the Middle West states that a number of manufacturing concerns and public utility plants are closing down, and throwing men out of work, on account of the coal shortage.

It can be seen from the above that the market for coal is very strong, and growing stronger every day. Illinois and Indiana operators are continuing to keep their prices at very fair levels, in fact we do not know of any advance over the price for Illinois and Indiana coals as published in these columns a few weeks ago.

Operators have had an opportunity, in spite of poor running time, to figure just how much the increase granted the miners will influence the selling price of their coal, and, therefore they have closed some contracts with their preferred customers. Operators and wholesalers alike, however, are not seeking new business, but merely renewing old contracts that expired March 31. Contract prices are ranging very closely around the April circular prices given the trade by the operators during the first week of April. Some railroad contracts have been closed, but not many.

During the last week there have been numerous small and ineffectual strikes reported in the producing fields of Illinois and Indiana. These strikes in nine cases out of ten, arose from some trivial situation which meant nothing much either to the operators or to the men themselves, except that it indicates the general spirit of unrest which is prevalent in this territory among practically all labor groups. This spirit of unrest has permeated the wholesalers as well as the operators and consequently is felt by the buying public who are extremely nervous over their coal supply, and are doing all possible toward making their purchases early in the season.

CHICAGO

Coal yards on the Illinois Central and the Chicago, Burlington & Quincy R.R. were lucky in receiving some fuel this week.

This is also true of yards on any of the other big coal carrying roads coming into Chicago. Those, however, who operate retail yards on non-coal roads have had to discontinue business for the time being.

The writer was in this yard, on April 20, and all of the coal left in the yard was represented by a small pile of anthracite, about two tons, which was being closely watched by the owner of the yard. Other gangs of workmen in and about the yard were salvaging coal dust and screenings and loading it into the wagons to deliver it to their customers. The switchmen's strike is most certainly far reaching.

A number of manufacturing plants in the city have been forced to close down because they have received no coal, and unless the strike is settled definitely and completely very shortly, other plants will have to close, thus throwing more men out of work. The rebel switchmen are rapidly losing ground as they are very unpopular, first, with the regular unions, and, second, with the general public. In addition to this countless laborers who have been thrown out of work feel that the switchmen have been extremely selfish in their demands.

ST. LOUIS

Railroad strike has suspended work in almost the entire field.—A little tonnage produced and railroads taking it.—Local conditions critical.—Prospects of conditions easing up, however.

Practically every railroad in the St. Louis district has been hit by the strike of the yardmen who took with them much force of the other crafts. With the exception of the Missouri Pacific all lines were abandoned by their yard crews at the beginning. The Missouri Pacific have a few crews remaining at work and the condition as the week ends shows improvement on other roads. For a few days officials of the Terminal and office employees took care of switches and handled a few cars of perishable matter, as well as coal for plants that had to have it.

At the end of the week a few crews went back on practically all roads, but this had not helped the coal tonnage to any extent, other than to move what was in the terminals.

In the Standard district the mines on the St. Louis, Troy and Eastern worked a little every day. This coal was brought to East St. Louis on their own road, the trains manned by their office help who unloaded it at their yards, where it was transported to St. Louis in trucks and wagons.

At a few other points in St. Louis where there was coal the dealers and industrial plants managed to get to it, but in a general way the railroads grabbed most of the coal in sight.

On the Mobile & Ohio, Illinois Central, Vandalia and Baltimore & Ohio a mine here and there worked a day or two, loading railroad company coal. On the Illinois Central a little coal was shipped on commercial business south. In the Mt. Olive field the Illinois Traction System worked their line every day bringing their coal into St. Louis. There is no strike on this road.

MILWAUKEE

Cold weather makes a lively coal market. —Little to sell.—Pea anthracite advanced 50c. per ton.—Railroad strike hampers receipts.

Because of a scarcity of supplies of all kinds, the coal market at Milwaukee is very unsatisfactory. A continuance of raw, spring weather increases the number of empty bins daily, and the demand from householders grows correspondingly urgent. The inflow of rail coal was meagre enough before the strike began, but now there is practically no coal coming. A strike of coal handlers at several of the yards still further complicates the situation.

No boats have arrived as yet and the outlook in this respect is not promising, as the ice in the Straits of Mackinac shows no sign of weakening. One steamer with 9,000 tons of anthracite was forced to winter in the Straits. This cargo should be the first to arrive. Last year the first cargo was received on April 20, and by the end of the month 59,535 tons of anthracite and 92,652 tons of soft coal had been unloaded on the docks. Pea anthracite has been advanced 50c. per ton, but prices of all other grades of coal continue the same.

Pacific Coast

SAN FRANCISCO

Prices advance.—Further increases expected by some.

The expected has come to pass, following the increase in the wages to miners awarded by the President's commission and dealers here have been notified by the operators of Utah and Wyoming of an advance in price from \$3.65@\$4 f.o.b. net ton, wholesale, on stove and lump coal at the mines. Whether or not a further raise will come after the summer lull in business is a deep puzzle to dealers.

Hopes are held out by the more sanguine of the fraternity that things will be soon be stabilized, both as regards the operators on the one hand, and the public on the other. Under present conditions, dealers are very much "up in the air." Little effort is being made for consumers to put in stocks this summer for the winter. For domestic use, bituminous prices from Utah and Wyoming, f.o.b. net ton, are:

Stove, \$4; Lump, \$4.; Bunker price, \$13.55.

Coke

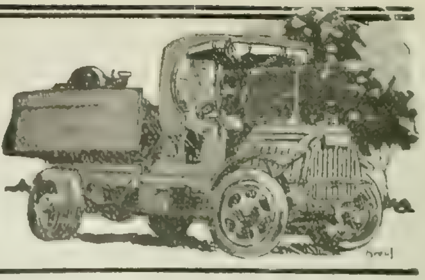
CONNELLSVILLE

Connellsville coke market has been at a standstill, there being no coke to sell or buy.

While the rail strike was strong at the beginning of last week there was a fair supply of empties, largely placed Sunday, with some cars held over from the previous week. There was full drawing in the region Monday, and some drawing on Tuesday, with cars left over, but afterwards there were no empties. As a rule operators had a change to recharge their ovens and put them on the lightest possible draft so as to hold the charge. By skillful operation the charge can be held about a week and still produce fair coke.

The coke loaded moved only to sidings or railroad scales, but shippers have received a good many weights, showing that some coke did reach yards. A fair movement of empties is expected to follow immediately the ending of the rail strike, also good dispatch to furnaces since the railroads realize that their iron and steel freight business hinges upon their getting the blast furnaces in operation promptly. Practically all the blast furnaces dependent on Connellsville coke are banked, also quite a number dependent on byproduct coke, as the byproduct ovens had little coal in stock received scarcely any since the rail strike started.

COAL AND COKE NEWS



Charleston, W. Va.

Railroad Strike Creates Serious Situation in the West—High Volatile Delayed—Smokeless Reaches Tide—Contracts Being Placed

The most serious situation which confronted the coal industry in this section of the state and in fact throughout the length and breadth of the Chesapeake & Ohio R.R. system as the week ended the tenth drew to a close, was the railroad strike in the West, which was materially affecting western coal shipments, through numerous embargoes and which was at the same time affecting the coal supply.

The strike not only shut off the movement of coal west of Russell, Ky., on the Chesapeake & Ohio and west of Columbus on the Kanawha & Michigan and Toledo & Ohio Central, but also prevented eastbound cars from passing through the western gateways.

During the greater part of the week the car supply was under rather over 50 per cent. Production was materially reduced in this area with no prospect of any immediate improvement, at least until order had been restored in connection with the strike of railroad trainmen.

Unfortunate Traffic Interruption

Interruption to traffic came just at a time when producers were making preparations to begin shipments to the Lakes. Inasmuch as nearly all gateways leading to the Lakes were embargoed, insofar as shipments from West Virginia were concerned, no attempt was made to initiate Lake shipments. It had been hoped that when Lake shipments were begun they might tend to some extent to remedy the car shortage, inasmuch as cars would have a short distance to travel in making a round trip.

The larger proportion of high-volatile coal was moving westward, so it will be seen just what the barrier at Russell and Columbus meant to the West Virginia coal trade. Smokeless coal originating at Chesapeake & Ohio mines was for the most part moving eastward to tidewater, so that the strike had not until the close of the week exerted any perceptible effect on such shipments; early in the following week with the strike spreading, it was anticipated that smokeless coal for tidewater would be to a large extent embargoed.

It is realized by operators that tidewater pools are essential in order to insure prompt dumping of coal, yet there are many producers who are reluctant to see their coal lose its identity, so that there is some opposition to the continuance of the tidewater pool.

Kanawha Coal Fails to Reach Destination

Ground was lost by Kanawha mines, during the week ended the tenth, owing to an extremely poor car supply, in comparison with the production of the previous week. While fully two-thirds of the Kanawha output was being shipped to western [illegible] was reaching its destination after the middle of the [illegible] Russell and [illegible] shipments off [illegible]

It was believed, after careful inquiry, that about 65 per cent of the year's output in the Kanawha field was under con[illegible] to some extent at least, in the volume of export tonnage from [illegible] River field, though it was stated by some operators that export shipments were being halted somewhat by slowness in dumping at tidewater. It is also believed that more contracts for New River coal were completed during the week, with a view to relieving uncertainty as to prices. While of course the embargo at Russell, Ky., affected New River shipments somewhat, it was not to as great an extent as was true of coal from high-volatile fields.

Bluefield, W. Va.

Norfolk & Western Recovers from Clerks' Strike Only to Meet Switchmen Trouble—Little Coal Goes West—Eastern Shipments Fair

Inasmuch as the Norfolk & Western was slow in recovering from the effect of the clerks' strike, production in the southern part of the state was still about on a par with that of the previous week, mines being short of cars for fully half the week. Indeed it was not until well on toward the end of the week that the supply of empties was at all adequate, so that production did not reach even the swing to which it had been accustomed during weeks antedating the strike.

There had been a decrease in all districts served by the Norfolk & Western during the week ending the third, of approximately 200,000 tons. In the first place it required some time to prepare engines for operation, the fires having been banked in many locomotives when it was believed the strike would be prolonged. Next, the run of empties from the West was slow in reaching normal, owing to the fact that cars originally intended for the Norfolk & Western had been sent elsewhere during the strike.

On the other hand, the flow of empties from the East was not so greatly affected, so that there was a larger supply from that source than from the West. Still another factor interfering both with the car supply and with the movement of coal in the week ended the third, was the switchmen's strike.

Embargo and Strike Stop Shipments

Inasmuch as there was no flow of empties through the usual channels, and inasmuch as the Norfolk & Western had placed an embargo on coal movement west of Columbus and Cincinnati, of course there was an accumulation at those points and no empties were being received from sections west of those places.

While it is anticipated that the car supply will show improvement under normal conditions, especially as the season advances, for the time being at least mines on the Norfolk & Western are running far behind schedule for the reasons assigned.

Pocahontas and other points on the Norfolk & Western were the meccas for numerous buyers during the week ended the tenth, there being manifest an insatiable demand for coal. While a large number of contracts have been consummated since April 1 and while a considerable part of the year's output is now under contract deliveries will be made at prices in keeping with the desire of producers to hold prices down to a level commensurate with production costs plus a reasonable profit. On such a basis numerous contracts calling for the delivery of large tonnages have been closed.

There was during the first ten days of April a growing demand for export. It was possible to meet only a part of such demand owing to the continuance of the permit system, the shortage of cars and inability to load ships fast enough. Owing to the heavy export demand and the short route to tidewater, the tonnage left for Western markets in so far as could be learned, was comparatively small.

No progress was made by Pocahontas producers in catching up with the demand for their product in the week ended the tenth, there being a decided dearth of cars in the field generally during the first half of the week when officials of the Norfolk & Western were striving to restore conditions to normal following the strike.

To further complicate matters, just about the time transportation conditions were beginning to take on a normal semblance, the switchmen's strike closed many western gateways to coal from the Norfolk & Western.

There was for the reasons assigned, therefore, not more than a half week's production in the entire Pocahontas field. Under existing conditions production and loss is now about a "fifty-fifty" proposition.

Coal loading in the Tug River field, during the week ended April 10, reached only 55,450 net tons, a decrease of no less than 27,250 tons, as compared with the output for the week ended March 27. Without having an opportunity of recovering from the effects of the labor trouble initiated at Roanoke last month, the outlaw switchmen's strike at Chicago had spread to the East quite rapidly, and, during the period ending the tenth, was affecting Portsmouth, Kenova and Williamson.

Empties Tied Up in the West

On the tenth the Norfolk & Western put into effect a strict embargo on all shipments West owing to the inability of the road to handle coal in that direction, and by the thirteenth absolutely no empties were being received through the western gateway. The absence of the Western car supply just about cut Tug River production in two, empties received from the East being apportioned and distributed to the western limits of the railway system. There was absolutely no difficulty in handling to the East all coal that could be mined in fields of the Norfolk & Western under a limited car supply.

The Williamson field was affected to as great an extent as other fields depending upon the Norfolk & Western for transportation facilities, and to make matters worse, switchmen and yardmen employed at Williamson joined the ranks of "outlaw" strikers on Wednesday, April 14, making it certain that there would be a serious reduction in production before the end of the week; the output having suffered quite appreciably, during the week ending April 10, for reasons already described in connection with conditions in the Tug River and Pocahontas fields.

Production in the Winding Gulf area was somewhat larger than usual, during the period ended the tenth, owing to a slight increase in the number of cars available. However, Winding Gulf mines were being affected during the following week by the strike which was expected to cut down the district's output. A large part of the district's production was reported as being under contract for the present coal year.

Huntington, W. Va.

Car Shortage Serious in Logan Field—Little Coal Under Contract With Lake Season Opening—Strong Export Demand

Production was seriously retarded in the Logan field, during the week ended April 10 because of a continuance of the shortage of cars, with which the mines of the field have been afflicted since the first of the year. There has been during recent weeks a car shortage loss of not less than 225,000 tons every week, and in the week ended the tenth, the loss was just as serious as it had been during previous weeks of the year, it seemingly being impossible to boost production above 175,000 tons a week.

The car shortage was even more pronounced during the week ended the tenth, than it had been in preceding weeks; the production for the entire week reaching only about 160,000 tons. As showing just how serious railroad disabilities have proved to be in the Logan field, a total of 1,008,525 tons were lost through that source alone during the month of March, as against only 768,953 tons produced here during the same period. In other words, the car-shortage loss for the month of March in the Logan field amounted to 53 per cent of the potential capacity (1,801,322 tons) of the entire field.

There was at the end of the week ended April 10 quite a considerable tonnage of the Logan region still not under contract, it was stated, operators awaiting final decision on the wage scale in various non-union fields. However, it was expected that as the season advanced, progress would be made in the closing of contracts. Comparatively little coal for the Lakes was under contract, however, although it was rather anticipated that there would be a large movement of fuel from the Logan region to the Lakes during the season.

There was a pressing demand from export sources for Logan gas and splint, although a larger proportion of Logan fuel was being shipped to Inland West markets than to tidewater, despite the fact that export permits were not so hard to secure. However, the railroad strike necessitated, toward the end of the week, the cessation of shipments from the field to many of the western markets, having a tendency to drive more coal eastward to tidewater.

The embargoes, which prohibited a large part of the western movement, also made it impossible to begin the shipment of coal to Lake points, even as a part of numerous spot orders pouring into the field.

According to figures compiled by the Chesapeake & Ohio Allotment Commission, there was little difference in the amount of coal handled by that road during the week ended April 3 and during the week ended April 10, there being 81 cars more moved during the last-named week than during the previous one, the total gain amounting to 4,050 tons; total loadings for the week ended the tenth being 11,037 cars, equivalent to 551,850 tons.

Fairmont, W. Va.

Delay in unloading coal at Curtis Bay.—Embargo cripples shipments to tide.—Lake season starts.

Northern West Virginia operators were principally concerned in the week ended the tenth by the failure of the railroads, over which their coal was shipped, to function at tidewater piers, necessitating an embargo against shipments to all tidewater points except Port Richmond. As Curtis Bay is the principal tidewater terminal, to which coal from the Fairmont region is shipped, the embargo, coming just when it did, seriously interfered with arrangements made by the operators of nearly all northern fields.

There had been a steady growth in the volume of coal shipped to Curtis Bay and the tonnage to that point (much of it for export) was reaching fairly normal proportions. The fact, however, was that when the Curtis Bay shipments did reach a large tonnage, the Baltimore & Ohio was unable to handle it, and found it necessary to embargo further shipments. This was not particularly pleasing to operators who had been assured by Federal Manager Galloway a few months ago that the road would like to be tested as to its ability to handle tidewater coal at Curtis Bay.

It was stated, however, that the delay in unloading coal at Curtis Bay was due to a breakdown in the unloading facilities. Right on the heels of an embargo as to eastern shipments came the embargo on shipments of coal to certain western markets, although the effect of western embargoes was comparatively insignificant during the week ended the tenth. However, it was generally believed that there might be serious interference with Lake shipments if the strike should spread much further.

Improvement in Car Supply

Taking northern West Virginia fields as a whole, the car supply was somewhat better than for the previous week, although not averaging much over 50 per cent after the large run of cars for Monday and Tuesday had been exhausted. Mines on the Monongahela R. R. enjoyed a larger run of cars than has been true for many a month, the supply being almost equal to full requirements throughout the week. No doubt this was the result of a special effort of the new executive of the road to improve the service.

At the rate at which tidewater shipments were being made from the Fairmont region at the beginning of the week, a new high-water mark for tidewater tonnage would probably have been established, more than 600 cars of coal having been started on their way to Curtis Bay Monday and Tuesday. When the embargo was clamped on, it put an end to the bulk of tidewater shipments, although innumerable vessels were riding at anchor at Curtis Bay.

Two large consignments of coal from northern West Virginia mines were made to the Lakes, during the week ended the tenth, the shipments in question being the first of the season, it is believed. This coal so shipped was from the mines of the Consolidation Coal Co.

Norton, Va.

Southern Railway resorts to assigned car practice.—Coal coked to relieve car shortage.

The Virginia fields were suffering heavy losses during the week ended April 10 through a car shortage, while at the same time many mines in the fields of this state were placed at a serious disadvantage, because of the fact that the Southern Ry. was resorting to the assigned car practice in order to obtain fuel; in fact this road was characterized as the worst offender in the South in that respect.

While confiscation of coal had largely ceased, the Southern Ry. was falling back on the assigned car system to achieve the same end. The car system of this road was denounced as being extremely unsatisfactory, it being pointed out that the policy of the Southern Ry., in favoring certain mines (furnishing it with fuel) with a preferential car supply, was working a hardship on the small producing mines.

For the week ended the tenth, the output in the Virginia fields had been reduced to 90,000 tons, the loss from a car shortage running up to 75,000 tons. In other words there was a 40 per cent loss from a car shortage alone, production being, manifestly, only 60 per cent of potential capacity. Mines managed to go ahead with production, over and above that made possible by a limited car supply, through coking in all 37,258 tons.

Ashland, Ky.

Northeast Kentucky Output Gains.—Switchmen's Strike Sends Coal to Tide.—Private Ownership of Coal Cars

Gains were recorded in the output of the northeast Kentucky field for the week ended April 10, the output reaching 54 per cent of production or nearly 145,000 tons, out of a possible full-time capacity of 265,000 tons. The gain scored over the previous week's production amounted to 10,000 tons and was principally due to a somewhat improved car supply on the Chesapeake & Ohio; mines on that road being operated about 3½ days out of the six, with mines on the Louisville & Nashville able to make only 2½ days, or less than 50 per cent of normal.

Production in fact during the period referred to was about on a par with the best week so far during the present calendar year, and a further growth in the output was looked for, unless the switchmen's strike in the West should affect transportation conditions. During the same period of 1919, the output for the field was 117,000 tons, that being about 20 per cent below the 1920 production.

Even though there was not a full car supply and, therefore, no special reason for a labor shortage, the loss from lack of men at all the mines in the district reached 10,000 tons. This increase in the tonnage loss from a shortage of labor is believed to be due to an exodus to the farms on the part of many miners, who follow mining during the winter months only. There is little chance of the miners, who have left the mines for their farms, returning during the summer season, especially if an inadequate car supply makes for irregularity of operations and no opportunity to work.

With railroad officials pessimistic as to any improvement in the car supply, it is not generally anticipated that there will be any decline in prices in the near future; that belief only having been confirmed at a meeting of Lake shippers at Cincinnati on April 8, when railroad officials held out no hope for any improvement in transportation facilities.

The belief was quite generally entertained by northeast Kentucky operators that the strike of switchmen would have the effect of driving coal eastward to the export trade, especially in view of the fact that Kentucky operators are securing much export business and have been shipping a generous tonnage to tidewater.

Of more than passing concern to northeast Kentucky operators was the question of private ownership of coal cars and its effect on the general car distribution. It was expected that that particular question would receive attention at a meeting at Huntington, on April 13, between coal operators and the executives of the Chesapeake & Ohio. Impetus has been given to the development of new mining properties by favorable weather conditions and under such conditions a number of new companies hope to be able to begin operating before the lapse of many months, although carriers are unable to take care of existing operations.

Birmingham, Ala.

Corona Coal Co. Secures Injunction Against Southern Ry.—Coal Car Discrimination Case

A temporary injunction restraining the Southern Ry. from discriminating in the matter of furnishing coal cars to the Corona Coal Co., has been granted here by Judge Dan A. Greene in the Circuit Court, in a case of the Corona Coal Co. against the Southern Ry.

The injunction restrains the Southern Ry. from any practice working a discrimination upon the complainant in the supply of coal cars, according to the just and reasonable rating of the complainant's mine, as ascertained and promulgated by the respondent for distribution of cars during times of car shortage.

The injunction as granted by the court also restrains the respondent from ordering or enforcing a preferential distribution of cars to the Southern subsidiary, the Railway Fuel Co. or others, or any distribution of coal cars in violation of the provisions of Subdivision 12 of Section 402 of the Transportation Act of 1920.

The petition for the injunction was filed by attorney Johnson and Cocke representing the Corona Coal Co. The bill alleges that the complainant is a corporation organized under the laws of the state of Delaware, but maintaining general offices in Birmingham, and that the respondent is a corporation organized under the laws of the state Virginia, and is engaged in a general transportation business. The respondent is alleged as a common carrier to be subject to the Transportation Act of 1920.

According to the allegation of the bill the Southern Ry. is the only direct connection for the transportation of the output of the Corona Coal Co., and that complainant is exclusively dependent upon the Southern Ry. for its car supply and initial transportation. For some time there has been an acute car shortage, and the complainant alleges that it has not been furnished with its full requirement of cars and that, furthermore, other mines have not been furnished their full requirement of cars.

The complainant further contends that it has outstanding contracts for its output, and that the failure of the supply of cars tends to disorganize and dissatisfy its employees, forces its mines to suspend, causes losses to its customers, through demurrage and delay in receiving fuel at the proper time.

The petition prays that a temporary injuncting be issued against the defendant restraining it from enforcing the rules referred to and from continuing its discrimination against the complainant.

PENNSYLVANIA

Anthracite

Hazleton—The heavy rains of the first part of the week, ended April 10, failed to make much difference in the water levels of the flooded mines in this section. The region was just recovering from the effects of the previous heavy rains and thaw when the recent rains came. The reports state that the water has made little material gain on the pumps.

On April 6 the Hazleton and Mahanoy division of the Lehigh Valley R.R. moved 650 railroad coal cars from the mines, against 128 cars on Easter Monday. The record for the sixth compares favorably with the war record from the same district, which was about 700 a day. Even with the big tonnage the coal companies cannot meet the demand and the Lehigh Valley Coal Co. has just put into operation again a large locomotive crane loading steam sizes from storage.

Wilkes-Barre — A complimentary dinner was given to Truesdale colliery officials at Hotel Redington, Wilkes-Barre, on a Saturday evening recently, by William W. Inglis, vice president and general manager of the Delaware, Lackawanna & Western Company.

Truesdale colliery is in Hanover Township, in about the center of old Luzerne Grove, near the end of Wilkes-Barre & Wyoming Valley R.R., Askam and Warrior Run branch.

The plant was named in honor of William

H. Truesdale, president of the Delaware, Lackawanna & Western R.R., in 1889, and had led all the collieries in the anthracite field in coal production from 1913 to 1919, inclusive.

The following guests attended the dinner: John Allen, John Bobeck, James H. Brown, Dr. C. E. Bennett, James Bryan, Martin Brennan, Patrick Blewitt, Joseph Chervock, James Connell, Wayne Caruthers, Ted Corrigan, S. D. Dimmick, Frank Dobrowalski, Edward P. Davis, P. H. Dever, John Driscoll, Arthur Davis, William T. Dixon, John H. Davis, Anthony J. Early, Thomas J. Evans, Herman Fruehan, Joseph Foley, John Frew, Raymond Gottshall, Frank Gleason, David Girvan, Charles Gallagher, Hugh E. Hughes, Joseph Hocken, Harry E. Harris, Frank Hildebrand, Cyril Hammonds, William W. Inglis, John Ingram, William L. James, John R. James, Frank Kishel, Frank H. Kettrick, George Keller, Robert E. Love, Thomas H. Lewis, Patrick Lenahan, Thomas P. Long, David Lloyd, Frank Law, Samuel Mayers, John Mould, William Mullahey, Joseph Motley, William McHale, Eleazor Morgan, Karl Miller, Con McCole, Bernard McKee, N. N. Nichols, Stanley Nowak, George F. O'Hara, Henry Ormanowitski, Edward S. Powell, George Phillips, William F. Powell, John Rapadowski, Joseph Ruddick, William Roachford, John O. Richards, Joseph Richards, Joseph L. Reynolds, M. L. Roper, Bradford Samson, Frank H. Samson, Joseph Schappert, Patrick A. Shovlin, Martin Stamer, Charles Sperry, James Sweeney, Harry Smith, William S. Taylor, William B. Thornton, Zigmond Tomkiewicz, Frank Trimble, Ivor Vincent, H. M. Warren, William E. Walters, William R. Williams, Owen S. Williams, William E. Watkins, John Williams and John Walsh.

Bituminous

Chambersville—The Peterman mine of the Eliza J. Smith & Brothers Coal Co. here has been sold to the Clark Coal Co., of Barnesboro. The mine was opened up in 1915 and has a considerable development with a daily capacity of 300 tons. The sale price has not been made public.

Johnstown—The Penn Public Service corporation, operating in Cambria, Indiana and Somerset counties, will start on May 1, the extension of the high-power lines, arranging for a length of 18 miles of wire. The line will extend from the southern limit at Hooversville, Somerset County, to the northern limit at Heilwood, Indiana County. The wires will be carried on 200 steel towers. The lines should be in operation by October when the new power plant at Seward, which will generate 40,000 kilowatts as the minimum, will be completed. This line passes through some of the most active coal territory of western Pennsylvania.

Indiana—The largest class of applicants for certificates of qualification for bituminous mine foremen and fire bosses ever taking these examinations here, was in attendance recently when the examining board of the Twenty-fifth Bituminous district, composed of Thomas S. Lowther, inspector and chairman, W. B. Wardrop, representative for the operators and D. J. Jones, representative for the miners, held the annual examination. There were 59 applicants for second-grade foremen, 48 for first-grade foremen and 29 for fire boss. Several of the applicants were young men who had seen service in France in the world war and are now working themselves up in the mining industry.

Pittsburgh—The bi-monthly meeting of the mechanical section of the Engineers' Society of Western Pennsylvania was held on the evening of April 6 in the auditorium of the Union Arcade Building. E. B. Bailey, president of the Bailey Meter Co. of Cleveland, O., read an interesting paper on "Power Plant Instruments and Meters." Various meters that show the relation between the steam inflow and the energy input as well as other types made clear the [illegible] of this type of installation around power plants. The paper was illustrated with lantern slides and actual chart [illegible].

A meeting of 160 members of the American Institute of Mining & Metallurgical [illegible] located in the Pittsburgh [illegible] held on April 20 in the [illegible] of the Pittsburgh station of the Bureau of Mines. [illegible] ment in favor of a local [illegible] of the institute is the cause of the meeting, at [illegible] time a decision will be [illegible] whether or not a Pittsburgh [illegible] will be formed.

The American [illegible] of Engineers, a newly organized [illegible] society, met in the auditorium of the [illegible] of Mines in this city, on April 16. [illegible] meeting was open one and many [illegible] in the Pittsburgh district attended. [illegible] principles and plans of the society were outlined in addresses and the possibility of organizing a Pittsburgh chapter was discussed. E. A. Holbrook, superintendent of the Pittsburgh station of the Bureau of Mines, offered the freedom of the buildings to the society members and others. Inspection of the buildings was one of the entertainment features as well as the showing of the Bureau of Mines film, "The Story of Coal."

WEST VIRGINIA

Charleston—New officers were elected at the annual meeting of the New River Coal Operators' Association held in this city on April 12. C. C. Beury, of Charleston, after a service covering a period of four years as president of the association, declined reelection. The roster of new officers includes: G. H. Caperton, of Charleston, president; S. A. Scott, of Macdonald, vice president; T. L. Lewis, of Charleston, secretary. A special committee was selected by the association, consisting of C. C. Beury and G. H. Caperton to work in conjunction with like committees from other districts in an effort to secure a better car supply.

Much concern is being manifested by operators in southern West Virginia, over the increasing number of privately owned coal-carrying equipment. Extensive use of such cars, it is claimed, works a hardship on companies not owning their equipment, particularly on the small producer in that, with so many individual cars in use, it is impossible for many companies to secure an equitable car supply. It is said that the number of individual cars owned by the larger coal companies, by public utility companies and by many byproduct concerns is constantly on the increase. This situation, it is contended by some operators, is becoming serious. It is only a question of time, declares J. J. Ross, president of the Logan Operators' Association, until fully half the motive power of a road, such as the Chesapeake & Ohio for instance, will be required in transporting private coal cars. According to Mr. Ross, it is believed that the number of private coal cars this and other roads are permitted to transport should be limited.

KENTUCKY

Madisonville—If plans were not changed, the hospital committee of District 23, United Mine Workers, assembled at Central City, Ky., recently. President W. D. Duncan, of District 23, United Mine Workers of America, expected to issue a call for the committee to meet after the wage committee conference was held, and the members should be ready to submit their report by May 15. As soon as the committee outlines its policy, various towns in western Kentucky, who are seeking the proposed $100,000 miners' hospital, will be visited and inducements these towns offer for the location of the institution will be ascertained. After the committee makes its report, the matter will be in such shape that mine workers' locals can petition President W. D. Duncan to hold a referendum vote of the members of the mine workers. Should the union miners not request a referendum vote, the hospital committee's report will not be acted on until the United Mine Workers' district convention is held which will be in October.

OHIO

Steubenville—An official investigation will be begun looking into the accident, in which two coal miners were killed and three others injured (one probably fatally) at the LaBelle Iron Works. A motor train carrying miners out of the mine collided head-on with a string of empties. Brief reports of the company attribute the accident to a misunderstanding of signals.

Columbus—The Eastern Hocking Coal Co. has filed suit against the Elk Coal Co., of Columbus, for damages in the sum of $1,369,000, alleged to have been suffered when the defendant "secretly" mined 880,000 tons of coal under the plaintiff's lands in Muskingum County. The action was brought in the Franklin County Common Pleas Court.

Ohio soft coal operators, especially those operating in the Hocking Valley, Pomeroy Bend and Crooksville districts of the state, were much gratified at the news from Washington that the Interstate Commerce Commission is going to help the car supply on the Hocking Valley, the Kanawha & Michigan, and the Toledo & Ohio Central railroads. The mines have been operating at less than half capacity because of car shortage, and numerous complaints were made to the Interstate Commerce Commission. The announcement from Washington was to the effect that orders had been issued to deliver 425 cars per day to the Hocking Valley; 400 cars per day to the Toledo & Ohio Central, and other cars to smaller lines. In the Northwest it is said that railroads hold 43,000 cars in excess of their ownership and it is planned to bring them back to the owning lines.

INDIANA

Clinton—The Miami Coal Co. has set a new high record for total output in its five Clinton mines during the month of March. The total was 216,585 tons, as compared with the former record of 180,000 tons for one month. The average number of days the five Miami mines worked in the month was 24. Miami mine No. 8 produced 63,133 tons, the largest output in the field for the month. The Miami company ranked second in Indiana in last year's output; the Vandalia Coal Co. was first. The Miami company has discontinued the "drag" or pre-pay day for miners, a system under which the men who get their money in advance pay 10 per cent to the company for the privilege. The company officials say the action is taken in conformity with the recent recommendations of the coal commission. In the days when the saloons were operating, hundreds of miners took advantage of the "drag." Now the "drag" has fallen to less than half the former proportions.

ILLINOIS

Duquoin—Damage which has been estimated at $80,000 was done recently in the big storm that swept the Middle Western states, to two coal mines and a coking plant near Belleville, in St. Clair County, north of here. Among the mines damaged was the Senior Coal Co., the entire top works being destroyed, partly by wind and partly by fire, which originated during the storm; the other was the Henrietta mine of the I. X. L. Coal Co., of Edwardsville. In the latter case, the tipple was blown down and the large shaker engine dropped into the shaft, falling 300 ft. to the bottom. The third concern which received unusual damage was the plant of the St. Louis Coke & Chemical Co., which was only built last spring. Fifteen out of the 17 towers at this plant were blown down, some of them being as high as 164 ft. Other mines through this district received minor damages but none so severe as the three noted.

Benton—With the exception of the Middlefork mine of the U. S. Fuel Co., every coal plant in Franklin County, Illinois, is at a standstill on account of the yardmen's strike all over the country. The Middlefork mine owns its railroad cars, and is thus able to run, and the cars are taken directly from the mine to their destination. For more than a week the other mines have not been working, and the miners are beginning to chafe under the enforced idleness.

Saline County, Illinois (southeast of Franklin County), operators are pleased over the arrangement recently completed between the Big Four and New York Central lines, whereby the latter agrees to furnish the Big Four a large number of coal cars each day. This arrangement is expected to enable the Saline County mines to operate practically every day. The car supply heretofore has been wholly inadequate in that county as well as all other counties in the southern Illinois field.

CANADA

Toronto—An important consolidation of steel, coal, shipbuilding and shipping enterprises, promoted by the Dominion Steel Corporation, of Sydney, N. S., is now under way. The proposition for a merger of the Dominion Steel Corporation and the Nova Scotia Steel & Coal Co., which has for some time been under consideration, has, since the acquisition of a large interest in the Dominion Steel by British capitalists, been extended so as to include the Canada Steamship Lines, Ltd., and the Halifax Shipyards, Ltd., with other allied enterprises. The first step, involving the merger of the Dominion Steel and the Nova Scotia Steel, is understood to be nearing completion. Negotiations which have been in progress in Montreal for some weeks are to be continued in New York when a final decision will be arrived at. Expert accountants and appraisers have for some time been at work on the books and properties of the companies involved. When their reports are completed offers will be made to the shipping and shipbuilding companies of the terms, on which their properties will be taken over. The acceptance of these conditions, it is understood, will be little more than a matter of form, owing to the fact that the steel interests are largely identified with the other enterprises. Extensive plans for the expansion of the industries to be included in the merger are being matured, which will require additional capital to an amount estimated at between $20,000,000 and $28,000,000, which it is anticipated can easily be raised.

Personals

Walter C. Hess, formerly assistant mining engineer of the Temple Coal Co., of Scranton, has been appointed mining engineer of the same concern to take the place of Geo. W. Engel, deceased.

Tudor Aston, superintendent of the Mt. Lookout colliery of the Temple Coal Co., has resigned to go into business for himself.

Bruce Weir, superintednent of the North West colliery of the Temple Coal Co., has been transferred to the superintendency of the Mt. Lookout colliery at Wyoming, to take the place of Tudor Aston, resigned.

James McAndrew has been appointed assistant superintendent to John Mellow, superintendent of the Lackawanna, Sterrick Creek and North West collieries of the Temple Coal Co., northeast of Scranton.

D. S. Wolfe, division superintendent of the Lehigh division of the Lehigh Valley Coal Co., with headquarters at Hazleton, has resigned to become the general superintendent of the McTurk operations in Schuylkill County.

George Wood, formerly division engineer of the Lehigh division of the Lehigh Valley Coal Co., has been appointed to the position of division superintendent of the same division. His headquarters will be at Hazleton.

Fred Holderman, formerly a mining engineer of the Lehigh division of the Lehigh Valley Coal Co., has been promoted to the position of division engineer of the same division.

P. Burgger, Jr., has just been promoted to the position of assistant mine foreman of the Tomhicken colliery of the Lehigh Valley Coal Co., in Luzerne County.

David Flemming has resigned as general superintendent of the Colver mines of the Ebensburg Coal Co., at Colver, Pa. Mr. Flemming will remove to Greensburg, Pa., and retire from the active mining industry.

E. S. Brooks has been appointed general manager of the Union Pacific Coal Co., with headquarters at Rock Springs, Wyoming, to succeed Geo. B. Pryde, acting general manager, effective April 1. The president of the company is E. E. Calvin, with offices at Omaha, Neb.

R. L. Rogers, formerly sales manager for the Chicago, Wilmington & Franklin Coal Co., and until recently with the Clinton Coal Co., has been appointed general sales manager for the Sterling-Midland Coal Co., of Chicago, which has various operations around Duquoin, Ill., and other places.

William P. Rend, a son of Joseph Rend, of Chicago, president of the W. P. Rend Coal Co., which operates two large collieries in Franklin County, Illinois, has been sent to these mines by his father, in order that he may learn the business from the ground up. The younger Rend is about 21 years of age, and is said to be taking a keen interest in the mining busniess.

M. L. O'Neale, graduate mining engineer of Columbia University; member of the American Institute of Mining & Metallurgical Engineers; 7½ years superintendent of coal and coke properties in Alabama and West Virginia, and one year superintendent of pyrite mines and concentrating plant in New York, announces the opening, at Morgantown, W. Va., of an office for consultation in matters of mine operation, plant design and installation, examination of properties and reports.

S. W. Taylor, formerly president of the Cement Gun Co., Inc., whose main office is at Allentown, Pa., has recently taken over the duties of chairman of the board of directors of this company. **W. J. Roberts**, president of the Traylor Engineering & Manufacturing Co., has been appointed to the presidency of the Cement Gun Co., Inc. Another advancement in the Cement Gun organization is that of **B. C. Collier** to the position of vice president, in addition to his continued duties of general manager.

W. B. Wardrop has resigned as superintendent of the Iselin mines of the Pittsburgh Gas Coal Co., at Iselin, Pa., and has removed to Indiana, Pa., where he has purchased a property and will take a much needed rest. **James Patterson** has been placed in charge, temporarily of the Iselin mines. He has been general mine foreman for these mines for several years.

L. N. Ridenour, in charge of the manufacturing sales department of the Wellman-Seaver-Morgan Co.'s Akron office, moved his department to the company's general offices at Cleveland, Ohio.

Obituary

Roy Hart, vice president of the Oakland Coal Co., and a well known figure in coal circles in the Middle West, died recently at his late home from a complication of diseases. He had been in ill health for the past two years.

W. L. McDonald, general superintendent of the Mather Collieries since the opening of the mines in Greene County in 1917, died in a Pittsburgh hospital on April 11, after undergoing an operation for mastoid. Mr. McDonald's illness was of but short duration and his death was a distinct shock to many friends in western Pennsylvania and Ohio. He was connected with the coal industry in the latter state before coming to Pennsylvania.

William R. Martin, foreman at the Annabelle mines of the Four States Coal Co., in Marion County, W. Va., died on April 14 in the Fairmont, W. Va., State Hospital, from a fractured skull. The day before his death, Mr. Martin was struck by a trap door in one of the mine headings, after it had been rammed by a locomotive and sustained a fractured skull. Mr. Martin who was 36 years of age, leaves a widow and son.

Geo. W. Engel, for many years the mining engineer of the Temple Coal Co., died as the result of an attack of pneumonia. His death was a shock to his friends, for while he had been ill for a number of weeks, he was recovering rapidly from his illness, when a sudden change in his condition took place and in a few hours he died. Mr. Engel was born in Fountain Springs, Pa., but for more than twenty years was a resident of the city of Scranton, Pa. He was considered one of the leading engineers in the coal industry in this section of the country. He was often called into consultation with the larger companies of the anthracite regions.

ELIAS ROGERS

Elias Rogers, a prominent coal operator and merchant, and identified with many other large business enterprises, died on April 11 at his home in Toronto, Canada, in his seventieth year after a few days illness. He was born in Newmarket, Ont., and he purchased the first mines opened in Jefferson County, Pa.; in 1876 he came to Toronto and, in partnership with his brother Samuel, established the business afterward incorporated as the Elias Rogers Coal Co., Ltd. In 1909 he became president of the Crows Nest Pass Coal Co., which under his management rapidly expanded. He was prominently associated with numerous other important industrial and financial enterprises, being president of the National Life Assurance Co.; president of the Electric Light & Power Co., of British Columbia; vice president of the Imperial Bank of Canada, and a director of the Dominion Iron & Steel Co.; the National Trust Co., and the Carrington Air Brake Co.

Mr. Rogers took an active interest in public affairs. In 1887 he was elected to the City Council, and in 1898 was president of the Board of Trade. He was a prominent member of the Society of Friends and identified himself with a number of religious and philanthropic activities. He retired nine years ago from active connection with the Elias Rogers Coal Co., his eldest son Alfred succeeding him as president. He is survived by his wife, four daughters and two sons; his third son Clarence, who served overseas with distinction in the Royal Flying Corps, having been killed in action.

Coming Meetings

Chicago Coal Merchants' Association will hold its annual meeting April 13, at Chicago, Ill. Secretary, A. H. Kendall, Chicago, Ill.

American Chemical Society will hold its annual meeting at St. Louis, Mo., April 13, 14, 15 and 16. Secretary, Dr. Charles L. Parsons, 1709 G St., N. W., Washington, D. C.

National Coal Association will hold its annual meeting May 25, 26 and 27 at the Traymore Hotel, Atlantic City, N. J. Secretary, W. B. Reed, Commercial Bank Building, Washington, D. C.

The American Association of Engineers will hold its annual convention at the Planters Hotel, St. Louis, Mo., May 10 and 11. C. E. Drayer, secretary, Chicago, Ill.

The Rocky Mountain Coal Mining Institute will hold its annual meeting in Denver, Col., in conjunction with the National First Aid Meet, on August 20 and 21. Secretary, F. W. Whiteside, Denver, Col.

National Conference of Business Paper Editors will hold its next meeting June 4 at the Congress Hotel, Chicago, Ill. Secretary, R. Dawson Hall, 36th St. and 10th Ave., New York City.

M. O. I. Coal Association will hold its annual convention June 16, 17 and 18 at Cedar Point, Ohio. Secretary, B. F. Nigh, Columbus, Ohio.

National Retail Coal Merchants' Association will hold its annual meeting June 10, 11 and 12 at Detroit, Mich. Secretary-manager, Ellery Gordon, Philadelphia, Pa.

Kentucky Mining Institute will hold its annual meeting June 4 and 5 at Lexington, Ky. Secretary, C. W. Strickland, Huntington, W. Va.

American Society of Mechanical Engineers will hold its spring meeting May 24, 25, 26 and 27 at St. Louis, Mo. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

Chamber of Commerce of the United States of America will hold its eighth annual meeting April 26, 27, 28 and 29 at Atlantic City, N. J. Assistant Secretary, D. A. Skinner, Washington, D. C.

West Virginia Coal Mining Institute will hold its annual meeting June 7 and 8, at White Sulphur Springs, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

American Wholesale Coal Association will hold its annual meeting June 1 and 2 at Pittsburgh, Pa. Secretary, G. H. Merryweather, Washington, D. C.

The Colorado Retail Coal Dealers' Association will hold its annual meeting June 8, at Colorado Springs, Col. Secretary, E. Hopper, Denver, Col.

West Virginia Freeport Coal Operators' Association will hold its annual meeting June 3 at Kingwood, W. Va. Secretary, A. T. Carnahan, Akron, Ohio.

Publications Received

Coal. The Federal Trade Commission, Washington, D. C. Cost report. No. 2. Pennsylvania—anthracite. Illustrated; pp. 145; 6 x 9 in. Cost of production of anthracite for years 1917 and 1918.

Coal. No. 3 Illinois—bituminous. Federal Trade Commission Washington, D. C. Illustrated; pp. 127; 6 x 9 in. This report is the third of the series on the cost of producing coal; covers data for year 1918.

Twenty-eighth Annual Report of the Colorado Fuel & Iron Co., of Denver, Col. For the year ended Dec. 31, 1919. Not illustrated; pp. 15; 6 x 9 in. Report to the stockholders.

Thirty-Second Annual Report of Bureau of Mines, Mining and Mine Inspection, State of Missouri, for 1918. Not illustrated; pp. 82; 6 x 9 in. Statistical information about the coal, lead and zinc mines of the state for the year 1918.

Annual Report on the Mines—1919. Province of Nova Scotia. Department of Public Works and Mines. Halifax, N. S. Illustrated; pp. 74; 5½ x 9½ in. A report on the mines of the province for the year ended Sept. 30, 1919.

Ninety-ninth Annual Report of the Board of Managers of the Lehigh Coal & Navigation Co., of Philadelphia, Pa. For the fiscal year ended Dec. 31, 1919. Not illustrated; pp. 26; 9 x 12 in. Report to the stockholders.

Transvaal Chamber of Mines. Report. Monthly Analysis of Gold Production in the Transvaal, October, 1919. With Transvaal Output of Coal, Silver, Copper Ore and Tin Ore for September, 1918 and 1919. Not illustrated; pp. 9; 14½ x 20 in.

Report of Engineers Committee, 1918-1919. U. S. Fuel Administration, Washington, D. C. Illustrated; pp. 194; 9 x 11½ in. Results of the work of the Engineers Committee of the U. S. Fuel Administration connected with price fixing and costs of coal.

Absorption as Applied to Recovery of Gasoline Left in Residual Gas from Compression Plants. By W. P. Dykema and Roy O. Neal. Department of the Interior. Bureau of Mines. Technical Paper 232. Petroleum Technology 53. Illustrated; pp. 13; 6 x 9 in.

Experiment Stations of the Bureau of Mines. By Van. H. Manning. Department of the Interior. Bureau of Mines. Bulletin 175. Illustrated; pp. 106; 6 x 9 in. Notes about the 11 different field stations of the Bureau of Mines and the work done by them.

Waste and Correct Use of Natural Gas in the Home. By Samuel S. Wyer. Department of the Interior. Bureau of Mines. Technical Paper 257. Illustrated; pp. 23; 6 x 9 in. Practical hints to householders.

Eighth Annual Report of the State Inspector of Mines to the Governor of New Mexico. For the year ending Oct. 31, 1919. Not illustrated; pp. 74; 6 x 9 in. Considerable space is devoted to statements relative to time worked and wages paid coal mine employees.

Coal. No. 2. Pennsylvania Anthracite. Cost reports of the Federal Trade Commission, Washington, D. C. Illustrated; pp. 145; 5⅞ x 9⅞ inches. Data for 1917 and 1918 covering output of practically total anthracite produced, also details of operations of operators producing about half the anthracite tonnage for 1913-1918.

Boiler and Furnace Testing. Prepared by Rufus T. Strohm. Department of the Interior. Bureau of Mines. Technical Paper 240. Illustrated; pp. 23; 6 x 9 in. A description of what the author calls the simplest and best way of finding out how efficiently a boiler is working by means of an evaporation test.

Miners' Safety and Health Almanac for 1920. Compiled by R. C. Williams. Department of the Interior. Bureau of Mines. Miners' Circular 26. Illustrated; pp. 51; 6 x 9 in. Useful as a calendar and giving information on different diseases and how kept from starting; notes common accidents in mines.

Geology and Natural Resources of Rutherford County, Tennessee. By J. J. Galloway. State of Tennessee Geological Survey. Nashville, Tenn. Illustrated; pp. 81; 6 x 9 in. Report based on survey made in 1915, the purposes of which were (1) to determine the natural resources of the country; (2) study of the geology; (3) study of the soil.

Results of Forty-one Steaming Tests Conducted at the Fuel Testing Station, Ottawa. By John Blizard and E. S. Malloch. Canada Department of Mines. Mines Branch. Illustrated; pp. 83; 6½ x 9¾ in. Includes the results, and comments thereon, of all the steam-boiler trials conducted at the fuel-testing station at Ottawa, Canada, since this class of work was first undertaken.

Products, Mines and Facilities of the Hillman Coal & Coke Co. Main office, First National Bank Bldg., Pittsburgh, Pa. Bulletin. Illustrated; pp. 48; 8 x 11 in. A finely illustrated description of the plants and shipping facilities of the Hillman interests together with maps showing the location of the mines of the company. Interesting historical data about the coal regions in question noted.

The Industrial Outlook. By Guy E. Tripp, Chairman, board of directors, Westinghouse Electric & Manufacturing Co. Not illustrated; pp. 15; 6 x 9 in. An address delivered before the alumni of the Stevens Institute of Technology, at New York, Jan. 15, 1920. Takes up the industrial situation from the war to date; shows what labor has done and is now doing. Exposes tendencies of social unrest and necessity to speed up and get down to more productive work again. Excellent reading for the man in the shop and the president or manager in his office; any one who desires an insight into the present social and economic problems, will find in this address abundant material for serious consideration.

Trade Catalogs

Anti-Corrosion Engineering. Distributed [illegible] Pittsburgh, Pa. [illegible] Illustrated [illegible] appeared [illegible] American [illegible]

Jeffrey Shredders. The Jeffrey Manufacturing Co., Columbus, Ohio. Catalog 259. [illegible] Description of [illegible] hammer [illegible] both [illegible] other [illegible]

**Coal Mining [illegible] — [illegible] Lubricating Co., Philadelphia, Pa. Bulletin [illegible] illustrated. Some facts about [illegible] in general, [illegible] system, in particular. [illegible]

Why Bituminous Coal is Cheaper Than Fuel Oil — [illegible] & Kerr, Inc., North American Bldg., Philadelphia, Pa., and Grand Central Terminal, New York, N. Y. Pp. 15; 5 x 7¾ in.; illustrated. Some statements covering the cost of substitution of fuel oil in plants now operating with bituminous coal.

MacWhyte Wire Rope. The Macomber & Whyte Rope Co., Kenosha, Wis. Folder. Pp. 4; 6 x 9 in.; illustrated. An announcement calling attention to the quality of the wire rope manufactured by this company.

Deming Pumps. The Deming Co., Salem, Ohio. Catalog 26. Pp. 254; 6 x 9¼ in.; illustrated. Bound in cloth. Catalogue is divided into sections, each embracing a certain class of pumps of accessories. The engineering tables and information relating to hydraulics should be useful to dealers in pumps. Hand and power pumps for general service.

Public Utilities City of Nitro, W. Va. Distributed by the Charleston Industrial Corporation, operating the City of Nitro. Booklet. Pp. 21; 9 x 12 in.; illustrated. A technical description of the various public utilities of Nitro, erected during the war, and which are now in constant operation. Built for a city of 35,000 people, their tremendous reserves stand ready to be put to immediate use and to serve a community ten times the size of the present population of Nitro.

Industrial News

Blackey, Ky.—The Woodburn Coal Co. is considering plans for the immediate construction of the proposed new coal tipple and bins at its plant, to facilitate operations.

Cincinnati, Ohio—The Callaway Coal Co, has been chartered with a capital of $25,000, by S. D. Ducker, F. H. Callaway, W. K. Neuding, G. H. Sibbald and R. M. Plympton.

Bloomington, Ind.—The Arbutus Coal Co. has been incorporated with capital of $10,000, with Edgar Fish, George Dodson and T. B. Adams, as directors.

Eagle Pass, Tex.—The International Coal Mines Co. is planning to increase the capacity of its local mines. It is proposed to make enlargements and improvements at its plant for this purpose.

Herndon, W. Va.—The Monticello Coal Co., recently organized with F. M. Lee as president and general manager, is planning for the construction of about 50 miners' dwellings at its local properties.

Bramwell, W. Va.—The Thomas Coal Co. has awarded a contract to the Stevens-Adamson Co., Bramwell, for the construction of a new coal tipple and washery at its local operations. The work is estimated to cost about $100,000.

Louisville, Ky.—A report from Whitesburg, Ky., is to the effect that the Consolidation Coal Co., in the Jenkins-McRoberts field, is offering prizes this year for the best gardens, and best varieties of produce grown by the miners in its employ to encourage home growing.

Hamden, Ky.—The Kenmont Coal Co. is understood to be considering plans for the immediate construction of a large new coal tipple, to be used in connection with the development of additional mining properties. The plans also include the erection of approximately 30 dwellings for the miners.

Chehalis, Wash.—The Sheldon coal mine on Coal Creek, near this city, has been leased by Bert Hill of Chehalis; A. Hall, of Onalaska, and George Love, of Tacoma. The property has been developed by Olson & Guy, of Tacoma, who had it under lease, and it is now ready to produce coal for market. The lessees will at once enter the local market with their product.

Clarksburg, W. Va.—The Late-Kooper Coal Co. has recently been organized under a state charter to operate in the vicinity of Newburg, Preston County. The concern is capitalized at $50,000. Those principally interested in the new company are: Gordon B. Late, Addie Ruth Late, Joseph Van Zandt, J. Ray Smoot and D. B. Kooper, all of Newburg.

Henderson, Ky.—On March 31 the Southland Coal Co., operating the largest mine in Henderson County, secured control of the Mid West Fuel Co. properties, the consideration being around $120,000. Both mines are within the city limits of Henderson. W. L. Hughes, vice president of the Mid West company, will continue in active charge of the properties.

Praise, Ky.—The Kanawha Elkhorn Collieries, of Buffalo, N. Y., is arranging plans for the installation of new electrical equipment for increased operations at its local mining plants. The company is developing about 4,800 acres in this section with a capacity of about 1,200 tons daily, and the new equipment will include three new generating units. R. C. Simpson is general superintendent.

Jeff, Ky.—The Carr's Fork Coal Co. is having plans prepared for the installation of machinery and equipment for the development of about 3,000 acres of coal properties in the vicinity of Hamden, Ky. Henry E. Bullock, of Lexington, Ky., is president.

Columbus, Ohio—The Northland Coal Co., of Columbus, has increased its capital from $25,000 to $300,000 for the purpose of taking over a large tract of 7,000 acres of coal lands in Wayne County, West Virginia, on the Norfolk & Western R.R. The tract has one working mine. It is planned to open three or four more mines and increase the output to about 5,000 tons daily. The offices of the company are in the Clinton Bldg., Columbus.

Pocatello, Ida.—The Idaho Coal Mining Co., backed by Vice President Simpson of the Lincoln Trust Co., of Spokane, which is preparing to operate in the Teton basin near Driggs, will open headquarters in this city at once, according to E. H. Clarke, president of the Chamber of Commerce, which has endorsed the coal-mine proposition. The properties are said to contain over 13,000,000 tons of coal and, their opening will prove to be a large undertaking.

Ithaca, N. Y.—The Morse Chain Co., of this place, announces the change of address of its Greensboro (N. C.) office, which has been moved to Charlotte, N. C., with headquarters in the Commercial Bank Building. George W. Pritchett, the company's southeastern manager, has found this change advisable owing to the increase in the use of Morse chains, necessitating the building of new mills and also increasing the capacity of others. H. E. Matthews continues with the company answering questions and showing Morse drives to all inquirers.

Duquoin, Ill.—The Elder-Bixler Coal Co., of Carrier Mills, Ill., southeast of here, has announced a change of location to Harrisburg, Ill., and an increase in stock from $25,000 to $100,000.

The Sangamon County Mining Co., has increased its capital stock from $10,000 to $200,000 and announces that it will make large extensions on its mining property in the near future.

The Polonia Coal Co., with offices in Chicago, has increased its capital stock from $110,000 to $150,000.

Charleston, W. Va.—The Mountain Eagle Collieries Co., Charleston National Bank Building, recently incorporated with a capital of $75,000, has perfected its organization, and plans are being prepared for the immediate development of about 2,250 acres of coal properties in the vicinity of Heatheman, W. Va. Complete machinery and equipment will be installed and electric power drive will be utilized wherever possible. It is proposed to have an initial capacity of 140 tons daily, to be increased ultimately to 600 tons. The work also includes the construction of a power plant for plant service. Lee Stone is manager.

Bristol, Va.—The Hazard Blue Grass Coal Corporation, which recently filed articles of incorporation with a capital of $1,000,000, has perfected its organization and plans are being made for the installation of machinery and equipment in connection with the proposed development of a total of 3,000 acres of coal properties in the Hazard district, Ky. It is planned to have an ultimate capacity of about 2,000 tons daily. Included in the development plans is the erection of a number of miners' dwellings for employees. S. R. Jennings is president; F. A. Garth, vice president, and F. Zulandt, secretary-treasurer, all of Johnson City, Tenn.

Louisville, Ky.—The Hazard-Blue Grass Coal Corporation, with a capital of $1,000,000, is offering $350,000 worth of preferred stock, through investment houses. This concern was recently incorporated under the laws of Virginia, as a consolidation of the Hazard Coal Co. and Blue Brass Coal Corporation. The mines are located in Perry County, near Hazard, and the general offices are at Johnson City, Tenn. The directors are principally bankers of Kentucky, Tennessee and Virginia. Leases cover 5,000 acres of coal land, the highest royalty rate being 10 cents per ton. The properties are estimated to contain 35,000,000 tons of coal. These mines are laid with good steel, have more than 500 mine cars and ten electric locomotives; ten electric mining machines, three substations, two conveyor lines that cost $25,000 each; two modern tipples with shaker screens that would cost not less than $75,000 to erect; electric fans, electric pumps, machine and blacksmith shops. The plant is one of the most complete in the state. J. F. Hatfield, of the Belmont Coal & Coke Co., Cincinnati, Ohio, is one of the incorporators.

DISCUSSION by READERS

EDITED BY JAMES T. BEARD

Roller Bearings for Mine Cars

Letter No. 7—The discussion, in *Coal Age*, regarding the merits of plain and roller bearings, for mine cars, has been very interesting. However, I seriously question the figures presented by Richard W. Harris, in the issue of Mar. 4, p. 455, respecting the cost of lubrication for mine cars equipped with plain bearings.

Last year, we used 746 mine cars, which were scattered among six different mines. These cars were equipped with the Eureka wheel made by Hockensmith. The cars were oiled on an average once every six weeks, using for that purpose No. 119 Keystone grease

For the ten months extending from January 1 to October 31, the grease for lubrication cost us $1,370.71. The labor cost for applying the grease to the cars was $204.15 which made a total outlay, for lubricating the 746 cars, during the ten months mentioned, $1,574.86. Adding one-sixth to this amount, to reduce to a basis of a year, gives a total estimated cost for the lubrication of these cars, $1,837.34, which makes the average cost, per car, per year, $1,837.34 ÷ 746 = $2.46, as against $4,380 ÷ 700 = $6.25, per car, per year, by Mr. Harris' estimate. This is only slightly above his estimated cost for lubricating cars equipped with roller bearings, which was $1,400 ÷ 700 = $2, per car, per year.

Let me say in addition, that all of our cars are drawn by rope haulage, with speeds that run as high as eighteen miles per hour. R.

Robertsdale, Pa.

Letter No. 8—Referring to the letter of Richard W. Harris, *Coal Age*, Mar. 4, p. 455, relating to roller bearings for mine cars, allow me to say that his reference to the cost of lubricating both plain- and roller-bearing cars has interested me greatly, as I have been operating trucks equipped with both types of bearings.

Our plain-bearing trucks have the cavity-type wheels, which require greasing every 90 days, while the roller-bearing equipment requires greasing but once in eight months. Each roller-bearing car requires eight pounds of grease at 10c. a pound, making the cost for grease 80c. per car, in eight months, or $1.20, per car, per year.

Two men will grease thirty of these cars a day. They are paid $5.42, each, for this work, which makes the labor cost, per car, 2 × 5.42 ÷ 30 = $0.36, in eight months; or 54c., per car, per year. This makes the total cost for labor and grease 1.20 + 0.54 = $1.74, per car, per year.

On the other hand, the plain-bearing, cavity-type wheels, require greasing four times a year, using four pounds of grease per car; or sixteen pounds, per car, per year, at 10c. per pound, which makes the total cost of grease $1.60, per car, per year.

Two men will grease 50 of these cars, per day, each man receiving $5.42 a day, which makes the cost for labor 2 × 5.42 ÷ 50 = $0.22, per car, each time they are greased, or 88c. per car, per year. This makes the total cost for labor and grease 1.60 + 0.88 = $2.48, per car, per year; and shows a saving, in favor of roller-bearing cars of $2.48 — 1.74 = $0.74, or 74c., per car, per year.

Mr. Harris gives the cost of labor for greasing roller-bearing cars four times a year, as taken from his records at the mine, as 40c., per car, per year, or 10c., per car, each time they are greased. At this rate, my cost for grease and labor, for roller-bearing cars, greased once in eight months, would be $1.20 per car, for grease and 15c., per car, for labor, making the total cost for grease and labor $1.35, per car, per year.

However, I am satisfied that roller-bearing cars cannot be greased for ten cents, per car, when the car has to be sidetracked, and the cast-iron plug removed from each wheel, the grease put in with a grease-gun, the plugs replaced and the car returned to service again. At the rate of wages paid for this work, this operation would have to be completed in four-and-one-half minutes to reduce the cost to ten cents, per car.

Staunton, Ill. B. F. MEYER

Tamping Dynamite

Letter No. 5—Referring to the letter of Gaston F. Libiez, on the subject of the need of tamping dynamite, *Coal Age*, Jan. 29, p. 244, I am glad to see that he emphasizes what I have always found an important factor in gaining efficiency in the shooting of coal. Aside from the danger to the health and lives of miners, there are many thousands of dollars wasted annually through ineffective shooting, and the loss in tonnage from the same cause is immeasurable

Aside from the proper mining of a shot, one of the strongest—in fact I may say *the* strongest argument, in behalf of the effective use of dynamite and permissible explosives, is the proper tamping of the charge. My own personal experience, as well as data gathered from every reliable source, has convinced me that the most effective results are obtained when a charge is tamped full to the mouth of the hole. The almost invariable custom of using short lengths of fuse and tamping the hole to a fraction of its depth only, gives inferior results.

It was my pleasure to witness a series of comparative tests of black powder and permissible explosives. These tests were made for the purpose of demonstrating the effectiveness of the latter in the blasting of coal. In the course of the demonstration, it was shown that when a permissible powder was tamped to the end of the hole, the results exceeded those that could be obtained by the use of black powder, and there was less hazard or risk to the miner. Other tests made with partly tamped charges of permissible powder proved that there was a considerable loss of time and energy, which gave unsatisfactory results.

While the fully tamped charge brought the coal down in an excellent manner, the same charge but partly tamped only broke and sprung the coal, and fifteen or twenty minutes of hard muscular effort was then required of the miner to loosen or break down the shot. This was far more time and effort than would have been necessary to properly tamp the charge. Perhaps the fully tamped hole would require a little longer fuse and consume a minute or so more for the fuse to burn to the powder; but the rest and relaxation in that time would do the miner no harm.

TESTS NEEDED TO SHOW THE EVIL OF POOR TAMPING AND USE OF SHORT FUSE

The tests to which I refer were necessary at that time, to discourage the use of black powder in shooting coal, which practice has been the direct cause of numerous fatal accidents and gas and dust explosions. At present, it is just as necessary to show the evil attending the use of short fuse and improperly tamped holes, with a view to discouraging such practices.

The miners' chief objection to the use of permissible powders was their increased cost, amounting to about two cents. To offset this, miners resorted to the use of short fuse and improperly tamped holes. But, saving two cents in this manner meant the loss of dollars in effective shooting. Notwithstanding the success of these demonstrations, which showed the effectiveness of fully tamped holes, the practice of using short fuse and half-tamped charges still prevails in many localities, and these will require greater effort to show the fallacy of such methods.

In the explosion of nitroglycerine, as in dynamite and highly nitrated powders, the action is very quick. While it is possible to break a rock by placing the explosive on its flat surface, it cannot be denied that far better results are obtained when mud or dirt is placed over the dynamite. While it is readily admitted that the force of the exploding charge is radiated in every direction, it is only reasonable to conclude that the expansion of the gases is greatest in the line of least resistance; which, in a poorly tamped hole, is along the axis of the hole. On the other hand, a fully tamped hole presents almost equal resistance in the line of the hole as in the solid coal, which will be broken down by the force of the explosion.

Because apparently good results are obtained in an untamped hole charged with a high explosive, many are deceived and led to think that the tamping of such powders is not required. Comparative tests are needed to show that a smaller charge will produce equal results in a hole that is fully tamped. No careful and intelligent miner can fail to profit by such demonstations. Where the honest miner has made these tests for himself, he has saved time, powder, energy and money, whether he uses a 15 per cent or a 60 per cent dynamite.

Aside from the effective results obtained in shooting coal, the factor of safety in the matters suggested is of equal importance. According to statistics compiled by the Bureau of Mines, about 25 per cent (24.80 per cent) of the fatalities due to blasting coal occur from premature blasts, and only about 3 per cent (2.97 per cent) are ascribed to tamping the holes. Those familiar with the practice of blasting in coal mines will agree that accidents described as "premature blasts" are chiefly the results of the use of short fuse. The latter tabulation, however, is avoided, as it is a practical admission of the violation of the mining laws. It will also be agreed that many of the accidents due to tamping result from hurriedly trying to get the powder back into the hole with a short fuse, already lighted, attached to it. Let us hope that these practices, which are so dangerous, will be discarded and the reckless habits of miners will give place to a deeper regard for safety.

Thomas, W. Va. W. H. NOONE.

Shifting the Worker

Letter No. 5—Reading the letters written on this subject calls to mind a statement made by one of our greatest manufacturers and financiers who remarked, "It is easier to finance the building of a large plant than it is to find a man big enough to manage it."

Reflecting on this truth, one is brought to face the fact that the success of any undertaking will depend largely on the ability and judgment of the boss, in selecting and placing competent men in the various positions. Therefore, a boss's business, first and last, is to select the right man for the right place; and to do this he must be familiar with the general order of things, and reserve the power of employing and dismissing every man under his supervision who fails to show the required capability and fitness.

When a change is made from one department to another, or from one job to another, the same care must be exercised. Some of the most serious accidents and numerous breakdowns, causing fluctuations in production, have been due to unwise changes. To overcome the necessity of placing inexperienced men at certain work, which is a common occurrence at a coal mine most any morning when the regular man fails to report, extra men should always be in training.

TRAINING WORKERS FOR FILLING HIGHER POSITIONS

A good rule is to train brakemen for motormen, trackmen for brakemen, timbermen for drillers, scrapers for cutters, etc. This should be done on idle days or whenever an opportunity is offered that will not interfere to any great extent with the general order of production. In this way only, can a safe and uniform output be maintained. A common cause of accident is allowing a man to do certain work just because he wanted to do it. The boss is the judge as to whether or not a man is physically or mentally fit for the work he desires. I know of many instances that illustrate this point, but one will suffice to explain. It is as follows:

A young man who was helping on a rockdrill wanted to change to braking on a motor. He was of the right build, but unfortunately had a nervous, excitable temperament. He was given a trial and proved the most anxious man on the job; but it soon developed that he could not keep his head when anything out of the ordinary happened. For that reason the boss put him back on the drill, much to the surprise of the motorman and some others acquainted with the matter. The mine committee took it up with the boss, but quickly agreed with him when it was shown that his first thought was to prevent accidents. Later, however, a new boss put this same young man back on the motor, with the result that he was killed inside of the first month.

Another case was that of a trackman who was put on braking, a work in which he had had no previous experience. Not being used to running and being continuously on his feet, he tired quickly. I regret to say that this man also was killed when gathering the last trip, before quitting for the day. The accident might have been avoided had the motorman given him plenty of time toward evening. But, as it was, he drove the new man the same as the regular man in trying to quit early.

Still another accident, on the same class of work, occurred when a miner was called out of his place to brake; he was not dressed for the work and was killed by having his ragged trousers caught in a rail joint. An experienced brakeman keeps his trouser legs inside of his socks and wears high shoes.

Occasionally we find men who can do more than one thing well. They should always be encouraged, for they are the most valuable workers and will never be satisfied to continue doing but one kind of work. Changes of occupation on laborious work is the best cure for staleness, which is the greatest detriment to progress. A thinking foreman, with a plan in his head, gets results by keeping his men contented.

Pikeville, Ky. G. E. DAUGHERTY.

Are Shotfirers Harmful?

Letter No. 2—It was with much surprise that I read a short article in *Coal Age*, Feb. 12, p. 309, in which the writer claims that the employment of shotfirers and the use of shotfiring systems are most harmful and dangerous. The article is unsigned, but apparently the writer is viewing the subject from what he considers would be a saving effected by spending the money that would be used to employ shotfirers, and apply it to the better ventilation of the mines. His concluding statement is "spend just half as much money in real ventilation and make the mines really safe."

If by "shotfiring systems" is meant the electric system of shooting, I agree that this is unnecessary and might well be discarded, whether the firing is done by hand batteries or from the surface. However, there are several reasons why shotfirers should be employed to shoot down the coal after all the miners have left the mine and gone home for the day.

MINING LAW IN COLORADO

Though not familiar with the requirements of the mining laws of other states, the law of Colorado (Sec. 149) requires the use of permissible powder in all coking-coal mines and mines where safety or electric lamps are exclusively used because of the presence of explosive gas, and in such mines as the chief inspector believes the dust to be highly explosive.

My opinion is that if miners were permitted to do their own shooting in any of the mines mentioned here, it would not be long before some one of them would blow up the entire mine. The law further states (Sec. 158) that, where permissible powder is used, the primers shall be handled only by the shotfirers or shot examiners, who alone shall prepare the charge and fully tamp all shots before firing them.

Speaking of poor ventilation in mines, the employment of shotfirers would eliminate this trouble, as no competent shotfirer will undertake to fire shots in a mine that is improperly ventilated. The argument advanced by the writer of the article mentioned assumes a condition in the mine that will permit the use of open lights. If the mine is generating gas in any quantity whatsoever, the ventilation must be sufficient to assure safety. In the presence of open lights and the probable use of black powder and squibs or fuse, there is always the possibility of the occurrence of a windy or a blownout shot, owing to the improper tamping of the powder, overcharging the hole, or a badly placed shot or other cause. Any or all these things are liable to result when miners do their own shooting.

FATALITIES DUE TO CARELESS HABITS OF MINERS

Many miners have been killed by the explosion of their powder when preparing a cartridge, the accident being caused by a spark from their open light falling into the powder. Frequently the miner will tamp his hole with an iron bar and pay for his heedless act by the loss of his life; or he will cut off the end of the match from his squib, in order to shorten the time of the explosion of the shot, and, as a result, be caught by the flying coal before he can reach a place of safety.

A practice that has often proved fatal to the miner is that of returning to the face to ascertain the cause of a delayed shot, which may explode about the time he has reached the coal. Or, if that does not happen, the miner may be overcome by the smoke and gases of other shots. The practice of shooting off the solid has often produced a blownout shot, and perhaps a local explosion of gas or dust has occurred with fatal results.

NO ECONOMY IN ELIMINATING SHOTFIRERS

My opinion is that any person who desires to do away with the employment of shotfiring has had no practical experience in the mining of coal in mines generating much gas, or where the coal is friable and contains a high percentage of gas and makes much fine dust. Although in Colorado we have a good mining law that is second to none, it cannot be denied that there is a tendency on the part of mine officials to overstep the law in many ways, and the ventilation of our mines cannot be said to be modern, for which the high cost of operation is responsible.

Shotfirers, here, obtain $7 a day and ordinarily earn an amount approaching $2,000 a year. In eight hours a shotfirer will examine, prepare, and charge the holes, and shoot about 400 tons of coal; but he must have good ventilation to insure safety. Let me ask if it would be a saving of time and labor to eliminate the shotfirer, and allow the miners do their own shooting, when a single fatal accident will cost the company about $3,000. Will anyone say that it will be possible to operate a coal mine a single year and not have some miner blown to pieces by reason of his own or another's carelessness, ignorance or reckless disregard of danger.

In closing, let me say that we have some "honest to goodness safety men" on the inspection staff of this state, and they cannot be classed as "porch lizards." Also, we have superintendents, foremen, firebosses, shotfirers and timber safety men, who know safety from A to Z in respect to mining coal. Somebody would have an awful time in attempting to eliminate from the mining laws of Colorado the requirements relating to shotfirers.

Farr, Col. ROBERT A. MARSHALL.

Co-operation Among Mine Officials

Letter No. 7—I have been reading the many interesting letters on this subject that have appeared in *Coal Age;* and the discussion is most timely, as co-operation is, to my mind, one of the greatest factors in a coal-mining organization. Without it, it is practically impossible to acquire the highest efficiency.

My own experience in the operation of mines is one that exhibits a marked contrast between one organization where there was harmony and co-operation on the part of every official, and another where there was a great lack of such co-operation. The recital may prove of interest to many others who doubtless have had similar experiences.

Hard-Luck Stories Told the Superintendent

A few years ago, it was my fortune to be employed by a coal company, in the position of mine foreman. The superintendent was a man who knew nothing about a coal mine and had no desire to learn. He seldom came to the mine, and never ventured underground.

As will be readily understood, this type of superintendent was always ready to listen to any hard-luck story that a miner was ready to tell him. Not being a practical man, he accepted as truth these tales of miners claiming they had a "bad place, very wet, low hard coal," where they could not earn a living.

In reply, the superintendent would say "Never mind, I'll fix that on pay day"; and, sure enough, when pay-day came these fellows would find, $10, $15 or $25 extra money in their envelopes. This was too good to keep and the fellow thus favored would make his boast at the hotel when drinking, and show his pay envelope. The result was that my best men began to accuse me of giving these fellows a higher rate that enabled them to make the money they did. The trouble was soon traced to its source, however, with the result that the superintendent blamed me.

About this time the president of the company advanced the superintendent to the position of manager, and I was made superintendent and given full charge of the operating end of the business, with instructions to report to the manager.

Changes Made Give Increased Efficiency

My first visit to the different mines of the company brought about numerous changes, and others were recommended. Naturally, this stirred the ire of my already cross boss, and caused him to ignore many of my reports, and he also made some effort to start a crusade against me. However, the changes made in the mines, and my treatment of the different foremen and the men brought them to my side; and they always greeted me warmly and expressed themselves as glad to get someone to whom they could talk and who understood their plans and would co-operate with them.

The result of these changed conditions wrought a large increase in the daily tonnage of the mines, while the operating expenses were reduced at the same time. It was not long before the mines were getting in fairly good shape and everything was running smoothly on that end of the business. At this juncture, however, it so happened that I was offered a position with another company, which I gladly accepted. In contrast with the conditions under which I had been working, I will recite briefly the conditions which surrounded the work in my new position.

The manager of this company was well acquainted with mines and mining conditions, having been associated with the mining of coal from his boyhood. He took a deep interest in every detail. Any change to be made, or any recommendation offered, received his careful attention. The result was that the mines were worked on a paying basis. The company was satisfied and the men likewise. Good feeling prevailed not only throughout the organization but likewise among all with whom the company did business.

I need not say that it has been a pleasure to be associated with a company where the officials' one desire was to co-operate with each other and with their men. From the manager down, each man was on the job doing his best at all times; and there were no idle days, except when there were no cars. It had been the habit of one of the company to invite different ones among him men for a short stay at his hunting camp where they were treated on terms of equality and made to enjoy their trip.

Outsiders have frequently failed to understand why this company has had no labor troubles or strikes to mar the harmony that exists among the workers in their mines. Though my former manager has often tried to get me back, there is no desire on my part to return to the old conditions. **S. D. Hainley.**

Osceola Mills, Pa.

Growing Scarcity of Mine Timber

Letter No. 2—Regarding the question of how mine roof can be supported without the use of timber, it would seem that the proper answer, or at least, the answer most readily made, would be to advise the use of iron or steel supports, which is not new in mining practice. However, the question of cost is an important one and must be considered in this connection.

The relative cost of different materials that can be used to support mine roof can only be determined by experimenting, for a sufficient time, in order to enable a correct judgment to be reached in regard to the practicability of their use. The results should then be tabulated so as to show the minimum cost per ton of coal mined in the use of each material.

It is common to speak of the "life of mine timber," by which is meant the duration of service up to the time when the wood becomes so rotten or decayed that it is of no further use; or the post is crushed or broken under the weight it should support. The life of mine timber can be lengthened by such treatment as creosoting and other methods known in mining practice. Many of these have been described, from time to time, in the pages of *Coal Age*, and need not be repeated here.

Another method of prolonging the life of timber is to adopt such a method of working as will lessen the load resting on the timber supports, by throwing much of the weight of the overburden over onto the solid coal and by leaving adequate pillar supports that will prevent the crushing of the coal and reduce the liability to squeeze, which is so destructive of timber. These and other methods of conserving timber must be carefully studied. It is of chief importance to draw all timbers from abandoned places, and use these again.

Linton, Ind. **W. H. Luxton.**

INQUIRIES OF GENERAL INTEREST

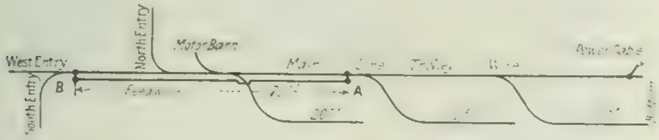
ANSWERED BY JAMES T. BEARD

Feedwire in Locomotive Haulage

Kindly permit me to submit a rough sketch of our trolley wire, showing the present installation in the mine. My desire is to ascertain what gain there is, if any, in the extra feedwire shown as running a distance of 700-ft. from A to B. As indicated in the sketch, power is supplied to the trolley wire from a large cable to which it is connected at the shaft bottom. Branch lines extend into the back entry, as I have shown and tried to make clear in the drawing.

We are operating two 6-ton Goodman locomotives. One of these runs into the south entry while the other operates on the straight west, besides hauling coal from the north entry. The locomotive running south travels a distance of 3,000 ft. from the shaft bottom to the inside parting, which makes 6,000 ft. for a round trip. The locomotive operating in the west and north entries must run a distance 5,000 ft. each round trip. The voltage is 250 volts.

As shown in my sketch, an extra feedwire 700 ft. long has been installed for the purpose, as our electrician says, of enabling the locomotives to operate with greater efficiency. This feedwire is attached or cross-connected to the trolley line by common cast-iron trolley hangers bolted together with short pieces of copper wire. Both the main trolley line and the feedwire are No. 0000. Kindly state if there is any necessity for maintaining this extra length of feedwire.



PLAN OF A TROLLEY-HAULAGE SYSTEM

La Salle, Ill. ASSISTANT SUPERINTENDENT.

The electrician is right in stating that the feedwire mentioned is required for the more efficient operation of the two locomotives. A 6-ton locomotive operating on a 250-volt circuit will require a current of about 100 amp. The two locomotives, operating at the same time, will call for a current of 200 amp. Both of these locomotives may chance to be at the end of their respective lines at the same time.

In that case, making due allowance for a return either by wire or through the rails, which must be well bounded, the transmission of a current of 200 amp. through a 0000-wire, a distance of 1,200 ft. to the mouth of the south entry, shows a drop of 10 per cent, in voltage, or a loss of 25 volts, reducing the voltage at that point to 225 volts.

Again, the transmission of a current of 100 amp. to the face of the south entry, a distance of 4,000 ft., including the return, the round trip from the shaft bottom to that point being 6,000 ft., would mean a further drop of 8 per cent, or a loss of 18 volts, which would reduce the voltage available at the face of the south entry to 207 volts.

Likewise, the voltage at the face of the west entry would be reduced to 212 volts. Owing to this drop in voltage, locomotives would operate at a greatly reduced efficiency.

On the other hand, the 700-ft. length of extra 0000-wire provides an additional 8 volts at the faces of the south and west entries, respectively, affording an increased efficiency of about 4 per cent at each of those points. This increase in the voltage available at the extreme end of the trolley system will be appreciated by experienced motormen, who realize what a drop of pressure means in the operation of a haulage locomotive.

Arkansas Mining Law

A question has arisen here that has caused considerable discussion of late, in respect to the requirements of the Arkansas State Mining Law, as it relates to men entering the mine when one or more places have been "marked out" as being dangerous for work. Some say that if there are two places marked out by the fireboss when making his examination of the mines, in the morning, it would be a violation of the mining law to permit men to enter the mine. Others say that if but one place is marked out by the fireboss as being dangerous, it is sufficient to prevent the men from entering the mine. Still others claim that there is no requirement of this kind in the law; but that the law is silent on the subject of men being permitted to enter the mine after the fireboss has completed his examination of the workings. I want to ask what the law says regarding this matter.

Russellville, Ark. J. P. HILL.

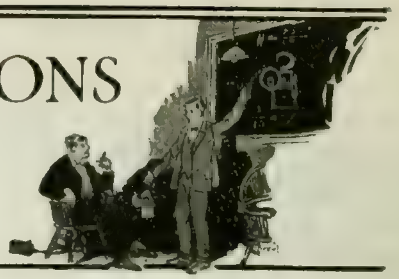
The mine regulation specified in Act No. 225 of the Arkansas law, describing the duties of the fireboss reads as follows:

> SECTION 10. In all mines where a fireboss is employed, all working places, and worked-out places adjacent to working places, shall be examined when it can be done at least once a day by a competent fireboss, whose duty it shall be to enter a report of the existing conditions of such working places and worked-out places in a well-bound book to be kept by him for that purpose, and all dangerous places that are marked out shall be marked on a blackboard furnished by the company, before any other employees enter the mine.

From the reading of this section, it appears that there are no restrictions placed on the men being permitted to enter the mine, after the fireboss has entered the report of his examination in the book kept for that purpose, and has marked on the blackboard those places where he has found danger. It may be reasonably supposed that men who work in the places reported as dangerous would be instructed not to proceed into the mine, until their places have been made safe.

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD



Mine Inspectors' Examination Pottsville, Pa., March 30, 31, 1920

(Selected Questions)

Ques.—Name and describe the four electrical units in common use.

Ans.—The four common electrical units are the ampere, volt, ohm and watt. The ampere is the unit used to express the strength of the current flowing in a conductor. The ampere, in electricity, corresponds to *volume* in ventilation, it being an expression for quantity.

The volt is a unit used to measure the electromotive force, and expresses the pressure of the electric current. It corresponds to pressure in ventilation.

The ohm is the unit used to measure the resistance offered by a conductor to the flow of an electric current. A resistance of one ohm requires a pressure of one volt to pass a current of one ampere through a conductor.

The watt is the unit of electric power. It is the power required to pass a current of one ampere, under a pressure of one volt. Seven hundred and forty-six (746) watts are equivalent to one horsepower.

Ques.—How is electric current generated before it is transmitted, and how is the transmitted electric power utilized?

Ans.—The current is generated by an electric dynamo or generator. The transmitted current is utilized in the operation of an electric motor.

Ques.—A current of air entering a mine is 150,000 cu.ft. per minute, at a temperature of 40 deg. F. The air at the outlet measures 165,000 cu.ft. per minute, at a temperature of 65 deg. F. What is the percentage of mine gases present in the air leaving the mine?

Ans.—In this case, ignoring the effect of the reduced pressure at the discharge opening of the mine, and calculating the increase of volume due to rise of temperature, we have for the estimated volume of the return air, from this cause,

$$\frac{x}{150{,}000} = \frac{460 + 65}{460 + 40} = \frac{525}{500}$$

$$x = \frac{150{,}000 \times 525}{500} = 157{,}500 \textit{ cu.ft. per min.}$$

Then, since the measurement on the return airway shows 165,000 cu.ft. of air and gas, the volume of gas present in that current is 165,000 — 157,500 = 7,500 cu.ft. per minute. The percentage of gas present in the return current is, therefore, 100(7,500 ÷ 165,000) = 4.54, say $4\frac{1}{2}$ per cent.

Ques.—Name and describe the different gases, common to the anthracite mines. What are their dangers to life and their injurious effects on man? Give also their symbols, specific gravities and properties. Where are they found? How are they produced? Give their effects on combustion.

Ans.—Methane or marsh gas (CH_4); specific gravity 0.559, is combustible gas. It is not poisonous, but when breathed in an undiluted state produces death by suffocation. This gas forms an explosive mixture with air. Being lighter than air, it accumulates at the roof or at the face of steep pitches and in rise workings where it may be found in large quantities. Methane is produced by the slow metamorphosis of carbonaceous matter, in the absence of air and the presence of water. This gas is occluded in the coal formations. Having no available oxygen, the gas extinguishes flame, except when mixed with air in proportion to form either an inflammable or an explosive atmosphere.

Carbon monoxide (CO) specific gravity, 0.967 is a combustible gas and very poisonous, small percentages present in the mine air producing instant death when breathed. This gas is formed by the slow combustion of carbonaceous matter in a limited supply of air. It is found in abandoned workings where there is little or no ventilation. It occurs also in the return from a mine fire. The effect of carbon monoxide on combustion is to increase the activity, the gas itself being combustible.

Carbon dioxide (CO_2), specific gravity 1.529, is an extinctive gas, heavier than air. It accumulates at the floor and in swamps, dip workings and other low parts of a mine. It is produced by the various forms of combustion that take place in the presence of a plentiful supply of air; as, for example, the burning of lamps, breathing of men and animals and other forms of active combustion. With the nitrogen of the air it forms the blackdamp, which always accumulates in poorly ventilated mine workings and in abandoned places that are unventilated. Having no available oxygen, it will not support combustion.

Olefiant gas (C_2H_4) specific gravity 0.978 is a heavy, hydrocarbon gas often associated with methane. Its properties are much the same as that gas. This gas and ethane (C_2H_4) specific gravity 1.0366, also a heavy hydrocarbon gas, like methane, has been produced in the formation of coal. But unlike methane, both of these gases have been produced in the absence of air and water.

Hydrogen sulphide (H_2S) specific gravity 1.1912 is a combustible and poisonous gas, having a strong disagreeable odor resembling that of rotten eggs. The gas is formed by the disintegration of iron pyrites in the presence of moisture. The gas seldom occurs in quantity to be dangerous in the mines, although like methane it forms explosive mixtures with air. Having no available oxygen, it is not a supporter of combustion.

F. G. Tryon Heads Mineral Fuels Division of Geological Survey

Receives Permanent Appointment as Successor to C. E. Lesher — Assisted in Economics Section at Peace Conference

F. G. TRYON has been formally appointed as head of the Mineral Fuels Division of the U. S. Geological Survey. He has been acting head of the division since the resignation a few months ago of C. E. Lesher. His appointment is now made permanent.

F. G. TRYON

Mr. Tryon is a native of Indianapolis, where he acquired his early education. Later he attended the University of Minnesota, where he specialized in economics, economic geology and mining engineering. He was graduated from that institution in 1914. He took a two-year post graduate course, however, and earned a master's degree. He was elected Rhodes scholar for Minnesota, but owing to the imminence of the war he did not undertake that work.

He spent a short time in the Mid-Continental oil field, where he did work as an oil geologist. While engaged in that work war broke out. He was denied admission to the army because of physical disability. Determined to do some sort of war work, however, he went to Washington and secured employment as assistant geologist on the staff of the U. S. Geological Survey.

Shortly thereafter he was transferred to the Council of National Defense to take charge of statistics of mineral raw materials, chemicals and explosives. After several months of that work his return was requested by the Geological Survey in order that he might assist in the increased work being done by that bureau in the collection and compilation of mineral fuel statistics.

A few months later Mr. Tryon was commissioned as captain and assigned to the statistical division of the General Staff, where he was placed in charge of statistics on chemicals, fuels and explosives. His duties in this connection made it necessary for him to join the American Expeditionary Forces, where he was attached to headquarters at Chaumont.

After the signing of the armistice Mr. Tryon was transferred to the staff of the Peace Commission in Paris, where he was assigned to the economics and statistical section. Later he became American secretary of the raw materials section of the Supreme Economic Council. With the completion of his work in the economics section he was ordered to return to Washington, where he spent two months completing his statistical duties. On being released from the army he resumed his work with the Geological Survey.

For many years Mr. Tryon has made a special study of matters pertaining to the conservation of mineral fuels. He is convinced that this problem must combine the points of view of economics and engineering. While he realizes that the conservation of fuels is essentially an engineering problem he also is aware of the inability to carrying out policies in that connection in disregard of the dollars and cents consideration.

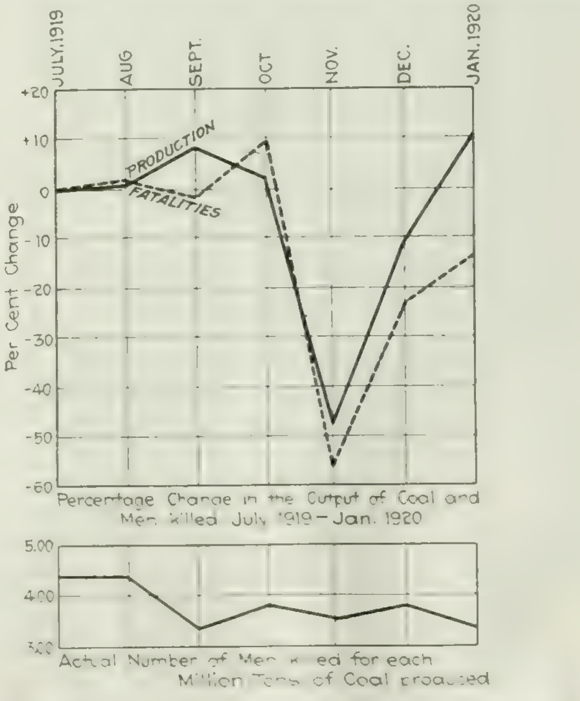
Have Fatal Accidents Been Reduced by Increased Sobriety?*

W. W. Adams, U. S. Bureau of Mines, Mine Accident Statistician, Presents This as a Problem as Yet Unsolved

A GRATIFYING decrease is noticeable in the number of men killed in the coal mines of the United States during the past six months as compared to the quantity of coal produced. During July last year, when 221 men lost their lives, the production of coal was over 50 million tons. In January, 1920, the production had increased to 56 million tons, or 11 per cent, while the fatalities, instead of increasing proportionately, actually decreased to 188, or nearly 15 per cent. Nor is this decrease a mere accident or coincidence peculiar to the month of January, as may be seen from the following table:

	Production (short tons)	Men killed	Number killed per Million Tons
July, 1919	50,501,000	221	4.38
Aug. 1919	50,805,000	223	4.39
Sept. 1919	54,735,000	179	3.27
Oct. 1919	64,702,000	243	3.76
Nov. 1919	26,389,000	94	3.56
Dec. 1919	44,527,000	169	3.80
Jan. 1920	56,043,000	188	3.35

From the figures shown above it may be observed that the average monthly production for January and the five months immediately preceding was 49,500,000



HAS LACK OF SPIRITOUS LIQUORS DEPRESSED THE FATALITY CURVE?

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*"Decrease in Coal Mine Accidents," in Monthly Reports on Investigations, U. S. Bureau of Mines.

tons, or only 2 per cent below that for July, while the average number of men killed was 183, or a decrease of over 17 per cent.

The improvement is more clearly shown by the accompanying diagram, based upon the percentage of increase or decrease in the output of coal and the number of men killed, as well as on the actual number of deaths for each million tons of coal produced. The month of July, 1919, has been used as a standard for this comparison because it is fairly representative of the average number of men killed each month since 1911.

It will be noted that during the last six months the accidents have by no means kept pace with the increasing production of coal and that during the coal strike last November the decline in the output of coal was accompanied by an even greater decline in the number of lives lost. It is interesting in this connection to note that a number of large municipalities report an equally important decrease in the death rate from tuberculosis during 1919 and the hypothesis has been advanced that this decrease is due to the effect of prohibition.

New York Anthracite Wage Conference Still Without Result

Union Officials Profess Difficulty Holding Men in Line —Expected That Conference Will Be Concluded This Week

ANOTHER week of conferences by the sub-committee of anthracite operators' and miners' representatives has failed to bring about an agreement. These conferences have been going on since March 9 and as a result of their duration many workers in the mining regions have become disgruntled and talk of remaining away from the mines until an agrement is reached.

In order to pacify some of the workers members of the Wage Scale Committee who happened to be in New York City last week were sent back to their home towns to tell the workers that substantial progress was being made.

A meeting of the Wage Scale Committee was held at the Continental Hotel of this city on April 14, at which the members were made acquainted with the progress made in the negotiations. The utmost secrecy is being maintained by both operators and miners regarding the progress made and as to what discussions take place in the conferences.

During the session on March 15 the Sub-Committee discussed six demands of the miners and made what was regarded as the first actual start toward a new agreement. These demands as set forth in the official statement given out following the conference were:

"The term of years of any agreement that might be reached; the question of abolishing individual contracts; the increase in wages; the establishment of a uniform wage scale so that like occupations would carry the same rate; the demand that shovel crews operating for coal companies be paid the rates paid by contractors to shovel men; and the reduction in hours of pumpmen, engineers, fan runners, stablemen and watchmen."

The sub-committee at the conclusion of its conference on Friday, April 16, issued a statement denying the correctness of figures published in some of the newspapers on April 16, purporting to show profits of coal-mining companies.

The official statement issued by the sub-committee read:

"At the meeting of the sub-committee of anthracite operators and mine workers held today the mine workers submitted a rejoinder to the operators' exhibit relating to rates, opportunity for employment and earnings. A general discussion followed upon the matter of earnings and increase in wages demanded by the mine workers.

"The committee has not at any time had before it figures and data carried as news by the Associated Press purporting to show excessive profits or profiteering by the anthracite operators."

Further discussion of the increase in wages demanded by the miners took place at the session of the sub-committee held on Saturday, April 17. The sub-committee also gave consideration to the expense of maintaining an average family in the anthracite region because of increases in the cost of food, clothing, rent and coal.

While no official announcement was made, the operators are expected in a few days to issue a statement of the action they will take in regard to the demands of the miners.

The sub-committee of anthracite mine workers and operators met on April 19 and resumed consideration of the matters pending before the committee. Upon the question of increase a large part of the session was devoted to an effort to reach a basic conclusion upon which to predicate an adequate wage scale to the anthracite workers.

That there is much unrest among the radicals in the coal fields was stated by some of the Miners' Union officials upon their return to this city on Monday. They say the delay in reaching an agreement is giving the radical elements a chance for agitation and that this is especially true in the Schuylkill County region. So far the union officials have been able to hold the men in line.

It is reported that the check off and other questions raised by the Bituminous Coal Commission have been under discussion.

Retail Prices of Coal by Cities from 1913 to 1920

Figures Are Given Only for Cities Which Quoted Prices for Food and in Years When Food Prices Were Scheduled

AVERAGE retail prices of coal on Jan. 15 and July 15 of each year from 1913 to 1919, inclusive, and on Jan. 15, 1920, by cities have been published by the *Monthly Labor Review* of the Bureau of Statistics of the United States Department of Labor. The prices quoted are those that were charged by the retail trade for fuel for household use.

In addition to the prices for Pennsylvania anthracite, prices are shown for Colorado, Arkansas and New Mexico anthracite in those cities where these coals formed any considerable portion of the sales for household use.

The prices shown for bituminous coal are averages made on the several kinds. The coal dealers in each city were asked to quote prices on the kinds of bituminous coal usually sold for household use.

The prices quoted are for coal delivered to consumers but do not include charges for storing the coal in cellar or coal bin where an extra handling was necessary.

Prices are shown for coal only in the cities in which prices are scheduled for food and are shown for the years when food prices were obtained.

Retail Domestic Coal Prices Per Short Ton on Jan. 15 and July 15, 1913-1919 Incl., Also Jan. 15, 1920

City, and Kind of Coal	1913		1914		1915		1916		1917[1]	1918		1919		1920
	Jan.	July	Jan	July	Jan	July	Jan	July	Jan	Jan	July	Jan	July	Jan
Atlanta, Ga.														
Bituminous	$5 875	$4 833	$5 295	$5 083	$5 250	$4 575	$5 050	$4 500	$7 000	$7 444	$7 778	$8 029	$8 250	$9 050
Baltimore, Md														
Pennsylvania anthracite—														
Stove	7 700[2]	7 240[2]	7 700[2]	7 280[2]	7 620[2]	7 138[2]	7 650[2]	7 860[2]	8 160[2]	9 600[2]	10 450[2]	11 983[2]	11 750[2]	12 500[2]
Chestnut	7 930[2]	7 490[2]	7 950[2]	7 520[2]	7 870[2]	7 363[2]	7 880[2]	7 910[2]	8 316[2]	9 750[2]	10 550[2]	12 042	11 850[2]	12 600[2]
Bituminous												7 540[2]	6 893[2]	7 500[2]
Birmingham, Ala														
Bituminous	4 217	4.011	4 228	3 833	4 090	3 646	3 913	3 644	5 080	5 616	6 461	6 741	7 286	7 496
Boston, Mass														
Pennsylvania anthracite—														
Stove	8 250	7.500	8 000	7 500	7 750	7 500	8 000	8 000	9 500	9 850	10 250	12 000	12 000	12 750
Chestnut	8 250	7.750	8 250	7 750	8 000	7 750	8 250	8 000	9 500	9 850	10 250	12 000	12 000	12 750
Bituminous		. . .	. . . .									10 250	9 000	9 500
Bridgeport, Conn														
Pennsylvania anthracite—														
Stove	. . . . .	. . . . . .	. . . . . .	. . . . .	. .		.	.	10 000	10 500	10 400	12 370	11 750	12 500
Chestnut	. . .	. . . . . .	. . . . .	. . .	.		.		10 000	10 500	10 400	12 370	11 750	12 500
Bituminous	. . . .	. . . . . .	. . . . .	. . . . .								9 125	8 000	8 500
Buffalo, N. Y.														
Pennsylvania anthracite—														
Stove	6.750	6.542	6.817	6.650	6 850	6 650	6 850	7 010	7 600	8 830	9 180	10 400	10 700	10 890
Chestnut	6.992	6.800	7.067	6.900	7 100	6 900	7 100	7 260	7 850	8 830	9 240	10 500	10 800	10 990
Bituminous	. . . .	. . . . . .	. . . . . .	. . . . . .								6 000	8 000	
Butte, Mont														
Bituminous	. . .	. . . . . .	. . . . . .	. . . . . .	7.417	6.750	7 125	7 125	8 222	9 188	9 083	9 377	9 836	10 381
Charleston, S. C.														
Pennsylvania anthracite—														
Stove	8.375[2]	7 750[2]	7 750[2]	7.750[2]	7 750[2]	7 750[2]	7 750[2]	7 875[2]	8 750[2]	12 275		(3)	13 400[2]	13 400[2]
Chestnut	8.500[2]	8 000[2]	8 250[2]	8 250[2]	8 250[2]	8 250[2]	8 250[2]	8 375[2]	9 250[2]	12 475		(3)	13 500[2]	13 500[2]
Bituminous	6.750[2]	6 750[2]	6 750[2]	6 750[2]	6 750[2]	6 750[2]	6 750[2]	6 750[2]	7 000	8 000	8 375	8 500	8 500	8 500
Chicago, Ill.														
Pennsylvania anthracite—														
Stove	8 000	7.800	8 080	7.900	8 100	7 900	8 100	8 240	9.570	10 350	10 900	11 808	12 200	12 590
Chestnut	8 250	8 050	8 330	8.130	8 350	8 150	8 350	8 490	9 670	10 388	10 975	12 016	12 300	12 690
Bituminous	4 969	4.650	5.000	4.850	5 068	4 708	4 938	4 800	7 083	6 671	6 475	6 700	7 017	8 020
Cincinnati, Ohio														
Pennsylvania anthracite—														
Stove	8 250	7 500	8.000	7.917	7 917	7 667	8 000	7 875	10 000	9 500	11.660	(3)	12 000	12.500
Chestnut	8 750	7 750	8.250	8 167	8 167	7 833	8 083	8 125	10 125	9 500		(3)	12 000	12 667
Bituminous	3 500	3 375	3.750	3 500	3 500	3 500	3 688	3 500	5 500	6 098	6 725	6 478	6 139	6 739
Cleveland, Ohio														
Pennsylvania anthracite—														
Stove	7 500	7 250	7.500	7 500	7 650	7 400	7 650	7 850	9 688	9 825		11 050	11 538	12 300
Chestnut	7 750	7 500	7.750	7 750	7 900	7 650	7 900	8 100	10 000	9 575		11 175	11 650	12 233
Bituminous	4.143	4.143	4.400	4 571	4 643	4 607	4 643	4 946	8 227	6 901	6 443	6 821	7 710	7 911
Columbus, Ohio														
Bituminous	. . . . . .	. . . . . .	. . . .	. . . .	. . .			3 640	6 400	5 943	6 179	6 088	6 056	6 513
Dallas, Tex.:														
Pennsylvania anthracite—														
Chestnut	. . . . .	. . . . . .	. . . . . .	. . . . . .	. . .			.		. . . .		18 000	20 000	22 000
Arkansas anthracite—														
Egg	. . . .	. . . .	. . . .	. . . .	. . .	8 250	9 000	8 375	11 500	14 334	14 250	15 800	14 500	18 500
Bituminous	8.250	7.214	7.929	7.150	7.545	6 950	7 458	7 208	10 167	10 139	10 386	10 980	11 083	14 583
Denver, Col.:														
Colorado anthracite—														
Stove, 3 and 5 mixed	8.500	8.500	10.500	8.929	9.214	9.071	9 333	8 786	9 600	11.750	12.325	12 650	13 150	14.000
Furnace, 1 and 2 mixed	8 875	9 000	11.000	9.071	9 286	9 071	9 333	9 071	9 900	11 750	12 325	12 650	12 650	13 500
Bituminous	5.250	4.875	6 474	5 300	5 641	5 192	5 250	5 019	6 000	7 598	7.995	8 148	8 348	8 908
Detroit, Mich.:														
Pennsylvania anthracite—														
Stove	8.000	7 450	8.000	7 500	7.938	7.500	7 950	8 000	9.750	9 880	10 150	11 600	11 890	12 650
Chestnut	8 250	7 650	8 250	7 750	8 188	7 750	8 200	8 250	9.800	10 080	10 520	11 710	11 980	12 750
Bituminous	5 200	5 200	5 200	5 188	5 179	5 237	5 237	5 611	7.583	8 267	8 180	7 732	7 988	8 781
Fall River, Mass.:														
Pennsylvania anthracite—														
Stove	8.250	7.425	7.750	7.688	8.000	7.750	8 750	8 438	11 000	10 750	11 000	12 700	12 500	13 000
Chestnut	8 250	7.613	8.000	7 688	8.000	7 750	8 750	8 438	11 000	10 750	11 000	12 383	12 250	12 750
Bituminous	. . .	.	. . . . .	. . . . .	. . . . . .	. . . . . .	. . .		.		10 000	10 250	9 500	10 000
Houston, Tex.:														
Bituminous		. . .	. . . . .	. . . . . .	. . . . . .	. .		. . . .		9 000		10 000	10 000	12 000
Indianapolis, Ind.:														
Pennsylvania anthracite—														
Stove	8.950	8 000	8 300	7.750	8 250	7 650	8 250	8 500	10 167	9 825	10 250	12 250	12 250	13 000
Chestnut	9 150	8 250	8 500	7 950	8 450	7 900	8 450	8 688	10 333	9 925	10 500	12 333	12 250	13 167
Bituminous	3 813	3 700	4 611	4 000	4 673	4 208	4 411	4 568	6 800	7 107	6 163	6 875	7.375	8 188
Jacksonville, Fla.:														
Pennsylvania anthracite—														
Stove	10 000	9 000	9 000	9 125	9 000	9 000	9 000	9 000	11 000	12 000		(3)	15.000	17 000
Chestnut	10 000	9 000	9 000	9 125	9 000	9 000	9 000	9 000	11 000	12 000		(3)	15 000	17 000
Bituminous	7 500	7 000	7 125	6 875	7 500	7 000	7 500	7 375	8 000	9 333	9 825	10.000	10 000	11 000
Kansas City, Mo.:														
Arkansas anthracite—														
Furnace			8 286	7 917	8 333	7 833	8 333	8 125	9 292	12 592	13 700	15 107	13 593	15 950
Stove, or No. 4			8 929	8 500	8 833	8 375	8 833	8 667	9 958	13 150	14 200	15 550	14 450	16 583
Bituminous	4.391	3.935	4 276	4 093	4 200	4 056	4 515	4 353	6 438	6 703	6 700	7 354	7 469	8 625
Little Rock, Ark														
Arkansas anthracite—														
Egg		. . . . .	. .	. . . . . .	. . .		7 625	7 625	9 000	11 500	12 750	12 975	12 500	
Stove	. . .	. . . .	. . . .	. . . .	. . .							13 333	13 250	13 333
Bituminous	6.000	5.333	6.250	5.833	5 972	5 361	6 000	5 750	8 000	8.250	9 155	9 414	9 250	10 375
Los Angeles, Cal.:														
New Mexico anthracite—														
Cerillos egg		. . . . . .	17 000		15 000	15 000	18 000	16 000	. . . .	22.000	20 000	21 150		21 000
Bituminous		12.500	13.500	12 000	13 600	11 375	13 700	12 900	15.000	14.881	14.700	14 688	14 583	16.000
Louisville, Ky.:														
Pennsylvania anthracite—														
Stove	9 000	8 250	8 750	8 450	8 700		. . . .	. . . . .	. . . . . .	. . . .	. .	(3)	12.750	13 750
Chestnut	9 000	8 250	8 750	8 450			. . .	. . .	. . . .	. . .	10 640	(3)	12 750	13 750
Bituminous	4 200	4 000	4.377	3 953	3 997	3 478	3.816	3.737	5.734	6.038	6 783	6 743	6.816	6 836
Manchester, N. H.:														
Pennsylvania anthracite—														
Stove	10 000	8 500	8.750	8 500	8 750	8 500	9 000	8 750	11 000	11 000	10 500	12 500	12.750	13 417
Chestnut	10 000	8 500	8 750	8 500	8 750	8 500	9 000	8 750	11 000	11 000	10 500	12 500	12 750	13 417
Bituminous	.					.	. . . .	. . . . .	. . . . .		10 000	10 000	10 000	10 000
Memphis, Tenn.:														
Bituminous	4 344[4]	4.219[4]	4.219[4]	4.219[4]	3.883[4]	3.838[4]	3.904[4]	4.083[4]	6.222[4]	6 539	7 171	7 221	7 528	8 000
Milwaukee, Wis.:														
Pennsylvania anthracite—														
Stove	8 000	7 850	8 080	7 930	8 100	7 900	8 100	8 300	9 020	9 560	10 968	12 286	12.400	12.600
Chestnut	8 250	8.100	8 330	8 180	8 350	8 150	8 350	8 550	9 270	9 650	10 904	12 378	12 500	12.700
Bituminous	6 250	5 714	6 143	5 714	6 143	5 625	6 000	5 875	7.743	7 385	7 385	7 814	8 144	8.900

City, and kind of coal	1913 Jan.	1913 July	1914 Jan.	1914 July	1915 Jan.	1915 July	1916 Jan.	1916 July	1917[1] Jan.	1918 Jan.	1918 July	1919 Jan.	1919 July	1920 Jan.
Minneapolis, Minn.:														
Pennsylvania anthracite														
Stove	$9.250	$9.050	$9.350	$9.133	$9.307	$9.150	$9.350	$9.900	$10.350	$10.826	$12.238	$13.708	$13.800	$14.000
Chestnut	9.500	9.300	9.600	9.383	9.557	9.400	9.600	10.150	10.600	10.926	12.328	13.786	13.900	14.100
Bituminous	5.889	5.792	5.875	5.846	5.990	5.960	5.977	6.375	8.077	8.888	8.474	9.000	9.189	10.425
Mobile, Ala.:														
Pennsylvania anthracite—														
Stove	...	......	......	......	......	......	......	......	......	14.000	......	......	17.000	17.000
Chestnut	...	......	......	......	......	......	......	......	......	14.000	......	......	17.000	17.000
Bituminous	..	......	......	......	......	......	......	......	......	8.000	9.000	9.429	9.722	10.333
Newark, N. J.:														
Pennsylvania anthracite														
Stove	6.500	6.250	6.500	6.250	6.500	6.250	6.500	6.750	7.208	8.100	8.500	9.750	10.050	10.483
Chestnut	6.750	6.500	6.750	6.500	6.750	6.500	6.750	7.000	7.292	8.100	8.500	9.750	10.050	10.483
New Haven, Conn														
Pennsylvania anthracite—														
Stove	7.500	6.250	6.571	6.579	7.000	6.750	7.500	7.742	9.500	9.750	10.100	12.050	11.333	12.250
Chestnut	7.500	6.250	6.571	6.579	7.000	6.750	7.500	7.742	9.500	9.750	10.100	12.050	11.333	12.250
New Orleans, La														
Pennsylvania anthracite														
Stove	10.000	10.000	10.000	10.000	10.000	10.125	10.500	11.700	13.100	13.067	.. ..	(2)	16.000	17.500
Chestnut	10.500	10.500	10.500	10.500	10.500	10.625	11.000	12.200	13.500	13.300	14.550	(2)	16.000	17.500
Bituminous	6.056[4]	6.063[4]	5.944[4]	6.071[4]	5.950[4]	6.083[4]	6.091[4]	6.063[4]	6.944[4]	8.040	7.789	8.900	8.292	9.269
New York, N. Y.:														
Pennsylvania anthracite—														
Stove	7.071	6.657	6.857	6.850	7.143	6.907	7.107	7.393	8.500	9.058	9.300	10.757	10.800	11.536
Chestnut	7.143	6.800	7.000	6.993	7.286	7.057	7.250	7.421	8.500	9.083	9.293	10.764	10.857	11.600
Norfolk, Va.:														
Pennsylvania anthracite														
Stove	. .	......	......	......	......	......	......	......	......	10.000	9.500	11.700	12.500	13.000
Chestnut		......	......	......	......	......	......	......	......	10.000	9.500	11.700	12.500	13.000
Bituminous		......	......	......	......	......	......	......	......	7.750	7.750	8.250	9.375	9.750
Omaha, Neb.:														
Pennsylvania anthracite –														
Stove	12.000	10.750	10.700	10.700	10.750	10.700	10.750	11.750	13.200	13.188	......	......	16.450	17.275
Chestnut	12.000	11.000	10.950	10.950	11.000	10.950	11.000	12.000	13.400	13.338	......	......	16.550	17.450
Bituminous	6.625	6.125	6.125	6.125	6.083	6.167	6.042	6.000	7.857	7.950	7.388	8.471	8.930	10.108
Philadelphia, Pa.:														
Pennsylvania anthracite—														
Stove	7.150[2]	6.894[2]	7.281[2]	7.050[2]	7.250[2]	7.013[2]	7.250[2]	7.494[2]	7.969[2]	9.594[2]	9.806[2]	11.244[2]	10.850[2]	11.881[2]
Chestnut	7.375[2]	7.144[2]	7.531[2]	7.300[2]	7.500[2]	7.263[2]	7.500[2]	7.744[2]	8.188[2]	9.681[2]	9.888[2]	11.319[2]	10.950[2]	11.906[2]
Pittsburgh, Pa.:														
Pennsylvania anthracite—														
Stove	7.938[2]	7.375[2]	7.713[2]	7.550[2]	7.875[2]	7.567[2]	7.967[2]	8.000[2]	10.500[2]	..	11.000[2]	12.750[2]	12.750[2]	13.750[2]
Chestnut	8.000[2]	7.438[2]	7.775[2]	7.550[2]	7.933[2]	7.567[2]	8.017[2]	8.100[2]	10.850[2]	10.150[2]	11.050[2]	12.700[2]	12.663[2]	14.000[2]
Bituminous	3.158[5]	3.176[5]	3.188[5]	3.158[5]	3.225[5]	3.225[5]	3.326[5]	3.450[5]	4.857[5]	5.278[5]	5.656	6.000	5.833	6.179
Portland, Maine:														
Pennsylvania anthracite –														
Stove	.	......	......	......	......	......	......	......	.....	10.890	11.040	13.000	12.200	13.440
Chestnut	...	......	......	......	......	......	......	......	.....	10.890	11.040	13.000	12.200	13.440
Bituminous	.	......	......	......	......	......	......	......	......	10.453	10.890	10.853	8.573	9.370
Portland, Ore.:														
Bituminous	9.786	9.656	9.625	9.279	9.382	9.224	9.438	9.263	10.276	10.181	10.442	10.566	11.493	11.618
Providence, R. I.:														
Pennsylvania anthracite—														
Stove	8.250	7.500	7.750	7.450	7.750	7.500	8.750	8.500	10.000	10.500	11.375	12.400	12.000	12.950
Chestnut	8.250	7.750	8.000	7.700	8.000	7.750	9.000	8.500	10.000	10.500	11.375	12.400	12.000	13.000
Bituminous			.	. .	.	. .....	.... .			.	......	10.500	9.000	10.000
Richmond, Va.:														
Pennsylvania anthracite—														
Stove	8.000	7.250	7.750	7.542	8.000	7.500	7.900	8.000	9.450	9.500	9.900	11.500	12.000	12.125
Chestnut	8.000	7.250	7.750	7.542	8.000	7.500	7.900	8.000	9.450	9.500	9.900	11.500	12.000	12.125
Bituminous	5.500	4.944	5.423	5.042	5.444	5.023	5.364	5.063	7.268	7.686	7.811	8.222	8.464	8.931
Rochester, N. Y.:														
Pennsylvania anthracite—														
Stove	.	.....	......	......	......	......	.....	7.200	7.750	8.550	9.050	10.300	10.600	10.800
Chestnut		.....	......	......	......	......	......	7.450	7.900	8.650	9.150	10.400	10.700	10.900
St. Louis, Mo.:														
Pennsylvania anthracite—														
Stove	8.438	7.740	8.150	8.175	8.333	8.033	8.583	8.500	9.813	10.433	11.000	. . .	12.900	13.100
Chestnut	8.680	7.990	8.350	8.363	8.500	8.200	8.750	8.750	10.050	10.533	11.250	.....	12.900	13.225
Bituminous	3.360	3.037	3.288	3.056	3.214	3.050	3.179	3.073	4.615	5.444	5.893	5.463	5.425	5.970
St. Paul, Minn.:														
Pennsylvania anthracite—														
Stove		9.050	9.333	9.183	9.350	9.150	9.350	9.883	10.350	10.727	12.248	13.453	13.800	14.000
Chestnut		9.300	9.583	9.433	9.600	9.400	9.600	10.133	10.600	10.827	12.417	13.543	13.900	14.100
Bituminous		6.041	6.121	6.089	6.167	6.153	6.203	6.610	8.213	9.162	9.148	9.582	9.875	11.531
Salt Lake City, Utah:														
[illegible] anthracite—														
Furnace, 1 and 2 mixed	11.000	11.500	11.500	..	11.500	11.563	11.714	11.429	12.000	14.000	15.000	15.333	16.000	16.313
Stove 3 and 5 mixed	11.000	11.500	11.472	....	11.500	11.571	11.786	11.429	12.000	14.000	15.000	15.333	16.000	16.583
Bituminous	5.639	5.458	5.580	5.552	5.462	5.462	5.464	5.464	5.658	7.250	7.303	7.875	7.250	8.236
San Francisco, Cal.:														
New Mexico anthracite—														
Cerrillos egg	17.000	17.000	17.000	17.000	16.833	16.833	17.000	17.000	19.000	20.750	18.600	21.550	20.500	23.000
Colorado anthracite														
Egg	17.000	17.000	17.000	17.000	16.833	16.833	17.000	17.000	19.000	18.600	18.600	19.400	19.400	21.750
Bituminous	12.000	12.000	12.091	12.400	12.273	12.333	12.250	12.250	13.429	13.867	14.083	14.200	13.591	15.100
Scranton, Pa.:														
Pennsylvania anthracite—														
Stove	4.250	4.313	4.500	4.313	4.438	4.125	4.375	4.800	5.250	6.113	6.050	7.475	7.683	8.233
Chestnut	4.500	4.563	4.750	4.563	4.688	4.313	4.625	4.800	5.250	6.150	6.150	7.563	7.783	8.300
Seattle, Wash.:														
Bituminous	7.125[6]	7.200[6]	6.167[6]	5.800[6]	5.906[6]	5.313[6]	5.528[6]	5.750[6]	5.850[6]	7.867[6]	9.133[6]	9.163[6]	9.103[6]	9.588[6]
Springfield, Ill.														
Bituminous		....	......	2.646	2.078	2.094	2.563	2.750	2.706	3.711	3.661	3.832	3.976	3.950
Washington, D. C.:														
Pennsylvania anthracite—														
Stove	7.500[2]	7.381[2]	7.588[2]	7.419[2]	7.731[2]	7.400[2]	7.625[2]	7.725[2]	8.206[2]	10.100[2]	9.960[2]	11.890[2]	11.911[2]	12.447[2]
Chestnut	7.650[2]	7.531[2]	7.738[2]	7.569[2]	7.881[2]	7.550[2]	7.775[2]	7.856[2]	8.200[2]	10.190[2]	10.064[2]	12.019[2]	12.011[2]	12.538[2]
Bituminous	.			.		..	. . .	. ..	. .	......	7.700[2]	7.974[2]	8.050[2]	8.267[2]

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[1] Prices not secured [illegible] in July, 1917

[2] Per ton of 2,240 pounds.

[3] Zoned out by Fuel Administration.

[4] Per 10-barrel lots ([illegible] pounds).

[5] Per 25-bushel lots (1,900 pounds).

[6] At yard, delivery $0.05 to $2, according to distance

[7] Prices in Zone A

Council of Defense Criticizes High Coal Prices

Government Official Takes Position that Buy-Early Campaign and Car Shortage Should Not Boost Prices

PRESENT high prices of bituminous coal were characterized as inexcusable on any theory of supply and demand or on any economic principle in a formal statement issued by Herbert N. Shenton of the Council of National Defense and formerly secretary of the U. S. Bituminous Coal Commission. Mr. Shenton concludes that neither the advice of the commission to buy and store coal early, the requirements of the export trade, the status of car service, the daily output of the mines, the weather conditions nor supposed shortage of supply explains in any manner the rise in prices, which are out of all relation to the increase in the cost of production caused by higher wages granted by the commission. Mr. Shenton thinks that prices will soon decline.

"The present rise in the price of bituminous coal," says the statement, "can in no way be attributed to the campaign for early buying and storage recommended by the U. S. Bituminous Coal Commission to be carried out by the Council of National Defense. The commission had thoroughly in mind the fact that, owing to bad weather conditions and various other reasons, the removal of fixed prices would doubtless cause a flurry in coal prices for several weeks even after the usual annual drop in consumption of coal.

"The recommendation for the campaign of early buying and storage was that such buying and storage should be urged to commence on or about May 15, when, at the present rate of production, there was reason to believe that production would be in excess of market demand. The plans for this campaign are, therefore, being rapidly developed, and the heartiest co-operation of the largest consumers in the country has been enlisted and pledged.

"There are various causes for the present, and probably very temporary, upward trend in the prices of bituminous coal. Consideration must be given to the fact that there was a rearrangement in the distribution of coal after April 1; that the first week in April happened to include the low production period always associated with Easter, and that high cost production mines, which have for past years been able to operate only because of the fixed price conditions, are making a last effort to obtain what they can.

"A widespread feeling has developed throughout the country that there is going to be a scarcity of coal for domestic consumption owing to the foreign demand. Some persons point to Senator Frelinghuysen's statement of the foreign need for coal. Doubtless a great deal of coal is badly needed in Europe this year, and such as cannot be supplied from other sources will come from the United States, in so far as it can be shipped; but there are very real limitations to our ability to make foreign shipments, and the present large foreign demand is not likely to be continuous enough to warrant the permanent enlargement of dock facilities and the diverting into the coal trade of a large portion of our merchant fleet.

"In spite of the fact that the fleet which was supplying the American Expeditionary Forces was one of the greatest that the United States has ever gotten together, the total number of short tons conveyed by this fleet to Europe was not in excess of 7½ million tons of cargo from our entrance into the war through April, 1919. During 1919 we exported overseas 7,198,000 long tons of coal. This record was better than that of any other year with one exception. During the first ten months of 1919 we were exporting coal overseas at a greater rate than ever before. It is therefore safe to say that on this basis our coal exports overseas in 1920 cannot exceed 10,000,000 tons, which is only 2 per cent of our total production.

"There seems also to be a misapprehension in regard to production. The weekly reports of the Geological Survey show that in the first quarter of the present year our production was decidedly in excess of the production last year and slightly in excess of the production under high pressure in 1918. There is, therefore, no reason based on the past few months for the skyrocketing of prices.

"The fear of immediate suffering from car shortage seems also to figure in the reasons for the flurry. There were sufficient cars and motive power to distribute this unusual production of the past few months, on account of careful and energetic car distribution. These cars and motive power are practically all available, and, while there is definite need for more of both in order to stabilize the industry, there is no immediate serious threatening of a car shortage such as has not existed during the winter, unless it is necessary, because of emergencies, to divert coal cars for other purposes. The more open weather conditions and the efforts to improve allocation of cars by the Car Service Commission of the American Railway Association give promise of a greatly improved car situation in the near future.

"Frenzied bidding up of prices on the part of coal buyers seems, therefore, at this time to be entirely unjustified. There is no reason to believe that there will be a limited supply of coal for the domestic market or that there will be an increased shortage of cars in the near future, save as it is a part of the general transportation difficulties of the present time. Efforts are being made to stabilize prices through regulations of the Interstate Commerce Commission and by special legislation. The educational campaign for early buying and storage will also tend to stabilize the market."

Dynamite Home of Manager Laing

As the outcome of a strike which has lasted since Sept. 1 and which arose because the mine workers insisted on closed-shop regulations, attempts have been made to blow up the homes of T. K. Laing, general manager, and John Gilkerson, mine foreman of the Willis Branch Coal Co., at Willis Branch, a point situated two miles from the town of Pax—a name suggestive of a condition that the mining towns of West Virginia cannot be said in general to enjoy. Pax, be it said, is in the southern end of Fayette County.

Striking mine workers are thought to have been the perpetrators of the crime. A heavy charge of dynamite was placed in front of the homes and as a result all the front of the Laing house was blown down, while the Gilkerson house, which sustained less injury, escaped with the breaking of all the windows. The occupants of the residences, which included three women and five children and Mr. Lang and Mr. Gilkerson, were not injured.

Senate Will Hold Hearings on Frelinghuysen's Coal Bills

Government Officials and Coal Operators Will Present Views in Seasonable Coal Rates and Coal Commissioner Plan

PUBLIC hearings on Senator Frelinghuysen's bills providing for a seasonal freight rate and for a coal commissioner will begin April 22. Early witnesses will be Eugene McAuliffe; Commissioner McChord, Interstate Commerce Commission; Commissioner Clark, Interstate Commerce Commission; George Otis Smith, Director, U. S. Geological Survey; Van H. Manning, Director, U. S. Bureau of Mines, and J. D. A. Morrow, Vice-President, National Coal Association. In addition, representatives of the local coal associations will appear.

Senator Frelinghuysen expects to continue the hearings until every angle of the questions raised in the bills have been presented. Senator Frelinghuysen already is convinced that it would be better to have a graduated increase in the rate rather than have an abrupt change which would be certain to result in great congestion during the latter part of the summer rate.

So far as the coal-commissioner bill is concerned, Senator Frelinghuysen is not altogether convinced that the provisions of the bill should be administered in the way specified in the bill which he has introduced. He admits the possibility that it may be better to turn over the administration of the matter to one of the existing departments. There seems to be a widely-held view that there is no need for a new and independent official. It is suggested that the Bureau of Mines could be given whatever new duties are provided in the bill. This would interfere in no way with the existing coal work of the Geological Survey or of the Federal Trade Commission, it is pointed out. If such a plan were adopted, undoubtedly the responsibility would be fixed directly with the Secretary of the Interior.

It is pointed out that the work already in progress in collecting the facts of the coal industry and in planning for improvements in the mining, storing and using of coal largely comes under the Department of the Interior and the new work proposed would be aided by the forty years of experience of the Geological Survey and the ten years of experience of the Bureau of Mines. The machinery already in operation could continue to function without interruption or lost motion under the Secretary of the Interior.

Business Men Will Gather To Increase Production

BUSINESS men generally are showing a deep interest in a great gathering of business men from all parts of the country to be held at Atlantic City, April 27 to 29, under the auspices of the U. S. Chamber of Commerce for the purpose of making a comprehensive study of means to stimulate production in industry.

The National Coal Association has delegated a representative group of operators from the bituminous fields to attend the conference and this committee is taking considerable interest in preparing to tell the business men of the country that the coal industry is producing to the limit of its ability with a limited supply of cars.

In calling the business men of the nation together to discuss this subject the National Chamber announces that lack of production in all lines of industry is a big factor in our present towering prices and that high prices breed social unrest. Many economists and business men are convinced that once production is speeded up and the supply is greater than the demand, there will be an appreciable cut in the prices of necessities.

With this thought as a background, the convention will consider the question of maximum production from its manifold angles. Finance, labor, agriculture, transportation and numerous other phases that enter into the scheme of production will be studied according to their relative importance to a greater output.

Men prominent in each of these lines of industry and commerce will present their views to the convention. The banker will explain the need of extending a helping hand to Europe in order that Europe may become once more a producer rather than a consumer. For more than four years Europe has been depending largely upon the United States for its commodities. The demand has been greater than our industries could meet. The result has been advanced prices. If European industries can be put back on their feet again by supplying them with raw materials and credit, then the strain will be partially relieved, and American industries will be better able to meet the domestic demand.

Government Officials Oppose Federal Coal Control

Government Scale of Salaries Would Not Secure Men of Sufficient Experience and Ability to Perform Duties

SO FAR as official opinion can be judged at this time, it appears that the main features of the coal commissioner bill are regarded as justified. The consensus is that the consuming public is the chief party in interest and needs to be informed as to the facts of the coal situation. There are scarcely any important officials in Washington who are not opposed to unnecessary interference with the coal industry, but they do believe that the Government must have closer contact with it than has been the case in the past.

The average Government official regards the consumer as having a more important interest in the correct conduct of the coal business than have the operators or labor. It may be stated, however, that with the interest of the consumer at heart they are anxious to save him from Government operation of coal mines. The Government only with difficulty can find enough men of experience and ability, at the Government's scale of salaries, to perform the task of exercising some degree of public control of public utilities and it is regarded as entirely impossible for it to undertake to equip railroads and industries with operating executives who would get the results that private initiative and enterprise can secure.

Since it is feared that nationalization of coal mines, with costs enormously higher than at present, is likely to come unless the Government exercises that type of control that joins with the owners, operators and miners in lowering costs, and enforces upon the operators that relation of prices to costs that recognizes the partnership of the consuming public in the industry, there is a generally held belief that authoritative publicity of facts will tend to avert such a calamity.

Wage Scale Drawn Up In Kanawha Field

Second Important Field to Accept Coal Commission Awards—Adopts Recommended 60-Day Commission to Adjust Differences

An amicable agreement, conforming to the findings of President Wilson's coal commission, has been reached by the scale committees of the Kanawha field operators and miners, after a conference which began in Charleston, W. Va., Wednesday morning, April 7. Much of the delay was caused by the attention the conference found it necessary to devote to various differentials and inequalities.

The memoranda provides that "all internal differences are hereby referred to the various districts for settlement with the understanding that only by mutual consent shall anything be done in sub-district, district or wage scale convention that will increase the cost of production or decrease the earning capacity of the men."

Provision is also made for the creation of a commission to investigate conditions in regard to tonnage rates, differentials, inequalities and dead work, and to make report within 60 days from date. The findings of this commission are to be the basis of adjustment of these matters.

The practice of paying bonuses for the purpose of enticing employees from other mines is condemned, and it is agreed that all fines provided for in all agreements shall be automatically collected under penalty of fine.

The text of the agreement follows:

FIRST—Resolved, that the award of the Bituminous Coal Commission be accepted and the prices written into our agreement, the advances to be applied on prices in effect on October 31, 1919 the advances to be as follows:

Pick mining	24c.
Machine cutting	4c.
Machine loading	20c.
All room turning, yardage and dead work, 20 per cent increase.	

The award of the commission to apply to all day men, monthly men, and trapper boys.

SECOND—Dead work, yardage and room turning is advanced 20 per cent on the prices being paid Oct. 31, 1919.

THIRD—The eight-hour day, in effect on Oct. 31, 1919, shall continue. An eight-hour day means eight hours' work in the mines at usual working places for all classes of inside day labor. This shall be exclusive of the time required in reaching such working places in the morning and departing to and from the same at night.

Drivers shall take their mules to and from stables, and the time required in so doing shall not include any part of the day's labor, their work beginning when they reach the change at which they receive empty cars, but in no case shall the driver's time be docked while he is waiting for such cars at the point named.

When the men go into the mine in the morning they shall be entitled to two hours' pay, whether or not the mine works the full two hours. But after the first two hours the men shall be paid for every hour thereafter by the hour, for each hour's work or fractional part thereof. If for any reason the regular routine work cannot be furnished the inside labor for a portion of the first two hours, the operators may furnish other than the regular labor for the unexpired time.

FOURTH—All internal differences are hereby referred to the various districts for settlement with the understanding that only by mutual consent shall anything be done in subdistrict, district or wage scale convention that will increase the cost of production or decrease the earning capacity of the men. All rules now incorporated in existing contracts shall remain in force until changed by agreement between operators' and miners' representatives.

It is further resolved that a commission be created by this committee to investigate conditions in regard to tonnage rates, differentials, inequalities and dead work, and to make report of their findings to this committee within 60 days from date, the findings of said commission to be the basis of adjustment of the matters which have been referred to it.

FIFTH—The practice of voluntarily paying more than the contract price, either by bonuses or otherwise, which is done ordinarily for the purpose of enticing employees from other mines, and thereby creating discord and disorder in the coal industry, is condemned. It will therefore be assumed in future joint conferences convened for scale-making purposes that all bonuses or advances in excess of wages provided in contract were paid because of physical conditions in or around mines where such methods are practiced, and the wages so paid shall be considered the base price for such mines.

SIXTH—Whereas, stoppage of work in violation of the agreement has become so serious as to menace the success and perpetuity of the United Mines Workers of America and our joint relations, this conference instructs the respective district executive boards to meet the operators in their various districts for the purpose of agreeing on a penalty clause where none now exists, and if necessary meet to amend and strengthen existing clauses so as to make the penalty more effective in preventing strikes and violations of agreements.

All fines provided for in all agreements shall be automatically collected, and any operator failing to collect and forward to proper parties such fine shall pay a penalty of $2 for each employee subject to be fined, the same to be collected and retained in the miners' district organization. And in no case shall any fine be refunded except by mutual agreement of the accredited representatives of the operators and miners.

It is further agreed that where any employee enters suit in the civil courts to recover any fine collected in accordance herewith the district organization shall reimburse the operator for expenses incurred on account of such suit.

SEVENTH—That the fulfillment of this agreement is guaranteed by the international union, and the fulfillment of joint agreements entered into in any district shall also be guaranteed by the officers of the international organization, as well as by the officers of the district, and it shall be their duty to see that all such agreements are carried out, both in the letter and in the spirit.

EIGHTH—That the price at which house coal shall be furnished the mine workers at the tipple shall be determined by adding to the price in effect on Oct. 31, 1919, the average percentage allowed as an increase on the wage scale, to wit.: 27 per cent, and that when the coal is delivered to the miners' houses by the operator the actual cost of delivery shall be added.

NINTH—That the prices charged the miners for blacksmithing shall be on the basis of existing contracts; providing, however, that the maximum charges shall not exceed three-fourths of 1 per cent of the miners' gross earnings.

TENTH—That explosives shall be furnished the miners at cost, which is to include handling, transportation and insurance. To furnish a basis of charges until the correct figures can be determined, it is understood that for a period of 90 days the price of black powder to the miners shall be $2.25 a keg, and that for permissible explosives and other blasting material be at cost plus 10 per cent allowance for handling.

ELEVENTH—This contract is effective on April 1, 1920, and shall remain in force until March 31, 1922.

Large Flat Rate Increases Granted in New River District

While there has been some delay between the operators and miners of District 17 in formulating a new wage agreement operators and miners of District 29, which takes in the New River field, were able to reach an agreement in short order at a joint scale meeting held at Charleston on Thursday, April 8. It is stated that the increases granted the New River miners will average as much as 41⅓ per cent, which is the actual increase for machine mining. The increase in the wages for pick miners, according to Secretary T. L. Lewis of the New River Operators Associtaion, amounts to about 40½ per cent.

Under the terms of the new scale pick miners will receive an advance of 24c. per ton, increasing the rate for pick mining in the Loop Creek fields to 83.11c. per ton of 2,000 lb., as against the former rate of 59.11c. per ton. Under the old contract machine cutting was at the rate of 10.71 c. per ton. The new rate agreed upon is 16 cents per ton.

As against the old rate of 47.32c. per ton, the new rate for loading and scraping, rooms and pillars is

66.03c. a ton, an increase of 18.71c., making a total advance for loading and cutting of 24c. a ton. The new rate agreed upon for loading and scraping, rooms and pillars where the loader pushes cars and lays the track is 70.9c. a ton.

For all employees working in the day time, both inside and outside the mines, the wage advance agreed upon was $1 a day except as to trappers and boys receiving less than the wages allowed men, the latter class receiving an advance of 53c. a day. For yardage and dead work the increase agreed upon was 20 per cent. Instead of percentage rate advances the increases in the New River field are calculated on a flat rate.

Granting Injunction, Court Says Sections of Lever Act Are Unconstitutional

Judge Lewis Restrains U. S. Attorney from Presenting Alleged Evidence to Grand Jury — Coal Companies Contend Prices Were Fixed Without Investigation

IN A SUIT brought in the United States District Court to test the constitutionality of the Lever Food Control Act and the legality of U. S. District Attorney Harry B. Tedrow's proposed grand jury investigation into charges of profiteering by Colorado Coal companies, Judge Robert E. Lewis, on April 8, granted an injunction restraining District Attorney Tedrow from presenting his alleged evidence to the grand jury.

The coal companies questioned the constitutionality of the Lever Act and its application at this time. The companies contended that the prices fixed during the war by the President were without investigation, and that the President was incompetent to fix prices; that the war is over; that between the discontinuance of the Fuel Administration in January, 1919, and its re-establishment in October, 1919, costs of production materially increased and no new investigation was made.

The companies also contended that the revival of the Fuel Administration was for a domestic emergency and not in furtherance of the war; that the Government prices were unfair and unjust and that District Attorney Tedrow proposed to prosecute them regardless of these facts.

In granting the restraining order Judge Lewis expressed the opinion that at least certain sections of the Lever Act are unconstitutional and have ceased to function, that the Lever Act was emergency legislation and as such it was extremely doubtful that it had application now to private business.

Upon the handing down of the decision District Attorney Tedrow announced his intention of taking an appeal to the Supreme Court of the United States.

Bureau of Mines to Hold First-Aid and Mine-Rescue Contest

An international first-aid and mine-rescue contest is to be held in Denver, Sept. 9, 10 and 11, under the auspices of the Bureau of Mines. This event, the bureau points out, is of direct interest to an industry which is second only in importance to agriculture and employs in this country more than a million men in hazardous work.

An idea of the general interest of miners in this practical, humanitarian work is had when it is pointed out that more than one hundred thousand miners already have taken the training course of the Bureau of Mines in first-aid and mine-rescue methods.

Logan County Fixes a New Scale 135 Per Cent Over Pre-war Rates

In addition to advances previously given voluntarily, the operators of the Logan field have announced advances in wages applying in the Logan County (West Virginia) field running from 20 per cent to 31 per cent, the increase in the pay of miners for the Logan field alone amounting to $6,000,000. This will bring the annual payroll of Logan mines up to $26,000,000 a year.

Increases granted by the Logan operators since prewar days aggregate 135 per cent. The latest advance in the Logan field, effective as of April 1, will mean an increase of 20 per cent for day workers and a 31 per cent increase for loaders. It is estimated that under the new scale now prevailing in the Logan field the earnings of machine men will be approximately $12 a day and of loaders approximately $10 a day.

Logan operators are now of the belief that wages paid in the field in which they operate are on a par with wages in the highest paid mines in the country. Miners of the Logan field appear to be well satisfied with the increases granted them.

Choctaw and Chickasaw Coal and Asphalt Deposits To Be Sold

Coal and asphalt deposits aggregating 394,577 acres in the Choctaw and Chickasaw Nations, Okla., will be sold at auction by the U. S. Government June 15 and 17. Only the coal and asphalt minerals—not the land—will be offered for sale, in tracts of 960 acres each, the sale to take place at McAlester, Okla.

There are 456 tracts, practically all located near cities, towns and railroads, and some are crossed by railroads, so that they are easily accessible and desirable for mining purposes.

The coal is bituminous and semi-bituminous, mostly low volatile bunker coal for steamship use, high-grade domestic coal, railroad steam coal, high-grade blacksmith coal and coking coal. The seams average four feet thick and have an average dip of from 10 to 15 deg., outcropping at the surface and extending to an estimated depth of 2,300 ft. at the deepest part of the basin.

Convention Discusses New Wages in Fifth Ohio Sub-district

Sessions of the 22nd annual convention of the United Mine Workers of America of the Fifth sub-district of Ohio were begun at Bellaire on Tuesday, April 13, with William H. Roy, president of the district, in the chair. The date originally set for the convention was in March but the convening of the convention was postponed at that time owing to the fact that the Bituminous Coal Commission had not submitted its report. Sessions of the convention were expected to consume the entire week and it was apparent at the time the delegates assembled for the convention that wage questions would consume the major part of the deliberations of the convention since day men employed at many of the mines in eastern Ohio had been on strike claiming that they had not received the full 27 per cent increase.

COAL AGE

The Weekly Journal of the Coal and Coke Industries

Volume 17 NEW YORK, THURSDAY, APRIL 29, 1920 Number 18

Coal Miners Should Help the Farmer

SECRETARY MEREDITH of the Department of Agriculture has issued an appeal to city men, college students and others to spend their vacations working on farms, particularly as helpers in harvest fields. He states that shortage of hired farm labor is as acute as in 1918 and the labor situation on farms threatens to curtail food production. Herbert Hoover in a recent published article drew particular attention to the growing disparity between the growth of our industrial and rural populations and prophesied that if labor continues to abandon the farm for the factory, we will become a food-importing nation.

In years of slack demand for coal there is a steady movement of coal-mine labor from the mines to the farms in a number of important centers. This year, however, with the prospect of all the work at the mines for which cars can be had, and with the recent considerable increase in wages of miners, the farms may not see as many miners as, for instance, last summer. If the farms can offer the inducement to labor to attract them from the mines, the country will be better off, for more food will be produced and no less coal will be mined.

Buy-Late Campaign Needed This Year

HOW generally does the public at large realize the speed at which we are drifting into a serious condition of coal supply? Prosperous industry and cold weather combined to make the demand for coal exceptionally strong last winter. The miners' strike cost us 40,000,000 tons of output; storms blocked traffic and prevented the mines and railroads from making up the loss even in small degree and now the "outlaw" railroad strike is having a serious effect on production.

According to the Geological Survey production of bituminous coal during the week of April 17 was 7,668,000 tons, compared with 7,411,000 the same week a year ago. The total production January to date is 157,797,000 tons, somewhat below the figures established in the war years 1917 and 1918, but well above the 126,141,000 tons in the same period of last year.

These production figures however, do not tell the whole story. Last year at this time the country was still burning coal from storage piles accumulated before the armistice. The railroads had abundant stocks, the lake docks were carrying coal over from 1918, and exports overseas were limited by ship shortage. There was on every side utter indifference to coal.

Today consumers' stocks are low or gone, the railroads have just been forced to resort to assigned cars to get coal for current use, the upper Lake docks are bare, with the trade talking about 30,000,000 tons up Lakes this season, and offshore exports are gaining in volume every month.

The situation has its serious aspects because for months to come consumers will not be able to get as much coal as they demand. If for 1920 total requirements plus exports greatly exceed 500,000,000 tons we are going to be short of coal. Prices of bituminous coal are advancing and the one certainty is that they will not soon come down.

Last year the consumer could help by buying and storing coal; this year he can help only by staying out of the market except for necessary requirements.

Let us have clearly in mind that the remedies to stabilize coal industry proposed by Senator Frelinghuysen, the American Institute of Mining Engineers and others, really are for the purpose of equalizing demand. No treatment is needed this summer to boost demand. In considering the arguments pro and con on seasonal rates, storage and stabilization generally, think in terms of 1919 conditions that may possibly be repeated in 1921 or 1922. No need to stabilize the industry this summer; rather should producers and consumers bend all their efforts toward steadying the market.

College Graduates for Miners Promise Solution of Labor Problems

MACHINES to take the place of men is the constant aim of our engineers. This country's preeminence in industry is due to our ability to make the work of a man go farther than in other countries. The high average annual per capita consumption of coal here compared with European nations is often taken as an index of this very fact.

Compared with manufacturing, mining has been backward in this regard, and in the mineral industries, coal, with its greater opportunities still has a vast field to explore. Although several decades have passed since the first coal-mining machine was used, but little more than half of our coal is undercut by machine. Undercutting the coal, however, is only one operation in the getting. Two machine runners can now keep from eight to ten loaders busy with hand shovels.

When machines to cut and load coal are perfected the miner will be supplanted by the expert mechanic. Two, three or four highly trained men will do the work for which from twelve to twenty are now required. The wages that operators can afford to pay such men will attract the best there are, and some observant and far-sighted mine managers are looking forward to employing young graduates of mechanical engineering colleges in their mines. The reasons prompting such a selection are obvious.

A class of men above the average, less liable to radical labor influence, seeking advancement through individual effort rather than through organization, which holds all down to the level of the less able, is the aim of the future. College-trained mechanics will always tend to further perfect their machines. Practice will supplement theory with these miners of the future, and the progress of the industry will be even faster than now. Perhaps the day is not far distant when Paddy the miner will send his son to college to learn his trade, instead of taking him to the face.

Improvement Through Borrowed Lenses

MOST machines today embody a long series of separate improvements and adaptations. In some instances improvement has been carried so far that the fundamental or original idea has been largely if not entirely lost. Thus, it is a far cry from the fire-spitting bamboo tube employed in Chinese pyrotechnics to the modern high-power rifle, yet the two are linked together by a long and complete chain of evolution. In such an extended series of developments ideas spring from their own primordial elements or they may be borrowed from any source whatsoever.

A large manufacturing company has built a new design of electric mine locomotive that embodies at least two details of construction apparently borrowed and adapted from the automobile industry. These are the method of spring mounting intended to secure equal wheel pressure and the detachable tire. One of these refinements will reduce the frequency of derailments and the other will make it easy and rapid to renew worn tires.

It matters little to the operator who buys and uses mine equipment from what source the designer received his inspiration or from what corner of the universe or what age of civilization he got his idea so long as the detail worked out in a real improvement upon existing practice.

Any mining man who has almost broken his neck and possibly one or two of the commandments in trying to lift on a mine car after it had derailed simply because no provision had been made in its design to compensate for inequalities in the track or any small permanent "set" taken by the car frame or box as the result of a wreck or collision, can appreciate the advantage of a "motor" that will safely traverse such track inequalities.

Low-Temperature Coal Distillation in Germany

We print on page 850 a short article entitled "Coal, a Hardened Petroleum." This sets forth that two German experimenters by trials conducted during the war were enabled to secure by means of low-temperature distillation of coal all of the products usually obtained in the refining of petroleum. Thus in addition to the gas, coke and ammonia compounds ordinarily secured these men were able to produce gasoline, lubricating oils, paraffin and a tar differing somewhat in composition from that normally obtained from the so-called destructive or high-temperature distillation of coal in the ordinary byproduct oven.

Unfortunately the article referred to does not go into any detail whatsoever and give the quantity of each product secured per ton of coal coked. It is at least interesting, however, to know that, as the writer of the article phrases it, coal is "in a sense hardened petroleum."

The results secured by these German experimenters closely parallel those obtained in this country by the Greene-Laucks and other processes of low-temperature distillation. American experimenters, however, while possibly slightly less successful in the segregation of light or volatile oils, have apparently attained a greater degree of efficiency in coke production. The securing of a commercial solid residue (coke) is claimed by American operators to be among the least of their troubles, while it is stated that the structure of the German product is so defective as to require additional treatment and to form at the present time one of the problems of the process as yet unsolved.

That we in America burn our coal raw, wasting all of the byproducts contained, has long been regrettable. The time may come, and possibly at no remote date, when we will no more think of burning freshly-mined coal than we will think of eating raw, whole wheat or corn. Most coals produced in this country can be improved as fuels—weight for weight of raw and treated products—by low-temperature distillation. This process of treatment, provided it can be perfected and economically applied upon a commercial scale, will be highly interesting to the general public, since it bids fair to bolster up the decreasing supply and in a measure appease the constantly increasing demand for that all but universally used propulsive fuel, "gas."

In somewhat lighter vein it appears well within the range of possibility that future advertisements of fuel may display prominently a legend that has already become familiar to straphangers and others who make pilgrimages by street car or interurban, namely, "It's toasted."

Trade Commission Renews the Demand for Cost Reports

On April 26 the Federal Trade Commission announced the following policy in connection with its monthly reports:

"The Commission has received numerous inquiries recently as to whether, in view of the recent decision in the Maynard Coal Co. case, it would continue to require monthly reports from coal mining companies. The Commission believes that this information is useful and important.

"To the general public and also to the coal operators, it seems that a large number of the operators realize this situation. Therefore, the Commission will continue to require these reports, except from the Maynard Coal Co., in the manner provided by the Federal Trade Commission Act, until the appeal in the Maynard Coal Co. case is decided by the U. S. Supreme Court."

The order recently made by the District of Columbia Supreme Court in respect to the Maynard Coal Co. put that company under bond to pay the penalties provided for by law in the event the final decision should be in favor of the Commission, and meantime the Commission is restrained only from proceeding against that company.

World Production of Coal in 1919 Fell to Level of 1910

Compared with 1913, Decrease of Output in United Kingdom and Belgium Was 20 Per Cent, in Germany 40 Per Cent Reduction in French Production Was Due to Destruction of Mines by Germans

WORLD production of coal in 1919 seems to have dropped back to the level of 1910. Preliminary estimates, necessarily rough, place the total output of all kinds of coal in 1919 at 1,170,000,000 metric tons, or 1,290,000,000 net tons. This is 162,000,000 metric tons less than the production in 1918, the last year of the World War, and about 171,000,000 tons less than that of 1913, the year before the war began.

THE WORLD'S PRODUCTION OF COAL, 1910-1919
(Metric tons of 2,205 Pounds)

Year	Production (in Part Estimated)	Per Cent Produced by United States
1910	1,160,000,000	39.2
1911	1,189 000,000	37 9
1912	1,249,000,000	38.8
1913	1,341,000,000	38.5
1914	1,208,000,000	38.5
1915	1,190,000,000	40.5
1916	1,270,000,000	42.1
1917	1,336,000,000	44.2
1918	1,332,000,000	46.2
1919	1,170,000,000	42.1

This estimate is based by F. G. Tryon, of the Geological Survey, upon reports to the Supreme Economic Council from countries which contribute about 85 per cent of the world's output. Obviously, returns from the other countries may materially alter this figure; if anything, they probably will reduce it still further.

The above table shows the estimated production of the world for each year from 1910 to 1919. Because of disturbances and interruptions in the compilations of Government statistics, particularly in central and eastern Europe, the figures since 1913 are not to be regarded as final. The metric ton of 2,205 lb. is used because it is the prevailing unit in non-English speaking countries.

It is pointed out by the Supreme Economic Council that from 1913 to 1919 the output of bituminous coal in the four European countries shown in the table has fallen from 532 millions to 386 millions, the decrease being about 20 per cent in the United Kingdom and Belgium, and nearly 40 per cent in Germany. In the Saar Valley, whose output appears to have fallen from 12 million tons in 1913 to about 8 millions in 1919, the percentage of decrease was over 30. The reduction in the French output is mainly due to the destruction of the mines in the Nord and Pas de Calais.

The output of lignite in Germany in 1919, though less than in 1918, was still greater than before the war, being 94 million tons, as compared with 87 millions in 1913.

In the break-up of Austria-Hungary the bulk of that country's coal and lignite, the production of which amounted before the war to about 55,000,000 tons, was inherited by the Republic of Czecho-Slovakia. The 1919 production of Czecho-Slovakia was about one-third less than the same territory produced in 1913.

Comparative production in millions of metric tons in five of the belligerent countries before and after the war is shown in the following table:

[illegible]	1913	1919
United Kingdom	292	237
France (present boundaries)[a]	44	22
Belgium	23	18
Germany (present boundaries)[b]		
Bituminous	173	109
Lignite	87	94
United States	517	494

[a] Includes Alsace-Lorraine [b] Excludes Alsace-Lorraine and the Saar.

PRODUCTION OF COAL IN THE UNITED STATES AND CERTAIN EUROPEAN COUNTRIES, BY MONTHS 1919, AND ANNUAL MONTHLY AVERAGES 1913-1919[a]
In metric tons of 2,205 pounds.

Period		United States (all coal)	United Kingdom (all coal)	France[b]	Belgium	Netherlands		Germany[c] (excluding lignite)
						Coal	Lignite	
Monthly average								
	1913	43,089,000	24,336,000	3,404,000	1,904,000	159,000	......	14,383,000
	1914	38,822,000	22,493,000	2,482,000	1,393,000	165,000	......	12,331,000
	1915	40,190,000	21,439,000	1,686,000	1,182,000	194,000	......	11,340,000
	1916	44,611,000	21,707,000	1,790,000	1,405,000	221,000	......	12,281,000
	1917	49,245,000	21,039,000	2,411,000	1,244,000	261,000	......	12,822,000
	1918	51,272,000	19,282,000	2,078,000	1,152,000	296,000	119,000	12,301,000
	1919	41,145,000	19,731,000	1,869,000	1,533,000	294,000	152,000	9,049,000
1919	January	44,577,000	19,855,000	2,473,000	1,233,000	298,000	221,000	8,832,000
	February	33,165,000	19,700,000	2,284,000	1,269,000	270,000	145,000	8,389,000
	March	35,197,000	20,515,000	2,125,000	1,426,000	294,000	237,000	9,299,000
	April	35,290,000	19,273,000	1,745,000	1,494,000	281,000	244,000	5,091,000
	May	40,743,000	22,048,000	1,733,000	1,572,000	299,000	165,000	8,772,000
	June	40,187,000	18,526,000	858,000	1,456,000	721,000	112,000	8,312,000
	July	45,814,000	17,861,000	1,430,000	1,659,000	317,000	86,000	9,988,000
	August	46,090,000	16,174,000	1,787,000	1,573,000	294,000	145,000	8,907,000
	September	49,655,000	19,192,000	1,838,000	1,685,000	290,000	141,000	9,962,000
	October	58,697,000	19,687,000	2,265,000	1,885,000	318,000	114,000	10,358,000
	November	23,940,000	20,110,000	1,820,000	1,692,000	290,000	86,000	10,217,000
	December	40,394,000	20,257,000	2,066,000	1,449,000	311,000	128,000	10,458,000
1920	January	50,852,000	21,685,000		.	320,000	128,000	...

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[a] Figures from the Monthly Bulletin of Statistics of the Supreme Economic Council for February, 1920, except that figures for the United States are corrected and those for the United Kingdom in 1919 are converted from a weekly to a monthly basis

[b] Includes output of Alsace-Lorraine in 1919.

[c] Includes bituminous output of the Ruhr, Upper and Lower Silesia, Saxony, and Aachen districts. Excludes the Saar and Alsace-Lorraine. In addition, Germany has a large production of lignite which amounted in 1919 to nearly 8,000,000 tons per month.

Supreme Court Dissolves Reading Company

Separation of Coal and Railroad Companies Not Expected To Have Important Effect on Anthracite Coal Situation

By a four to three opinion the U. S. Supreme Court on April 26 sustained the Government's charges of illegal combination against the Reading Company because of its holdings in various coal companies and in other roads. The combination was held to be a violation of the Sherman anti-trust act and was ordered to be dissolved.

The decision reversed Federal Court decrees rendered in Philadelphia in 1915 refusing to sustain the Government's charges of monopoly, but directing the separation of the Central Railroad of New Jersey from its subsidiary, the Lehigh and Wilkes-Barre Coal Co.

The court's opinion was delivered by Justice Clarke. Chief Justice White and Justices Holmes and Van Devanter dissented from the majority opinion, stating that their views coincided with those of the three judges of the lower court. Justices McReynolds and Brandeis took no part in the decision. Justice McReynolds was Attorney General during the time the Government prosecuted the suit, which was instituted in 1913.

The decision came on appeals by the Government and a cross-appeal by the Reading Company, the ruling of the lower court being unsatisfactory to both parties.

Dissolution was ordered of the combination of the Reading Co., the Philadelphia & Reading Railway Co., the Philadelphia & Reading Coal & Iron Co., the Central Railroad of New Jersey and the Lehigh and Wilkes-Barre Coal Co., so that they would be entirely independent of each other. Disposition of the stock and bonds of the companies held by the Reading Co. also was directed.

The court, however, sustained lower court decrees absolving the Lehigh Coal and Navigation Co., the Lehigh & New England Railroad Co. and the Lehigh & Hudson River Railway Co. on charges as to restrictive covenants in mining lease with respect to the shipping of coal and refusing to order the dissociation of the Philadelphia & Reading Coal & Iron Co. and the Lehigh and Wilkes-Barre Coal Co. maintained through the holding company.

Charges against the directors of the holding company, who also were named as defendants, were dismissed. Most of them have died since the suit was instituted and their successors in office were not made parties to the suit.

Injunctions restraining enforcement of provisions inserted by the Reading and Wilkes-Barre coal companies in coal leases, requiring the lessee to ship all coal mined by designated rail routes, were made permanent, the court condemning such provisions as unlawful.

The action grew out of the financial reorganization of the Reading and associated lines in 1896. The suit was filed by the Department of Justice, charging a number of railroad and coal companies with restraining and monopolizing the trade of coal. It was filed against the Reading Company and others, known as the anthracite coal combination, on Sept. 2, 1913.

The case was argued in the Supreme Court in October, 1916; restored to the docket for reargument in May, 1917; reargued in November, 1917; restored to the docket for reargument in June, 1918, and in October, 1918, was continued at the request of the Government on account of war conditions.

While the decision seems to be a complete victory for the Government, the court emphatically denouncing the combination of the railroads and the coal companies and declaring that the great power obtained had been used to restrain commerce, the opinion held by legal authorities in Washington is that the effect of the ruling will be to cause the companies affected to do by contract what they have been doing by co-ordination. As a consequence they expect no important net result.

British Mine Workers Accept a 20-Per Cent Increase

After making large demands the members of the Miners' Federation of Great Britain agreed April 15 to accept the Government offer of a 20-per cent increase on gross earnings. As the Miners' Federation rules require a two-thirds majority before a strike can be authorized, it was not expected that any such further misfortune would be visited at this time on the United Kingdom.

Fortunately, not only did the men not vote to strike but they voted by an ample majority of 65,135 in favor of acceptance of the wage offered.

The increase in wage will add £36,000,000 to the mine workers' payrolls, 900,000 men participating in the benefit. The mine workers hoped for a wage which would have raised the rolls £43,000,000 a year.

The miners' delegates, seeing the large amount of profit in exported coal, thought they would like to hear it jingling in their pockets. The Government, however, decided that the price of export coal must be reduced £2 per ton.

Running Time in Bituminous Mines October, 1917, to Date

Condensed figures on time worked and lost at the mines, which the bituminous operators have been furnishing weekly to the Geological Survey, are given in the following table, prepared by F. G. Tryon:

SUMMARY OF REPORTS ON OPERATING CONDITIONS AT SOFT COAL MINES IN THE UNITED STATES, OCTOBER, 1917 TO APRIL, 1920

Figures represent per cent of full time operated and shut down for various causes

			Per Cent of Full Time Lost on Account of					
Period		Per Cent Operated	Total Lost All Causes	Transportation Disability	Labor Shortage and Strikes	Mine Disability	No Market	Other Causes and No Cause Given
1917	3rd Quarter	72.6	27.4	17.1	5.3	3.6		1.4
1918	1st Quarter	66.9	33.1	24.2	2.4	4.1	0.8	1.6
	2nd Quarter	75.1	24.9	12.2	6.2	3.2	1.2	2.1
	3rd Quarter	83.0	17.0	7.2	4.6	3.8	0.2	1.2
	4th Quarter	77.4	22.6	4.2	9.3	3.0	5.0	1.1
1919	1st Quarter	57.0	43.0	1.6	1.9	2.3	36.2	1.0
	2nd Quarter	54.7	45.3	2.2	3.1	2.6	36.9	0.5
	3rd Quarter..	65.1	34.9	16.4	4.4	3.2	9.7	1.2
	4th Quarter	56.1	43.9	7.3	33.3	2.2	0.2	0.9
1920	To April 10	60.2	39.8	33.1	2.8	2.6	0.4	0.9
Calendar year 1918		75.6	24.4	12.0	5.6	3.5	1.8	1.5
Calendar year 1919		58.2	41.8	6.9	10.6	2.6	20.8	0.9

Price-Pancoast Breaker Relies On Gravity To Do Much of the Work

Only Two Conveyors Are Installed in This Breaker—One of These Handles the Condemned Coal and the Other the Rock—Degradation Is Thus Kept at a Minimum

By Dever C. Ashmead
Tarrytown, N. Y.

IN THE effort to achieve economy in operation as well as better preparation, anthracite coal companies have shown a marked tendency to rebuild or remodel their breakers during the last few years. Old-time dry breakers have been extremely wasteful because of the unfavorable working conditions with which the men have had to contend, the unnecessary breakage of the coal, the large force of men and boys required for the operation of the breakers and the incomplete preparation obtained.

Among the coal producers who in the last few years have remodeled their breakers is the Price-Pancoast Coal Co., at Scranton, Pa. This firm's old breaker was of the dry type, and it yielded results that were unsatisfactory, in that a large amount of dust was formed during the treatment of the coal. Besides this the coal was not properly prepared.

No change was made in the building but the machinery and methods were entirely altered. The headframe and the breaker are practically one, as is shown in the accompanying photograph of the breaker. The headframe is of steel construction, while the breaker proper is of wood.

At present the arrangements for handling coal at the top of the headframe and breaker are extremely old-fashioned and dangerous. No accidents have occurred, however. The coal company has ordered and will this spring install self-dumping cages which will dispense with the services of twelve men who are now required to handle the coal cars at this point, and this will further reduce the likelihood of accident.

It is necessary at present to haul the cars a distance of about 50 ft. from the landing stage to the dump. The cars are moved out by means of a small hoisting engine and are brought back to the cage after dumping by a car haul.

After being dumped from the cars the coal passes

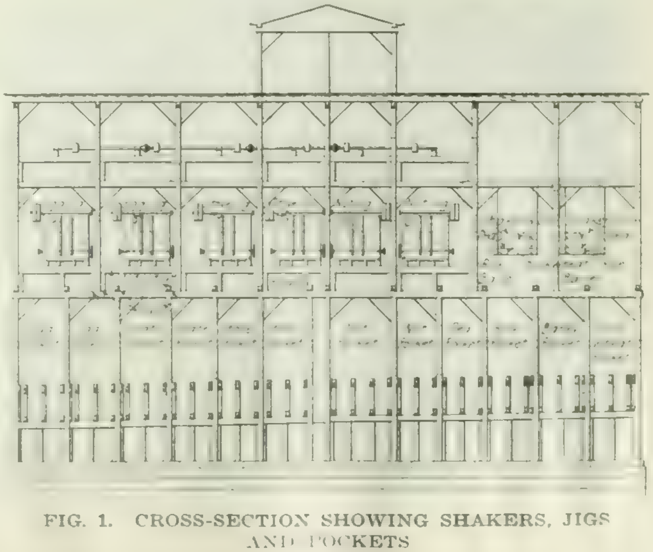


FIG. 1. CROSS-SECTION SHOWING SHAKERS, JIGS AND POCKETS

Great simplification of arrangement marks the remodeled breaker

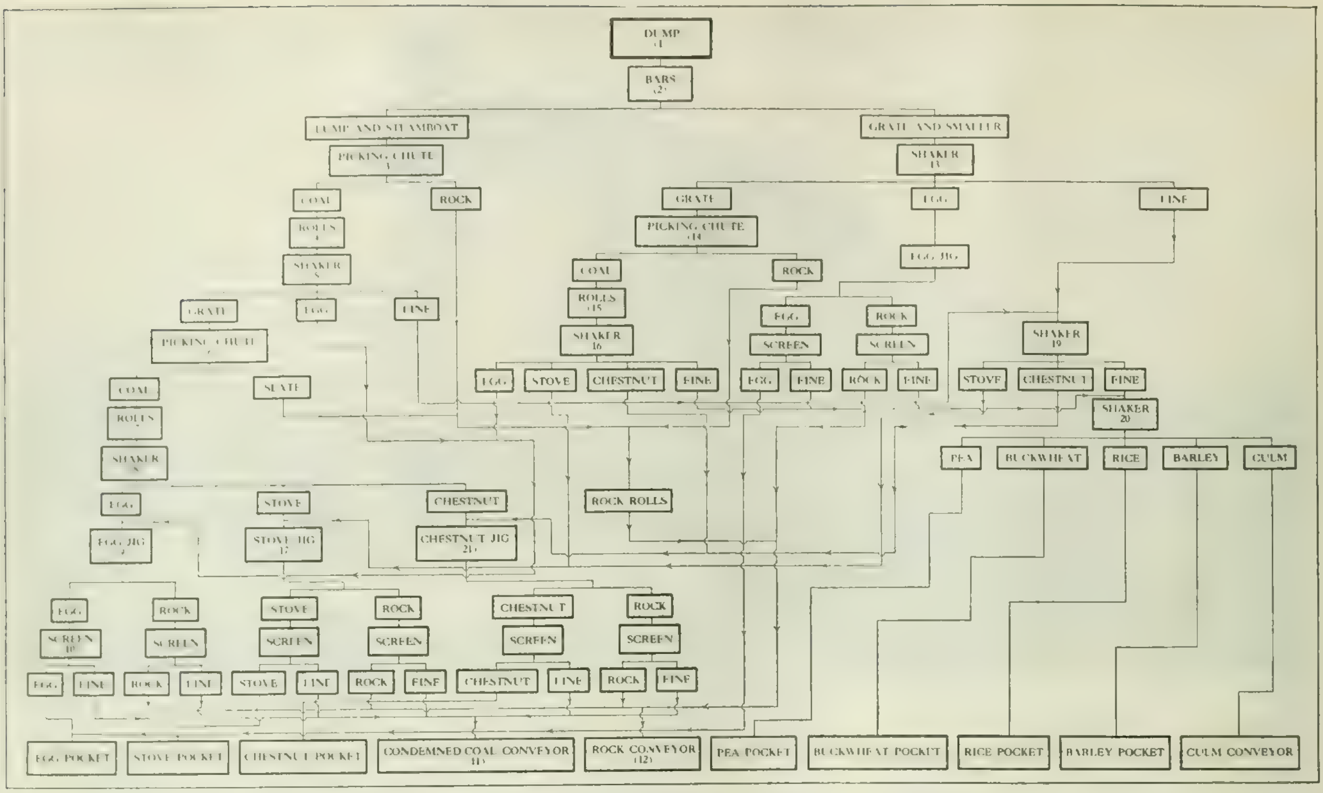
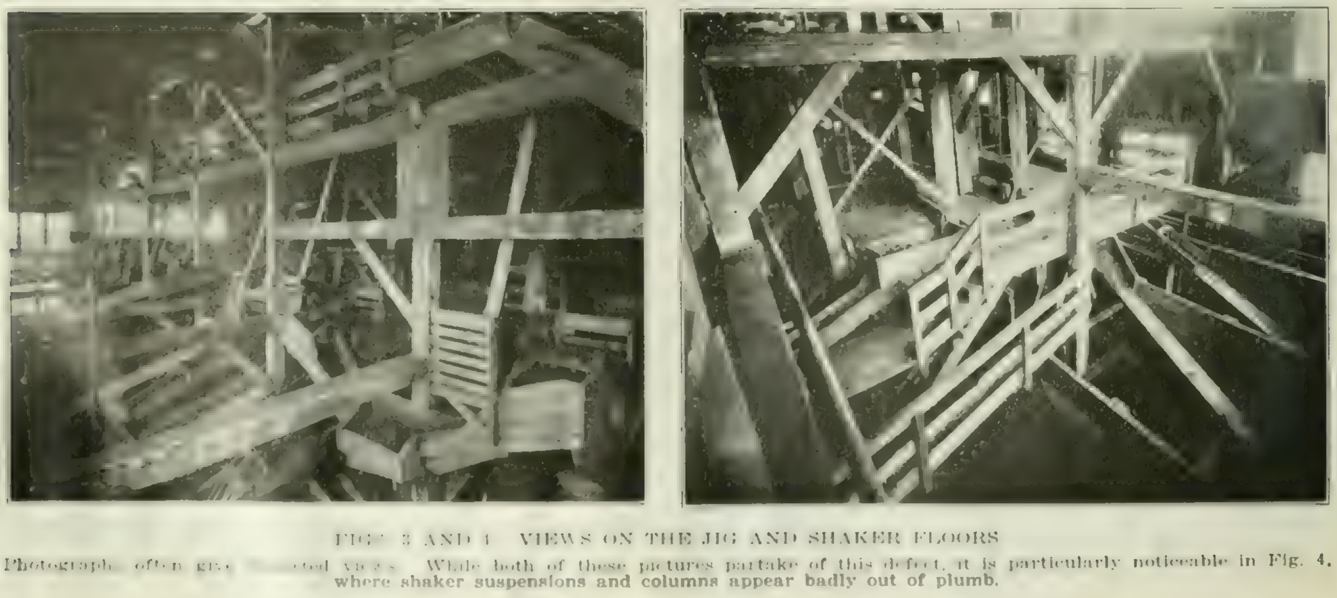


FIG. 2. FLOW SHEET OF THE PRICE-PANCOAST BREAKER

over a bar screen (see Fig. 2) which separates it into two sizes—steamboat and larger, and grate and smaller. The steamboat coal and larger passes through a picking chute (3), where the rock is separated. The coal then goes through a set of rolls (4) and from them to a shaking screen (5), which separates the coal into grate, egg and fine coal. The grate size from shaker 5 is next picked on a picking chute (6), after which it goes to another set of rolls (7) and from there it passes to another shaking screen (8) having three decks preparing egg, stove, chestnut and fine. The egg coal then passes to the egg jigs (9), where the coal is separated from the rock. Leaving the jig, the egg coal then passes over a small stationary screen (10), which removes the undersize.

The material passing the screen then goes directly to the egg pocket, while the fine coal is sent to the condemned-coal conveyor (11). In a similar manner the rock from the egg jig (9) passes over a screen and is hand picked in order to catch stray pieces of coal that pass through the jig with the rock. The coal there obtained is thrown in with the egg coal and goes directly to the pocket. The rock from the jigs passes to the rock conveyor (12) and the fine particles which have passed through the screen are taken to the condemned-coal conveyor. The egg coal made on shaker 5 goes directly by means of chutes to the egg jig (9), where it is prepared in a manner similar to that above described.

Coal passing through the main bars (2), grate and smaller, goes over a shaking screen (13) having two decks on which grate, egg and fine coal are sized. The grate coal passes over a picking chute (14), where the



FIGS. 3 AND 4. VIEWS ON THE JIG AND SHAKER FLOORS

Photographs often give distorted views. While both of these pictures partake of this defect, it is particularly noticeable in Fig. 4, where shaker suspensions and columns appear badly out of plumb.

rock is separated from the coal. Passing through a set of rolls (15), the coal then goes over a three-decked shaking screen (16), making egg, stove, chestnut and fine. Added to the coal of this size from shakers 5 and 8, the egg is treated in jigs, as previously described.

Uniting with the stove coal from shaker 8, the stove from shaker 16 passes to the jigs (17) and receives exactly the same kind of treatment given the egg size. The clean coal goes to the stove pocket while the undersized coal passes to the condemned-coal conveyor and the rock to the rock conveyor.

The chestnut coal (from shakers 8 and 16) is handled in the same manner, there being practically no difference in the method between the egg-, stove- and chestnut-coal treatment except that in this case no effort is made to hand pick the slate from the chestnut jigs and to recover any coal that might pass through.

From shaker 13 the egg coal goes directly to a jig (18) which is located near the top of the breaker, and the coal receives at this point exactly the same preparation as was received by the egg coal from shaker 8. The coal from this jig is sent directly to the egg pocket without further treatment.

From shakers 5 and 13 the fine coal is conducted in chutes to the fine-coal shaker (19), which has two decks on which stove, chestnut and fine coals are prepared. The stove and chestnut coal unite with the same respec-

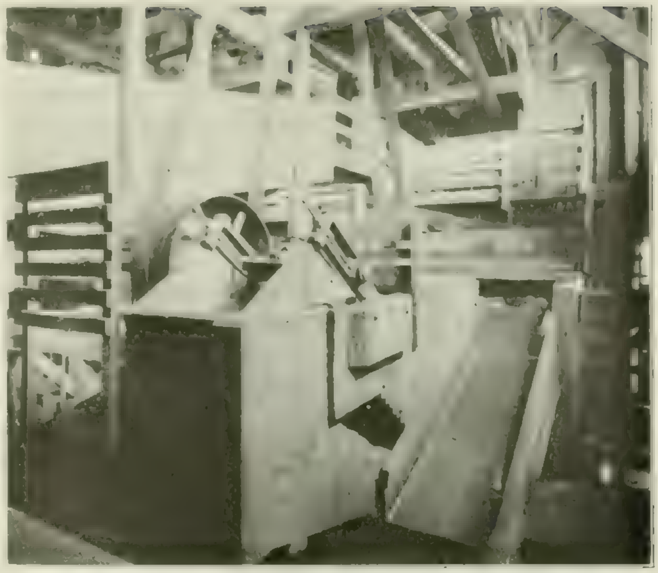


FIG. 4. EGG JIG NEAR THE TOP OF THE BREAKER

The egg coal, made on the second set of shakers near the top of the building, is jigged immediately and sent direct to its proper pocket over the loading track.

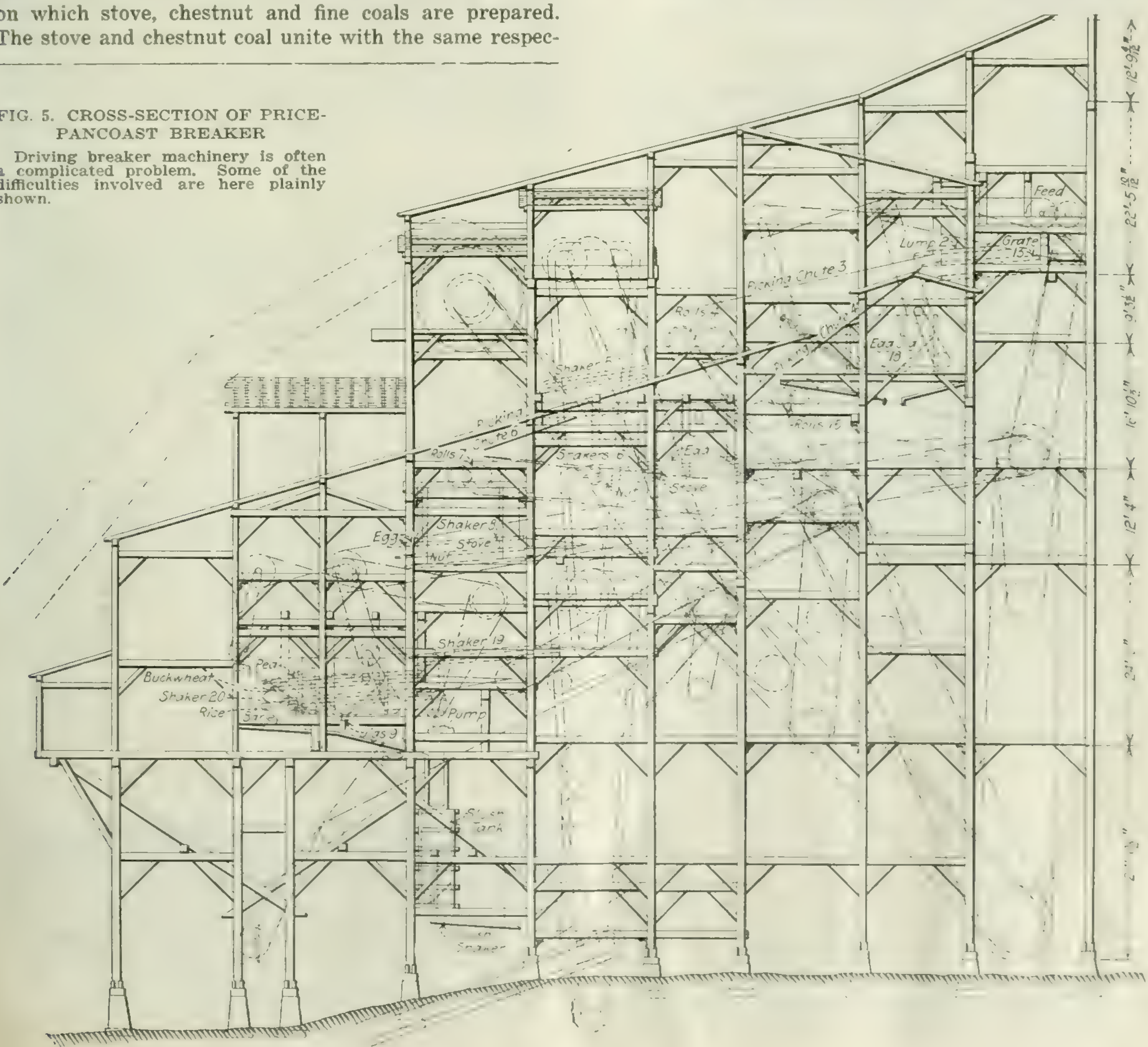


FIG. 5. CROSS-SECTION OF PRICE-PANCOAST BREAKER

Driving breaker machinery is often a complicated problem. Some of the difficulties involved are here plainly shown.

tive sizes from shakers 8 and 16 and are treated with them as has already been described. The fine coal from shaker 18 is passed to a four-decked shaker (20) on which is also treated the fine material from shakers 8 and 16. Five sizes are made on this shaker—pea, buckwheat, rice, barley and culp. The pea, buckwheat, rice and barley pass directly into their respective pockets, while the culm is returned to the mine for filling purposes.

Rock rolls crush to small size the rock from picking chutes 3, 6 and 17 and it is then delivered to the rock conveyor together with the rock from the jigs (9, 17, 18 and 21). This conveyor delivers the coal at a point where it can be sent into the mine for filling.

The condemned-coal conveyor carries the condemned coal, together with the undersized coal from the jigs and lip screens, back to shaker 8 for treatment. Some of the culm is settled in a slush tank in the bottom of the breaker and then passed over a shaking screen on which No. 2 barley is prepared. This coal is used in the boiler house when mixed with rice and barley sizes.

The Price-Pancoast Co. insists that as far as possible its coal be handled by gravity during preparation. With this idea in view it has so designed this breaker that there are no elevators within it other than the condemned-coal and rock conveyors.

Comparatively little extra height was required to so lay out the method of preparation that it could be operated by gravity, and the cost of this extra construction probably was offset by avoiding the expenditure that the installation of elevators and conveyors would have entailed. As the breaker does not have to be made any higher by reason of this differentiation of the plans from those which are usually adopted in breaker construction there is no extra cost from this source while, by reason of the absence of elevators, a marked saving is made in the power required to operate the breaker and the cost and annoyance from breakdown is reduced. A further economy arises from a reduction in the degree to which the coal is broken in the operation of the breaker. The fewer times coal has to be handled the less will be the degradation.

Correct Method for Trolley Wiring Mines—II

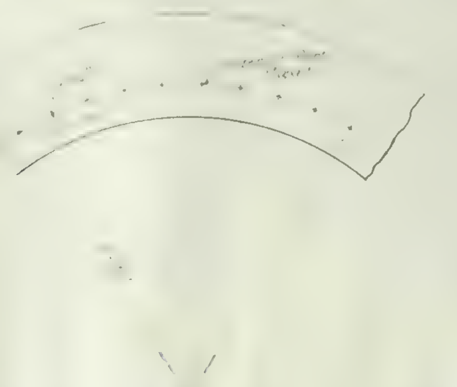
Standard Methods of Hanging Curves and Placing Frogs, Section Insulators, Anchors, Protection Boards and Wire Splices — System of Salvaging Old Equipment Described

By M. W. Beddow
Lundale, W. Va.

IT IS the purpose of the article to supply a description of standard and economical methods for the hanging of underground trolley wire, to be followed by mine wiremen. On the final page of this article is reprinted the table giving the various parts used in construction with the numbers by which they are demonstrated in the test. The previous exposition in the issue of April 22 described (1) the dead ends and (2) the suspensions used in trolley-wire work.

(3) The hanging of trolley wire on curves may be accomplished in a variety of ways, viz:

(a) In high coal, single track (see Fig. 5), the fixture is made up of parts Nos. 6, 7, 12, 19, 20, 21 and 33. Where the coal is soft and shelly and the roof not too high an expansion bolt (8) placed in a hole drilled in the roof should be used instead of parts 12 and 20.



(b) In high coal, double track, the support fixture is composed of parts Nos. 6, 7, 12, 19, 20, 21 and 33, the same as in fixture (a), while in addition the type N hanger, double curve (No. 22), is necessary.

(c) In low coal where curve hangers or pull-overs cannot be used the proper hanger support must be installed and spaced according to the radius of the curve as shown in Table II and illustrated in preceding column.

Remarks—It is always better to use curve hangers or pull-overs when the height of the coal will permit. Curve hangers or pull-overs give the wire that much-desired flexibility which eliminates hard spots, kinks at the points of suspension and which permits the trolley wheel to traverse the wire with the greatest ease and smoothness, thus decreasing the wear on the wire, on the trolley wheels and on their bushings. In cases (a) and (b), where the wooden plug is used, it is sometimes split at the end and a wedge inserted so that when it is driven into the hole in the roof the wedge bears against the bottom of the hole and is forced into the split in the plug, expanding it (the plug) against the sides of the hole. The hole in the roof for the reception of the plug is drilled with a breast auger or, if the material is hard, with a Niron ratchet. The galvanized wire strand (33) is spliced into curve hangers (19 and 22) in cases (a) and (b).

TABLE II

Radius of Curve	Chord in Feet	Middle Ordinate in Inches	Distance Between Suspension Points
40	10	3¾	5 ft
50	10	3	5½ ft.
60	10	2½	6 ft.
75	10	2	6½ ft.
85	10	1¾	7 ft
100	10	1½	7½ ft
200	10	¾	10 ft

(4) Frogs are installed at all switches and turnouts.

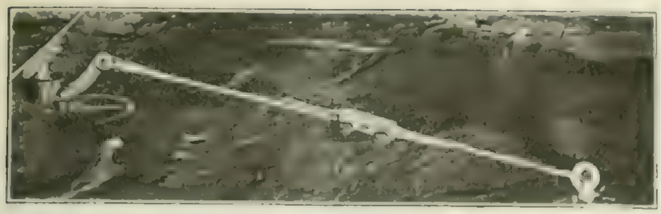


FIG. 5 THE CURVE HANGER OR PULL-OVER

It is always advisable to use this fixture where the height of the coal will permit.

(a) The frog fixture complete is made up of materials Nos. 1, 2, 3, 6, 7, 8, 24, 25, 33 and 34.

Remarks—The branch line wire is dead ended over the frog as shown in Fig. 6. There should be little tension in this dead end; not enough to pull the frog out of place. The purpose of this dead end is largely to hold the end of the branch line wire out of the way and to protect the frog in the event that a heavy stress comes on the branch-line wire between the frog and the section switch.

The frog is steadied and held in alignment by means of No. 6 galvanized wire passed through the pull-off rings in the frog. The wire is doubled from the pull-off rings to the strain insulator. The clevis end of the strain insulator is attached to an eyenut, screwed onto an expansion bolt in the roof on each side of the frog and then twisted to get the necessary tension to hold the frog in its proper position. The hanger suspensions supporting the wire on either side should not be too close to the frog as it is not desirable that the frog be held too rigidly.

The type and degree of frog here specified have given good service and even if only located and installed in approximately the correct location it relieves the motormen of the trouble caused by the trolley pole jumping off or getting on the wrong wire at frogs.

(b) Frogs should be placed from the point of the track frog or the point of the track switch the distance indicated in the table below:

30 lb Rail	44 in Gage No 3 Frog	5 ft Switch Points
Degree Trolley Frog	Distance from Point of Switch	Distance from Point of Track Frog
5	2 ft. 3 in.	17 ft. 8¾ in.
15	6 ft. 6 in.	13 ft 5¼ in
40 or 56 lb Rail	44 in Gage No 3½ Frog	7 ft. 6 in. Switch Points
8	4 ft. 6 in.	20 ft. 1¾ in.
15	9 ft. 10 in.	14 ft. 9¼ in.

Remarks—The angle of the trolley frog should always be less than the angle of the track frog. In Fig. 7, "A" is the point of intersection of the branch trolley wire with that on the main line. Trolley frogs must never be located between point A and point of the track frog, but must invariably be placed between point A and the point of switch. Before setting a trolley frog place hangers "BB" opposite the track frog at a horizontal distance of 53 in. (gage plus 9 in.) from it. On these hangers is placed the section switch. The hangers "BB" also should be at the regulation distance, 9 in., from the gage of the branch track.

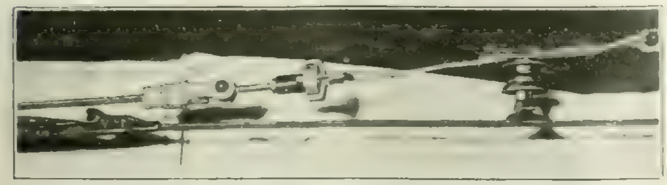


FIG. 6. DEAD END ON A BRANCH-LINE WIRE

Little tension, not enough to pull the trolley frog out of line, should be applied to this dead end.

(5) Section switches or insulators are highly desirable pieces of apparatus. (a) The switch fixture consists of parts Nos. 5, 6, 7, 8, 9, 24, 26 and 27.

Remarks—Wherever a trolley frog is used and a branch circuit is taken off the main line it is necessary to install two section switches (26), one on the main line and the other on the branch. If there is a short circuit or ground on the branch, the section switch on this line can be pulled and work can continue on the main line. If there is trouble on the main-line wire inside of the branch, the main-line switch is pulled and work need not stop on the branch line.

If trouble develops in the mine and a ground or short is reported by the sub-station attendant, by trying one switch and then the other it can soon be ascertained whether the trouble is on the main line or on the branch circuit.

The switches are placed close together so that unnecessary time will not be consumed in walking a hundred feet or more up the branch entry and then back and up the main entry two or three hundred feet. When the switches are placed at too great a distance from the branching point trouble may occur between them and the frog and it would then be necessary to go to the next pair of switches, 500 to 1,700 ft. away, cutting off a whole section of the mine simply because a switch was not placed correctly.

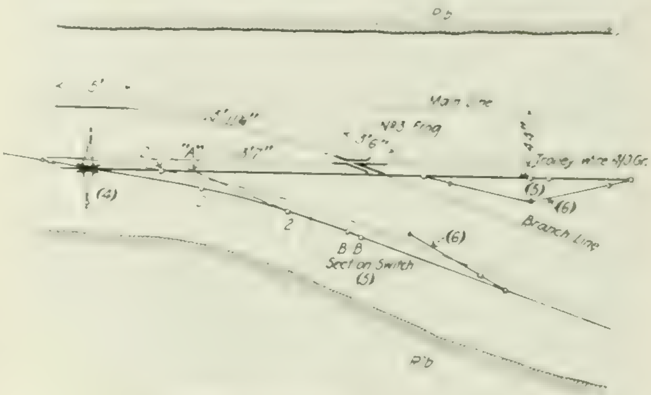


FIG. 7. TROLLEY WIRING AT A TURN-OUT

This shows the correct relative positions of frog, section switches, anchors, etc.

The switch on the main line should be placed 12 ft. inside the point of the track frog. The switch on the branch line is placed opposite the track frog on the hangers "BB," as previously mentioned.

The switches should be so placed that the handles point toward the outside. If they are set with the handles pointing toward the inside and a motor comes from the inside going outbye and the trolley wheel jumps off as it comes to the switch (which should not happen but which does nevertheless), the chances are that the pole will pull out the switch. The locomotive, however, will roll on toward the outside, and when the wheel is replaced it will be on wire outside of the switch and will give current to the motor. It usually happens upon such occasions that the motor continues on its way without the motorman noticing that the switch has been pulled. In the meantime the motors and machines on the trolley line inside the switch are without power and by the time the trouble is discovered much time may have elapsed.

Of course, when the switch is placed with the handle pointing toward the outside the switch can be knocked out in the manner above described only when the

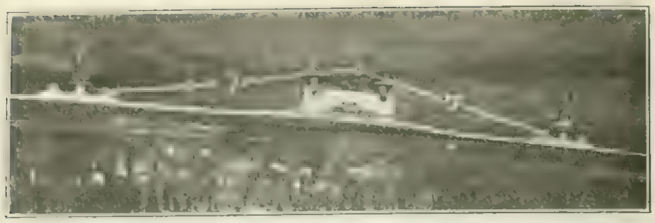


FIG. 8. A SECTION INSULATOR ANCHORED IN PLACE
Anchors should be placed on each side of the switch if the pull in the trolley is great.

motor is going inbye, and if it is so thrown it will be discovered immediately because the motor will be found to be on the dead side of the switch. The section switch must be protected by anchors; otherwise an extraordinary stress coming on the wire on either side of the switch would pull it in two. This was a common occurrence before the protection of switches with anchors was introduced. An anchor is placed on each side of the main line switch, while on the branch line switch an anchor is placed on the inside of the switch only. The wire on the outside of the switch extends but a short distance to the trolley frog.

The Brooklyn strain insulator is placed 12 in. from the strain clamp (27), with the insulated bolt on the clamp side. This puts the bell or large part of the insulator against the roof—if the roof is low—and thus eliminates the possibility of the device getting grounded thereon. A galvanized strand is spliced into the Brooklyn strain insulator and the Detroit strain clamp. When the Detroit strain clamp is screwed onto the hanger the eyebolt must be taken out of the strain insulator. The galvanized wire strand on the dead side of the insulator has its other end passed through the eyenut, doubled back on itself and fastened with a 3-bolt clamp. The eyebolt of the Brooklyn strain insulator is then tightened up to secure the necessary tension in the wire.

Section switches must always be placed on hangers. Where the top is low it may be necessary to cut a channel in the roof to accommodate these hangers so that the runway of the switch will be in alignment with the trolley wire. Many switches with a downward curve in the wire on either side may be seen. This is because the trouble was not taken to cut a channel in the roof for the hangers. A job of this kind should not be tolerated and should be ordered taken down and installed properly.

Where the roof is high, suspensions (2-f) should be used. All section switches are numbered. A brass check with the number of the switch stamped on it is tacked on each switch. This number, shown in its correct location on the trolley-wire map, is used when orders are given to isolate trouble. The sub-station attendants and section foremen are given detailed instructions what to do in the event of a short circuit or ground on the trolley lines. Such troubles are speedily found and isolated, the maximum time required for this purpose never exceeding ten minutes.

FIG. 9. UNANCHORED SECTION SWITCH
Two supports are always necessary to support a section switch.

In some mines, instead of using section switches, section insulators and circuit breakers (automatic or manual) are employed. The section insulators are mounted in the same manner as section switches but a feeder is taken off each side of the insulator and run to the circuit breaker, which is mounted on pipe supports in a convenient refuge hole or breakthrough. However, in the present status of the art of mine wiring I do not think it pays to use circuit breakers in the mines except at points where an attendant is employed and a telephone is installed.

(6) Anchors are built up of parts 5, 6, 7, 8, 24 and 27.

Remarks—Anchors should be installed every 500 ft. on main-line wire. Without the protection of anchors, in the event of a slate fall or other unusual strain coming upon the wire it might be pulled down for a thousand feet or more on each side of the trouble.

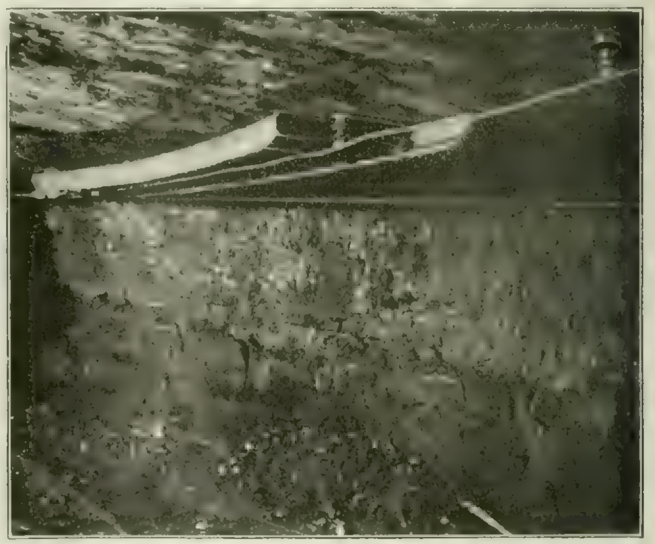


FIG. 10. TROLLEY PROTECTION BOARDS
Protection of this kind should be adequate to prevent contact with the wire anywhere at the turnout.

When anchors are installed every 500 ft., the wire is divided into sections and any trouble arising is confined to the region in which it occurs. Anchors are installed in the same way as that described under section switches (5).

The manufacturers furnish only screws with the Detroit trolley clamps (27). These screws frequently work loose and render the anchor valueless. Such screws extend through the clamp far enough to permit nuts being employed to jam them. Extra nuts for this purpose should always be used on these devices.

(7) Protection boards are made up of parts Nos. 28, 29 and 30.

Remarks—I have experimented with every kind of a protection board that I could think of or that I ever heard of but have finally come to the conclusion that those here described are the best and the cheapest that can be installed. Wooden plugs are placed and expanded in the same manner as described under curves (3).

Where the roof is low a swinging protection board may be better than a rigid one. Such a board can be made by having the blacksmith make hangers from

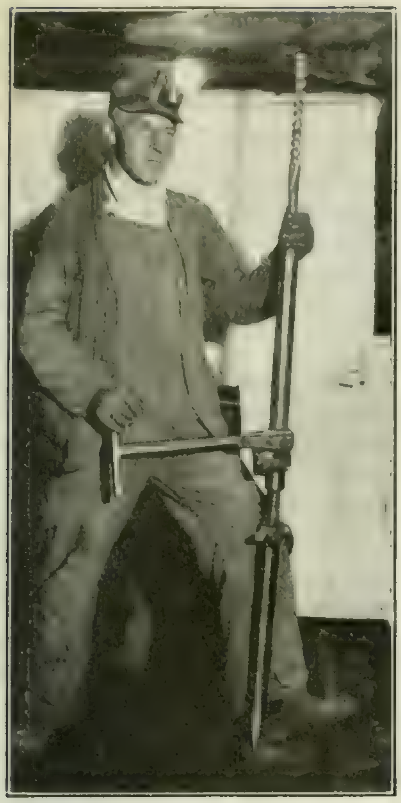


FIG. 11

Nixon Ratchet

This device is extremely useful for putting plug holes into the roof for trolley hangers and the like.

½-in. round iron and putting eyenuts upon expansion bolts placed in the roof and nailing the boards to these hangers. As a general rule protection boards do not extend far enough along the wire at crossings. They frequently extend only from the point of switch to the point of the track frog, but this is not far enough.

In Fig. 10 the protection boards are too short. They should come forward at least 6 ft. No part of the crossing should go unprotected. It should not be possible for a man to bump his head into the wire in turning from one entry into another. In many instances protection boards are placed too far from the wire. They should be located 4 in. from the wire on either side.

(8) Splices or connectors are composed of parts Nos. 32 and 35.

Remarks—The splicer shown in Fig. 12 without a doubt is the one that is quickest, cheapest and easiest to apply. The trolley wire is held in place by means of tapered steel dogs that are barbed on one side so as to grip the wire and tapered on the other to correspond with the tapered inner wall of the splicer. It is not necessary to solder this connection as the tension of the wire is sufficient to keep the dogs in place.

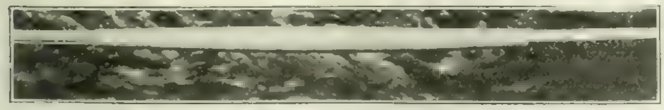


FIG. 12. AN EFFECTIVE TROLLEY WIRE SPLICER

In using this splicer, the ends of the wire are inserted in each end of the splicer. This is easily done, for the wire goes in straight and no short-radius curves are necessary. The dogs are slipped through the slot in the center of the splicer and placed properly, tension is put on the wire and the connection is made. This procedure is much easier and quicker than that necessary when using an extruded metal or brass trolley wire connector. With such a device the wire must be pushed through a curved path, brought out on top and a short-radius curve bent in it. About this time the wire breaks and a few more inches of it must be pushed through and the process repeated. In my experience no K-I splicer has ever failed under strain. The wire will break first.

Tools necessary for hanging wire are:

(100) 1 Nixon ratchet
(100) 2 1¼ in. bits *
(101) 2 1½ in. bits *
(102) 1 8 in. file
(103) 1 plumb bob
(104) 1 25 ft. metallic tape
(105) 1 piece of chalk *
(106) 1 hanger wrench *
(107) 1 clamp wrench *
(108) 2 10 in. Stillson wrenches
(109) 1 1½-lb. hammer
(110) 1 10 in. Westcott wrench
(111) 1 pair 8-in. pliers
(112) 1 punch
(113) 1 cold chisel
(114) 1 pair of wire stretchers (lever and chain*)
(115) 1 1-ton chain block *
(116) 1 wire tightener (O B No. 8126*)
(117) 1 chalk line
(118) 2 comealongs with flat grips for 4-0 grooved wire *
(119) 10 ft. of ⅜ in. chain
(120) 1 1-qt. blow torch
(121) 1 hand saw, 8 point cross cut
(122) 1 brace
(123) 1 ¾ in. bit with square taper shank
(124) 1 pulling tool *
(125) 1 hatchet
(126) 1 breast auger *
(127) 1 heavy screw driver
(128) 1 12 in. monkey wrench
(129) 1 hack-saw frame for 12 in. blades
(130) 12 12 in. hack saw blades *

The tools marked with an asterisk (*) are furnished by the company; the others each wireman is required to own himself.

Fig. 11 shows clearly how a pipe has been fitted up for use with the Nixon ratchet in order to drill vertical holes. This drill possesses a combination of qualities—lightness, convenience, speed in operation, ability to drill all kinds of top—that I have not seen equalled. The hanger and clamp wrenches furnished by the companies that sell the hangers and clamps are short lived. They are too narrow and too light and the jaws are soon sprung. It is much better to have the blacksmith make substantial wrenches for these purposes.

The wire stretchers (114) shown in Fig. 13 are made in the shop from a piece of flat iron rod, some ⅝-in. chain and two comealongs. Three holes are punched in the flat iron rod, about 4 in. apart, near one end. The center of the main chain—it is about 10 ft. long—is fastened in the center hole. This acts as the fulcrum of the lever.

In each of the other two holes is fastened a short chain about 16 in. long, with a hook at the end which

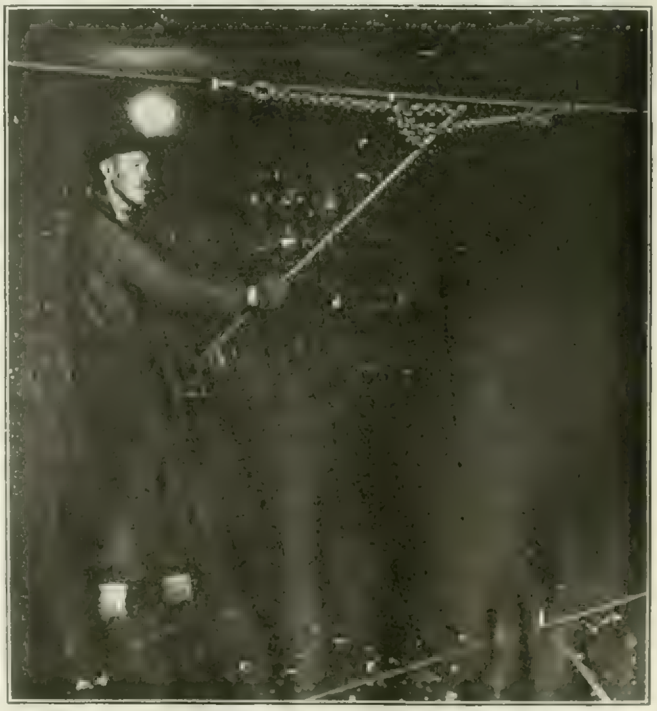


FIG. 13. HOME MADE WIRE STRETCHER

This device may be fastened to either two wires or to one wire and a post or other anchor and the wire quickly tightened

FIG. 14. PULLING TOOL IN USE

This curved bar is extremely useful in removing the lag screws from the wooden support plugs.

is so fashioned as to fit over a link of the long chain. The lever, in tightening wire, is worked back and forth. As it is drawn one way, it loosens the hook on one of the short chains and this is fastened two or three links ahead of its former position on the long chain. The lever is then moved in the opposite direction, and the other chain is loosened and moved up two or three links on the long chain. In this way, the necessary tension on the wire is speedily secured.

The pulling tool (124) shown in Fig. 14 is used in withdrawing the lag-screw support from the wooden plug when the entry is finished and the wire is being taken down.

(10) Trolley wire must be extended periodically. When an entry has advanced to such a distance that the motorman finds that he has barely enough cable on his reel to reach the inside face, he reports this fact to his foreman and orders are given for additional wire to be hung. The wire car—equipped with a reel of wire, tools, necessary material, etc.—is attached to a trip going to this entry. When it arrives the motor pulls the proper length of wire off the reel and it is cut by the wireman and laid down in the clear on the crosscut side of the entry. In pulling the wire off the reel a comealong is used. In no case is the wire allowed to be kinked or looped, as the avoidance of such sharp bends facilitates handling and stretching. A kinked or looped end has to be cut off and is usually wasted.

In the meantime the wiremen put up the suspensions to a point as close to the face of the entry as the top will permit—if draw slate is encountered the suspensions are not put up until it has been taken down or the place otherwise made safe. These suspensions are lined up 31 in. from the center of the track (the track gage is 44 in.). A chalk line is stretched on the center line of the entry and the hangers are placed in a parallel line 9 in. from this center line.

On straight track and where the top is regular the hangers are spaced 30 ft. apart; where the top is irregular, the hangers are so spaced as to secure the best possible vertical alignment of the wire, so that the wire clears the roof and so that the trolley wheel will not touch the roof at any time.

Trolley extensions are usually made in the evening after the motor in the entry has finished for the day. The nearest section switch controlling the "juice" on this particular entry is pulled, making the end of the wire dead. The dead-end fixture is taken off, advanced and put on the end of the piece of wire about to be installed. The turnbuckle on the dead end is opened up as far as possible. The other end of the wire is connected to the wire already in place, with a splicer.

At the inside end of the new wire a prop or tie is placed on end and wedged between the roof and floor to serve as a pulling post or anchor for the chain blocks or wire stretchers. To this post is fastened with ⅜-in. chain either the chain block (tool No. 115) or the wire stretchers—lever and chain—(tool No. 114). The chain block or wire stretcher, as the case may be, is fastened to the galvanized strand of the dead-end fixture close to the turnbuckle by means of a comealong, and the slack in the wire is taken up.

Before the wire is made tight five or six of the clamps holding the wire outside of where the dead-end installation has just been removed are loosened because when the dead end is taken away the drawing up of the wire ordinarily pulls the nearest hangers out of plumb. The wire is now stretched tight, an eyenut is screwed onto the expansion bolt near the end of the galvanized strand on the dead end, a thimble is placed in the eyenut and the end of the strand is run through the eyenut and around the thimble, turned back on itself and fastened with a 3-bolt clamp.

The chain block or wire stretcher is now loosened and the comealong taken off. The turnbuckle in the dead end is next employed to bring the wire to the proper degree of tautness. The wiremen now go to the outside hangers, where the clamps have not been fastened to the wire, proceed to put the wire into these clamps and draw them securely to the wire. As they perform this bolting-up process they knock the clamps gently toward the outside with a hammer, just enough to barely get the suspension out of plumb. This tends to regulate the spans between hangers. When the clamps are all tightened up there is usually a little slack at the dead end which is taken up with the turnbuckle.

MATERIALS USED IN HANGING TROLLEY WIRES IN MINES*

1. 410 Grooved trolley wire
2. Wedge grip. O.B. No. 12,634, opening in clevis $\frac{11}{16}$ in., diameter of clevis bolt ⅝ in. Will take 410 grooved or ½ in. round strand
3. Giant strain insulator, 2⅝ in. diameter with large eye and clevis
5. ⅜ in. galvanized steel wire strand
6. 3-bolt guy-wire clamp, O.B. No. 3,206, length 4 in. with square hole and square head on bolt
7. Hubbard eye-nut, drop forged, to screw on ⅝ in. bolt; inside diameter of the eye is 1 in
8. Expansion bolt. O.B. No. 10,073, 6 in. long
9. Universal mine hanger, O.B. No. 11,309, form 1, 2 in. high
19. Type N hanger, O.B. No. 11,650, single curve, complete with separable arm
20. Wooden plug, diameter 1½ in., length 12 in.; to be split out of ash or other soft wood
21. Detroit trolley clamp, O.B. No. 10,972; 4-screw clamp
22. Type N hanger, double curve, O.B. No. 11,651, complete with separable arm
24. Single Brooklyn strain insulator,O.B. No. 9,995; ⅝ in. eyebolt
25. Type D trolley frog, malleable iron with renewable bronze tips, 8 degree, 410 grooved; right hand O.B. No. 11,892; left hand O.B. No. 11,897
26. Type M mine section-insulator switch, O.B. No. 11,600
27. Detroit double strain clamp, O.B. No. 10,370
28. Wooden plug, 1½ in. x 18 in., split at end with a wedge fitting in the split; to be made out of ash or other soft wood
29. Boards, 1 in. x 4 in. x 14 ft.
30. 8d nails
32. K-I splice, 15 in. long, O.B. No. 8,573
33. ¼ in. galvanized steel-wire strand
35. Dogs for K-I splice, O.B. No. 5,700

* Abridged from table appearing April 22.

While two men are bolting up the clamps the third man of the wire crew is painting the hangers, clamps and the other sherardized materials with a bright red paint having an asphaltic base. A lead paint should never be used for this purpose. This painting protects these materials from the corrosive action of the mine air and water and increases their life several fold. Finally, the tools, materials left over and any scrap copper that has been made are loaded on the wire car.

Reading Co. Completes New Mining Town of Lorraine, Pa.

Concrete Sidewalks in Front and Around House, Concrete Gutters and Curbs, Streets Electrically Lighted, Running Water in all Houses, Heat Supplied by Pipeless Furnaces and Ample Closet Room Are Notable Features of Attractive Dwellings Containing Seven Rooms

AT ITS Eagle Hill Colliery, near Pottsville, Pa., the Philadelphia & Reading Coal & Iron Co. has commenced and partly completed the new town of Lorraine. This town now consists of 24 double dwellings and a school house. It will be enlarged from time to time as housing demands may determine. At present there are only three streets in the place but there is sufficient ground to make the town about four times its present size. Each house has large grounds surrounding it, giving plenty of room for gardens and lawn. The grounds are inclosed by a picket fence.

Concrete walks extend from the sidewalk completely around each house. The street is graded and has concrete curbs and gutters. A stretch of lawn about five feet wide lies between the curb and the concrete sidewalk, with another strip between the sidewalk and the fence line. The streets are electrically lighted. Running water is supplied in all houses, and each is furnished with an outbuilding that can be used either as a garage or storehouse, or for any similar purpose. Six fire plugs are placed at regular intervals along the curb line and the town is furnished with a fire house containing a hose cart. The houses are of an attractive design and are uniform in plan. They are painted different colors, however, in order to avoid monotony of appearance as far as possible. All the houses have seven rooms besides the cellar.

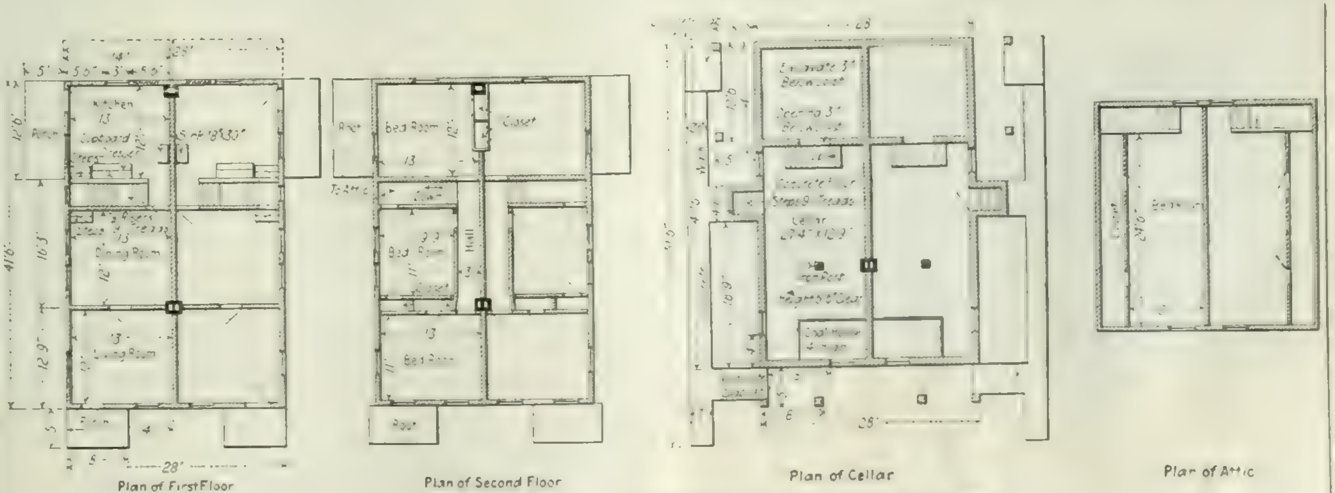
The cellar does not extend the full length under the house but is 12 ft. 9 in. x 27 ft. 4 in. and 6 ft. 6 in. in the clear, which gives reasonably ample headroom. A coal bin is placed in the front part of the cellar at a window and within easy access from the street. The flue for the front of the house extends down into the cellar so that a pipeless furnace can be used for heating. The company has installed a number of this type of furnaces. There is an entrance to the cellar from the outside as well as one from the kitchen, as may be seen by a glance at Fig. 1. The cellar floors are all finished in concrete.

On the first floor, Fig. 1, there are three rooms, the living room, the dining room and the kitchen. They are all 12 x 13 ft. in dimensions. The stairway opens into both the dining room and the kitchen. There is also a front porch 5 x 8 ft. and a side porch 5 x 12½ ft. Plenty of light and sunshine is assured by numerous windows.

The second floor has three bedrooms and a hall. Two of these bedrooms are the same size as the rooms on the first floor but the third is a little smaller, being only 9 ft. 9 in. x 11 ft. One extremely utilitarian feature of these houses is the large number of good sized closets. The attic, or third floor, Fig. 1, extends over only the front portion of the building and has one big finished room 10 x 24½ ft. and one large closet.

Fig. 2 is a good illustration of the outside of the house, which is quite attractive. The roofing is vulcanite slab shingles. These dwellings are placed rather near the street line. The indispensable school house is now in course of construction in the town but is not yet quite finished.

The housing problem, now quite acute the world over, is present in the anthracite region as well as elsewhere and much study is being devoted to its solution. The day and age when a coal miner and his family could be lodged in the "shack" are past and gone, probably never to return. The houses composing a modern mining community must today compare favorably with those of industrial towns and cities or the miners' sojourn



Plan of First Floor Plan of Second Floor Plan of Cellar Plan of Attic

FIG. 1. INTERIOR ARRANGEMENTS OF READING HOUSES

These houses are of the double type, having seven rooms on each side. Every dwelling has a finished cellar and a finished room in the attic.

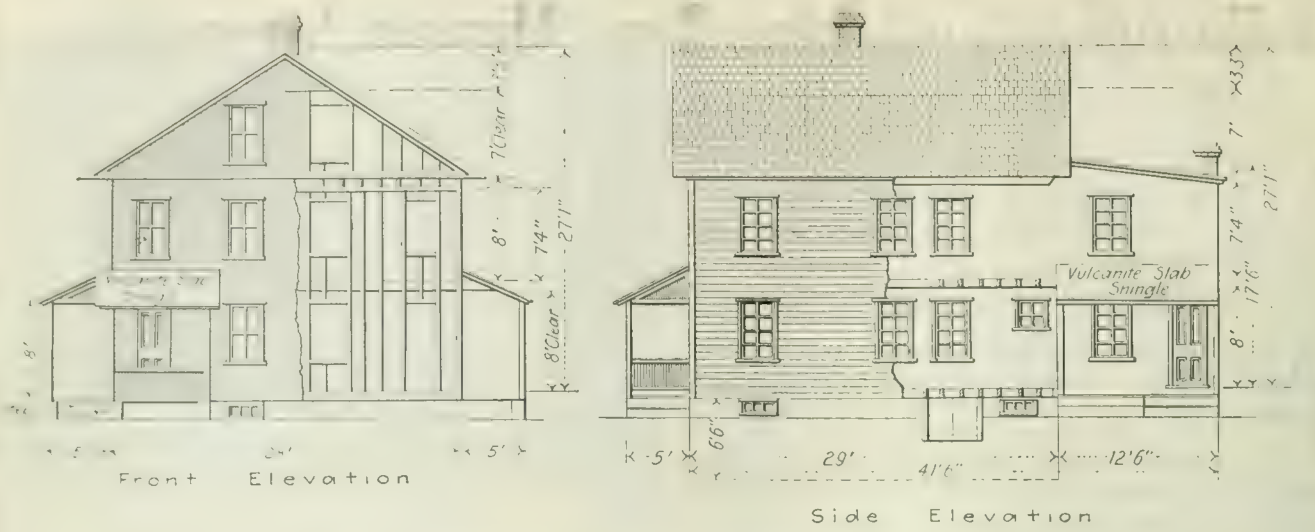


FIG. 2. EXTERIOR OF THE NEW HOUSES AT LORRAINE

Although the exterior of these houses is plain, still, because of their location and varied color scheme, they are quite attractive.

therein will be short and the employing company will be continually looking for men to take the places of those seeking modern homes. The planning and construction of a complete town present many problems, but more and more the tendency is toward creating buildings with many modern conveniences.

Coal Is, in a Sense, a Hardened Petroleum

Virtually Devoid of Petroleum Wells, Germany Obtained Practically All Oil Products from Distillation of Coal—Low-Temperature Distillation, Giving Products Such as Are Obtained in Petroleum Distillation, Seems to Be Growing in Favor

CONDITIONS encountered during the recent war rendered it desirable for Germany to utilize to the fullest the coal resources of the nation. Such utilization is perhaps even more necessary now. During the height of hostilities Germany carried on some important scientific work at the Institute for Coal Research in Muelheim. Professors Franz Fischer and W. Glund there made certain discoveries the value of which to Germany and its industries cannot yet be accurately estimated.

The seriousness of conditions at the time compelled the scientists to direct their attention primarily to devising ways and means by which all the constituents of coal could be utilized as directly and efficiently as possible. Both scientists have proved by their investigations and studies that all products of petroleum can be extracted also from coal.

To perfect a distillation of coal under conditions approximating those obtaining in nature, especially in regard to low temperature and atmospheric pressure, had already been attempted by Boernstein in Berlin. Similar experiments were made by Pietet, a Frenchman, and by Wheeler, an English scientist. Fischer and Glund, however, went into the study of coal tar at low temperatures, extracting phenol by the same process as that used in the petroleum industry. By means of distillation with superheated steam they secured oils of pleasant odor and a golden color which proved themselves useful lubricants.

These experiments brought out another important fact. Distillation at low temperature shows that the same products may be extracted from coal that the petroleum industry gains from crude oil: namely, fuel oil, machine oil, lubricants, paraffin and benzine. It was found, therefore, that coal, in a certain sense, is a hardened petroleum. Simultaneously the fact was established that tar resulting from low-temperature distillation has an entirely different chemical composition from that ordinarily secured. Low temperatures yield combinations like petroleum and benzine, higher temperatures combinations like benzol.

There can be no doubt that these discoveries are of value to Germany's economic life, petroleum being almost entirely lacking in that country. The researches of the scientists will now lead to the development of a second industry for the production of tar which will not be won, as heretofore, through coke furnaces but by a process of distillation at low temperature. Germany and her industries now hope to become independent either entirely, or at least in large measure, of imports of petroleum and its byproducts.

In the same manner as with the usual distillation of tar there remains in the case of the low-temperature process a coke. This, however, is not of the same consistency as that produced heretofore. Experiments to give this coke the required consistency are now under way and have already resulted in a product which is called "semi-coke" and which can be used for fuel purposes. This coke is also termed "smokeless coal," although it still contains a small percentage of an easily inflammable substance, which burns, however, without producing smoke.

Science is now confronted with the task of giving this smokeless coal such consistency that it can be utilized, perhaps in the form of briquettes, as fuel for industry and for domestic consumption.

What Cars and Bearings Should We Select?

Anti-Friction Bearings Are Rapidly Gaining in Favor Because They Are a Good Investment—Cars Should Be Made as Low as Conditions Will Permit on Account of the "Man Item"

By H. G. Nash
Huntington, W. Va

FOR the past year or so I have been reading the comments appearing in *Coal Age* and elsewhere on mine cars and roller-bearing wheels of the "pin" and "flexible" types. It is assuredly mystifying to observe the seeming diversity of opinion on a subject that to me appears easily solved, especially so far as regards the roller-bearing car or truck. Because there has been and still is much doubt in the minds of some operators on the above subject, I want to state a few facts that I have picked up from personal observation which have been highly valuable to me and which should go far toward settling in the minds of some doubters two important questions, viz., Are roller-bearing mine cars a good investment? Which does it pay to use, a low mine car or a high one?

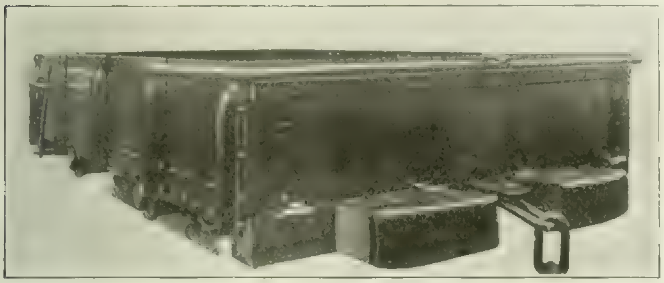


FIG. 1. QUARTERING END VIEW OF LARGE-CAPACITY LOW CAR

This car is 30 in. high over all and has a struck capacity of 90 cu.ft.

I will first take up the subject of roller-bearing mine cars and trucks. For the past ten years the roller-bearing mine car has been a profitable investment. As evidence of this fact it is an easy matter to turn to almost any coal field and see mine cars equipped with roller-bearing trucks that have been giving excellent service throughout that entire period at a saving in power, lubricant and labor for its application, wheel repair and general upkeep cost.

Roller Bearings Insure Low Lubrication Cost

Some friends of mine have been using roller bearings for a number of years and I will quote one as saying that he produced an output close to a million tons during the specified period. He has a long haul, heavy loads and hard service, but in spite of this fact his expenditure for lubrication and labor for its application has been .00122c. per ton of coal passed over the tipple. In my own experience the least lubricant cost I have seen applying to an improved self-oiling wheel has been .00989c. per ton. The man who gave me this figure stated that the black oil bought was charged both to machinery and cars and he felt that this figure should probably be a little higher as he believed that more oil was used on his mine cars than was charged to them.

Another friend of mine roughly estimated that it was costing him $5.68 per year per car for lubricant and labor for applying it to his self-oiling wheels and that he was getting his roller-bearing equipment lubricated for approximately $1.30 per car per year. As the two companies furnishing these figures are large ones and carefully investigate all types of equipment before they make any statements it seems to me that this saving alone is worthy of serious consideration, since it comes from practical experience.

W. H. Noone, in the issue of *Coal Age* dated Jan. 15, 1920, p. 148, "assumes that a large majority of coal mines still have their mine cars equipped with plain bearings." He may be in a measure justified in this assumption, for plain bearings were first put in service simply because there was nothing else to use and the older mines are so equipped through necessity. I believe, however, that he will revise his statement if he will look around at the newer properties—those that have been developed in the past eight years—for he will find an astounding number that use roller-bearing cars. He will also find numbers of companies who equipped their mine cars with plain bearings and are now gradually changing to those of the roller type.

Bearings May Be Saved from Broken Wheels

Another statement made by Mr. Noone I want to take issue with is the following: "However, aside from the excessive cost of renewals, the cost of repairing such bearings is excessive." I have in mind a friend who operates approximately 5,000 roller-bearing cars of the flexible type. He tells me that he has yet to purchase a repair bearing and that he has lost practically no bearings from wreck or other cause. He also states that he often has broken wheels, but that he puts the bearing back into another wheel and keeps it going.

In my own experience I was connected with a large company which has both the self-oiling and the roller-bearing wheels, and during a period of five years I failed to see a roller-bearing wheel on the scrap pile because of bearing trouble, although I did see a few with broken flanges, treads and spokes. These cars

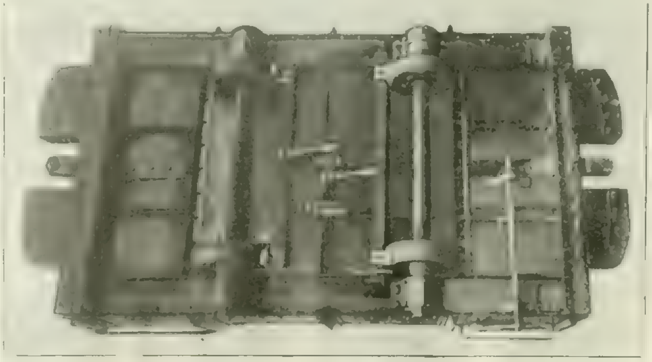


FIG. 2. BOTTOM VIEW OF THE CAR SHOWN IN FIG. 1

This view shows plainly the arrangement of wheels, journals, brake rigging, etc.

received scarcely any attention and the majority (at least 90 per cent) are running satisfactorily today.

In looking over the field I find such experiences as this to be the rule, therefore I cannot agree that the roller-bearing wheel or this type of bearing means "excessive cost of renewals, etc." I have in mind several mines located in West Virginia having long inclines that have found self-oiling wheels absolutely useless. Their planes were long and the cars came down at a high rate of speed. The centrifugal action thus set up caused the oil to be thrown to the circumference of the hub and away from the bearing surface. The wheels therefore rapidly wore out in the bore. The same firms have many roller-bearing wheels that have been going for from four to five years and have not given the least trouble.

It seems to be Mr. Noone's belief that a large part of the rolling stock of a mine will get wrecked in the course of its life and that the wrecking will tear up the mine-car bearings. This I believe is contrary to the experience of most of the operators using roller-bearing mine cars, for the smashing up of a wheel does not mean, necessarily, a broken bearing. In the majority of cases the modern roller-bearing wheel has the bearing so securely housed that it is well-nigh impossible to injure it, and if the wheel be broken the bearing may be taken out and put into another wheel casting. Consequently a higher efficiency will be secured from a roller-bearing wheel in general service, and when an occasional wreck occurs the only loss will be a broken wheel casting. Nowadays, with heavy rail and well-kept track, serious wrecks are far more infrequent than in former years when it was considered good policy to use nothing heavier than 20-lb. mine rail.

ROLLER BEARINGS ARE FAVORITES

In spite of the fact that in past years there have been some mighty inefficient types of roller-bearing mine cars put on the market and that even now some roller-bearing trucks are much better than others, nevertheless, in those fields where roller bearings have been tried the demand for them is heavy. I have questioned several mine-car manufacturers with whom I do business as to the percentage of roller-bearing trucks they sell as compared with their total output, and I find that the reputable manufacturers who ship into West Virginia make from 50 to 95 per cent roller-bearing equipment. One prominent manufacturer tells me that he has averaged 90 per cent of this type of equipment throughout a period of several years.

In my section of the state a majority of the companies—a large majority—that produce a million tons or more per annum each are users of roller-bearing mine cars and are gradually getting rid of their plain-bearing wheels and trucks. I noticed some months ago that a certain concern was experimenting on a roller-bearing crankshaft for automobiles and I understand that a large railroad in the East is trying out both ball and roller bearings on railroad cars. Both these firms are working with the hope of perfecting the particular type of bearing suitable to each individual application.

There has always been an effort made to get away from bearing friction and daily we see new applications of anti-friction bearings being used in mine machinery of every sort. A representative of a large company building mining machines tells me that his firm will soon have an undercutter on the market equipped throughout with roller bearings. The plain bearing is still in use because there are certain applications for which there has not as yet been developed any type of anti-friction bearing that can supplant the plain bearing.

It is, however, merely a matter of time until practically all types and kinds of machinery will be equipped with some form of anti-friction bearing and the one that is nearest to being fool-proof and most durable, though it may cost most in the beginning, is going to become the accepted type for the purpose in question.

Now we will consider the mine car itself. I was much amused at a miner some months ago. He was loading coal over the side of a car 41 in. high which would hold with a little "cribbing" approximately 3 tons. He said he was going over to another operation, as he could load "two of that man's cars to one of these, and a lot easier." On investigation I found that "that man's cars" were only 26 in. high and that because of their width and length the miner would put approximately 4 tons of coal into each.

BIG, LOW CARS ARE MOST ADVANTAGEOUS

It seems to me that this is the answer when the question of the height of a car is under consideration. Make it as low as possible but keep the container so large that with a little coal piled up on top the same load will be had as with the high car level full. Of course there are mines that are unable to "crib" or pile coal higher than the side boards because of conditions peculiar to themselves, but the lower the car the easier it is to load.

I notice in this field that there is a decided tendency to keep the car below 32 in. in over-all height, and several of my friends who have high cars are seriously considering a change to a lower type on account of the "man item" involved in loading the high cars. The two accompanying illustrations show a car recently built by one of the largest companies in West Virginia. It is unusually low, yet at the same time it has a large capacity. It is all steel, 30 in. in over-all height and has a water-level capacity of about 90 cu.ft. and can be "cribbed" to hold about 4 tons without losing coal in transit. This car, by the way, is equipped with the flexible type of roller bearing, and it is my understanding that all of the many hundreds of cars owned by this company have roller bearings of some variety.

The efficiency of mine cars is a problem that is receiving constantly increasing consideration from the operator. This is as it should be, since the mine car is about the most important piece of equipment on the job. The finest kind of a tipple, power house and general plant may be provided, but if a poorly-designed car is in use, coal will not go over the tipple as cheaply as it should.

AN EFFICIENT CAR IS NECESSARY

It is "up to" the operator to secure a car that will do the work for which it is intended. The fact that an additional brace here or an inch more (board measure) there, and a good truck equipped with modern roller bearings, all add to the first cost of the car should not be the cause of the operator forgetting that he should get what he pays for, namely, a good car, economical to operate and keep going, and one that will bring back to him in actual dollars and cents its additional first cost by giving "value received."

Federal Trade Commission Publishes Coal Production Costs for January, 1920

Commission Believes That Garfield's Wage Increase of 14 Per Cent Raises Production Costs 23c., or 11 Per Cent—Shortened Time Also Had Some Effect on Increased Costs, Especially at the Mines with a Slow Run

BEGINNING with the month of January, 1920, the Federal Trade Commission resumed the collection of monthly cost reports from the bituminous coal operators. The information obtained is similar to that secured for the Fuel Administration during the war period—August, 1917-December, 1918. During 1919 the commission did not collect such information.

The January, 1920, statistics herewith presented are preliminary figures only, covering returns from 1,589 operators. They show "claimed costs" only, i.e., figures compiled directly from the returns actually appearing on the operators' reports. The commissioner has not subjected these figures to any critical analysis or revision. This has been left undone to hasten matters so as to present to the public immediately the best available information. The "revised costs" for January, 1920, will appear in a subsequent report. Experience with the 1918 figures indicates that the revision will in most cases reduce "claimed costs" only a few cents per ton.

For the purpose of general comparison, statistics for 1918 are shown. These figures appear in detail in the various coal-cost reports of the commission, of which reports No. 1 (Pennsylvania-bituminous), No. 2 (Pennsylvania-anthracite) and No. 3 (Illinois-bituminous) has already been issued, and reports No. 4 (Alabama-, Tennessee-, and Kentucky-bituminous), No. 5 (Ohio-, Indiana-, and Michigan-bituminous), No. 6 (Maryland-, West Virginia-, and Virginia-bituminous) are in press; and No. 7 (Trans-Mississippi States-bituminous) in preparation.

The information obtained by the commission shows minor subdivisions of costs, but the summaries published in this bulletin are (1) the cost of labor, (2) the cost of supplies, and (3) the general expense or overhead involved in mining coal, bringing it to the surface, preparing it for market, and placing it in railroad cars for shipment. The total of these three costs is (4) the f.o.b. mine cost shown by the commission. All costs and sales realizations shown in this bulletin are based on tons of 2,000 lb.

The costs shown are not intended to include selling expense; interest on the investment, including borrowed capital; allowances for income and excess profits taxes, and profit on investment. The difference be-

TABLE I. JANUARY, 1920, SALES REALIZATIONS AND "CLAIMED" COSTS OF 1,589 OPERATORS AND 1918 ANNUAL SALES REALIZATIONS AND "REVISED" COSTS OF 2,483 OPERATORS, BY GENERAL COMPETITIVE REGIONS

	January, 1920							Year, 1919						
			Claimed Costs per Ton							"Revised" Costs per Ton				
General Competitive Regions	No. of Operators	Sales Realization per Ton	Labor	Supplies	General Expense	Total F O B Mine	Margin per Ton	No of Operators	Sales Realization, per Ton	Labor	Supplies	General Expense	Total F O B Mine	Margin per Ton
Central Competitive "Interstate" Field[1]	461	$2.45	$1.63	$0 23	$0 28	$2 14	$0 31	765	$2 45	$1 39	$0 25	$0 26	$1 90	$0 55
Eastern Adjacent Districts[2]	545	2.82	1.72	.25	.41	2.38	.44	966	2.81	1.45	.28	.32	2.05	.76
Western Adjacent Districts[3]	68	2.63	1.64	.21	.29	2.15	.48	138	2.75	1.75	.26	.26	2.27	.48
Southern Appalachian Field[4]	252	3.01	1.85	.27	.41	2.53	.48	288	2.81	1.61	.29	.36	2.26	.55
Southwestern "Interstate" Field[5]	148	3.52	2.47	.22	.40	3.09	.43	172	3.13	2.15	.25	.34	2.74	.39
Rocky Mountain Field[6]	115	3.11	1.85	.30	.36	2.51	.60	154	2.73	1.63	.26	.30	2.19	.54
United States	1,589	$2 74	$1 74	$0 24	$0 34	$2 32	$0 42	2,483	$2 65	$1 49	$0 26	$0 29	$2.04	$0 61

[1] Includes all of Illinois, Indiana, Ohio and southwest district of Pennsylvania.
[2] Includes all of Maryland, West Virginia, Virginia and the central district of Pennsylvania.
[3] Includes all of Michigan, Iowa and No. 1 district of Kentucky.
[4] Includes all of Alabama, Tennessee and districts Nos. 2, 3 and 4 of Kentucky.
[5] Includes all of Missouri, Kansas, Arkansas, Oklahoma and Texas.
[6] Includes all of Colorado, New Mexico, North Dakota, Montana, Wyoming, Utah and Washington.

TABLE II. COMPARISON OF COSTS AND SALES REALIZATIONS FOR YEAR 1918 WITH THOSE OF JANUARY, 1920, FOR 1,272 IDENTICAL OPERATORS, BY GENERAL COMPETITIVE REGIONS

		Year, 1918 Per Ton of 2,000 Lbs. Revised					January, 1920 Per Ton of 2,000 Lbs. Claimed						Jan., 1920, Production Compared with Average Monthly Production in 1918	
General Competitive Regions	No. of Operators	Average Monthly Production, Tons	Sales Realization	F.O.B. Mine Cost	Margin	Excess of 1918 Claimed Cost Over 1918 Revised Cost, Cents per Ton	Production, Tons	Sales Realization	F.O.B. Mine Cost	Margin	Increase of Jan., 1920, Claimed Cost Over 1918 Claimed Cost, Cents per Ton	%	Increase %	Decrease %
Central Competitive "Interstate" Field	390	9,323,810	$2.45	$1.89	$0.56	.07	8,956,880	$2.46	$2.13	$0.33	17	9		4
Eastern Adjacent Districts	434	5,156,261	2.77	2.00	.77	.10	4,693,396	2.83	2.37	.46	27	13		9
Western Adjacent Districts	58	823,290	2.52	1.92	.60	.07	950,791	2.62	2.13	.49	14	7	15	
Southern Appalachian Field	179	2,155,909	2.80	2.19	.61	.08	2,194,415	3.06	2.63	.43	36	16	2	
Southwestern "Interstate" Field	117	1,163,650	3.11	2.70	.41	.07	1,197,895	3.52	3.09	.43	32	12	3	
Rocky Mountain Field	94	2,393,959	2.36	2.19	.17	.07	2,637,850	3.11	2.52	.59	26	12	10	
United States	1,272	21,016,879	$2 60	$2.03	$0.57	.08	20,631,227	$2.78	$2.34	$0.44	23	11		2

TABLE III. COSTS AND SALES REALIZATIONS OF 1,589 OPERATORS FOR JANUARY, 1920, AND OF 2,483 OPERATORS FOR YEAR 1918.

	January, 1920							Year 1918						
	Per Ton of 2,000 Lbs.							Per Ton of 2,000 Lbs.						
			Claimed Costs							Revised Costs				
State and District	No. of Operators	Sales Realization	Labor	Supplies	General Expenses	Total, F.O.B.	Margin per Ton	No. of Operators	Sales Realization	Labor	Supplies	General Expenses	Total, F.O.B.	Margin per Ton
Alabama:														
District No. 1	18	$2.78	$1.75	$0.33	$0.35	$2.43	$0.35	20	$2.42	$1.53	$0.33	$0.31	$2.17	$0.25
District No. 2	21	4.08	2.63	.35	.48	3.46	.62	21	3.23	2.00	.37	.38	2.75	.48
District No. 3	27	3.19	2.03	.30	.34	2.67	.52	40	2.63	1.77	.29	.32	2.38	.25
District No. 4	3	3.72	.30	.30	.52	3.12	.60	4	4.13	2.28	.77	.54	3.59	.54
State total	69	$3.28	$2.03	$0.33	$0.37	$2.73	$0.55	85	$2.74	$1.73	$0.33	$0.33	$2.39	$0.35
Arkansas:														
Sebastian District	10	$3.64	$2.67	$0.28	$0.37	$3.32	$0.32	16	$3.27	$2.14	$0.25	$0.29	$2.68	$0.59
Excelsior Logan District	4	4.96	3.69	.30	.45	4.44	.52	5	4.60	3.47	0.43	0.55	4.45	.15
Anthracite District	5	5.67	3.70	.11	.35	4.16	1.51	4	4.66	3.23	0.23	0.52	3.98	.68
State total	19	$4.04	$2.89	$0.26	$0.37	$3.52	$0.52	25	$3.42	$2.27	$0.25	$0.31	$2.83	$0.59
Colorado:														
Domestic District	32	$3.43	$1.94	$0.28	$0.42	$2.65	$0.78	41	$2.96	$1.75	$0.27	$0.38	$2.40	$0.56
Trinidad District	11	2.75	1.91	.33	.37	2.61	.14	14	2.49	1.62	0.26	0.27	2.25	.24
Lignite District	10	2.66	1.65	.23	.43	2.29	.37	15	2.46	1.49	0.21	0.40	2.10	.36
State total	53	$3.09	$1.87	$0.28	$0.41	$2.56	$0.53	70	$2.73	$1.66	$0.26	$0.37	$2.29	$0.44
Illinois:														
District No. 1	13	$3.22	$2.32	$0.29	$0.23	$2.84	$0.38	21	$3.11	$2.20	$0.25	$0.26	$2.71	$0.40
District No. 2	24	2.67	1.78	.16	.25	2.19	.48	30	2.69	1.74	.25	.26	2.25	.44
District No. 3	28	2.43	1.61	.18	.19	1.98	.45	51	2.27	1.40	.18	.18	1.76	.51
District No. 4	12	2.25	1.54	.14	.16	1.84	.41	50	2.16	1.39	.18	.17	1.74	.42
District No. 5	2	2.78	2.07	.10	.28	2.45	.33	2	2.79	1.83	.21	.28	2.32	.47
District No. 6	22	2.42	1.72	.17	.20	2.09	.33	54	2.38	1.45	.24	.24	1.93	.45
State total	101	$2.43	$1.66	$0.17	$0.19	$2.02	$0.41	208	$2.35	$1.47	$0.21	$0.20	$1.88	$0.47
Indiana:														
District No. 1	80	$2.37	$1.64	$0.17	$0.26	$2.07	$0.30	92	$2.33	$1.42	$0.21	$0.23	$1.86	$0.47
Brazil Block District	10	2.73	1.98	.19	.51	2.68	.05	10	3.08	1.87	.27	.43	2.57	.51
State total	90	$2.38	$1.65	$0.17	$0.26	$2.08	$0.30	102	$2.35	$1.43	$0.21	$0.24	$1.88	$0.47
Iowa:														
Marion-Monroe-Polk District	6	$3.12	$2.14	$0.15	$0.24	$2.53	$0.59	42	$2.98	$2.17	$0.22	$0.29	$2.68	$0.30
Appanoose-Boone District	9	3.86	2.83	.24	.36	3.44	.42	27	3.32	2.48	.22	.30	3.00	.32
State total	15	$3.36	$2.36	$0.18	$0.28	$2.82	$0.54	69	$3.06	$2.25	$0.22	$0.29	$2.76	$0.30
Kansas:														
Cherokee Crawford District	29	$3.19	$2.38	$0.18	$0.39	$2.95	$0.24	39	$2.90	$2.00	$0.22	$0.33	$2.55	$0.35
Osage and Leavenworth Districts (combined)	2	4.65	3.35	.04	.44	3.83	.82	3	3.86	2.96	.21	.43	3.62	.24
State total	31	$3.24	$2.41	$0.18	$0.39	$2.98	$0.16	42	$2.93	$2.02	$0.22	$0.34	$2.58	$0.35
Kentucky:														
District No. 1	49	$2.35	$1.45	$0.19	$0.28	$1.92	$0.43	61	$2.32	$1.25	$0.25	$0.24	$1.74	$0.58
District No. 2	49	2.74	1.83	.29	.50	2.62	.12	34	2.61	1.40	.31	.50	2.21	.40
District No. 3	83	2.93	1.52	.19	.41	2.12	.81	104	2.93	1.61	.26	.41	2.28	.65
District No. 4	9	2.78	1.49	.42	.45	2.36	.42	13	2.67	1.29	.25	.31	1.85	.32
State total	190	$2.63	$1.57	$0.23	$0.38	$2.18	$0.45	212	$2.63	$1.36	$0.25	$0.34	$1.95	$0.68
Maryland*	36	$2.87	$1.95	$0.20	$0.45	$2.60	$0.27	62	$2.82	$1.77	$0.26	$0.34	$2.37	$0.45
Michigan	4	$4.31	$2.47	$0.38	$0.50	$3.35	$0.96	8	$4.02	$2.56	$0.54	$0.31	$3.41	$0.61
Missouri:														
District No. 1	22	$3.27	$1.91	$0.27	$0.46	$2.64	$0.63	24	$2.93	$1.80	$0.30	$0.41	$3.51	$0.42
District No. 2	15	3.76	2.78	0.23	0.33	3.34	0.42	20	3.23	2.39	0.25	0.28	2.92	0.31
State total	37	$3.52	$2.35	$0.25	$0.40	$3.00	$0.52	44	$3.08	$2.09	$0.28	$0.35	$2.72	$0.36
Montana	9	$2.88	$1.93	$0.27	$0.23	$2.43	$0.45	17	$2.56	$1.79	$0.25	$0.22	$2.26	$0.30
New Mexico:														
Gallup and Sugarite Districts (combined)	5	$4.00	$2.62	$0.37	$0.65	$3.68	$0.32	5	$3.31	$2.26	$0.32	$0.53	$3.11	$0.20
Carthage and Cerrillos District (combined)	1	4.67	3.20	.54	.65	4.39	.28	4	4.20	2.64	.56	.54	3.74	.46
[illegible] District	2	3.08	1.66	.24	.35	2.25	.83	2	2.83	1.39	.22	.24	1.85	.98
State total	8	$3.37	$1.92	$0.29	$0.42	$2.63	$0.74	11	$3.04	$1.61	$0.25	$0.31	$2.17	$0.87
North Dakota:														
Northern District	2	$2.93	$2.02	$0.21	$0.50	$2.73	$0.20	3	$2.72	$1.62	$0.20	$0.41	$2.23	$0.49
Southern District	1	2.60	1.73	.15	.41	2.29	.31	3	2.10	1.33	.09	.23	1.65	.45
State total	3	$2.64	$1.77	$0.16	$0.42	$2.35	$0.29	6	$2.22	$1.39	$0.11	$0.26	$1.76	$0.46
Ohio:														
District No. 1	5	$2.89	$2.15	$0.20	$0.47	$2.82	$0.07	9	$2.80	$1.77	$0.30	$0.41	$2.48	$0.32
District No. 2	18	3.17	1.98	.17	.36	2.51	.66	21	3.42	2.06	.23	.48	2.77	.65
District No. 3	28	2.69	1.53	.18	.37	2.08	.61	39	2.57	1.43	.23	.27	1.93	.64
District No. 3a	6	2.91	1.46	.23	.34	2.03	.88	10	2.64	1.58	.29	.44	2.31	.33
District No. 4	17	2.55	1.47	.33	.57	2.37	.18	20	2.74	1.49	.26	.30	2.05	.69
District No. 5	8	2.64	1.94	.27	.33	2.54	.10	10	2.57	1.61	.25	.35	2.21	.36
District No. 6	37	2.79	2.39	.32	.44	3.15	†.36	54	2.89	1.67	.34	.30	2.31	†.85
District No. 7	10	3.33	2.12	.22	.42	2.76	.57	15	3.45	1.96	.26	.41	2.63	.82
District No. 8	19	2.42	1.53	.24	.35	2.12	.30	67	2.49	1.22	.28	.29	1.79	.70
District No. 9	10	2.39	1.67	.21	.25	2.13	.26	11	2.59	1.35	.21	.20	1.76	.83
State total	158	$2.57	$1.72	$0.24	$0.36	$2.32	$0.25	256	$2.61	$1.38	$0.26	$0.29	$1.93	$0.68
Oklahoma:														
[illegible] District	33	$4.01	$2.78	$0.25	$0.40	$3.43	$0.58	35	$3.53	$2.49	$0.27	$0.35	$3.11	$0.42
McAlester Vein District	8	5.22	3.27	.48	.59	4.34	.88	8	4.42	3.11	.45	.36	3.92	.50
State total	41	$4.22	$2.86	$0.29	$0.43	$3.58	$0.64	43	$3.68	$2.59	$0.30	$0.36	$2.25	$1.43
Pennsylvania:														
Southwest District	112	$2.49	$1.54	$0.32	$0.36	$2.22	$0.27	199	$2.50	$1.33	$0.29	$0.30	$1.92	$0.58
Central District	252	2.93	1.87	.24	.38	2.49	.44	425	3.05	1.62	.27	.32	2.21	.84
State total	364	$2.72	$1.67	$0.29	$0.36	$2.32	$0.40	624	$2.78	$1.45	$0.28	$0.31	$2.04	$0.74

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* Upper Potomac, Cumberland and Piedmont District of Maryland and West Virginia.

† F.o.b. cost exceeded sales realization.

TABLE III.—Continued

State and District	No. of Operators	Sales Realization	Labor	Supplies	General Expenses	Total, F.O.B.	Margin per Ton	No. of Operators	Sales Realization	Labor	Supplies	General Expenses	Total, F.O.B.	Margin per Ton
	January, 1920 Per Ton of 2,000 Lbs. Claimed Costs							Year 1918 Per Ton of 2,000 Lbs. Revised Costs						
Tennessee														
District No. 1	32	$2.97	$2.04	$0.21	$0.33	$2.60	$0.37	44	$2.94	$1.83	$0.28	$0.34	$2.45	$0.49
District No. 2	3	2.70	1.74	.13	.37	2.24	.46	3	2.61	1.30	.15	.32	1.77	.84
Blue Gem District	7	3.54	2.55	.34	.38	3.27	.27	5	3.41	2.14	.31	.39	2.84	.57
State total	42	$2.98	$2.04	$0.20	$0.34	$2.60	$0.38	52	$2.92	$1.78	$0.27	$0.34	$2.39	$0.53
Texas:														
Bituminous District	3	$4.79	$3.66	$0.34	$0.66	$4.66	$0.13	4	$4.12	$2.86	$0.41	$0.41	$3.68	$0.44
Lignite District	17	1.65	1.01	.10	.33	1.42	.23	14	1.36	.76	.09	.23	1.08	.23
State total	20	$1.95	$1.26	$0.13	$0.36	$1.73	$0.22	18	$2.02	$1.27	$0.16	$0.27	$1.70	$0.32
Utah	12	3.00	1.59	.30	.38	2.27	.73	11	2.78	1.48	.27	.34	2.09	.69
Virginia:														
District No. 3	2	2.84	1.94	.28	.36	2.58	.26	9	2.81	1.81	.28	.39	2.48	.33
District No. 5	9	2.94	1.84	.42	.48	2.74	.20	22	2.58	1.26	.37	.30	1.93	.65
State total	11	$2.91	$1.85	$0.40	$0.46	$2.71	$0.20	31	$2.60	$1.30	$0.36	$0.30	$1.96	$0.64
Washington:														
Kittitas Bituminous district	4	$3.95	$2.18	$0.31	$0.41	$2.91	$1.04	5	$3.08	$1.90	$0.23	$0.24	$2.37	$0.71
Pierce-King Bituminous District	7	4.17	2.79	.48	.61	3.88	.29	9	4.36	2.75	.43	.53	3.71	.65
Sub-bituminous District	5	4.89	2.54	.52	.61	3.67	1.22	7	3.24	2.10	.39	.34	2.83	.41
State total	16	$4.16	$2.43	$0.41	$0.51	$3.35	$0.81	21	$3.45	$2.19	$0.32	$0.35	$2.86	$0.59
West Virginia:														
Pocahontas District	22	$2.71	$1.35	$0.23	$0.40	$1.98	$0.73	50	$2.45	$1.09	$0.26	$0.28	$1.63	$0.82
Tug River District	5	3.15	1.70	.42	.42	2.58	.57	24	2.72	1.50	.29	.34	2.13	.59
Thacker District	5	2.68	1.58	.40	.36	2.35	.33	20	2.76	1.30	.32	.32	1.94	.82
Kenova District	5	2.87	2.07	.29	.48	2.84	.03	7	2.87	1.72	.18	.43	2.33	.54
Logan District	30	2.54	1.29	.27	.54	2.10	.44	46	2.64	1.13	.26	.33	1.72	.92
New River District	53	3.05	1.85	.27	.51	2.63	.42	102	2.88	1.48	.31	.37	2.16	.72
Kanawha District	48	2.74	1.63	.24	.36	2.23	.51	59	2.60	1.37	.25	.29	1.91	.69
Putnam County District	3	2.93	2.46	.48	.51	3.45	†.52	2	2.76	2.27	.40	.42	3.09	†.33
Mason County District	..	..	....	.....	....			2	2.74	1.74	.30	.31	2.35	.39
District No. 10, Coal and Coke, and Gauley Districts (combined)	32	2.64	1.71	.23	.43	2.36	.28	49	2.59	1.38	.25	.30	1.93	.66
Fairmont District	34	2.62	1.73	.29	.41	2.43	.19	74	2.59	1.35	.27	.34	1.96	.63
Pittsburgh Seam District	9	2.58	1.63	.24	.25	2.12	.46	13	2.55	1.48	.29	.24	2.01	.54
State total	246	$2.73	$1.57	$0.27	$0.42	$2.26	$0.47	448	$2.63	$1.30	$0.27	$0.32	$1.89	$0.74
Wyoming	14	$2.70	$1.65	$0.28	$0.23	$2.16	$0.54	18	$2.41	$1.40	$0.24	$0.22	$1.86	$0.55
Total United States	1,589	$2.74	$1.74	$0.24	$0.34	$2.32	$0.42	2,483	$2.65	$1.49	$0.26	$0.29	$2.04	$0.61

tween the sales realization and the f.o.b. mine cost per ton is the "margin." This "margin" must not be confused with what is called profit. Selling expense, interest, income and excess profits taxes, as well as other items, must be deducted from it before the net profit from the mining operations available for dividends or surplus can be determined.

In the following table are shown for the principal production regions the claimed costs, sales realizations and margins of the 1,589 operators from whom complete reports for January, 1920, have thus far been received. With these costs are also shown the costs (as revised by the commission), sales realizations and margins of the 2.483 operators from whom reports were received for the entire twelve months of 1918. The 1,589 operators had a production of 25,365,384 tons of commercial coal during January, 1920, and the 2,483 operators mined 496,960,342 tons of

TABLE IV. CHANGES MADE IN 1918 CLAIMED COSTS THROUGH REVISION

State and District	Amount the Claimed Cost Exceeds the Revised Cost
Alabama:	
No. 1	$0.05
No. 2	.11
No. 3	.04
No. 4	.20
State	$0.06
Arkansas:	
Sebastian	$0.11
Excelsior-Logan	.00
Anthracite	.16
State	$0.12
Colorado:	
Domestic	$0.07
Trinidad	.05
Lignite	.07
State	$0.07
Illinois:	
No. 1	$0.03
No. 2	.06
No. 3	.02
No. 4	.00
No. 5	.06
No. 6	.06
State	$0.04
Indiana:	
No. 1	$0.05
Brazil Block	.10
State	$0.05
Iowa:	
Marion-Monroe-Polk	$0.06
Appanoose-Boone	.05
State	$0.06
Kansas:	
Cherokee-Crawford	$0.05
Osage and Leavenworth (combined)	.01
State	$0.04
Kentucky:	
No. 1	$0.07
No. 2	.10
No. 3	.12
No. 4	.05
State	$0.09
Maryland:	
Upper Potomac, Cumberland and Piedmont of Maryland and West Virginia	$0.09
State	$0.09
Michigan	$0.17
State	$0.17
Missouri:	
No. 1	$0.13
No. 2	.05
State	$0.08
Montana	$0.05
State	$0.05
New Mexico:	
Gallup and Sugarite (combined)	$0.04
Carthage and Cerrillos (combined)	.13
Raton	.04
State	$0.05
North Dakota:	
Southern	$0.03
Northern	.03
State	$0.02
Ohio:	
No. 1	$0.24
No. 2	.16
No. 3	.11
No. 3a	.08
No. 4	.08
No. 5	.06
No. 6	.08
No. 7	.17
No. 8	.12
No. 9	.03
State	$0.11
Oklahoma:	
McAlester Vein	$0.11
Eastern	.08
State	$0.09
Pennsylvania:	
Southwest	$0.07
Central	.06
State	$0.07
Tennessee:	
No. 1	$0.09
No. 2	.06
Blue Gem	.07
State	$0.09
Texas:	
Bituminous	$0.05*
Lignite	.04
State	$0.04
Utah	$0.08
State	$0.08
Virginia:	
No. 3	$0.16
No. 5	.13
State	$0.13
Washington:	
Kittitas bituminous	$0.15
Pierce-King bituminous	.37
Sub-bituminous	.02
State	$0.18
West Virginia:	
Pocahontas	$0.14
Tug River	.08
Thacker	.20
Kenova	.18
Logan	.20
New River	.15
Kanawha	.11
Putnam County	.08
Mason County	.02*
No. 10, coal and coke, and Gauley (combined)	.10
Fairmont	.04
Pittsburg Seam	.10
State	$0.13
Wyoming	$0.03
State	$0.03
United States	$0.08

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* Amount by which Revised cost exceeds the Claimed cost.

TABLE V. COMPARISON OF COSTS AND SALES REALIZATIONS FOR YEAR 1918 WITH THOSE OF JANUARY, 1920, FOR 1,272 IDENTICAL OPERATORS

		Year, 1918 — Per Ton of 2,000 Lbs.					January, 1920 — Per Ton of 2,000 Lbs.						Jan. 1920 Production Compared with Average Monthly Production in 1918	
			— Revised —					— Claimed —						
State and District	No. of Operators	Average Monthly Production, Tons	Sales Realization	F.o.b. Mine Cost	Margin	Excess of 1918 "Claimed" Cost Over 1918 Revised Cost, Cents per Ton	Productions, Tons	Sales Realization	F.o.b. Mine Cost	Margin	Increase of Jan., 1920, Claimed Cost Over 1918 Claimed Cost Cents per Ton	Per Cent	Inc., Per Cent	Dec., Per Cent
Alabama														
No. 0 (Big Seam)	13	376,578	$2 42	$2.08	$0 34	5	373,607	$2 82	$2 46	$0 36	33	16		1
No. 2 (Cahaba)	15	137,043	3.40	2.86	54	11	179,475	4 08	3.46	62	49	17	31	
No. 3 (Pratt)	21	377,296	2.64	2.34	.30	4	418,879	3 21	2 67	54	29	12	11	
Montevallo	3	50,032	2.72	2 10	.62	20	52,991	3 72	3 12	60	82	36	6	
State	52	940,949	$2.72	$2.30	$0.42	6	1,024,962	$3.32	$2 76	$0 56	40	17	9	
Arkansas														
Sebastian	8	98,615	3.35	2 67	.68	11	76,115	3 60	3 31	29	53	19		23
Excelsior-Logan	3	3,789	4 56	4 55	.01	0	5,020	5 08	4 46	62	9[1]	2[1]	32	
Anthracite	2	3,147	5.63	4 68	95	16	5,635	5.47	3 95	1.52	89[1]	18[1]	79	
State	13	105,551	$3.46	$2.80	$0 66	12	86,770	$3.82	$3 42	$0.40	50	17		18
Colorado														
Domestic	25	347,045	2 92	2.33	59	7	391,708	3 45	2 65	80	25	14	13	
Trinidad	10	242,535	2 49	2 24	.25	5	239,111	2.83	2 60	23	31	14		2
Lignite	8	140,658	2 48	2.14	.34	7	162,786	2 54	2 33	.21	12	5	16	
State	43	730,238	$2.72	$2.27	$0.45	7	793,605	$3 09	$2.57	$0.52	23	10	9	
Illinois														
No. 1	10	169,524	3 06	2 69	37	3	183,852	3 22	2 86	36	14	5	8	
No. 2	21	164,120	2 69	2 19	50	6	219,361	2 66	2 18	48	7[1]	3[1]	34	
No. 3	24	1,168,721	2 38	1 80	58	2	1,162,469	2 43	1 97	46	15	8		1
No. 4	39	858,504	2 15	1 71	.44	0	996,738	2 24	1.79	45	8	5	16	
No. 5	2	13,381	2 79	2.32	.47	6	14,307	2 78	2 45	33	7	3	7	
No. 6	15	407,376	2 34	1.86	.48	6	420,210	2 44	2 02	42	10	5	3	
State	111	2,781,626	$2 36	$1 86	$0.50	4	2,996,937	$2 43	$1.99	$0 44	9	5	8	
Indiana														
No. 1	59	1,312,987	2 31	1 87	44	15	1,091,593	2 36	22	22	22	11		17
Brazil Block	6	32,895	3.12	2 73	.39	10	27,408	3 04	3 04	00	21	7		17
State	65	1,345,882	$2 33	$1.89	$0 44	5	1,119,001	$2 37	$2.16	$0 21	22	11		17
Iowa														
Marion-Monroe-Polk	4	52,023	2 95	2 60	35	6	73,036	3 03	2 55	48	11[1]	4[1]	40	
Appanoose-Boone	8	31,477	3.35	3 05	.30	5	37,748	3 88	3 48	40	38	12	20	
State	12	83,500	$3 10	$2 77	$0.33	6	110,784	$3 32	$2.87	$0.45	4	1	33	
Kansas														
Cherokee-Crawford	27	452,260	2 93	2 58	.35	5	459,705	3 21	2 95	.26	32	12	2	
Osage & Leavenworth	2	13,669	3 81	3 57	.24	1	14,834	4 65	3 83	.82	25	07	9	
State	29	465,929	$2.95	$2.61	$0.34	4	474,539	$3 26	$2 98	$0.28	33	12	2	
Kentucky														
No. 1	42	686,029	2 32	1 71	61	7	766,609	2 35	1 91	44	13	7	12	
No. 2	24	362,973	2 70	1 89	.81	10	294,589	2 82	2 41	41	42	21		19
No. 3	63	416,106	2 92	2 20	72	12	423,665	2 92	2 59	.33	27	12	2	
No. 4	6	154,308	2 76	1 79	97	5	129,899	2 77	2 30	.47	46	13		16
State	135	1,619,416	$2.60	$1 88	$0.72	9	1,614,762	$2 62	$2.21	$0.41	24	10		
Maryland	32	174,516	2 42	2.35	07	9	165,511	2 83	2 59	24	15	6		5
Michigan	4	53,762	4 06	3.20	86	17	73,398	4 31	3 35	96	2[1]	0	36	
Missouri														
No. 1	17	137,097	2 90	2 49	41	13	136,361	3 29	2 65	64	3	1		1
No. 2	14	156,311	3 20	2 87	33	5	158,642	3 76	3 35	41	43	15	[illegible]	
State	31	293,408	$3 06	$2 70	$0 36	8	295,003	$3 54	$3 03	$0 51	25	9	1	
Montana	9	237,218	2 38	2 18	20	5	299,071	2 88	2 43	45	20	9	26	
[illegible]														
Raton	2	247,424	$2 83	$1 85	$0 98	4	223,338	$3 08	$2 25	$0 83	36	19		10
Gallup	3	53,101	3 32	3 18	14	4	58,715	4 01	3 75	26	53	17	11	
Cerrillos	1	4,553	4 41	4 11	30	13	10,760	4 67	4 39	28	15	4	136	
State	6	305,078	$2 99	$2 11	$0 88	5	292,813	$3 36	$2 63	$0 73	47	22		4
North Dakota														
Southern	[illegible]	23,870	2 10	1 66	44	3	23,598	2 60	2 29	.31	60	35		1
Northern	2	3,196	2 94	2 12	.82	3	3,565	2 93	2 73	20	58	27	11	
State	[illegible]	27,066	$2 20	$1 72	$0 48	3	27,163	$2 64	$2 35	$0 29	60	34	0	0
Ohio														
No. 1	[illegible]	10,460	$2 82	$2 54	$0 28	24	10,920	$2 76	$2 67	$0 09	11[1]	4[1]	3	
No. 2	[illegible]	41,508	3 36	2 66	70	16	47,770	3 16	2 54	62	28[1]	10[1]	15	
No. 3	[illegible]	78,544	2 66	2 22	44	11	84,336	2 66	2 26	40	7[1]	3[1]	7	
No. 3a	[illegible]	9,420	2 63	2 20	43	8	16,375	2 88	2 05	83	23[1]	10[1]	74	
No. 4	[illegible]	88,619	2 79	2 02	77	8	85,360	2 56	2 43	.13	33	16		4
No. 5	[illegible]	25,819	2 62	2 19	43	6	24,431	2 66	2 33	33	8	4		5
No. 6	[illegible]	216,043	2 86	2 28	58	8	234,896	2 80	2 39	.41	3	1	9	
No. 7	[illegible]	34,616	3 40	2 55	85	17	49,519	3 24	2 54	70	18[1]	7[1]	43	
No. 8	[illegible]	[illegible]	2 50	1 80	.70	12	678,867	2 43	2 12	31	20	10		12
No. 9	[illegible]	425,634	2 58	1 76	82	3	331,628	2 39	2 14	25	35	20		23
State	140	1,702,272	$2 64	$1 93	$0 71	11	1,564,102	$2 56	$2 22	$0 34	18	9		8
Oklahoma														
Eastern	[illegible]	188,461	3 57	3 08	49	8	220,827	4 03	3 40	63	24	8	17	
McAlester Vein	[illegible]	37,699	4 47	3 93	54	11	51,133	45 24	[illegible]	90	30	7	36	
State	[illegible]	226,160	$3 72	$3 22	$0 50	9	271,960	$4 26	[illegible]	$0 68	27	8	20	
Pennsylvania														
Southwest	[illegible]	3,494,030	2 50	1 85	65	7	3,276,840	2 48	2 19	29	27	14		6
Central	[illegible]	2,237,932	3 00	2 19	81	6	[illegible]	2 94	[illegible]	43	26	12		12
State	283	[illegible]	$2 76	$1 98	$0 78	7	5,243,365	$2 70	$2 32	$0 38	27	13		9

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[1] Decrease

TABLE V. COMPARISON OF COSTS AND SALES REALIZATIONS FOR YEAR 1918 WITH THOSE OF JANUARY, 1920, FOR 1,272 IDENTICAL OPERATORS (Continued)

		Year, 1918 —Per Ton of 2,000 Lbs.—					—January, 1920— Per Ton of 2,000 Lbs.						Jan., 1920, Production Compared with Average Monthly Production in 1918	
			— Revised —					— Claimed —						
State and District	No. of Operators	Average Monthly Production, Tons	Sales Realization	F.o.b. Mine Cost	Margin	Excess of 1918 "Claimed" Cost Over 1918 Revised Cost, Cents per Ton	Productions, Tons	Sales Realization	F.o.b. Mine Cost	Margin	Increase of Jan., 1920, Claimed Cost Over 1918 Claimed Cost Cents per Ton	Per Cent	Inc., Per Cent	Dec., Per Cent
Tennessee:														
No. 1	27	232,234	$2.97	$2.42	$0.55	9	268,364	$2.99	$2.62	$0.37	11	4	16	
No. 2	2	30,210	2.59	1.90	69	6	33,197	2.64	2.31	33	35	18	10	
Blue Gem	5	19,128	3.41	2.84	.57	7	19,739	3.50	3.24	26	33	11	3	
State	34	281,572	$2.96	$2.40	$0.56	9	321,300	$2.98	$2.62	$0.36	13	5	14	
Texas:														
Bituminous	3	14,236	4.05	3.54	51	5[1]	8,114	4.79	4.66	13	117	33		43
Lignite	12	58,368	1.36	1.12	24	4	61,509	1.63	1.36	27	20	17	5	
State	15	72,604	$1.89	$1.59	$0.30	4	69,623	$2.00	$1.74	$0.26	11	7		4
Utah	9	370,076	$2.78	$2.08	$0.70	8	450,818	$3.38	$2.27	$1.11	11	5	22	
Virginia:														
No. 3	2	9,776	2.96	2.27	69	16	13,344	2.84	2.59	25	16	7	37	
No. 5	8	62,339	2.77	2.36	.41	13	59,276	2.93	2.78	.15	29	12		5
State	10	72,115	$2.81	$2.34	$0.47	13	72,620	$2.91	$2.74	$0.17	27	11	1	
Washington:														
Kittitas	4	136,333	3.08	2.37	.71	15	155,201	3.96	2.91	1.05	39	16	14	
Pierce-King	6	90,780	3.80	3.16	64	37	93,506	4.17	3.89	28	36	10	3	
Sub-Bituminous	5	47,034	3.32	3.43	.39	2	50,679	3.91	3.67	24	22	6	8	
State	15	274,147	$3.43	$2.81	$0.62	16	299,386	$4.02	$3.34	$0.68	37	12	9	
West Virginia														
Pocahontas	20	697,430	2.24	1.51	.73	14	626,984	2.71	1.98	73	33	20		10
Tug River	5	42,547	2.84	2.22	.62	8	43,053	3.15	2.58	57	28	12	1	
Thacker	4	34,178	2.68	1.87	81	20	39,701	2.69	2.30	39	23	11	16	
Kenova	5	28,667	2.89	2.33	66	18	31,636	2.87	2.84	.03	33	13	10	
Logan	20	398,917	2.65	1.58	1.07	20	319,187	2.53	2.04	49	26	15		20
New River	46	446,805	2.77	2.04	.73	15	398,168	3.04	2.60	44	41	19		11
Kanawha	38	545,387	2.62	1.88	.74	11	567,667	2.73	2.21	.52	22	11	4	
Putnam County	2	18,204	2.76	3.09	.33[1]	8	17,892	2.82	3.53	.71[1]	36	11		2
No. 10, Coal and Coke and Gauley	15	83,421	2.58	1.84	74	10	90,553	2.55	2.23	32	29	15	9	
Fairmont	20	238,336	2.63	2.05	58	4	203,283	2.67	2.52	15	43	20		15
Pittsburg Seam	8	137,812	2.65	2.04	.61	10	150,616	2.57	2.13	.44	1[1]	1	9	
State	185	2,671,704	$2.57	$1.81	$0.76	13	2,488,740	$2.73	$2.24	$0.49	30	16		7
Wyoming	9	466,803	2.51	1.86	65	3	474,994	2.66	2.17	.49	28	15	18	
United States	1,272	21,016,879	$2.60	$2.03	$0.57	8	20,631,227	$2.78	$2.34	$0.44	23	11		2

[1] Decrease.

commercial coal during 1918 (an average of 41,413,362 tons monthly).

In table I only 1,589 operators appear for January, 1920, while 2,483 operators are shown for 1918. Also, revised costs shown for 1918 average about 8c. per ton lower than the claimed costs were for that year, and, consequently, the revised margins for 1918 are that much higher. In order to get comparable operators for the two periods there are presented in table II the figures of 1,272 identical operators, and to arrive at comparisons of increased costs the average amounts of revision found for all operators in each region in 1918 have been added to the 1918 revised costs of the operators shown in this table. These 1,272 operators mined 252,202,547 tons during 1918 (averaging 21,016,879 tons monthly) and 20,631,227 tons during January, 1920.

TABLE VI. DISTRIBUTION OF TOTAL F.O.B. MINE COST INCREASES ACCORDING TO CHANGES IN PRODUCTION TONNAGE OF 1,272 OPERATORS, JANUARY, 1920, FROM AVERAGE MONTHLY PRODUCTION, 1918

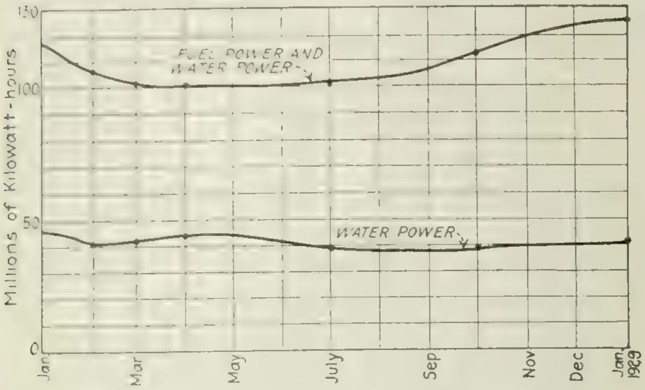
Change of January, 1920, Production from 1918 Average Monthly Production	No. of Operators	Production January, 1920, Tons	Increase of Jan., 1920, Claimed Cost Over 1918 Annual Claimed F.O.B. Mine Cost,	Per Cent
Decrease over 25 per cent	3	8,114	$1.17	33
Decrease 16-25 per cent	132	2,270,419	29	15
Decrease 6-15 per cent	410	7,374,005	28	14
Decrease 0- 5 per cent Increase 0- 5 per cent	312	4,546,242	23	10
Increase 6-15 per cent	210	2,784,344	.19	9
Increase 16-25 per cent	127	2,651,976	.15	7
Increase over 25 per cent	78	996,127	.12	
Totals	1,272	20,631,227	$0.23	11

As far as can be judged, therefore, from the returns at present available, the increased cost attributable to the increased wage scale is about 23c. per ton, or 11 per cent (the increased cost shown in table VI for the group where production changed least—5 per cent or less—and where the effect of the wage agreement is consequently best seen). For the total 1,272 operators the average decrease in tonnage was 2 per cent and their average increase in cost 23c. per ton, or 11 per cent. This increase of about 23c. per ton, or 11 per cent, was the result in January, 1920, of the Garfield 14-per cent wage increase, which it should be noted is about one half of the total increase (27 per cent) recently recommended by the United States Bituminous Coal Commission.

The great diversity in mining conditions between the different districts, both in regard to thicknesses of seam mined and the relative use of machinery in mining the coal, caused the wage increase to affect to a different degree the labor costs of the various districts. In the Federal Trade Commission's coal cost reports for 1918 much detailed information on these diverse conditions is available.

Public Utility Consumption of Coal

THE Geological Survey has just issued statistics on the production of electric power at public utility stations that show some interesting relations between water power and steam power. About 63.4 per cent of its total power produced came from the use of fuel—coal, gas and oil, equivalent—it is estimated to 38,347,000 tons of coal. Water power represented 36.6 per cent, equivalent in the developed power to 22,140,000 tons of coal.



AVERAGE DAILY PRODUCTION OF ELECTRICITY BY PUBLIC UTILITY PLANTS

The interesting feature of these figures is brought out in the accompanying diagram which shows that the seasonal demand for power from public utilities fall upon coal. The water power is almost uniform during the year, being a little higher in the spring, whereas in the winter coal is called upon to meet the winter load.

AVERAGE DAILY PRODUCTION OF ELECTRICITY BY PUBLIC UTILITY PLANTS IN UNITED STATES — WATER POWER AND FUEL POWER, 1909

State	Coal, Short Tons	Petroleum and Derivatives, Barrels	Natural Gas Thousands of Cubic Feet
Alabama	29,211	1,255	0
Arizona	198	42,473	0
Arkansas	8,675	4,888	155,222
California	0	545,829	179,563
Colorado	43,345	110	0
Connecticut	77,311	4,374	10,236a
Delaware	9,139	0	0
District of Columbia	23,237	0	0
Florida	2,425	54,753	0
Georgia	21,179	19,605	0
Idaho	150	10	0
Illinois	411,719	472	0
Indiana	205,453	254	2,025
Iowa	94,185	576	0
Kansas	39,710	91,428	76,283
Kentucky	45,149	188	0
Louisiana	7,589	60,528	68,510
Maine	3,410	49	0
Maryland	39,552	0	1,500
Massachusetts	173,088	1,764	0
Michigan	180,542	139	0
Minnesota	64,060	620	0
Mississippi	14,028	11,841	0
Missouri	90,997	90,657	0
Montana	4,206	22	1,257
Nebraska	37,926	16,503	0
Nevada	367	842	0
New Hampshire	6,768	0	0
New Jersey	156,280	136	280a
New Mexico	4,733	866	0
New York	478,533	763	72,579
North Carolina	20,992	34	0
North Dakota	19,362	150	0
Ohio	401,066	697	161,065b
Oklahoma	8,353	71,940	275,926
Oregon	190	3,657	0
Pennsylvania	342,761	5	49,937
Rhode Island	35,196	7,560	0
South Carolina	11,779	0	0
South Dakota	7,729	1,936	0
Tennessee	22,729	25	0
Texas	58,707	211,222	48,227
Utah	3	0	0
Vermont	1,748	2,146	0
Virginia	43,212	132	0
Washington	10,396	15,612	0
West Virginia	106,230	50	227,900
Wisconsin	64,626	544	0
Wyoming	14,418	4,217	3,300
Total	3,434,662	1,270,872	1,333,810

a Artificial gas. b Includes 1,520 artificial gas.

	Kilowatt-Hours	Per Cent
Total production	40,300,000,000	....
Water power	14,760,000,000	36.6
Fuel power	25,540,000,000	63.4

TOTAL FUEL CONSUMPTION

Coal	35,000,000 short tons
Oil	11,050,000 bbls
Gas	21,700,000 M. cu.ft.

The production of the electric power reported required the combustion of fuels in the quantities indicated in the preceding table.

PRODUCTION OF ELECTRIC POWER AND CONSUMPTION OF FUEL BY PUBLIC UTILITY POWER PLANTS IN THE UNITED STATES FOR THE MONTH OF JANUARY, 1920*

Thousands of Kilowatt-Hours Produced

State	By Water Power	By Fuels
Alabama	34,864	14,452
Arizona	8,567	11,702
Arkansas	132	7,675
California	164,727	112,346
Colorado	12,784	22,811
Connecticut	9,069	59,256
Delaware	0	6,807
Dist. of Columbia	0	23,317
Florida	965	10,890
Georgia	43,816	10,696
Idaho	48,574	1,348
Illinois	14,831	260,723
Indiana	[illegible]943	91,788
Iowa	55,574	31,622
Kansas	1,741	35,986
Kentucky	0	23,409
Louisiana	0	18,126
Maine	23,381	1,577
Maryland	284	31,261
Massachusetts	22,009	147,936
Michigan	51,799	138,180
Minnesota	28,053	36,157
Mississippi	0	5,886
Missouri	5,720	54,082
Montana	89,574	562
Nebraska	909	20,436
Nevada	3,416	119
New Hampshire	4,322	5,166
New Jersey	143	101,478
New Mexico	53	1,524
New York	227,033	382,108
North Carolina	53,035	10,956
North Dakota	0	2,732
Ohio	1,490	258,432
Oklahoma	217	17,287
Oregon	32,278	7,845
Pennsylvania	45,324	329,392
Rhode Island	355	37,114
South Carolina	61,911	5,825
South Dakota	477	3,327
Tennessee	39,443	9,233
Texas	74	55,397
Utah	13,932	0
Vermont	15,430	786
Virginia	13,801	30,423
Washington	103,981	4,480
West Virginia	1,775	95,306
Wisconsin	35,443	37,451
Wyoming	152	4,785
Total	1,274,401	2,580,198
Total, by water power and fuels		3,854,599

* Compiled by Division of Power Resources, United States Geological Survey

George Otis Smith Approves of Seasonal Coal Rates

GEORGE OTIS SMITH, director of the Geological Survey, commenting on proposed seasonal coal rates, said: "I often have put it before engineers that what is proposed in the way of seasonal coal rates is the most promising method of improving the load factor of the soft-coal industry, and incidentally, of helping in our great transportation problem of moving too much freight with too little equipment. I recently have figured the increased burden put upon our railroads by the whole mineral industry as 3,000,000 carloads a year, comparing the years 1913 and 1918."

The National Coal Association is leaving to the local associations such presentations as they may care to make in regard to the seasonal coal rates. Since such rates will affect each district differently, it was thought not to be a matter in which the national association could take a position.

Engineers and Railroad Presidents Study Stabilization of Coal Industry

Committee Is Appointed to Present to the Senate a Substitute for the Frelinghuysen Seasonal Freight Rate Bill —Storage of Bituminous Considered To Be Practicable

Engineers get behind movement to stabilize bituminous-coal industry and offer constructive suggestions to improve labor and transportation conditions. Railroad presidents lend counsel and offer to assist, but it is apparent that there is a limit to what suggestions can do. Read this and figure out where and how you can help the cause along.

A PRELIMINARY conference at which the stabilization of the bituminous industry was the chief topic of discussion was held at the headquarters of the American Institute of Mining and Metallurgical Engineers, New York City, on April 6. It was attended by a committee of railroad presidents representing the American Railway Association and the Coal and Coke Committee of the institute. Herbert Hoover, president of the institute, presided.

One definite result of the conference was the appointment of a committee to appear before the committee of the Senate having in charge the Frelinghuysen bill on seasonal freight rates and to present a substitute bill. While the meeting was in favor of seasonal freight rates, it did not believe that the bill now under consideration covers the subject in a complete enough manner. This committee, appointed by President Hoover, consists of S. A. Taylor, Eugene McAuliffe and E. W. Parker.

The storage of coal during the summer months for use in the following winter, the stabilization of labor, the better control of mining by greater employment of engineers, with suggestions as to how the numbers of engineers available for this work might be increased, and coal economy were other matters discussed.

Samuel Rea, president of the Pennsylvania system, was the chairman of the committee representing the American Railway Association. The other members of the committee were F. D. Underwood, president of the Erie R.R. Co.; A. T. Dice, president of the Philadelphia & Reading R.R.; E. J. Pearson, president of the New York, New Haven & Hartford R.R., and C. H. Markham, president of the Illinois R.R., who was represented by J. F. Porterfield of that company.

Railroads Discuss Summer Storage

The summer storage of coal by the railroads was discussed fully by the conference from the viewpoint of both the railroads and the operators. The discussion was extremely helpful in giving a better understanding of the difficulties to be overcome and the part the railroads can play in the solution of the problem of stabilization.

The Committee on Storage of Coal reported that storage of bituminous coal is practicable beyond doubt. It has been successfully carried on for years on a large scale at the docks on the Great Lakes, in New England, at many industrial and public utility plants throughout the country, at the Panama Canal, and at many of the Government bases of supply. For the domestic trade, the committee said, the best storage is in the bin or cellar of the consumer, and consumers should be encouraged by every means possible to purchase their winter's supply early in the preceding season.

So far as the domestic consumer is concerned, the cost of doing this would be practically nothing, and if a reduction in price or in freight rates were made practically all the reduction would represent a gain to the consumer. The committee told the conference that the chief points in favor of the storage of coal were fully set forth in the paper on the subject read by Prof. H. H. Stoek at the February meeting of the institute and in the majority report of the United States Coal Commission, which awarded a 27-per cent increase in wages to the bituminous mine workers.

Including all charges excepting degradation, the cost of storage in well designed plants should not exceed from 30c. to 50c. a ton, and where used for steam or coking purposes, the degradation would be of no consequence, as the heat value of the coal, or its value for coking, would not be appreciably affected.

Seasonal prices and a proper adjustment of freight rates to encourage delivery and buying during the spring and summer months will be large factors in the storage of coal, and the committee believes that prompt action that will result in bringing these matters to the attention of the public will be of great help. It believes that publicity and an educational campaign should be started through the Council of National Defense, the various coal associations and by every other agency possible. This publicity campaign should emphasize the importance of stabilizing the industry, helping the railroad situation, bettering the working conditions of the miner and the benefit to be derived by the consumer.

With regard to the suggestion of Governor Harding of the Federal Reserve Board that loans might be made against coal in storage under certain warehousing restrictions, it was thought that while these restrictions were perhaps suitable for other commodities as they stand, they might be prohibitive for the storage of coal. It was believed that if the situation were properly presented to the Federal Reserve Board modifications might be obtained which would make the rulings more favorable to application to the storage of coal. If this is done it should remove the one great objection to the storage of coal, viz., the amount of capital tied up.

To obtain the engineering talent needed in the bituminous industry it was the belief of the conference that the operators must make the first move by establishing scholarships in technical schools having mining courses. If the operators can be induced to establish such scholarships they should be awarded to the sons of mine employees who have the necessary preliminary education and who show talent and predilection for the profession.

More and better engineers are needed in the bituminous industry, and to secure this additional help now it was suggested that there be a consolidation of the engineering work of regions, districts or groups of operators on the lines already adopted in safety work, thus making available the talent obtainable and increasing the efficiency and reducing the cost of engineering work.

An extended publicity campaign of the facts already available concerning the economical use of fuel for heat, light and power was advocated by the Committee on Conservation in the Use of Coal. Some of the important points brought out by the Committee on Economy in Coal Consumption Through Electrification of Industries and Railroads were:

Electricity is the most efficient agency for power distribution. Power in the form of coal is maximum in bulk and minimum in efficiency. Power in the form of electricity is minimum in bulk and maximum in efficiency.

Within the territory of the so-called Boston-Washington zone there is consumed 40 per cent of the total coal produced. The area of this zone is less than 5 per cent of the total area of the United States.

Coal represents 30 per cent of the total freight tonnage transported by the railroads. In congested districts this rises to 40 per cent.

The yearly load factor in the above zone today is not greater than 15 per cent, and the coal consumption is in excess of four pounds per kilowatt-hour. The machine capacity is seventeen million horsepower; ten millions at industrial plants and seven millions on railroads.

The present coal consumption can be reduced one-half and machine capacity conserved to the extent of threefold in this zone through the adoption of a super-power system or systems, which, briefly described, consist of large high economic steam electric stations erected at tidewater and at the mouth of mines, both supplemented by hydro-electric stations constructed on the rivers, all interconnected with a high voltage system of transmission and distribution. The amount of money required to construct such super-power systems will be very much less than that required for the expansion of the present relatively small systems. The committee proposes that coal be transported by preferred routes from the mines to tide and thence to the power stations by ocean tugs and barges, thus relieving the railroads of this burden.

In conclusion the committee says that the country's prosperity depends upon its ability to speed up production, and in order that it may do so, the essential associates of production—power and transportation—must be provided. The method outlined, the committee says, while furnishing adequate power will automatically serve to greatly facilitate transportation.

During the conference President Hoover appointed the following committees:

Committee on Conservation in the Use of Coal—L. P. Breckenridge, David Moffat Myers, R. M. Atwater.

Committee for Stabilization of Labor—S. A. Taylor, E. W. Parker, Rembrandt Peale.

Committee on Storage—H. H. Stoek, George S. Rice, Howard N. Eavenson, H. N. Shenton.

Committee for Co-operation with the Railroads—J. D. A. Morrow, Eugene McAuliffe, J. G. Puterbaugh, C. E. Lesher, Edwin Ludlow.

Committee on Economy in Coal Consumption Through Electrification of Industries—W. S. Murray, W. S. Barstow, George Otis Smith, E. R. Welles.

Committee for Better Control of Coal Mining Through Greater Employment of Engineers—R. V. Norris, James H. Allport, Erskine Ramsay, Van H. Manning, L. E. Young.

Harlan and Hazard Operators Seek Better Car Service

Bring Action Before Interstate Commerce Commission Requesting That Body to Compel Railroads to Restore Cars to Louisville & Nashville

FINDING that the Louisville & Nashville Railroad Co. has been deprived of its open-top cars by the railroads with which that company's lines are connected, the Harlan County Coal Operators' Association, the Hazard Coal Operators' Exchange, the Southern Appalachian Coal Operators' Association and the West Kentucky Coal Bureau have made complaint to the Interstate Commerce Commission, in which the Louisville & Nashville Railroad Co., et al., are defendents.

The complainants state that the mines served by the Louisville & Nashville R.R. in the States of Kentucky, Alabama, Tennessee, Illinois and Virginia produce annually 23,000,000 tons of bituminous coal, of which about 17,000,000 tons are mined and shipped from mines located in the States of Kentucky and Tennessee. Of the total annual production of 23,000,000 tons of coal, between 3,000,000 and 4,000,000 tons are taken by the Louisville & Nashville Railroad Co. for its own fuel requirements, and of the commercial coal which constitutes the remainder fully 65 per cent is marketed at points on or reached by railroads connecting with the Louisville & Nashville Railroad Co. These connecting carriers have not been for many years returning Louisville & Nashville coal cars promptly, and the outcome has been that mines along that railroad have been supplied with an inadequate number of cars for the loading of coal.

Since the strike of the bituminous coal miners, which ended on Dec. 13, 1919, the coal-car supply, according to the complainants, has become worse. The Louisville & Nashville Railroad Co. furnished its mines during the month of March, this year, only 46.85 per cent of the empty coal cars ordered, which is approximately 10 per cent less than during February of this year, which was the month of the greatest shortage of coal cars on the Louisville & Nashville R.R. lines up to March 1, 1920.

The complainants declare that the Commission on Car Service appointed by the American Railway Association issued an order to the connecting lines to deliver to the Louisville & Nashville Railroad Co. each day 245 more empty coal cars than they received loaded coal cars from the Louisville & Nashville Railroad Co., specifying where the empty coal cars should be delivered by each line. During the period March 20-28 of this year, inclusive, there became due under said order to the Louisville & Nashville Railroad Co. 4,619 coal cars at the various junctions specified by the

Commission on Car Service, with the natural outcome that since that time the supply of coal cars has been much worse than before, which demonstrates that the orders of the Commission on Car Service, which body has no mandatory powers, have not received serious consideration, and certainly have not been observed by lines connecting with the Louisville & Nashville Railroad Co. with whom the orders were filed.

Past experience has demonstrated that unless the Louisville & Nashville R.R. has in its possession the equivalent of 83 per cent of its ownership of coal cars mines cannot be furnished with even a reasonably fair supply of cars.

The complainants address the prayer to the Interstate Commerce Commission, asking that the commission recognize the present shortage of equipment and the emergency existing at mines served by the Louisville & Nashville Railroad Co. and that peremptory orders be issued requiring defendant carriers to return promptly to the Louisville & Nashville Railroad Co. the open-top cars belonging to that company now in their possession. They request that the commission make effective the order of the Commission on Car Service just referred to, and take such other action as in the opinion of the commission would best meet the emergency and serve the public interest.

Strike Curtailed Washington State Production

State Mine Inspector Gives Statistics for 1919, Showing a General Decrease in Coal and Coke Output

THE strike of coal miners last year curtailed production in the State of Washington approximately 25 per cent, according to the annual report of James Bagley, state inspector of coal mines, which has just been forwarded to Governor Louis F. Hart. Coal production for the year 1919 was 3,059,580 short tons, as compared with 4,128,424 tons in 1918, a reduction of 1,068,844 tons.

"British Columbia coal has always been a factor in the Washington market, and during the last two years shipments of coal to this state from Utah and Wyoming have increased materially," says Mr. Bagley. "It looks as if the commercial mines of the state will work only half time during the summer months, making the present year one of the most unsatisfactory the coal industry has had in recent years.

"While fuel oil, which replaces coal as fuel on many of the railroads and steamers of the Pacific Coast, has advanced in price materially during recent years, the selling price of coal also has advanced, due to the high cost of production.

"The substantial advance in wages paid to miners in the last few years and the high cost of material have prevented coal from replacing fuel oil to a great extent. Electricity is replacing many thousand tons of coal in the State of Washington. The Chicago, Milwaukee & St. Paul R.R. is now using it exclusively on the division from Seattle to Othello, Wash."

The coal-producing counties of the state, with the exception of Whatcom county, showed a decrease. In Whatcom county an increase is shown due to the operation of the Bellingham mine, which was under development most of the year.

The national coal strike closed down the mines of the state from Nov. 1 to Dec. 15, 1919, and the mines of Kittitas county did not resume operations until December 23.

Mr. Bagley's report also shows nineteen fatal accidents in Washington coal mines last year, fourteen of which occurred inside of the mines and five outside. The amount of coal mined per fatal accident was 161,030 tons, and 3.79 persons were killed per 1,000 men employed in the industry. "The state has gone about as far as is possible in passing laws to safeguard the mine workers," says Mr. Bagley. "Education of the mine worker and mine official to 'think safety' and avoid danger is the only way accidents can be reduced."

The state reached its maximum coal production in the month of October, when the mines were rushed with orders on account of the impending strike. In that month 4,760 employes working 26.3 days produced 373,198 tons of coal. During part of the year, especially from February to July, many of the miners were idle part of the time due to lack of demand for coal. The average value per ton at the mine was $3.59 in 1919, compared with $3.53 in 1918. Total value at mine was $10,997,733.

The coke output for the state also shows a large decrease during the last year, the report shows. The output of coke for 1919 was 65,332 tons, as compared with 144,349 tons for the previous year, a decrease of about 55 per cent. Of the total output 35,888 tons was manufactured at the coke ovens at the mines located at Carbonado, Fairfax and Wilkeson. The remainder was manufactured at the plants of the Seattle Lighting Company at Seattle and the oven operated by M. S. Allison Co. at Croker, near Carbonado. The total value of coke at the ovens was $565,356 and the average value at the ovens, $8.65.

"The reason for the decrease in the coke output is that less coke is being used at the Tacoma smelter than formerly and there is less demand for Washington coke from smelters located in British Columbia," says the report. "The exports of coke to British Columbia show a gradual decrease during the last few years.

"During 1916 the exports of coke to British Columbia through customs district No. 30 were 47,560 tons. The exports for 1919 were 1,431 tons. British Columbia is now manufacturing practically all its own coke, which accounts for the decrease in demand for Washington coke. With the large decrease in output during the last year the future of the coal mining industry of the state is problematical."

Commission to Adjust Wages and Working Conditions in Washington State

FOUR members of the coal commission, who, with a fifth member to be selected by themselves, will review the coal mining situation in the State of Washington, with a view to covering working conditions and wages and act as an arbitration board, recently met in the offices of the Washington Coal Operators' Association, 608 Lyon Building, Seattle.

The commissioners are N. D. Moore, acting represensitive of the mine operators; D. F. Buckingham, general manager of the Roslyn Fuel Company, representing the mine owners, and Robert S. Harlin, president, and Ernest Newsham, secretary of District No. 10, United Mine Workers of America, representing Washington miners. The four will select a fifth member, who must be a mining engineer of experience.

The commission was provided for in a government plan developed after last winter's strike. The wage findings did not affect Washington and provision therefore was made for the commission. The commissioners did not expect to do more than hold a preliminary discussion of the problems confronting them.

To Investigate Alaska Coal For Navy's Use

Engineers Deny Reports That Cost of Mining and Transporting Fuel for Pacific Fleet Would Be Greater Than from West Virginia

IT IS the intention of the Navy Department to make a thorough investigation of coal in Alaska suitable for navy use. The work is to be begun immediately after July 1, when the appropriation of $1,000,000 for that purpose becomes available. Plans have not been completed but are being discussed by representatives of the navy, the Bureau of Mines and the Geological Survey. The Secretary of the Navy has announced his intention to send a geologist, an engineer and a naval officer to Alaska, and it is probable that they will undertake extensive prospecting with the idea of determining something of the extent of coal in the Matanuska field suitable for the navy.

Secretary Daniels admits that some reports have reached him to the effect that the cost of mining and transporting coal from Matanuska for the Pacific fleet will be greater than the cost of West Virginia coal brought through the Panama Canal to Pacific stations. He points out, however, that the reports made to him by the engineers who have actually investigated the coal are quite different. The Secretary called particular attention to the conclusions of a commission headed by Captain Kittell. In its report to Secretary Daniels the Kittell commission said in part:

> From its investigations this commission draws the following conclusions and indicates various lines of procedure that may be undertaken by the department in order to locate, mine, transport to seaboard and ship coal for use of the navy, viz.:
>
> That there is sufficient coal of navy quality underlying the Matanuska region to warrant definite and active development.
>
> That the whole Matanuska region, beginning with the Chickaloon section, should be thoroughly and scientifically investigated by a force of mining engineers and geologists, by means of diamond drilling, shaft sinking, tunnel and slope driving, to ascertain the quantity of navy coal present in the earth strata and to determine the best practical and economical method of mining this coal.
>
> Organize an expedition with mining engineers and geologists, together with all necessary apparatus and helpers, to thoroughly examine leasing units Nos. 8 to 15, inclusive, and definitely determine what quantity of navy coal is present and how it lies relative to the surface. In the meantime these leases should be set aside for the use of the Navy Department. At present leasing units Nos. 10 and 11 are held by the Chickaloon Coal Co. and leasing unit No. 12 by the Alaskan Engineering Commission. It is believed that the Chickaloon Coal Co. will be willing to part with its lease for a consideration.
>
> Having determined the amount of navy coal present in leasing units Nos. 8 to 15, both inclusive, proceed to mine the same, providing necessary equipment, labor and transportation facilities to the railroad.
>
> Under the department's instructions two plans are considered for getting coal from the Matanuska mines, transportation to the seaboard and loading it upon naval vessels. These plans are:
>
> 1. Mine coal at Chickaloon mine (leasing unit No. 12), other mines to be opened later, and pending the development of some other port of shipment (*a*) to temporarily utilize Anchorage during the open season of the year, using present facilities, including the deep-water pier and wharf which are in process of construction, including a temporary coal-loading apparatus which the Alaskan Engineering Commission intends to construct upon the deep-water wharf. This calls for relatively slight expenditure by the navy and can be put into operation without any loss of time; (*b*) utilize Anchorage as as permanent shipping port during the open season, and erect there such navy terminal facilities as may be necessary for the shipment of coal.
> 2. Mine coal as in plan 1 and transport it over the railroad to Seward. Utilize Seward (*a*) as a permanent port of shipment for navy coal throughout the year, or (*b*) so utilize it only during the season when Anchorage is closed. Construct at Seward (1) the necessary coaling plant on the Naval Reservation and connect the same with the railroad, or (2) construct the necessary coaling plant on the eastern water front of the Seward town site.
>
> The present naval commission has also incorporated a third plan: Mine coal as in plan 1 and transport it over the railroad to mile 64; build a railroad from mile 64 of the present road over a distance of 11.4 miles to Portage Bay, on Prince William Sound, Alaska, and there construct wharves and a coal-handling plant. Coal could then be delivered by railroad direct from the mines to Portage Bay quickly, cheaply and over negligible grades for the all-year-around shipment of navy coal.

There is no doubt in the minds of Secretary Daniels and of the engineers and geologists of the Interior Department who are familiar with the coal already prospected in the Matanuska field that it will meet the navy's requirements. In fact, an actual test was made some years ago on the Battleship Maryland, and the results were entirely satisfactory.

Government Salaries Too Low to Attract Engineering Graduates

ON ACCOUNT of serious difficulty in filling vacancies in its engineering staff the U. S. Geological Survey recently sent out a letter to twenty-one engineering schools calling attention to a civil service examination which may be taken by senior students who expect to be graduated this year. The salary of these positions is $1,200 per year.

The presidents of most of the schools stated that they would post the notices and call the students' attention to the matter, but expressed grave doubts about their being interested in such positions. One reply contains this statement: "In view of the number of more attractive openings which are abundant at this time, I do not anticipate that many of the young men will seek positions with the Government where the opportunities for rapid promotions are less than in a number of industrial lines at the present."

Another states that "it will not arouse much interest on account of low entrance salaries," and still another calls attention to the fact that men with such qualifications find "no difficulty in getting $1,800 per year."

Yale University calls attention also to a recent civil service examination announcement for the position of highway engineer at $1,800 to $2,400, the specifications for which call for "at least five years' responsible experience." The letter further states that "we do not know of a man who has been out of college long enough to meet these qualifications who would accept such a salary." A man with such training and experience, they assert, "probably would be rewarded in business by a salary of not less $4,000."

It is evident that any candidates certified as a result of these examination announcements will not be up to standard.

NEWS FROM THE CAPITOL

BY PAUL WOOTON

Hines Resigns Office of Rail Director

WALKER D. HINES has resigned the office of Director General of Railroads and President Wilson has accepted his resignation, effective May 15. The work of settling the affairs of the Railroad Administration will be assumed by Mr. Hines' successor.

Max Thelen, now in charge of the claims department, probably will be named. Mr. Hines is said to favor his appointment and news from the White House is to the effect that the retiring director will name his successor.

Mr. Hines is reported as having contemplated returning to the practice of law in New York with the return of the railroads to private control. It is likely, however, that he will take a vacation abroad immediately upon retirement from office.

In accepting the Director General's resignation President Wilson wrote Mr. Hines that he had "personally valued and admired the quite unusual services you have rendered the Government and the country."

Mr. Hines has served with the Railroad Administration since its creation in December, 1917, when the Government assumed control of the railroads of the country. He was appointed then as Assistant Director General, and when Secretary McAdoo retired to private life on Jan. 11, 1919, Mr. Hines was made Director General.

Secretary Daniels Seeks Competitive Bids In Supplying Navy Coal

IN AN effort to get away from obtaining coal under navy orders, Secretary Daniels has issued a statement in connection with a notice that bids will be reopened May 18 for the Navy's coal requirements, in the hope that the practice of awarding contracts after competitive bidding may be resumed. In his statement Secretary Daniels says:

"Because of the failure to receive satisfactory bids for naval coal requirements, and in keeping with advices received that a reopening of bids would result in more satisfactory tenders, proposals are again issued under an opening set for May 18, 1920, at 10 A. M.

"This decision is also prompted through the desire to return to the practice of awarding contracts after competitive bidding, thereby making it feasible to discontinue obtaining deliveries under navy orders; although the latter must, of course, be continued in effect until provision of the required needs can be assured.

"In this connection, and for your information, it is considered desirable to advise that of a total of about 2,300,000 tons of bituminous coal and 60,000 tons of anthracite coal on which bids were invited, quotations were offered on only 522,300 tons of bituminous coal and 25,400 tons of anthracite coal. Of this tonnage it appears that it will be practicable to accept 108,000 tons of bituminous coal and 21,700 tons of anthracite coal; furthermore, only a very few points of those at which deliveries were called for were covered in the bids received, and then for but an inappreciable quantity of the coal needed.

"In the absence of information to the contrary, it is assumed that the form of proposal issued is in general satisfactory, the periods of delivery as specified contemplating either fractions of a year or annual contracts. If however, because of uncertainty of conditions, a modification in the period for which contract is to run is desired, bids for different periods will be considered.

"Attention is again invited to the desire to comply with the recommendations of the Bituminous Coal Commission that storage space be stocked during the summer months."

Appropriation Needed for Payment for Cars Requisitioned by Fuel Administration

IN a letter to Senator Frelinghuysen in regard to Fuel Administration claims the Secretary of Interior says:

"For your information, I beg to advise that some three hundred carloads of coal have been traced and settlement arranged for. Vouchers to the number of one hundred for supplies, stationery, equipment, freight, expressage, telegrams, etc., amounting to $3,170.99, have been approved and forwarded to the auditor for the State and other departments to give preference and to expedite payment.

"There is another class of claims which are coming for which we have no appropriation—for cars shipped under requisition of the Fuel Administration and remittance made for less than the invoice price because of a lack of hauling or other charges and other matters of this general character. It is suggested that we let these claims accumulate until December and then report them to Congress for an appropriation."

Government Coal Yard Opens Bids

Bids for coal for the Government departments in Washington for the coal year beginning April 1, 1920, were opened on April 12 by the chief engineer of the Government fuel yards. Requests had been made for proposals either to furnish coal for the coming three months or for the entire coal year, the total estimated need being in excess of 300,000 tons. Only three bids were received, for a portion of the quantities desired in each case.

None of the bids has been accepted, and, because of the limited quantity offered, it is doubtful whether a decision can be reached in the immediate future.

Senate Commerce Committee Hears Arguments On Seasonal Freight Rates

Despite Opposition Senator Frelinghuysen Refuses to Believe His Plan Unwise McAuliffe Enumerates Advantages, but Snider, Representing Railroads, and Hurd, for Operators, Vigorously Oppose Proposal

OPPOSITION to legislation providing for seasonal coal rates developed in unexpected volume at the hearings being conducted by Senator Frelinghuysen's sub-committee of the Committee on Interstate Commerce. Despite the wave of opposition it is apparent that Senator Frelinghuysen has not been convinced by the arguments thus far advanced that his proposal is unwise. Apparently he is willing to accept the suggestion of the committee of the American Institute of Mining and Metallurgical Engineers, which advocated a tonnage basis for additions and deductions from the rate which would be graduated.

G. N. Snider says that there will be no surplus of open-top equipment this year, and maybe not for three years to come. He thinks seasonal freight rates on coal should not be tried just to see what will happen, but only after thorough investigation by the Interstate Commerce Commission has indicated that they would be advisable.

In the original Frelinghuysen bill the addition to the rate was to be 15 per cent above the existing rate beginning with Sept. 1. The fact that a 15-per cent deduction from the existing rate is provided during the period from April 1 to Sept. 1 would mean a difference of 30 per cent in the charge made for transporting coal as between Aug. 31 and the day following.

Various abuses and evils which would arise from such an abrupt change were pointed out at the hearing by Eugene McAuliffe, who testified as the representative of the American Institute of Mining and Metallurgical Engineers. The fact that he had been in charge of the coal conservation division of the Railroad Administration enabled Mr. McAuliffe to bring out many points of his own experience in support of his argument for seasonal rates.

Seasonal rates, Mr. McAuliffe pointed out, were to be regarded as the natural complement of seasonal coal prices. The strike of Nov. 1 had its chief cause, in Mr. McAuliffe's opinion, in enforced idleness during the spring and summer of 1919. He pointed to the absolute necessity of providing for continuous operation of coal mines, not only in the interest of the mine workers but in the interest of lowering production costs and in providing continuous employment for railroad equipment designed to handle coal. In the normal year uniform production throughout the twelve months automatically would provide one hundred thousand coal cars.

Mr. McAuliffe declared that the coal industry has been kept on the brink of a cataclysm through lack of stabilization and from the tendency of the American coal consumer to buy on a hand-to-mouth basis. With one-half the coal reserve of the world the United States, in the opinion of Mr. McAuliffe, should put the industry on a high national plane. He pointed out that the United States must furnish more coal for other countries. The need for an orderly production of coal for domestic and export consumption is increasing more rapidly than had been expected, because of the prospect that little fuel oil will be available in the future for steam-making purposes.

Mr. McAuliffe pointed out that the rates in no way would embarrass the railroads and should be of great help to them in reducing by many millions of dollars the investment in equipment necessary to handle the year's coal in five months. The plan of having graded fluctuations, measured in cents per ton, would mean the same revenue to the railroads, but, he pointed out, it would be entirely possible to exempt certain coal from the operation of the seasonal rates.

He suggested that coal for lake shipment and a portion of the tidewater tonnage could well be exempted. He also expressed surprise that there was opposition on the part of the operators, many of whom have changed from warm advocates of the seasonal rates to vigorous opponents of the plan. He expressed the opinion that this change must have been promoted by some belief that local or individual losses would result. It is his opinion, however, that the Interstate Commerce Commission can be relied upon to adjust any local irregularities.

At that point in Mr. McAuliffe's testimony Senator Frelinghuysen asked if the change of heart on the part of the operators could have been caused by the desire to obtain scarcity prices. Mr. McAuliffe replied that it unfortunately is true that a minority in the coal trade look upon coal as something with which to speculate and probably prefer present conditions to those which would make for a stable profit.

One of Mr. McAuliffe's important points was the economic wrong in transporting the bulk of the nation's coal when the actual cost of transportation is 35 per cent higher than in the summer months. He classed the coal industry as next in importance to agriculture. We have reached a point in our national development, he asserted, which justifies the public in demanding an improvement in the coal situation. He urged that this demand be met by voluntary effort.

Unless something is done to better conditions he predicted nationalization of the coal mines within a few years. Since he feels sure that nationalization would not bring the relief which the public expects, he urged that selfish considerations be disregarded rather than that the industry drift into that whirlpool.

The hearing revealed that Commissioner Clark of the Interstate Commerce Commission is of the opinion that the railroads now have sufficient cars to handle the country's coal requirements comfortably if the distribution can be spread over the twelve months.

G. N. Snider, who was later described as one of the best witnesses who ever appeared on Capitol Hill, presented the views of the railroads in the territory east of the Indiana line and north of the Carolinas. His argument was that there is no necessity for legislation, at this time at least, because there is certain to be no surplus of open-top equipment this summer and possibly will not be for three years to come. The railroads, he said, have no objection to the Interstate Commerce Commission requiring seasonal rates if they should seem advisable after a thorough study has been made of their effects, but there is objection to putting these rates into effect with the idea of seeing what will happen.

This year, in order to get the production the country needs, Mr. Snider pointed out, everything must be done to increase the handling of coal cars. Obviously it is unnecessary to make a reduction of the rates on coal moving to lake ports and to tidewater. If reductions were made to all rail destinations from the fields serving the lakes and tidewater the effect, in Mr. Snider's opinion, would be to take cars from an efficient lake and tidewater trade to put in the all-rail trade.

Vigorous opposition to the seasonal rate proposal came from the owners of the docks at the head of the lakes. It was pointed out that the low summer rate would enable a much larger quantity of Illinois coal to move into the territory which they are serving. At the same time a considerable portion of the distribution from the docks would have to be made when the high rates were in effect. This combined with the suggestion that the coal movement to Lake Erie ports be exempted from the low summer rate would constitute unjust discrimination against the owners of the docks.

D. F. Hurd, the secretary of the Pittsburgh Vein Operators' Association of Ohio, appeared in opposition to the bill. His testimony brought out that the members of his association believe that seasonal rates would:

(1) Precipitate chaos in the coal rate structure and, viewed under the present "Act to Regulate Commerce," result in discriminatory and unfair rates.

(2) It could not be made effective without a serious disturbance in differentials, which differentials have been arrived at after many investigations by the Interstate Commerce Commission and which differentials must be maintained to provide equity between coal-producing groups and fair and reasonable rates to consumers.

(3) Create more long-haul traffic and in consequence decrease car efficiency.

(4) Decrease the earnings of some railroads and enhance the earnings of others, neither of which could be foreseen, and therefore would be uncertain as to future effect.

(5) During low-rate period decrease car supply at the mines by reason of the temptation to supply cars preferentially for the more attractive 100-per cent rate traffic for which open-top cars may be utilized. During high-rate period increase car supply at mines because of the premium rate on coal traffic.

(6) Discourage purchase and delivery of coal in the period immediately preceding the reduction, the difference in a 15-per cent reduction being 30 per cent in the rate as between March 31 and April 1, when the rate increase period becomes effective.

(7) Create excessive demand for delivery toward the end of the low-rate period, viz., the month of September far beyond ability of the carrier to provide cars.

(8) Create heavy demand for delivery of railroad fuel during low-rate period, especially for railroads obliged to obtain their coal from mines located on other roads, in order to prevent penalty in freight charges during high-rate period.

(9) Cause excessive delivery on contracts during low-rate period beyond ability of producer to supply, or if able to supply, deprive other than contract buyers of delivery during low-rate period.

(10) Create conditions where lake shippers, obligated for heavy tonnage during season of navigation, would be unable to provide industries within their usual marketing field with coal for storage during low-rate period, or if dividing the tonnage, fail to supply Northwestern markets during season of navigation, the deficiency to be made up via all-rail movement during the higher-rate period with a tremendous loss of car efficiency due to the time occupied in movement of cars from mine to the Northwest during the winter season instead of from mine to the lower lake ports during the season of navigation.

(11) Force many industries during lake season to take coal of a quality unsuitable for their purposes, or wait until the lake season is over and then pay the penalty freight rate.

Other points brought out by Mr. Hurd follow:

Dealers will be unprepared to carry any considerable tonnage beyond the amount usually carried, although upon the dealer depends the supply for buildings, apartment houses, hotels and domestic use, and small industries where no storage is available.

Many industries now stock and store coal up to storage capacity. Others do not have nor can they procure storage space. Without exception these industries consume vastly more coal in winter and accordingly the greater portion of their coal would move in the high-rate period.

Domestic consumers of bituminous coal in markets reached by these producers represent less than 5 per cent of the production and if all could and would store during the low-rate period, the volume of tonnage distributed among all of the railroads would be insignificant.

Seasonal rates as proposed would destroy markets that the producer has created under the protection of the Government through the "Act to Regulate Commerce," which has justified him in an investment to provide facilities for handling and storing lake coal at northern points, insuring to him just and reasonable and non-discriminatory rates, and the final purchaser and consumer of that coal may justly claim these same rights and the benefits resulting to him therefrom.

The position of the coal operators in the East who are opposed to seasonal freight rates was presented by D. F. Hurd, secretary of the Pittsburgh Vein Operators' Association of Ohio. Mr. Hurd holds that the scheme is not practical, would result in discriminatory and unfair rates and lower car efficiency.

"The honorable chairman of the Interstate Commerce Commission," said Mr. Hurd, "in a communication to Senator Frelinghuysen has expressed the opinion that under the present 'Act' the commission is not authorized to prescribe seasonal rates. Our views are fully in accord with his."

The Labor Situation

Edited by
R. Dawson Hall

Northern West Virginia Miners Get Big Wage Increase

Difficulties were expected in the making of an agreement between the mine workers and operators located in the northern West Virginia fields, which region forms District No. 17 of the United Mine Workers of America, but on April 17 a contract was concluded, thus closing more than a week's discussion.

When the scale committee assembled at Baltimore it found the mine workers seeking an increase of 40 per cent over the wage paid under the October wage scale. It was, however, the consensus of opinion that the differences would all be adjusted and an agreement worked out, though not on the basis proposed by the miners. In the upshot the mine workers received a new scale virtually 45 per cent higher than before. The miners get a flat increase of 24c. per ton over present rates. The rate was 63.7c. per ton and it is now increased to 87.7c.

The sub-committee of operators and mine workers designated to draft the scale consisted of Brooks Fleming, Jr.; E. M. McCullough, Percy Tetlow, E. Drennen, C. J. Ryan, C. H. Tarleton, J. A. Clarke, Jr., S. D. Brady, George Devers, J. F. Forenash, E. W. Rockerstein, R. M. Williams, C. C. Montgomery and George S. Brackett. The new scale will affect about 27,000 mine workers and 750 mines in northern West Virginia. These men work in twelve and a half counties of the state.

Anthracite Mine Workers Reduce Their Wage Demands

After many sessions lasting since March 9 and bringing no concessions from either party except an undertaking on the part of the anthracite operators that that they would date the wage increase from April 1, a break took place on the part of the representatives of the anthracite mine workers and so brought the meeting of the subcommittee on the wage scale measurably nearer to an agreement.

Seeing the mine workers had so long stood for a 60 per cent increase for contract miners, a $2 a day increase for day men, a six-hour day and a five-day week it is surprising and comforting to know that on Saturday, April 24, they modified these demands asking only a 27 per cent increase for contract workers, a $1 per day increase for day men and agreeing to go on with the eight-hour day.

Thus the anthracite mine workers go back to the rate of increase and the working conditions prescribed by the Bituminous Coal Commission for the workers in soft-coal mines. No change was made in the remaining demands which cover working conditions, payment for dead work and several other details.

The statement given out at the conclusion of the day's session said:

"At the session of the Sub-Committee of Anthracite Operators and Mine Workers held today the mine workers' representatives offered two substitutes for two of the original demands presented:

"As a substitute for demand No. 2, calling for a 60 per cent increase in contract rates and $2 per day increase to day men, the following was offered: We demand that the present wages of the anthracite mine workers be increased to correspond to the increases granted the bituminous mine workers by the Presidential Coal Commission.

"As a substitute for demand No. 4, calling for a work day of not more than six hours from bank to bank, the following substitute was offered: We demand that the eight-hour day be extended to all classes of inside and outside day labor and monthly men, with time and half time for over-time and double time for Sundays and holidays.

"Upon presentation of the modified demands the operators' representatives requested an adjournment until Monday. The Committee will meet Monday." But Monday saw no change. The wage demands as modified were discussed but without any issue. However, the situation has changed for the better and a settlement cannot be far off.

It would be merely trying the patience of the reader to record all the reports made by the subcommittee during last week's conference other than that of Saturday, for Saturday's session easily dwarfed all those that preceeded it both last week and since March 6.

Hicks Interests Sign Wage Contract

No mining properties along the Kiskiminitas River are more important than those of the Hicks interests. These companies operate nineteen thin-vein properties. They have arrived at an agreement with their men, the scale providing an increase of 24c. per ton and a flat advance to their daymen of $1 a day.

Radicals To Be Kept Down in Ohio

In order to keep Industrial Workers of the World out of the union, sub-district 5 of district 6 (Ohio) in its conference which closed on April 17 after a six-day session voted to bar anyone from office who had not been five years a member of the organization. This vote was one of the most interesting and significant developments of the 22d session of the sub-district. The region unfortunately contains a number of "I Won't Works" and has suffered from sporadic strikes started solely to prevent the execution of Thomas Mooney for participation in the outrage on a procession in California.

Ray Says Unauthorized Strikes Anger Public and Impoverish Miner

THAT frequent strikes over trivial differences such as have been witnessed in the eastern Ohio fields in recent months are alienating public opinion, was the declaration of President William Ray of the fifth sub-district of Ohio toward the close of his annual report in opening the 22nd annual convention of the sub-district. He expressed fear that if such strikes were continued the mine workers' interests would suffer. The text of that portion of the president's report dealing with strikes is as follows:

"Strikes are becoming so common in our sub-district that I fear the final results. Long years have we contended that all labor employees in an industry should be organized under one head as we are. I believe it will get us the best results, but when so organized if one branch of labor can and does strike every time something happens that it doesn't like, thereby causing all the others to lose time, we shall draw perilously near the shores of danger. It has been that way in our union during the past months. I sound the warning. Our frequent strikes are not doing us any good but are keeping from making a daily wage many and many a man who is in need of it. Not only that but it is the thing which is turning public opinion of the great mass of people against the mine worker, and it is the judgment of the public that finally determines all questions in a country such as ours."

Try to Prevent Strike in Kanawha

ACTION has been taken by the officials of United Mine Workers of District 17 (in the Kanawha field) to see that miners continue at work while a joint commission of operators and miners of the Kanawha, Coal River and Cabin Creek fields investigates and works out a scale for deadwork and tonnage rates and adjusts various inequalities now in existence, the text of the instructions being as follows:

"For your guidance find inclosed copy of agreement which will be in effect until the commission makes its report, which will be at the expiration of sixty days. At that time the book of rules will be re-edited and a convention called to act upon the agreement in full. The duties of the commission are to investigate differentials, inequalities and deadwork, in order to arrive at uniform rates for deadwork and tonnage.

"The above arrangements have been entered into so that the members of our organization may receive the advance handed down by the Bituminous Coal Commission until we can work out an agreement satisfactory to all parties concerned. Therefore, the policy is to keep the mines in operation while this revision is being made. We insist upon co-operation in this work by every local officer and individual member to the end that the commission may if possible be able to complete its work sooner than within sixty days from date.

"The Cabin Creek and Coal River operators will meet your scale committee on Monday, April 19. They ask for this continuance in order that they may be able to consult their associates regarding the demands that are being made by the miners. In the meantime they will be guided by the above arrangements. We earnestly request that the mines be kept in operation pending the action on April 19."

Governor Allen and Samuel Gompers to Debate on Industrial Relations Court

GOVERNOR HENRY J. ALLEN of Kansas has accepted a challenge for a public debate with Samuel Gompers, president of the American Federation of Labor, on the new Kansas Court of Industrial Relations.

In fathering the new court Governor Allen established the precedent that in a controversy between employers and employees the rights of the public are paramount to those of labor or capital. Employers in such essential industries as the transportation or production of fuel are forbidden to close down their business without the permission of the court, and workmen in such industries are forbidden to strike.

This provision of the law, which was a conspicuous feature of the recent strike of Kansas coal miners, caused it to be attacked by Mr. Gompers. Cooper Union probably will be selected as the scene of the discussion, but the date has not been chosen.

Butler-and-Mercer District Accepts Wage Increase

NO difficulty was found in the Butler and Mercer County sub-district (No. 5) of Pennsylvania in arriving at a wage settlement. The mine workers received, of course, the full 27-per cent increase over the old contract, the new scale being signed on April 15. The scale, which affects eight thousand to ten thousand men in about sixty mines, is operative, like the other, for two years or until April 1, 1922. No changes were made in the working conditions.

Pick mining rates were increased from 93c. per ton to \$1.17 per ton, cutting by punchers from 22½ to 28½c. per ton, cutting by chain-machines from 14 to 18c., loading after punching machine from 54 to 72c., day work from \$5 to \$6, from \$4.84 to \$5.84 and from \$4.51 to \$5.51, according to the grade of work. All yardage and deadwork was increased 20 per cent over former rates.

Railroad Conductors and Switchmen Seek Wage Increase

Arguments on wage increases demanded by conductors and switchmen were made before the U. S. Railroad Labor Board April 22 by L. E. Sheppard, president of the Order of Railway Conductors, and S. W. Heberling, president of the Switchmen's Union of North America. The demands of switchmen call for pay increases of approximately 58 per cent with time and a half for overtime, Sundays and holidays. Similar overtime allowances are asked by conductors, together with wages sufficient to enable them to live at the pre-war standard.

Labor Conditions in Canada Improve

Latest reports from the Canadian Department of Labor in Ottawa show considerable all-round improvement in labor conditions, although there was a slight increase in unemployment. During March there were twenty-two strikes, involving about 3,789 workers and resulting in a time loss of about 43,169 working days.

Mine Workers Attack Senator Harding's Labor Record

AT THE April 15 session of the twenty-second annual convention of the United Mine Workers of Sub-District 5 of Ohio, Senator Warren G. Harding of Ohio was attacked as a candidate for President in a resolution reported by the resolutions committee and adopted by the convention. The labor record of the Ohio Senator was denounced as "black" and miners were called upon to aid in defeating Senator Harding as a candidate for President.

William E. Green, secretary-treasurer of the international organization of the United Mine Workers, in an address predicted that the struggle over what he termed the "Stone" question would rival that incidental to the enactment of the mine-run law.

Thurmond Board Hears Complaints

THE first meeting of the joint board of coal operators and mine workers of the New River field, constituted under the recent wage agreement entered into by the operators and mine workers of District 29, U. M. W. of A., was held at Thurmond, W. Va., on Tuesday, April 13. Sessions were continued until Thursday morning, April 15, to hear and pass upon complaints and grievances in the relations between the employers and their employees. The joint board is the means provided under the wage contract for arbitrating differences arising between mine workers and operators.

At this session twelve complaints, none of them of a serious nature, were lodged with the joint board and evidence on them was taken. On the new joint board are: G. H. Caperton, chairman; S. A. Scott, of MacDonald; R. H. Morris, of Ansted, representing the operators; J. R. Gilmore and J. H. Sprouse, president and vice-president, respectively of District 29, and Joe Patton, a member of the executive board, representing the miners.

Car Supply in Kentucky Considered by Railroad Men and Operators

WITH a view of improving the car service situation in the Kentucky coal fields, W. C. Kendal, chairman of the Car Service Commission of the American Railway Association, presided over a meeting of railroad officials held in the office of John A. Morris, chairman of the local operating committee, in Cincinnati, April 19.

Those present at the meeting were C. E. Phelps, Louisville & Nashville, of Louisville; F. M. Lucore, Southern Pacific, Houston, Texas; W. R. Harris, Big Four; J. G. Brooks, Baltimore & Ohio; W. S. Andrews, Cincinnati; D. E. Stangler, Norfolk & Western; W. L. Booth, Chesapeake & Ohio; J. H. Doggrell, Frisco system; G. W. Briece, Missouri Pacific; E. J. Grace, Missouri, Kansas & Texas; G. W. Eskridge, Monon; George McVeagh, Big Four; R. E. Quirk, former chief examiner of the Interstate Commerce Commission; R. C. Buchanan, inspector of the Interstate Commerce Commission, and A. G. Gutheim, member at large of the car commission.

Those complaining about the car shortage were the Hazard Coal Operators' Association, Harlan County Coal Association, Southern Appalachian Coal Operators' Association and Western Kentucky Coal Operators' Association.

It was said after the meeting that as soon as the labor troubles that have existed among switchmen are at an end the loading capacity, now said to be about 55 per cent, would be increased to 75 per cent by the return of empty cars, many of which are said to be in the southern part of Ohio. Meetings such as this one are becoming regular current events. It is generally admitted that but little immediate improvement can be expected in the car supply in these fields for some time to come.

Lack of Demand for Coke Affects British Columbia Coal Production

THERE has been a marked falling off in the production of the Crow's Nest Pass coal field of British Columbia, due largely to decreased demand for coke. The ovens at Fernie are idle, those at Michel alone being active in this field. In 1918 coke production of Michel and Fernie was about 18,000 tons a month.

The explanation of the slackness of the coke market as far as the Crow's Nest is concerned lies in the closing down of the Canada Copper Corporation smelters at Greenwood, and the Granby Consolidated Mining & Smelting Co. smelter at Grand Forks. The latter company also is now in a position to produce byproduct coke from Vancouver Island coal at the new Anyox smelter. There may be other reasons behind the condition at Coal Creek and elsewhere in that district, where the men have been working little more than half time, but those given may be accepted as chiefly responsible.

On Vancouver Island the situation is different, although there was a period following the strong demand of the winter during which the trade fell off sufficiently to affect to some extent the operation of the mines. During February the Canadian Collieries, Ltd., kept their men at work at the three Comox mines for seventeen days, at Extension for twenty-two and one-half days, and at South Wellington for twenty-three days. The Canadian Western Fuel Co. operated its properties at Nanaimo, Harewood, Reserve and Wakesiah for twenty-four days in February. This also applies to the collieries of the Granby Consolidated Mining & Smelting Co. at Cassidys, the Pacific Coast Coal Mines, the Nanoose-Wellington Collieries, as well as the Coalmont Collieries in the Nicola-Princeton Field.

What the forthcoming season is going to bring to coal operators in the bunker business remains to be seen, but it is feared that exchange conditions are likely to have such an effect on the mercantile trade of the Pacific that the collieries of this province will find the market unpleasantly quiet. However, the output figures for the island collieries for the month of March indicate that the market has become brisker and that production has increased. This is particularly evidenced in the output of the Pacific Coast Coal Mines and it also is worthy of note that the production of the Cassidy Collieries, Granby Consolidated Mining & Smelting Co., likewise shows a substantial advance.

The British Columbia coal output for the month of February, 1920, was as follows: Crow's Nest Pass district, 67,053 tons; Nicola-Princeton district, 15,289 tons; Vancouver Island district, 137,255 tons; Prince Rupert district, 325 tons.

The returns for March are available only for Vancouver Island and show an increase, due to greater number of working days, from 137,255 net tons to 144,605 tons.

Car Manufacturers Meet to Discuss Industrial Problems

MOST successful and interesting proved the second annual meeting of the Industrial Car Manufacturers' Institute, which was held in Pittsburgh on April 20, 1920. The following were elected as the Board of Directors for the coming year: Lion Gardiner, vice-president, the Lakewood Engineering Co., chairman; N. A. Doyle, vice-president, American Car and Foundry Co.; W. E. Farrell, president, Easton Car & Construction Co.; J. M. Hansen, president, Standard Steel Car Co.; J. R. Kilbourne, vice-president and general manager, the Kilbourne & Jacobs Manufacturing Co.; R. J. Magor, president, Magor Car Corporation; J. C. Shirer, president, the Star Manufacturing Co. Col. James Milliken was re-elected president of the institute and H. M. Wey, secretary.

The institute is a get-together association of a number of the manufacturers of industrial cars, organized to procure economic results, promote a spirit of co-operation among its members, provide means for interchange of views affecting the interests of industrial car builders, to preserve equitable conditions not only in the workshop but in selling practices, to standardize designs and specifications, and to bring about a uniformity in methods of inspection, purchase, etc. In order to secure the best results the organization has been divided into four groups, according to the class of cars manufactured, namely: Builders of (1) coal-mine cars; (2) standard-gage dump cars; (3) other standard-gage cars, and (4) all narrow-gage cars except coal-mine cars.

After adjournment of the meeting the members were taken to the country home of Charles H. Clark, president of the Clark Car Co., in the South Hills of Pittsburgh. An excellent banquet was served, after which R. J. Magor, as toastmaster, introduced the following speakers: Lion Gardiner, A. L. Humphrey, president of the Westinghouse Air Brake Co.; W. F. M. Goss, president of the Railway Car Manufacturers' Association; C. E. Watts, efficiency engineer of the Berwind-White Coal Mining Co. and who represented the American Mining Congress; N. A. Doyle, and H. E. Chilcoat, general manager of the Clark Car Co.

A Crime to Burn Oil Under Boilers

NOT only is it a crime to burn oil under boilers, but also an unprofitable sin into the bargain, was the testimony of Capt. Douglas E. Dismukes, commanding the Naval Training Station at Newport, R. I., in giving testimony before the Committee on Naval Affairs of the House of Representatives considering the Naval Appropriation Bill. This statement was recently circulated by the Wholesale Coal Trade Association of New York.

It appears that the captain declared that "it is more economical to use coal" than oil. On inquiry he admitted he was using oil at the training station, but only because he had oil-burning plants as well as coal-burning plants and therefore could not avoid burning oil in the former.

Captain Dismukes reported a conversation with Dr. White, of the U. S. Geological Survey, in which that authority declared it "no less than an economic crime to use oil under boilers as fuel," because the supply of oil was so rapidly declining in the United States and elsewhere and because it would soon be "a very serious problem as to getting the necessary amount of lubricants—which is really the most important part of the rock-oil business."

"I understand," said the captain, "that the Mexican wells supply us with about eight million barrels a year, and the information that now reaches us is that salt water is getting into those wells and there is an indication of exhaustion." Unless it would cost too much to get back to coal he proposed that the plants be changed so as to burn coal. Mr. Padgett stated that coal was found to be much cheaper than oil on the Atlantic coast, but on the Pacific coast oil was much the cheaper. At that time the freight on coal to the Pacific coast was $6 a ton. He added that Pocahontas and Georges Creek coal cost delivered at the water's edge $2.10 and $2.20, but it cost from $5.20 to $7.50 to get it around to the Pacific.

Circuit Court Upholds Mining Company in Important Mine-Tax Case

JUDGE DENISON of the Circuit Court of Appeals for the 6th district, has just handed down an important decision in the case of the Mohawk Iron Mining Co., of Minnesota. This company claimed an allowance of $35,000 for depletion on account of ore taken out subsequent to March 1, 1913, but the Bureau of Internal Revenue declined to allow the deduction because the mining company was operating under a leasehold and not in fee. The lower court rendered judgment in favor of the mining company for the full amount of the taxes.

The company claimed it was entitled to the depletion allowance the same as a fee owner, because the law allowed the allowance to the "taxpayer" rather than to either the owner or the lessee; that it would be natural for Congress to intend that such allowance be made to the party actually suffering substantial depletion; that the lessor would have a depletion allowance which would wipe out the royalty and leave him no tax to pay.

The Court said that when the question of right of allowance arises as between fee owner and lessee it can make no difference whether the claimed allowance is called by one name or by the other. It holds that the provision regarding depletion in real substance and effect pertains to a consumption of capital assets rather than to a business loss.

Bethlehem Steel Co. Buys 7,000 Acres of Bituminous Coal Land

FOLLOWING a meeting of the Board of Directors of the Bethlehem Steel Co., April 22, E. G. Grace, president of the company, announced the purchase of the Jamison Coal & Coke Co., bituminous coal properties in West Virginia.

"The property we have acquired," Mr. Grace said, "is located only fifteen miles away from the property of the Elkins Coal & Coke Co., recently acquired by the Bethlehem interests. The property consists of about 7,000 acres of coal land, having proved up over 65,000 tons of a good quality of low sulphur gas coal. The property is in operation and equipped to produce 1,000,000 tons of coal annually. The Bethlehem Steel interests are now fully supplied with their full requirements of all kinds of bituminous coal."

Discussion by Readers

Edited by
James T. Beard

Itemizing Costs in Coal Mining

Letter No. 1—In the issue of *Coal Age*, March 4, p. 437, there appeared an itemized list of coal-mining costs prepared by the Oakdale Coal Co. of Denver, Colo., the purpose of which was, no doubt, to stagger the reader with the immensity of the expense under which the coal operator is laboring.

No one believes more in justice to all than myself, but this reference appears to be slightly overdrawn or, in other words, is extreme in its position with respect to the operator.

It is not my intention to question the items, in fact more could be added than what appears. All the costs or expenditures that an operating company has made or ever will make should be included in such a list. On second thought, however, should not the weight of each item, or its relation to the determination of the price of the product, which in this case is coal, have been made the main feature?

As the list now stands, it would lead the unwary observer to the immediate conclusion that the operator is a philanthropist, and is giving good money away instead of earning it for the investors. In how many instances, let me ask, is this statement of mining costs applicable? Not many, I fear.

Would it not be more to our benefit to have such a table prepared showing the ratio that each item bears to the whole sum. The present showing is a mere conglomeration and its publication effects little of any value in the more economical operation of a mine. It would lead to a clearer understanding of the economics of the situation, and relieve many false ideas in the minds of those outside of the fold if relative values of the items of cost were made to appear.

Golden, Colo. MINING ENGINEER.

Carbide Lamps in Pillar Robbing

Letter No. 1—Referring to the inquiry of "Mine Foreman," *Coal Age* Feb. 26, p. 419, kindly permit me to present a few considerations relative to conditions that if considered may assist this correspondent in the solution of his difficulty. First, I will mention one or two points regarding ventilation. They are as follows:

1. Owing to the disastrous and far-reaching effects of explosive gases, our mining laws require adequate ventilation to dilute and sweep away the gases and render them harmless and make the mine safe for work. Then, why not use the same precautions with respect to that treacherous atmosphere known to the miner as "blackdamp," which appears to be the direct cause of the trouble in the instance cited in this inquiry.

2. If the proportion of carbon dioxide in the mine air has increased to such an extent as to extinguish an oil light, there is no assurance that it will not continue to increase to an extent that will render the atmosphere dangerous and extinguish the *lamp of life*.

3. If it is possible to control conditions so as to keep the oxygen content of the mine air above the stated 14 per cent so that the oxygen in the air will range from that point to 18 per cent, why not make still further effort and maintain a percentage of oxygen ranging from 18 to 21 per cent, or normal.

In making these suggestions, I have in mind the eliminating of large areas of abandoned workings in proximity to pillar work. Where the conditions will warrant and such abandoned areas exist and generate much carbon dioxide that is constantly fed into the workings, every effort should be made to drain the gas from such areas.

In the blowing system of ventilation, danger lies in the possibility that any derangement of the ventilating current, relieving the pressure that holds the gases back in the abandoned places, will permit those gases to expand into the workings. The draining of these gases from abandoned areas will eliminate this possibility.

WORKING IN "TWILIGHT ZONE" DANGEROUS

4. It should be considered risky business for men to work in what we may call the "twilight-zone" or where the lights of the miners burn dim. The extinction of an oil lamp indicates a near approach to the life-line of the oxygen content of the mine air. Let us consider, then, that the failure of an oil lamp to burn is a sure indication of the *twilight zone* of uncertainty; and the possible increase of carbon dioxide may cause the twilight to fade into darkness and the atmosphere become unsafe.

5. Turning now to the workmen, let us consider how they are affected when compelled to breathe air where the lights burn dim. The manufacturer of a 150 horsepower steam engine does not expect it to give good results when supplied with steam that will generate but 50 or 100 horsepower. In like manner, nature having provided an atmosphere containing normally 21 per cent of oxygen, good results in the performance of work cannot be expected when the oxygen content is depleted to 15 per cent, or even to 18 per cent, as shown by the dim burning or extinction of an oil lamp.

But, the conditions here described involve more than an ordinary element of danger. We are apt to attribute it to lack of ventilation, rather than to the generation of carbon dioxide; and forget that the resulting depletion of the oxygen means a corresponding increase in nitrogen in the air, whereby the atmosphere is rendered more dangerous than if the presence of the carbon dioxide had not depleted the oxygen.

One theory in explanation of the condition described is that it may have been caused by an obstruction of the ventilating current or an air-leak, either of which is liable to happen in mining practice, and that without warning. In any case, it is clear that the mine foreman in charge had not provided any safe margin to guard against such occurrences.

Another theory suggests a more likely and, incidentally, a more dangerous cause of this condition. It is stated that "the work of robbing pillars was proceeding in an abandoned section" of the mine. This assumes the possibility of the condition to which I referred previously; namely, the close proximity to large abandoned areas generating carbon dioxide, which will expand into the workings whenever there is a slight relief of pressure owing to a falling barometer or a possible derangement of the ventilating system.

In closing, I would only add to what the editor has said in his reply to this inquiry, that the warning given, by the carbide flame, of the presence of a dangerous atmosphere is only observable by experienced eyes. In my own practice, I have seen the carbide light show a reddish tint and an increased length of flame in perfectly pure air, which makes these appearances seem unreliable as an indication of bad air. We know that an oil lamp grows dim or goes out either from a lack of oil or from a lack of oxygen sufficient to support the flame, and it is an easy matter to find out which of these causes exists. I am not disputing the claim that the indications mentioned reveal the presence of bad air, I would emphasize the fact, however, that such indications are often misleading. It is my belief that the action of carbide lights, in bad air, can be summed up in a few words. As remarked by the editor, "They give a safe but frequently unobserved warning of the presence of danger to the men at work."

Portage, Pa. **Jerome C. White.**

Factors in Mine Ventilation

Letter No. 1—I was much interested in the article by R. Z. Virgin, *Coal Age*, Feb. 26, p. 395, entitled "Considerations Influencing Mine Ventilation." Having been employed for the past 25 years in the coal mines of Pennsylvania and having served for 12 years of this time in an official capacity, I am inclined to think that the subject of ventilation is not generally given the consideration that it deserves, especially in the planning and laying out of large or gaseous mines.

Where a mine is opened with the intention of working out the coal from a considerable acreage it is necessary to make the main intake and return airways of sufficient size to enable the required volume of air to be circulated at a moderate velocity. If this is not done there will result a great waste of power in the ventilation of the workings. The circulation of a considerable volume of air through airways of small size, means a high velocity and a high pressure or water gage, which can only be maintained by a large expenditure of power.

Frequently, I have observed fans producing, say 100,000 cu. ft. of air per minute, against a water gage of 4 in. or more. At some points in the main airways the velocity of the current would reach 2,500 ft. per min., owing to the restricted area of the air-course and the lack of proper distribution of the air throughout the mine; or, in other words, the failure to provide separate ventilating districts.

In my opinion, a mine should be so planned that the air volume required for ventilation can be circulated in such a manner that the velocity will nowhere exceed, say 1,000 ft. per. min. The ventilating system should be so arranged that the water gage will not exceed two inches in the fan drift. A high velocity of the air current produces a big mine resistance, the latter increasing with the square of the former. For example, if the velocity of the air is twice what it should be, the mine resistance is four times too great; and the power required for the circulation is 8 times what would be required if the velocity was normal.

Another consideration is the fact that a high pressure or water gage increases the leakage of air through the stoppings, with the result that a smaller proportion of the air entering the mine reaches the working faces. This also causes a great waste of power in ventilation. The only way to reduce the resistance of the mine is to provide ample airways so that the required air volume can be circulated at a low velocity.

This is an excellent subject for discussion and will prove of benefit to those who are fitting themselves for a mine foremen's or assistant foremen's examination. I hope to learn the opinion of practical foremen in regard to what they consider the limit of the velocity of air currents in mines; also, the limiting water gage to obtain the best results. **Ernest Krause,**

Adah, Pa. Mine Superintendent.

Letter No. 2—Kindly permit me to refer to a seemingly misleading feature, in the article entitled "Considerations Influencing Mine Ventilation," which appeared in *Coal Age*, Feb. 26, p. 395. The article is written with the evident intention of proving the necessity of keeping all air passages and air-courses clear of obstructions, as far as it is practicable to avoid these. Attention is drawn particularly to the obstruction caused by cars standing in the airway and rockfalls in air-courses, which decrease the sectional area of the passageway or entry.

The writer of the article presents three illustrations, one showing a 6 x 10 ft. airway, clear of all obstructions; another, the same airway obstructed by a mine car; and the third, the same airway obstructed by a rockfall, which is assumed to cause the same reduction of area as that produced by the mine car.

Calculating the Increase of Ventilating Pressure

For example, the unobstructed airway is shown to have a perimeter of $2(6 + 10) = 32$ ft., and a sectional area of $6 \times 10 = 60$ sq.ft. When this airway is obstructed by a mine car 4 ft. high and 5 ft. wide, it is explained that the cross-section of the car has an area of $4 \times 5 = 20$ sq.ft.; and the sectional area of the airway is thus reduced to $60 - 20 = 40$ sq.ft. The same reduction of area is assumed to be caused by a rockfall in the airway.

It is further explained that, not only is the sectional area reduced from 60 to 40 sq.ft., in each of these cases; but, the perimeter of the airway, which represents its rubbing surface is increased by the perimeter of the car, which is $2(4 + 5) = 18$ ft., making the total perimeter when the airway is thus obstructed, $32 + 18 = 50$ ft.

In the case of the rockfall, however, which rests on the bottom of the air-course, there is presented but three sides to the air current, and its perimeter is $2 \times 4 + 5 = 13$ ft., which makes the total perimeter, in that case, $32 + 13 = 45$ ft. all of which can be accepted as logical reasoning.

However, the features to which I wish to draw attention as being misleading are the following: In order to show the effect of thus obstructing an airway, the author of the article applies the first law of friction, which makes the pressure producing a circulation, vary directly as the rubbing surface or the perimeter of the airway, "other things being equal." But, it is needless to say that, in the cases assumed, other things are not equal.

For example, not only does the perimeter change, but the sectional area of the passage also changes when the latter is obstructed in the manner described. Therefore, the author should have applied another rule of friction, which states that the pressure producing circulation in an airway varies inversely as the cube of the sectional area, for the same quantity of air passing, the length of the airway being assumed constant.

Expressed in other words, the pressure producing any given quantity of air in an airway, varies directly as the perimeter and inversely as the cube of the area of the airway; or, the pressure ratio is equal to the product of the perimeter ratio and the cube of the inverse area ratio. Thus, assuming a 2-in. water gage, giving a pressure of $2 \times 5.2 = 10.4$ lb. per sq.ft., since the original perimeter of 32 ft. was increased to 50 ft. and the original area of 60 sq.ft. was reduced to 40 sq.ft., and calling the pressure x, due to the obstruction,

$$\frac{x}{10.4} = \frac{50}{32}\left(\frac{60}{40}\right)^3 = \frac{25}{16}\left(\frac{3}{2}\right)^3$$

$$x = \frac{10.4 \times 25 \times 27}{16 \times 8} = 54.8 \textit{ lb. per sq. ft.}$$

This would represent a water gage exceeding 10 in. Cars standing in an airway is a common form of obstruction, but no one ever heard of it resulting in such an increase of pressure. By omitting the effect of the reduction of area in his calculation, the author finds the pressure is increased only in the ratio of the perimeter, 50:32, making the increased pressure 16.25 lb. per sq.ft., or somewhat greater than a 3-in. water gage; but even that would be excessive.

My theory regarding an obstruction in an airway is that its effect is similar to that produced by a regulator that causes the same reduction of area. The pressure due to a regulator is calculated by the formula:

$$A = \frac{0.0004\ Q}{\sqrt{w.g.}}\text{; and } p = 5.2\left(\frac{0.0004\ Q}{A}\right)^2$$

For the sake of comparison, I will assume the airway, 6 x 10 ft. in section, to be of such length that it will pass, say 30,000 cu.ft. of air per minute, under a 2-in. water gage. Then, assuming an obstruction in the airway that reduces its area to 40 sq.ft., and applying the formula for finding the increase of pressure due to this obstruction, treating it the same as a regulator, gives for the water gage due to the obstruction

$$w.g. = \left(\frac{0.0004 \times 30{,}000}{40}\right)^2 = 0.09 \textit{ in.}$$

Practically, this is the increase of water gage due to an obstruction such as a car standing in an entry, which reduces the sectional area from 60 to 40 sq.ft., when the original unobstructed airway would pass 30,000 cubic ft. per minute under a 2-in. gage. The water gage would therefore be increased less than one-tenth of an inch. JOHN WALLS, SR.

Bayview, Ala

Health and Industry

Letter No. 3—I want to compliment John Rose for the expressions conveyed in his letter in *Coal Age*, Feb. 19, p. 364. The statement he quotes to the effect that solving the labor situation is wholly a question of religion, is a plain and truthful statement and shows the author to be a great and good man. We need more men of the same kind.

The more one observes conditions about the mines, and studies the labor situation, the more he is convinced that the principles of religion form a common platform on which not only nations, but employers and employees can meet and settle their difficulties. Faith in religion means trust in God, which is our national motto and will insure a like trust in one's fellows. Trust is mutual and invites trust in return. The man who fails to trust his fellow cannot be trusted himself; and such a condition makes possible the inroads of Bolshevism and other bad elements.

Trust and confidence must start with the higher officials of coal companies. Confidence in the men employed in the mine will, in time, develop a like confidence of the men in the goodwill and well meaning of their employers. Let us hope that this condition will increase and prevail and that the labor troubles of the past will rapidly disappear under its influence.

Connellsville, Pa. JOHN W. SWOPE.

Co-operation Among Mine Officials

Letter No. 8—The letters on the need of co-operation among mine officials should be read by all mine foremen, superintendents and managers. Many good ideas have been presented that are worthy of consideration, and the adoption of some of them will certainly prove worth while in building up and strengthening the organization.

One thought that I have in mind is that the relation between a mine foreman and his superior officer should be such that if an occasion arose in the mine that called for immediate and independent action on the part of the foreman, he would not be humiliated later by receiving a severe reproof.

HUMILIATING THE MINE FOREMAN

It goes without saying that a foreman called to act independently, as occasion may demand, will use his best judgment, though he may err, as results sometimes show. But, when a foreman is humiliated by receiving a severe reproof at such time, one of two things will surely happen if he is a true man. Either he will resign his place, or make up his mind then and there, that he will never again take the initiative.

Foremen should always be willing to submit all matters of importance to their superiors in office. An honest, well meaning foreman will do this, although it cannot be denied that an occasion will arise when he will be compelled to act on his own authority.

There are mines where a foreman seldom meets his superintendent, without being called to task for some action, trivial though it may be; or asked to explain some increased item of expense on the cost-sheet. These are not auspicious times for making the best showing in the operation of a mine. On this account, it is all the more important that there should be perfect understanding between the officials in charge of the several departments of the work; and this will go far to avoid unpleasant relations between them.

For the success of mining operations, there should be a team-spirit in the organization, from the trapperboy to general manager. A selfish and distant attitude on the part of an official is sure to result, sooner or later, in a large labor turnover, petty strikes and lockouts.

FAIR TREATMENT AND GOODWILL ACCOMPLISH MORE THAN FORCE AND COERCION

On the other hand, fair treatment of men will show in the increased production of coal, at a reduced cost per ton. The co-operation needed to effect this can only be secured through goodwill. Formerly, labor was loyal, because it was afraid to quit; but, today, conditions are different and unemployment has no terror for the workman. Labor can only be retained through the cultivation of interest and the expression of goodwill. But, it can be said with certainty that these will not fail to produce results.

Attention has been drawn to the fact that the day of force and coercion is past and the Golden Rule, suggested by John Rose when writing on another subject in *Coal Age*, must now take its place. Without exaggeration, it can be assumed that 90 per cent of men wish to deal fairly with each other; and it is not difficult to suppose that the remaining 10 per cent can be won by an appeal to reason.

Explain to a man who is wasting time and material, that he is throwing away what is not his own. Reason will cause him to understand that, in thus hindering the company who employs him, he is hindering himself. The man who loads slate with his coal, knows that his act will give the mine a bad reputation on the market, and lessen the chances of steady work.

Altoona, Ala. JOHN JONES.

Letter No. 9—It would seem that the need of co-operation was set forth so prominently in the recent discussion, in *Coal Age*, on the "Efficiency of Mine Officials," that further comment would be mere repetition. However, I want to emphasize the fact that co-operation, in its broadest sense, is not an abstract idea but a vital force without which little of real value is to be accomplished.

Reflection on the ideals and accomplishments, in life, causes one to realize that it is easy to speak glibly on co-operation; but a far more difficult matter to put our words into action. Co-operation is a lofty ideal. Its practice means the setting aside of our selfishness and working conjointly with another for a common purpose designed for the betterment of each.

As an ideal, co-operation appeals to us in every way; but its realization is kept at a safe distance, because of the natural selfishness of the human heart, the same now as throughout all time. Self-examination convinces us that we are each a mass of inconsistencies; our acts belie our words, until we are at variance with and strangers to ourselves.

Considering the question of co-operation in mining, from a practical standpoint, one is constrained to inquire as to what the term means and its application in practice. An honest study of industrial conditions makes clear that men of various ideals, temperament and education are brought into close touch with each other. They are associated in a common purpose, each with a selfish end in view; namely his own personal profit. Naturally, there is a conflict of individual interests which develops a restlessness on the part of each one involved in the transaction.

WHAT REAL CO-OPERATION MEANS

Here, then, is the opportunity to co-operate. Will either party put this ideal into action? Will they apply the Golden Rule and each treat the other as he would be treated himself? That would mean a sacrifice of possible attainment. It would mean standing, for a moment, in the other man's shoes and getting his viewpoint and appreciating his needs, which would eventually determine a more equable division of individual rights.

Co-operation is simple. It means going along with another; working side by side in a common cause; drowning personal ambition and profit in feelings of goodwill, sympathy and help, one for another. How many of us can rid our minds of the evil disease that pervades our selfish natures? How many of us can center our efforts on a closer fellowship with our associates in the industries in which we are engaged? We all have the power to make life brighter for a fellowworker when simply a cheery word, timely spoken, will dispel discouragement and bring success out of failure.

FACING THE STERN REALITIES OF LIFE

Turning then to the practical side, we face the stern fact that all must work to live. Many have the false notion that they live to work, forgetting the old saying "All work and no play makes Jack a dull boy." Plainly, it is our duty, as individual workers, to contribute our part to the brightening of the lives of fellowworkers, by sharing with them the ups and downs, the successes and failures, common to all industries. Genuine co-operation means the taking of a deeper interest in the work in hand. Where such interest is compelled by regulative measures and forced circumstances, the work and life itself becomes a monotonous routine.

Let me say in closing, that nothing is more certain than the fact that, in whatever way we strive and however well we may succeed in securing our own profit, we can take nothing with us when we go hence. Therefore, the fact remains that there can be no profit whatever in our lives, apart from the enjoyment of fellowship and co-operation that will lift the burden from the shoulders of another.

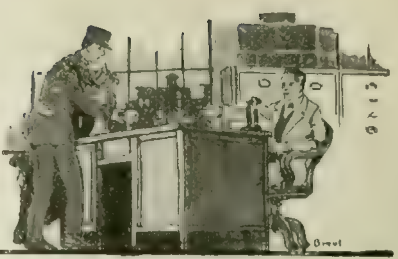
To reap the greatest benefit, co-operation must be genuine and prompted by a desire to be helpful. To this end, it is necessary to cultivate the simple faculty of human fellowship, which is possessed by all to a greater or less degree. In writing thus, it has been my desire to show that co-operation is not a passing fancy, but a real factor that is being practically considered by eminent men today, and is particularly applicable to coal-mining conditions.

Ladysmith, B. C., Canada. WILLIAM WESNEDGE.

Inquiries of General Interest

Answered by

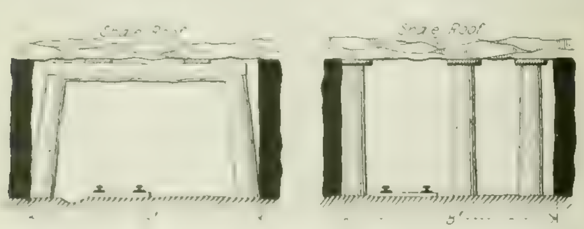
James T. Beard



Timber Booms or Crossbars

In going about the mines, it is common to see roads, travelingways, rooms and air-courses, having a good shale roof that is free from slips or other faults, where double timber is used, instead of posts. This consists of a boom or crossbar placed against the roof and supported by a prop at each end of the bar.

While such timbering gives a good roomy appearance to the entry, it always seems to me that the use of the boom is unnecessary when driving entries and rooms under a good shale roof. So often I have observed the boom bending under the weight of the strata above, or even broken. At other times, I have seen the ends of the booms crushed where it rests on the heads of the two posts. Often the boom has given away and the road is blocked with great falls, which cause much delay, until the road can be cleaned. I am wondering if a better method of timbering places that are eight or ten feet in width would not be to set posts along the roadside with good cap-pieces against the roof. Would there not be a saving if these crossbars were set as props in the manner I have indicated in the accompanying sketch, which shows both the method of supporting the roof with a boom resting on two posts and the plan I suggest of posting the entry.



To my mind, timbering with posts gives a better support to the roof, in the place it is needed, than is possible with a boom spanning the entry. The labor of setting timber is much less than that required in double timbering. There is also provided a good traveling space between the rib and the posts at the side of the road. My idea is that this plan would give better support to the center of the entry. I am assuming, of course, that the ribs are good solid coal. Kindly explain what objection there is, if any, to this plan of posting an entry, 8 or 10 ft. wide, under a good shale roof.

Nova Scotia, Canada. MAC.

It frequently happens that an entry 8 or 10 ft. wide, under a good shale roof will require little timbering when the roof strata is of a nature that does not cut under the action of the air. There is always an objection to standing posts on a haulage road, owing to the danger of the posts being knocked out by a derailed car, or men being caught between a post and a passing car. These dangers have often been referred to in *Coal Age*, and different methods explained for avoiding the standing of post timber on roads. One of these methods is to cut hitches in each rib a short distance below the roof, to enable the cross bar that spans the road to be slipped into the hitches. Another method is to support the crossbar on two short legs that rest in suitable hitches cut lower down in the rib.

In the opinion of *Coal Age*, where the roof above a road or entry requires support some form of double timbering is better than the posting described by this correspondent. A substantial form of post timbering is always advisable at the face of a room, but few will deny that double timbering is better on a roadway or entry where haulage is performed. It should be stated that a crossbar must never be wedged at its center. Instead, two wedges should be driven between the roof and the bar, a short distance from each end. This plan avoids throwing the weight of the sagging roof on the center of the bar; tending to arch the weight and throw the roof pressure on the supporting legs at the two ends of the bar.

Recharging Storage Batteries

Kindly inform me if the recharging of a storage battery on a mine locomotive will generate a gas that is ignitable, and if so, what is the cause and how can it be eliminated? Has there ever been an explosion occurring in a recharging room in a mine.

Canaanville, Ohio. H. CUNNINGHAM, Supt.

The recharging of a storage battery on a mine locomotive will generate hydrogen gas in sufficient quantity to prove dangerous under certain conditions. The quantity of gas generated will be greater if the recharging is carried too far, which is very liable to happen in mining practice by reason of the person in charge of the work neglecting to give it the careful attention required.

When the batteries are fully charged the current should be at once shut off, as otherwise overcharging will take place and hydrogen gas will be set free in larger quantity. In shaft mines operating storage-battery locomotives, the batteries must be recharged underground, and care must be taken in that case to prevent accident. The recharging of the batteries must be done in a well ventilated place where there can be no danger from a possible accumulation of gas. The attendant must not allow the batteries to become overcharged. In drift and slope mines the locomotives should be run to the surface and the batteries recharged in the open air, thereby avoiding all chance of trouble.

Where recharging of batteries is performed in a recharging room, the place must be thoroughly ventilated and no open lights permitted. We have no record of an explosion having occurred from this cause in a mine, but shall be glad to be informed if such has occurred.

Examination Questions

Answered by

James T. Beard

Mine Inspectors' Examination, Held at Pottsville, Pa., March 30, 31, 1920

(Selected Questions.)

Ques.—If the horsepower of an engine is 60 and the water gage 1.5 in., what quantity of air will you expect to get, assuming the horsepower of the engine is 70 per cent efficient?

Ans.—The efficiency of the engine being 70 per cent, the effective power on the air is 0.70(60 × 33,000) = 1,386,000 ft.-lb. per minute. A water gage of 1.5 in. corresponds to a pressure of 1.5 × 5.2 = 7.8 lb. per square foot. In this case, therefore, the quantity of air that should be passing under this pressure is

$$Q = \frac{u}{p} = \frac{1,386,000}{7.8} = 177,700 \text{ cu.ft. per min.}$$

Ques.—A slope is sunk, in a vein 6 ft. thick and pitching 30 deg., to the second lift. The east gangway is driven 1,000 ft. and the west gangway 2,000 ft. from the center of the slope, both on an ascending grade of 6 in. per 100 ft. Both gangways are 8 ft. wide at top, 12 ft. at bottom, and 7½ ft. high. There is a tunnel 12 ft. wide, 8 ft. high, on center line of slope, driven level to overlying veins in which there is a brick dam 150 ft. from top slate of slope vein. The slope is filled with water to a point 288 ft. on the pitch above foot of the slope. What is the total pressure on the face of the dam, and how much water is in the slope, assuming 45 per cent of the vein has been mined?

Ans.—It is difficult to understand the meaning of the statement at the close of this question; namely, "45 per cent of the vein has been mined." If this statement means that 45 per cent of the coal in each lift has been taken out, the distance between the lifts or the distance the coal is worked out above each gangway should be given. Even then, it could hardly be supposed that the space left by the extraction of the coal would remain open and be filled with water to the level indicated by the head of water in the slope. Though the question does not so state, it may be assumed that the two gangways and the tunnel mentioned start from the foot of the slope at the second lift. The width of the slope is not given.

It is a simple matter to calculate the cubic contents of the slope, assuming its width to be the same as that of the tunnel, and to make the same calculation for the tunnel and the two gangway levels at the second lift, taking the height of the tunnel as 8 ft. while the height of the slope is supposed to be the thickness of the vein, or 6 ft.

Since the distance of the dam is measured from the top slate of the slope vein, the roof line extended to intersect the floor of the slope would increase this distance 12 ft., since sin 30 deg. is 0.5, and 6 ÷ 0.5 = 12. Again, the distance from this intersection to the foot of the slope is 8 ÷ 0.5 = 16 ft. Then, since cos 30 deg. is 0.866, we have ½(16 × 0.866) = 6.9 ft.; and 150 + 12 — 6.9 = 155.1 ft., which is the mean measurement of the water in the tunnel extended to its level in the slope.

Now, since the water rises in the slope to a distance of 288 ft., measured on the pitch from the foot of the slope, we have 288 — 16 = 272 ft. of slope distance filled with water. The length of the two gangways, east and west, less the width of the slope is 1,000 + 2,000 — 12 = 2,988 ft.

The sectional area of the tunnel is 8 × 12 = 96 sq.ft.; that of the slope, 6 × 12 = 72 sq.ft.; and that of the gangways ½(8 + 12)7½ = 75 sq.ft. The volume of water in these openings is, therefor,

Tunnel,	155 × 96 =	14,880
Slope,	272 × 72 =	19,584
Gangways,	2,988 × 75 =	224,100
	Total	258,564

The head of water above the center of the dam is 0.5 × 727 + ½(8) = 140 ft. The total pressure on the face of the dam, under this head, is (140 × 62.5 × 96) ÷ 2,000 = 420 tons.

Ques.—What is the total ventilating pressure required to pass 22,400 cu.ft. of air per minute through an 8 x 8 ft. airway 5,000 ft. long?

Ans.—The rubbing surface of this airway is s = 2(8 + 8)5,000 = 160,000 sq.ft. and its sectional area, a = 8 × 8 = 64 sq.ft. The pressure required to pass the given quantity of air is, therefore,

$$p = \frac{ksq^2}{a^3} = \frac{0.00000002 \times 160,000 \times 22,400^2}{64^3} = 6\tfrac{1}{4} \text{ lb. per sq.ft.}$$

Ques.—Of two airways under the same pressure, one 6 ft. wide, 6 ft. high, 5,000 ft. long; the other 8 ft. wide, 4½ ft. high, 5,000 ft. long; which will pass the greater quantity of air and why?

Ans.—The sectional area of the first airway is 6 × 6 = 36 sq.ft.; and that of the second, 8 × 4½ = 36 sq.ft. Since these airways have the same sectional area and are of the same length, the quantity of air each will pass, under the same pressure, will vary inversely as the square root of the perimeter. The perimeter of the first airway is 2(6 + 6) = 24 ft.; and that of the second, 2(8 + 4½) = 25 ft. The first airway having the shorter perimeter has a less amount of rubbing surface and offers less resistance to the passage of the air, on which account it will pass a larger quantity of air, under the same pressure, than the second airway, the ratio being $\sqrt{25}:\sqrt{24}$, or 5:4.9. In other words, when the first airway is passing 50,000 cu.ft. per minute, the second airway will pass only 49,000 cu.ft., under the same pressure.

Foreign Markets and Export News

Switzerland Will Rely Chiefly on United States for Coal

Since the time of the armistice, according to a report by the Secretary General of the Swiss Department of Economy, transmittted by Consul General Leo J. Kenna, Zurich, Switzerland has had to look out more and more for new sources of coal supply. Since the middle of 1919 England has helped out with certain quantities, but this amounted to less than 20,000 tons monthly. The United States, however, has made substantial shipments of coal and thus saved the country from a catastrophe. As, apparently, shipments from England during the coming months will be restricted, Switzerland is depending chiefly on the United States.

Swiss requirements of American coal in the near future will be about from 120,000 to 150,000 tons monthly, and authorities earnestly hope that the United States will be able to supply this quantity. A purchasing department has been added to the Swiss Legation at Washington by the Swiss Coal Association at Basel, which is charged with the purchase and shipping (securing freight space) of the coal.

The impossibility of obtaining the above-mentioned monthly quota from the United States would create a most difficult situation for the economic life of Switzerland, since the quantities expected from America can apparently not be supplied by European production.

It is already evident to what degree Switzerland is dependent upon shipments from the United States, as especially industry and the railways see their supplies steadily decreasing in consequence of the continuance of miners' strikes and the enforced limitation of exportation.

France Imports from Germany Coal Valued at 407,446,000 f.

Coal, coke and briquets composed the most important class of imports by France from Germany in 1919, the value of the imports of these commodities amounting to 407,446,000 francs, or 69 per cent of the total for all imports from Germany. In 1913 the value of the imports of coal, coke and briquets from Germany was 164,958,000 francs, or 15 per cent of the total imports from Germany.

While the value of the imports of coal has increased 147 per cent compared with 1913, the quantity has decreased from 6,071,307 metric tons in 1913 to 3,165,532 metric tons in 1919, a loss of 48 per cent.

Coal Shortage an Obstacle to Belgian Rehabilitation

One of the chief stumbling blocks in the way of Belgium's industrial rehabilitation, Vice Consul Charles W. Drew, Jr., Brussels, reports, is shortage of coal. This factor tends to limit production and increase living costs, and so lies at the root of the constant demand for higher wages by the laboring classes.

The shortage of coal has been so acute that many factories have been forced to close or operate on part time. This has necessitated an indefinite continuance of Government assistance to the unemployed.

Exports and Imports of Coal and Coke During February and the Eight Months Ending in February*

Coal and Coke Exported	February 1919 Tons	February 1919 Value	February 1920 Tons	February 1920 Value	Eight Months Ending February 1918 Tons	1918 Value	1919 Tons	1919 Value	1920 Tons	1920 Value
Coal:										
Anthracite	216,018	$1,595,795	272,368	$2,388,712	3,300,105	$19,928,317	3,009,624	$20,484,427	3,160,955	$26,925,086
Bituminous	683,708	3,126,985	1,168,806	6,384,095	13,948,930	54,574,371	13,178,265	53,841,575	13,511,072	66,324,297
Exported to:										
[illegible]	4,933	32,500	81,739	531,953	196,731	779,927	16,236	104,367	1,614,705	10,017,224
Netherlands	15,076	103,519	49,634	324,801			70,030	460,880	725,553	4,226,205
Sweden			8,886	60,547					170,858	1,060,228
Switzerland			17,123	109,806					470,543	2,647,460
[illegible]	446,429	1,638,250	541,270	2,286,818	11,145,039	40,857,575	10,824,721	39,525,668	7,079,880	26,810,980
[illegible]	8,661	40,697	90,692	185,676	417,605	1,584,503	248,382	1,087,337	97,682	586,951
[illegible]	5,142	29,184	11,263	72,128	101,091	559,832	100,947	475,249	71,307	390,947
[illegible]	13,756	86,517	17,906	113,695	95,857	446,716	85,299	531,871	151,728	861,105
Cuba	40,644	262,319	130,846	856,511	864,488	4,312,168	732,249	4,620,623	786,992	4,925,890
Other West Indies	3,209	24,378	13,579	85,755	79,225	385,605	55,188	363,387	53,466	358,256
Argentina	38,993	240,101	70,902	469,739	154,336	803,901	133,911	818,983	516,300	3,349,473
Brazil	67,825	421,953	47,241	305,005	399,772	2,237,591	392,121	2,530,267	264,909	1,664,400
Chile	18,814	118,884	18,353	138,119	202,094	1,051,924	180,008	1,189,310	44,498	309,894
Uruguay.	12,007	76,621			44,438	241,539	247,173	1,528,916	85,913	550,149
Other countries	8,220	52,062	129,372	843,542	248,254	1,313,090	92,000	604,717	1,376,738	8,475,135
Coke	48,806	377,758	59,866	518,432	767,171	5,620,780	884,669	7,130,162	473,235	3,770,759

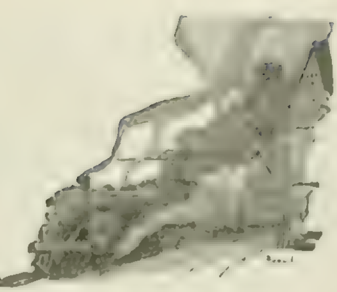
[illegible] bunker coal laden on vessels engaged in the foreign trade, which aggregated during the month and eight months ending February, as follows: February, 1919, 417,841 tons valued at $2,954,104; 1920, 512,886 tons, valued at $3,570,370; eight months ending February, 1918, 4,103,855 tons, valued at $20,298,597; 1919, 3,879,568 tons, valued at $23,006,949; 1920, 5,184,011 tons, valued at $34,524,091.

COAL AND COKE IMPORTS FOR FEBRUARY AND EIGHT MONTHS ENDING FEBRUARY

Coal and Coke Imported	February 1919 Tons	February 1919 Value	February 1920 Tons	February 1920 Value	Eight Months Ending February 1918 Tons	1918 Value	1919 Tons	1919 Value	1920 Tons	1920 Value
Coal:										
Anthracite	4,250	$31,342	1,027	$8,989	10,692	$40,922	43,885	$283,768	52,644	$368,607
Bituminous	55,834	331,914	87,890	489,666	927,345	3,855,850	758,367	4,126,335	728,004	3,986,289
Imported from:										
United Kingdom			200	800	19,198	157,542	2,186	10,490	6,496	75,178
Canada. .	55,834	331,914	85,852	481,000	898,103	3,655,857	741,776	3,996,922	666,740	3,624,172
Japan					7,889	32,372	12,714	112,435	6,312	72,588
Australia ...			731	3,159	1,413	5,157	1,369	4,869	46,202	197,810
Other countries ..			1,107	4,707	742	4,922	322	1,619	2,254	16,541
Coke	1,258	12,469	1,982	20,679	18,174	132,588	15,205	138,730	12,251	119,741

* Compiled by Bureau of Foreign and Domestic Commerce.

Production and the Market



Weekly Review

Railroad Strike Continues to Affect Coal Production—Situation Desperate in Some Sections of the East—Early Improvement Will Still Leave a Large Deficit That Will Keep the Market Strong the Remainder of the Summer—Prospects for Coal to Meet Lake Program Very Poor.

WORSE conditions than during the strike last November now confront the bituminous coal trade. At that time the country was well stocked and there were millions of tons of coal on the rails, a supply that lasted for many weeks even with the cold weather. Today, in the grip of the outlaw railroad strike, without reserve supplies, consumers are helpless and producers are able to assist them but little.

Because the railroads are unable to move the empties back to the mines or the loads from the coal fields except to a very limited extent, many mines are idle and the remainder are working irregularly. East of Chicago industrial plants are forced to work part time, and in some instances, to close entirely.

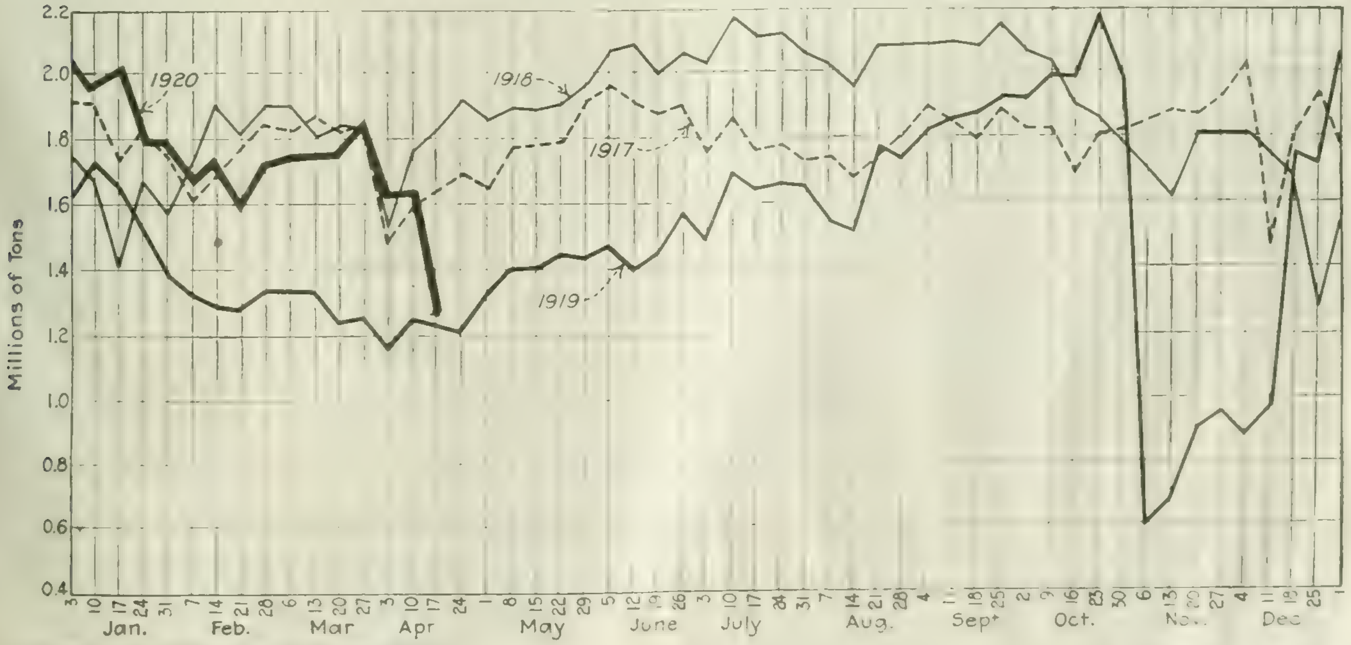
Among the plants which have been obliged to shut down owing to lack of coal are those of Cluett, Peabody and Co., at Troy, N. Y., the Eastern Malleable Iron Co., at New Britain, Conn., and at some other points, the Hunt-Spiller Co. at Boston, the Chevrolet Motor Co. at Tarrytown, N. Y., and the MacEwen Bros. paper mill at Whippany, N. J. There are many companies both in New England and in New York who are finding it impossible to run because of the lack of coal. MacEwen Bros. had twenty-five of their cars confiscated in one week, the railroads taking high-grade low-sulphur coal and using it for engine fuel. The Pennsylvania R.R. is reported to be confiscating coal quite indiscriminately, having no regard to its character or suitability for locomotive use.

In the East the situation in the coal fields is particularly acute—for example, the Monongahela Ry. has five thousand loaded cars on its line which have been standing for nine days, and practically no empties have been put in at the mines. The authorities at Pittsburgh demand permits for the shipment of cars, but when inquiry is made for permits at the headquarters of the railroads they respond by saying that none is required.

From Brownsville, Pa., to Fairmont, W. Va., the mines as an aggregate, received only thirty-five cars last Friday, and the operators were allowed to consign these only west. The Pennsylvania R.R. is moving cars which were weighed before the strike, but is unwilling to take care of any coal which was loaded since that time. The Baltimore & Ohio is running about 40 per cent., but no coal is allowed to go off its lines. In consequence a large amount of coal is moving to Curtis Bay, the shippers not having opportunity to deliver it elsewhere.

It is needless to say anything about prices because nobody has any coal to sell. It is true that some coal has been sold from storage, but the volume of sale is so small that no reliable inferences can be drawn from the price for which it is sold.

Average Daily Production of Bituminous Coal*



*From weekly report of Geological Survey.

Reports From the Market Centers

New England

BOSTON

Market Firm—Spot Prices Soaring—Traffic Troubles Unravelling Slowly—Few New York Piers in Operation—Hampton Roads Despatch about Normal, but Light Dumpings for New England—Distributors Inland Have Little Coal Available and Command High Prices — Anthracite Domestic Sizes Coming Forward Slowly—Steam Sizes Quiet.

Bituminous—The market here shows great strength. Buyers find it extremely difficult to arrange purchases with reliable shippers, for the reason that labor and other conditions at the mines are so unsettled. Most operators have sold a large proportion of current output, and some steam-users are in desperate straits to secure spot coal. Most manufacturers have so many orders for their goods that they do not quibble about price and spot coal sales are made at higher and higher prices—the better grades at figures well in excess of $5 per net ton.

New York piers being out of commission, because of yardmen's and longshoremen's strikes, has led to an extra volume available for destinations all-rail; some shippers selling at quite remunerative prices, others confining themselves to making better deliveries on contract. When the tidewater piers reopen it is probable there will be quite light shipments all-rail for a considerable period.

Bunker and Export Trade Is Attractive

Bunker and export trade is attractive for low volatiles, high-grade Pennsylvania coal being quoted here at $5.50 per net ton, but this does not seem representative. The trend is upward, and there is likely to be a further swing to higher levels in the course of the next fortnight.

The New York Central embargo against the Boston & Albany and the Boston & Maine was lifted on April 16, and shipments are moving toward New England. The railroads are quite short, especially the New Haven, and consignees expect that a heavy percentage of coal will be confiscated for railroad use. Car-supply is improving quite gradually, but motive power is short throughout this territory.

An attempt to move coal by the rail route occasions tie-ups and embargoes. Reserves cannot be piled up under anything like present conditions. Traffic is in an extremely bad way. The switchmen's strike did not break out in New England but the results of the strike elsewhere were acutely felt here in the non-arrival of all kinds of freight, including coal.

Only two of the New York piers have been in operation the past fortnight. Enough pier space has been available for bunkering important steamers, and most of the railroads have embargoed coal for these piers. The Philadelphia piers resumed loading on April 19. In view of all this there has been a tendency here among coal factors to send to Philadelphia, barges that ordinarily would load at the New York piers. This has been particularly true of gas coal.

At the Virginia terminals—Norfolk and Newport News—steamers are now receiving customary despatch. To piece out cargoes some high prices have been paid for spot delivery, $9 having been reported for high grade Pocahontas. Heavy tonnages are being loaded for overseas and for Government requirements, but loadings for New England are much restricted. Practically no spot coal is heard of here in the open market. What Pocahontas and New River comes forward is moving in customary channels, but undeniably there is less coming to this section on contract than was the case in 1919, a year of extremely low tonnages.

High prices continue to be charged for prompt coal at the various rehandling points for shipment inland; $11 on cars Providence and $12 at Portsmouth and Portland are again reported. This level is justified by the heavy demurrage charges that accrued at the loading ports a fortnight ago.

Current quotations on bituminous at wholesale range about as follows:

F. o. b. mines, net tons—Clearfields, $4.00@4.75; Cambrias and Somersets, $4.35@5.15. F.o.b. Philadelphia, gross tons—Clearfields, $6.35@7.18; Cambrias and Somersets, $6.72@7.62. F.o.b New York, gross tons—Clearfields, $6.70@7.55; Cambrias and Somersets, $7.10@8.00.

Pocahontas and New River are quoted at $4 per net ton f.o.b. mines for contract, and up to $6 per net ton for spot coal. This would mean $6.54@8.66 f.o.b. vessel.

Anthracite—There is increasing uneasiness over the extreme slowness with which domestic sizes are coming forward. Embargoes are still the rule on most of the all-rail routes and the tie-up of the New York piers has accentuated the serious outlook for the coming season. A strike among marine workers is said to be brewing for May 1, and that with an anthracite strike would bring the movement of hard coal to a standstill.

Prices on stove and chestnut are soaring, due to the reported tactics of some operators. As high as $10.25 has been heard of for spot coal. Grand Jury proceedings have been instituted in the Federal Court here with a view to investigating the recent advance of $1 per net ton in the retail price in Boston.

Steam sizes are remarkably quiet. The same embargoes that prevent the shipment of domestic sizes are applicable against the buckwheats also, but industrially there is not the anxiety for bituminous substitutes that was the case a few weeks ago before the cold weather had gone.

Tidewater

NEW YORK

Anthracite Situation in Bad Shape—Rail Strike Delays Shipments—Poor Car Supply Hinders Production—Conferences Over Miners' Wages Continue—Local Trade Needs Coal—Bituminous Shipments Slow—Few Cars to Load and Mines Idle—Railroads Take Coal—Export and Bunker Demands Heavy.

Anthracite—Continuance of the outlaw railroad strike and the practical suspension of shipments to tidewater have caused a serious shortage of coal here. The local market is practically without activity. Receipts at the loading piers have been far below normal and actual needs, but there have been no serious complaints from consumers because of the stocks in storage previous to the railroad difficulties.

Trade Is Impatient

The trade is becoming impatient at the delay of the operators' and mineworkers' representatives in deciding upon a new working agreement. So far no inkling has come from the conference as to what action the operators will take on the demands of the miners. As the new agreement will be retroactive as of April 1, shippers are postponing billing their sales until the new prices are announced.

Conditions at the mines are not favorable to heavy shipments. The workers are restless because of the long conferences and the car supply is bad. Union leaders have consented to a continuance of work but the men look upon the prolonged discussions as unnecessary and already have shown signs of jumping the traces.

Current quotations for company coal per gross ton at the mine and f.o.b., tidewater at the lower ports are as follows:

	Mine	Tidewater
Broken	$5.95	$7.80
Egg	6.35	8.20
Stove	6.60	8.45
Chestnut	6.70	8.55
Pea	5.30	7.05
Buckwheat	$3.40@$3.75	$5.15@$5.50
Rice	2.75@3.25	4.50@5.00
Barley	2.25@2.50	4.00@4.25
Boiler fuel	2.50	4.25

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Most of the coal now being produced is going to the West and New England, where supplies are low and consumers are anxious to fill their bins for next winter. The smaller sizes are in constant demand here with supplies way down. Owing to curtailed mining, most of these coals are being used in the boiler rooms at the mines.

Bituminous — Non-arrival of coal during the past week has caused many manufacturing plants to be on the verge of stopping operations. Tidewater receipts have been low, the railroads confiscating most of the coal on its way to this market. Contract coal does not move as easily as a week back.

Spot trading was almost unknown last week. There was no coal available and shippers who were fortunate enough to get some dumped saw that their contracts were taken care of.

Many of the harbor boatmen are still at odds with their employers, while those who are willing to work ask from 50c to $1 per ton towing charge. There are nearly 100 boats anchored near the leading piers waiting for coal.

The miners are exhibiting considerable uneasiness because of the poor car supply. Nearly 50 per cent of the mines were said to be idle on April 23 through the failure of the railroads to provide cars. The Pennsylvania R.R. has issued instructions that cars for fuel coal only be placed at some mines.

Confiscation of coal by the railroads continues, resulting in considerable trouble to the consignor who must endeavor to secure other fuel for his customer. Payment for coal so taken by the railroads is slow, but the trade expects that it will be at the full price at which the coal was billed originally.

Demand for coal for export is active. Freight rates have advanced in the neighborhood of $2 per ton, but shipments are said to be strong. Considerable more bunker coal could be used here were it available. The West is reported as receiving a large proportion of the present production. Heavy tonnages are also going into New England via all rail. Good gas coal is in heavy demand, but operators are so tied up with unfilled orders that they refuse to give quotations. Shippers have for the most part let contract holders know what additional cost they will be expected to pay for their coal because of the 27-per cent increase granted the mine workers. Where the contract provides for the change, the manufacturers will pay the increase.

Quotations for immediate delivery were hard to get here during the week ended April 24. Good coals were quoted from $3.75 to $4.50 f.o.b. mines, while loaded boats were held at from $10 to $12. No questions were asked concerning the quality or grade. Car supply on the Pennsylvania, Baltimore & Ohio and Western Maryland lines was about 50 per cent, while on the New York Central it was about 60 per cent.

Quotations for coal at the mines ranged from $4.50 to $4.75 for Shawmut; $4.75 for Buffalo, Rochester & Pittsburgh grades; while along the New York Central lines Pool Nos. 10 and 11 were being held at around $5, and Pool No. 18 around $4.50. Central Pennsylvania coals were being quoted around $4.50.

PHILADELPHIA

Anthracite Dealers Flooded with Coal—Embargo on Foreign Roads the Cause—Not Expected to Last Long—Dealers Stock to the Limit—Consumers Anxious for Delivery—Stove and Nut in Chief Demand, but Strong Call for Egg and Pea—Growing Trade in Buckwheat—Steam Sizes All Taken—Bituminous Does Not Improve—Light Tonnage Comes In—Spot Coal Runs from $5 to $5.70 at Mines—Light Contract Deliveries.

Anthracite—The unexpected has happened in the anthracite retail trade—the dealers have more coal than they know what to do with. This unusual condition is accounted for by reason of the connecting lines refusing to take any freight from the anthracite roads. To move their product, the smaller shippers solicited orders from retailers along the line; this was not difficult until the big companies began to make consignments, regardless of orders, to their regular customers, then the dealers had to cry quits. Many of the dealers ran up heavy car demurrage bills rather than miss the chance of storing a heavy tonnage at this time. But there was difficulty in securing the necessary labor to unload the coal and the consignees had to have shipments held up.

Delivery equipment has been kept active and it will not be long before the stocks in the yards again vanish. All see that the time is not far off when the deliveries from the mines will be extremely small—just the moment that the foreign lines are open for consignments. Due to the embargo against the city proper, the outside points at first received much heavier shipments, but later many cars that had been refused along the line were diverted to local dealers.

Fortunately the weather for the first time this season is quite summery, there is but little demand for current consumption and the dealers are enabled to put their full energy into filling the summer orders.

The question of price concerns all. The big companies still ship at the April figures, but subject to whatever wage arrangement is made with the miners. One independent is said to be pricing coal at $9.25 at mines for egg, stove and nut, and retailers are making a retail price based approximately upon this figure. Others are making deliveries to the trade well known to them, with the understanding that bills are to be rendered later, after the wage matter is concluded.

The great preference of the consumer continues to be for stove and nut, although pea coal is being called for in an amount almost unheard of at this time of the year. Usually pea is not heavily stored, but the consumers are taking advantage of the opportunity to get as much of this size in as possible, thinking there will be little pea coal to be had after a short time. Egg coal is also being called for in heavy quantity, as the adoption of hot-air furnaces in the last few years has greatly increased the demand for this size.

There is an increasing demand for buckwheat coal from the domestic trade, and the gradual increase from year to year indicates that in a short time most dealers will be carrying this size for house heaters, particularly if pea coal is eliminated as a domestic size.

There is a good supply of buckwheat coming into the market, principally to manufacturers, and they are taking full advantage of the situation to stock to the limit, as they realize that the company price of $3.75 at the mines will not long remain in effect. The same can also be said about rice and barley, especially since the companies have as yet been unable to resume shipment from the storage yards, due to lack of empties for loading.

Bituminous—The bituminous situation is discouraging, to say the least, as quite a limited tonnage is coming in. The demand from all quarters is strong, which is borne out by the fact that numerous industries are closed down for the lack of fuel. The iron trade has been particularly affected, there being an almost complete dearth of gas coal.

The spot market price for Fairmont and Westmoreland is about on a level, ranging from $5.25 to $5.70 for the ¾-in. lump, with mine-run from $5 to $5.20 these prices f.o.b. mines. In the steam coals those produced in Pennsylvania are selling on the market from $5 to $5.50, and with little to be had at such figures.

There is quite a little feeling shown by the concerns having contracts, at the very limited quantity of coal received, even under present conditions. The fact that coal can be had on the spot market at fancy prices annoys them. In addition, often when coal is consigned it is confiscated by the railroads for engine fuel.

BALTIMORE

Expected Relief Fails to Materialize—Bituminous Mines Closing Down—Spot Prices High—Contracts Delayed—Exports Continue Heavy—Anthracite Situation, a Waiting Game.

Bituminous—Coal men and consumers hoped that there would be a fairly quick recovery as to car movement, following the end of the railroad strike, but it failed to materialize. Starting the week with a little more than 50 per cent car supply on the Baltimore & Ohio, of around 70 per cent on the Western Maryland, and the Pennsylvania reporting a fair run, the supply on all lines has dwindled until it is now not much more than around 30 to 35 per cent.

A number of mines in the Georges

Creek and Upper Potomac regions report closing down as a result of lack of cars, the same with the Somerset and Fairmont sections. Coal men here are forced to use considerable discretion in distribution in order to prevent real trouble at local plants.

The usual stocking-up time is now entered with no immediate chance of using it to advantage. Meanwhile spot prices remain high. The good to best coals on immediate sale are now bringing (in this territory) around $5 to $5.50 f.o.b. mines.

Grades are not counting as the consumers are merely seeking coal to tide over an emergency. Contracting is still delayed by many coal firms. Others are entering contracts all the way from $3.75 to $4.50 f.o.b. mines.

The export movement goes on briskly. For the first half of the month the cargo loading here for foreign account ran close to 150,000 tons, and the month's total for export coal loading may run to close 400,000 tons.

Anthracite—The hard-coal situation here has resolved itself largely into a waiting game. Of deliveries of coal for immediate use the sales are being made strictly on existing schedule since last October.

For storage for future burning, the trade is merely taking orders on the basis of pay at the schedule to be set for the time of delivery. Some few dealers have accepted payment in advance at around 50c. a ton above present schedule from old customers, but the majority look for nothing less than a dollar advance over the present wholesale schedule.

Lake

BUFFALO

Coal Coming in Better, But Uncertain—More Goes to Canada—Miners Not All at Work Yet—Anthracite Demand and Loading to the Lakes.

Bituminous—Improvement is so slow that the trade is wondering what will overtake it next. It will be some weeks before the movement is regular. The shortage in Canada has not been as severe at any time as it was here; at the worst only a few concerns had to shut down.

The shortage is as yet mostly on account of the failure of a good many miners to go back to work, claiming they are waiting for wage adjustment. The Allegheny Valley men are working much more generally than those further south, quite a good many in the Pittsburgh district still being idle. And now comes the Lake opening, which will draw much coal away from the rail route through this market.

The ice off this harbor gave way sooner than was expected, so that vessels go through it freely; boats are now going out light to load coal at Ohio ports. Business generally starts up slowly, mostly on account of there being no accumulation of coal at the Lake ports to load. The need of fuel on the upper Lakes will hurry it forward.

Bituminous prices are still unsteady, but not much is heard of big charges as was the case when the Government prices were thrown off. The trade will need to act with caution, for if the efforts of the railroads to increase the car supply succeed then it will weaken the market at once. Quotations must yet be regarded as mostly nominal at $5.75@$6 for Allegheny Valley mine-run (no other size made), $6.25@$6.50 for Pittsburgh and No. 8 lump and three-quarter, $6.25 for mine-run and $6 for slack, with some Youghiogheny gas at $6.75, all per net ton f.o.b. Buffalo.

Anthracite—Only good about the situation is that somehow the supply did not give out during the switchmen's strike. Anthracite was in better supply on track than bituminous when the strike ended. The demand is now mostly for next winter's use, in the hope of setting it before the prices go up.

The Lake coal trade is bound to be slow for awhile. Only one company has any coal to load into vessels; other companies have no notice of shipments for Lake loading yet. Summer shipments in the Lake trade will need to be heavy to insure a full winter's supply. It will take a big summer movement to satisfy the upper Lake trade.

CLEVELAND

Many Local Plants Working on Part Time—Months Before Return to Normal—No. 8 Coal Advances—Anthracite and Pocahontas Unchanged—Lake Trade Outlook Worst in Years.

Bituminous—Though coal roads into Cleveland—the Baltimore & Ohio and Wheeling & Lake Erie—still are the hardest hit by the railroad strike, receipts are increasing daily. Many of the local plants are on part time or have closed certain departments. That this condition will continue indefinitely is greatly feared. Even with strikers returning daily, conditions are little improved, and it will take months for the railroads to get back to normal. Comparatively little stocking will be possible this spring and early summer, and operators look for prices to stiffen up considerably. It is hoped that the government will intervene and thus cause the prices to become more uniform, which will help the trade in general.

A good-sized block of No. 8 slack has been closed at $3.75 f.o.b. mines, an advance of 50c. over the point where more conservative operators hoped to hold contracts. For spot No. 8 slack and mine-run retail dealers are forced to pay $4.25@$4.50 f.o.b. mines, against $4 recently. The entire bituminous outlook is for higher prices, with steam-coal users seeking probably 50 per cent more than will be available all summer long. Some No. 8 mines have not operated for two weeks. The average for the district is not over 15 per cent.

Anthracite and Pocahontas—Prices on both grades have been unchanged. Demand has increased slightly, the railroad strike impressing upon domestic consumers the need for early buying. The expected advance in anthracite prices has not yet materialized.

Lake Season to Open Soon

Although the first bituminous coal cargo of the season has been taken to Lake Michigan ports, the first coal of the season probably will not get to the head of the Lakes before May 1. So acute is the shortage of fuel at upper Lake ports that tugs can scarcely be bunkered. What little coal is moving to Lake Erie ports is being confiscated by the railroads. Not in years have the prospects of the Lake trade been so poor, and a 20,000,000-ton season appears more probable than a 30,000,000-ton one.

Prices of leading grades of coal, per net ton delivered in Cleveland, by dealers follow: Anthracite—Egg and grate, $12.20 @ $12.40; chestnut, $12.50 @ $12.70; and stove, $12.50. Pocahontas—Shoveled lump, $10.50, and mine-run, $9.25. Domestic bituminous—West Virginia splint, $8.75; No. 8 Pittsburgh, $7.75; Millfield lump, $8.50, and cannel lump, $11. Steam coal—No. 6 and No. 8 slack, $7.75; No. 6 and No. 8 mine-run, $7.75; and No. 8 $\frac{3}{4}$-in. lump, $8.

MILWAUKEE

First Coal Cargoes of Season Arrive—Weather Milder—Coal Situation Relieved — Coke Scarce — Prices Unchanged.

The arrival of two cargoes of coal—one of 9,000 tons of anthracite and the other of about 7,000 tons of soft coal—together with a spell of milder weather, relieved the Milwaukee coal market of some of its tenseness, and from now on the situation promises to grow constantly easier.

Dealers had been unable to secure either coal or coke to supply an urgent demand, and steamers which were ready to sail could not secure bunker coal. Pea coke was the only fuel available before the new cargoes arrived. A strike of coal handlers complicated the situation at the yards, but unloading operations were not entirely blocked. The rail supply was held down to a minimum by the railway tie-up. Prices continue unchanged.

Continued cold weather keeps the Milwaukee coal market in quite an unsatisfactory condition. Supplies of all kinds are scarce and dealers are unable to keep pace with their orders. Some consumers have been compelled to resort to wood for their furnaces.

A cargo of 9,000 tons of anthracite, which arrived since last week's report, remains in the hold of the steamer because of a strike of coal handlers. The cargo was due last December, but the steamer was forced to winter in the

Straits of Mackinac. Some coal is coming by rail, but this supply is spasmodic and uncertain on account of the railway strike.

No Changes in Price

The following price list is maintained at all Milwaukee yards and docks. These prices represent the cost to the consumer in the wagon at the curb, or at points where coal can be dumped into chutes. When coal has to be carried into the bins an extra charge of 75c. per ton is made. An extra charge of 25c. per ton is also made in the case of less than ton orders. Coke is delivered in bags, hence there is no charge for carrying in.

Anthracite:	
Chestnut	$12 70
Stove	12 60
Egg	12 40
Pea	11 70
Buckwheat	9 75
Bituminous:	
West Virginia splint screened	8 50
Hi Heat	8 50
Hocking screened	8 25
Pittsburgh screened	8 25
Pocahontas mine-run	9 25
Pocahontas screened	11 50
Cheerful chunks	10 00
Smithing	9 25
Cannel	12.50
Steam Coal:	
Youghiogheny screened	7 50
Youghiogheny pile run	7 25
Youghiogheny screenings	6 25
Pittsburgh screened	7 25
Pittsburgh pile run	7 00
Pittsburgh screenings	6 00
Hocking screened	7 25
Hocking pile run	7 00
Hocking screenings	6 00
West Virginia splent screened	7 50
West Virginia pile run	7 25
West Virginia screenings	6 25
Kentucky screened	8 25
Kentucky pile run	8 00
Kentucky screenings	6 25
Pocahontas mine run	8 25
Pocahontas screened	11 50
Pocahontas screenings	7 25
Smithing	8 25
Kanawha gas	Sold up
Bunker Coal (steamers and tugs):	
Pittsburgh lump	6 75
Pittsburgh pile run	6 50
Youghiogheny lump	7 00
Youghiogheny pile-run	6.75
Coke:	
Large sizes	13 25
Small sizes	10 75

Inland West

COLUMBUS

Outlaw Railroad Strike Cripples Traffic—Reduces Coal Output to Low Point—Railroad Fuel 60 Per Cent—Factories Closing Down—Reserve Stocks Exhausted—Demand Strong and Prices Firm.

With the switchmen's strike still on, little coal is being produced in the Buckeye State. Some cars are being furnished and moved to users located on the originating lines. Demand for all grades is strong and prices are firm.

Railroad Traffic Still Crippled

While the strike of switchmen appears to be slowly disintegrating, still enough of the workers are out to seriously cripple railroad traffic in almost all sections. This is affecting the coal trade to a large extent and has reduced production to a low point. Empties are slow in being returned and loaded cars are held on side tracks awaiting movement to destination.

The longer the strike continues the worse conditions are, with railroads hopelessly congested at various points. The encouraging indication is that strikers will soon return to work to await action on the part of the new Wage Board.

While the railroads are not using as much fuel as customary, still a considerable tonnage is required to take care of passenger traffic. It is estimated that out of the total production in Ohio, railroad fuel is fully 60 per cent.

Factories are closing down in every locality and industry is seriously affected on all sides. This applies more particularly to northern Ohio and to Michigan industrial centers. In central Ohio industry has not suffered to any great extent.

The price question is still unsettled, and until costs are thoroughly gone over and prices in the open market are adjusted, little contracting is anticipated, either for commercial tonnage or Lake shipment. Steam users, whose contracts expired around April 1, are buying on the market and most railroads are doing the same. Some Lake tonnage is being loaded but prices have not been settled, and the loading is usually for permanent connections or for docks controlled by the producing company. Lake shippers are anxious for tonnage agreements.

Domestic trade is active, although stocks are light and dealers are now delivering only small orders so as to take care of all customers. Practically all reserve stocks are exhausted and dealers are operating from hand to mouth. Some few cars are being received which relieves the situation. Much coal is in Columbus, but can not be switched to dealers' yards because of the strike.

Retail prices are firm at the levels which have prevailed for several weeks. Hocking lump is firm at $7.50 and mine-run at $7.25, delivered; Pomeroy lump and mine-run are quoted about the same. West Virginia splints sell at $8.50 for lump and $8.25 for mine-run, while Pocahontas, which is quite scarce, retails at $10 to $10.50.

Prices for coals sold in Ohio, f. o. b. mines, are:

Hocking lump, $3.75; Hocking mine-run, $3.50; Hocking screenings, $3.25; Pomeroy lump, $4; Pomeroy mine-run, $3.75; Pomeroy screenings, $3.50; West Virginia splints, lump, $4.50; West Virginia splints, mine-run, $4.25; West Virginia splints, screenings, $4; Pocahontas lump, $6; Pocahontas mine-run, $5.50; Pocahontas egg, $5.25.

CINCINNATI

Little Coal Coming in from Points South—Lack of Cars—Car Distribution in Kentucky Fields—Cincinnati Receives Coal by Water—Brisk Coal Demand.

Conditions in the Cincinnati district continue abnormal. The rail strike is mainly responsible for this, aggravating, as it does, the shortage of cars at this gateway.

The transportation of coal seems to be the "thorn on the rose" as regards the rail strike in this section. Except for coal, it is reported that nothing approaching real inconvenience is being experienced in the Cincinnati terminals because of the strike.

Practically no coal is coming in over the Norfolk & Western and the Chesapeake & Ohio railroads, while it is reported that the Louisville & Nashville is confiscating coal for railroad use, although there is some coal being brought to Cincinnati by that road. Some of the industries up the state are reported to be in desperate need of coal.

The chief trouble at the mines is the lack of cars. This condition, the operators have been assured, will be relieved at least to the extent of 20 per cent, once the congestion caused by the switchmen's strike is lifted.

The railroads operating through the Kentucky fields, have not been receiving an equal number of empty cars in return for the loaded cars they turn over to connecting lines through the Cincinnati gateway

In many instances where a road was found to have more cars on its tracks than its quota, that line was directed to forward a certain number of empties to one or another of the "south bank" roads, which are said to be short about 40 per cent of their original number of coal cars.

The Ohio River again has stood by the Queen City district in the time of need. While the river has risen in the Cincinnati district to a flood stage, the high-water has not been so pronounced in the upper valley, and consequently Cincinnati has been able to get its full share of coal from the West Virginia fields.

Never before in the history of the city have so many domestic users placed coal in their cellars so early in the season as they are doing at this time. The demand for all kinds of domestic as well as fuel for industrial purposes continues brisk, with many dealers unable to keep up with the demand.

ST. LOUIS

Mild Weather Eases Demand—Coal Hauled from Mines by Truck—Country West of River Suffers—Little More Than Railroad Fuel Mined.

The local situation, while it is trying, is much easier on account of the mild weather, for there is little domestic call. There were about 400 or 500 cars of coal in St. Louis when the strike started and this is gradually being delivered, as the few crews at work get cars unloaded.

The bulk of the coal for St Louis and East St. Louis is, however, brought over from nearby Illinois mines in trucks at a hauling expense of $1.75 to $2.50 per ton.

Coal at East St. Louis is selling f.o.b. track for about $2.50@$3, for screenings, $3@$3 50 for mine-run and $3 75 @$4.50 for lump. This is Standard and Mt. Olive grades. Carterville coal, such as can be brought into East St. Louis for delivery, is worth $4@$4.50 a ton at the mine A few mines on the Mobile & Ohio and Illinois Central have been working about 1½ days during the week, ended April 24, loading chiefly railroad coal, which has moved south. A little domestic coal has been loaded for movement north to points where coal could go without passing through the terminals. The country west of the river is suffering for coal, especially steam and municipal plants; however, the railroads are relieving the situation somewhat. The Alton & Southern line at East St. Louis (connected with all the trunk lines) is open and delivering coal to the Missouri Pacific, at Dupo, which operates the ferry to St. Louis. The Missouri Pacific is thus enabled to deliver to connecting lines at St. Louis on railroad emergency coal only.

The railroad tonnage is sufficiently good to keep the roads fairly well supplied. Mines in the Mt. Olive field are practically idle, excepting on railroad coal one or two days a week. In the Carterville field the mines are working the same length of time on railroad coal and domestic tonnage that moves to points without going through terminals.

No mine prices are quoted, inasmuch as the tonnage is sold up for a month or two after the mines resume operations.

DETROIT

Bituminous Coal Supplies Diminishing—No Hope of Early Relief—Power and Light Companies Greatly Curtail Service—Anthracite Stocks Small—Weather More Springlike—Little Coal Movement on Lakes.

Bituminous—With only a small amount of coal arriving while the supply at hand is steadily diminishing, the situation in the Detroit market continues quite unsatisfactory both for dealers and consumers. Neither the railroads nor officials of the Detroit Edison Co. are able to give any hope for early relief.

The railroads, with the assistance of volunteer switching crews, recruited from the ranks of idle factory workers, are attempting to handle cars on the local terminal tracks; they are making a special effort to move coal in various railroad yards, to points where it will be accessible to the Detroit Edison Co. and the Detroit City Gas Co. While the amount thus made available is not great, it has enabled the Edison company to restore power service to its customers to the extent of 40 per cent of their normal requirements.

Leaders among the striking switchmen agreed that anyone desiring to do so might return to work but none of the strikers took advantage of this privilege.

Anthracite—Supplies of anthracite in the yards of retail dealers are quite small, and with almost no receipts the situation would be full of hardship for many household consumers were it not that temperatures are more springlike. Some of the dealers are reported as placing orders for anthracite, without knowing at what price shipments will be charged to them.

Lake Trade—Because of the strike on the railroads and the urgent demand for coal at lower Lake markets, there has been little coal sent to the Lakes for shipment to the northwest. In fact, the movement of coal from the mines is so light that few of the freighters have been able to get fuel for their opening trip.

South

LOUISVILLE

Better Car Supply Before Conditions Improve—Big Demand for All Grades—Prices Advancing Steadily—No Market—Operators Still Filling Contracts—Reduction in Rate to Ohio River.

Car shortage is resulting in average of less than two days at mines in this section, while prices are showing steady advance on better grades and by-product coal.

No betterment of the general situation is possible without an improvement in the coal car supply, and although numerous efforts are being made to secure relief, they have not increased the car supply as yet. The Commission on Car Service on March 20 issued orders for connecting lines to deliver daily to the Louisville & Nashville R.R. 245 more cars than were shipped; but the orders were not obeyed, and during the first week of the order it is reported the Louisville & Nashville was due 4,619 cars under this order.

Demand is in Excess of Supply

Demand for all grades of coal continues far in excess of supply, and car shortage is the dominating factor in curtailing production. Contracts should be coming in, but under existing price conditions, the consumer will not contract, nor will the operator accept contracts.

Many operators in the Kentucky fields predicted that upon the return of the railroads to private ownership car supply would improve, but this has not proved to be the case. Equipment has been badly scattered, the strikes have made it impossible to get it back promptly to owning roads, carriers are not co-operating with one another and sufficient new cars and locomotives have not been built to offset the number worn out and discarded. Such equipment as remains is in poor condition, with the result that no real improvement is looked forward to. Embargoes at present are checking a movement of empties back to the mines and loaded cars can only move into certain sections.

There is no such thing as a market today, as operators are still filling contract orders, which are taking practically all of the present small production, and any small surplus stocks mined are in such demand as to sell at fancy prices. It is reported that mines in the eastern Kentucky fields are getting over $6 a ton in many instances for run-of-mine.

BIRMINGHAM

Good Local Market—Railroads About to Close Yearly Contracts—Car Supply and Output Improve Somewhat.

There is a good steady demand for coal in this market, inquiry for steam being confined for the most part to spot business, contracting by steam users not having reached any material proportions as yet. The two railroads—Louisville & Nashville and Frisco Lines—which sent out specifications of requirements for bids, prior to April 1, have not yet closed contracts for the current year, but are expected to do so quite shortly.

Fuel requirements now being taken are subject to price adjustment when agreements are executed as of April 1. Quotations are reported to have averaged 50c. per ton above Government prices for the respective grades. Contracting for domestic coal has begun and considerable tonnage has been sold to dealers in this territory.

Few Price Changes Noted

Prices for steam and domestic sizes for April have not changed materially from quotations of a week ago. The movement of both grades is somewhat better with a slight improvement in car supply, efforts to speed up production and delivery to consumers now receiving the close attention of operators and distributors.

The output for the week ended April 10 (latest figures available) show a production of 323,152 net tons, an increase of about 45,000 tons over the previous week. Labor is somewhat short and not disposed to work full time, but working conditions otherwise are satisfactory.

West

SAN FRANCISCO

Rail Strike Hardly Affects Coast—Steamers Coaled as Usual.

The railroad strike has not affected the coal trade materially on the coast, although shipments from Utah and Wyoming have been suspended for awhile. With the strikers apparently losing out, normal conditions will be restored shortly, according to all indications.

No hardship has been worked on the big fleet of steamships calling at this port for coal for their bunkers, as the King Coal Co. has an immense reserve stock. Steamships have been coming here from the Orient and from Atlantic ports for fuel just as in the days before the strike and have been furnished all the coal wanted.

The bituminous prices, f.o.b. mines, wholesale, Utah and Wyoming, per net ton, are as follows: Stove, $4.00; lump, $4.00. The bunker price is $13.55.

News From the Coal Fields

Anthracite

WILKES-BARRE

Outlaw Strike Affects Anthracite Output—Many Northern-Field Mines Shut Down—Situation Elsewhere.

Railroad difficulties were rather disturbing to the anthracite companies during the week ended April 17. The outlaw railroad strike had quite a bad effect on the production of coal, the Wyoming Valley in particular. The Delaware, Lackawanna & Western R.R. ceased moving any freight as all of the switchmen and a large part of the firemen went out on strike. This meant that the coal department of the same company had to cease operations entirely, throwing out of employment about 20,000 men. Not only has the freight handling been disrupted but the passenger service has been hurt to a large extent.

Next to the Lackawanna the Erie R.R. has been the most affected, and for the greater part of the week no freight was handled. This meant that the Pennsylvania and the Hillside coal companies were forced to shut down, throwing 15,000 more men out of work. A total of 35,000 men were idle in the anthracite fields, and at the present writing there seems to be no probability of improvement in the near future.

Owing to the outlaw strike on the Central R.R. of N. J., the Lehigh & Wilkes-Barre Coal Co. has had to cease operations at all but two of its operations. No estimate has been made as to the number of men idle at the plants of this company.

PITTSBURGH

Shipping Conditions Improved Only Slightly—Monongahela River Proves Useful—Contract Negotiations Continue—Shipments Forwarded Without Price Attached.

While transportation conditions, in connection with the rail strike, have improved greatly at so many points, the betterment, as affecting the movement of coal from the Pittsburgh district, has been quite slight. The Conway yard of the Pennsylvania R.R. remains virtually out of commission, the Pittsburgh & Lake Erie is moving little freight outside of perishables and foodstuffs, and the Baltimore & Ohio is doing but little better.

One or two devious routes to seaboard have been discovered. A little movement is possible to Youngstown from some steam-coal mines of the Pittsburgh district, but nothing from any gas-coal mines, and nearly all the steel works of the Youngstown district are closed tightly.

CONNELLSVILLE

Coke Accumulating at Ovens—Fair Coke Movement by Water — Market Nominal and Prices Unchanged.

Practically the only business done in Connellsville coke since the rail strike tied up most of the movement more than a fortnight ago has been between parties separated by the rail strike from those with whom they usually do business. In such cases the business was done at practically the prompt market, or $11@12 for furnace grade.

Northern Appalachian

Columbus—Columbus city officials are considering the proposition of purchasing a 200,000-ton pile of slack, stored at New Straitsville, for use by the various city departments, including the water works and the municipal light plant. Officials have visited the pile and have taken samples for analysis. In case the purchase is made, the supply will last approximately five years. Officials claim it will work quite a saving in the fuel bills of the city.

Columbus—Bituminous coal mines in Ohio are nearly all closed because of the railroad strike and thousands of coal miners have been forced out of work. A few mines in scattered districts have been reported as still working, but all of the big mines have been closed, as the inability of operators to secure cars makes mining almost impossible. Public utilities all over the state are appealing for coal, and most of them have declared that unless an immediate supply of fuel is forthcoming many of them will be forced to suspend.

Columbus—The annual stockholders' meeting of the Sunday Creek Coal Co was held April 7 at the offices of the company, when the former board of directors and officers were re-elected. The year, which dates from May 1, 1919, when the company was organized under the present name, was generally satisfactory, although there were a number of bad conditions in the coal trade to face. The board of directors consists of John S Jones, H. B. Arnold, John H Winder, C. C. Cook and George K. Smith John S Jones is chairman of the board; H B. Arnold, president; George K. Smith, secretary, and C. C. Cook, treasurer. No vice-president was named to fill the vacancy caused by the resignation of I A. Coen. O. S. Newton has been named general manager of the physical properties. J. R. Fitzer continues as sales manager and is given wider authority.

Cambridge—A record is reported in the production of coal in the Guernsey County fields for an eight-hour shift recently at the Forsythe mine, when two loaders mined and loaded 58½ tons of coal. The men were paid 80c. a ton and their aggregate earnings amounted to $4,680, or $2,340 each.

Cambridge—Of about 3,000 foreign-born miners in the Cambridge coal mining district of Ohio, practically every one has taken steps to become an American citizen. That is the statement of William C. Thompson, president of the sub-district United Mine

ESTIMATED UNITED STATES PRODUCTION OF BITUMINOUS COAL (IN NET TONS)

Total bituminous, including coal coked

	1920		1919*a*	
	Week	Calendar year to date	Week	Calendar year to date
April 3*b*	9,715,000	140,467,000	6,984 000	111,186,000
Daily average	1,619,000	1,749,000	1,164,000	1,385,000
April 10*b*	9,652,000	150,119,000	7,544,000	118,730,000
Daily average	1,609,000	1,740,000	1,257,000	1,376,000
April 17*c*	7,668,000	157,787,000	7,411,000	126,141,000
Daily average	1,278,000	1,709,000	1,235,000	1,367,000

a Less one day's production during New Year's week to equalize number of days covered for the two years. *b* Revised from last report. *c* Subject to revision

ESTIMATED UNITED STATES PRODUCTION OF ANTHRACITE (IN NET TONS)

	1920		1919	
	Week	Calendar year to date	Week	Calendar year to date
April 3	1,278,000	27,570,000	1,044,000	18,571,000
April 10*a*	1,488,000	23,058,000	1,792,000	20,363,000
April 17*b*	1,280,000	24,338,000	1,603,000	21,966,000

a Revised from last report *b* Subject to revision

ESTIMATED PRODUCTION OF BEEHIVE COKE (IN NET TONS)

	Week ended				
	April 17. 1920*b*	April 10. 1920	April 19, 1919	1920 to date	1919 to date
United States total	244,000	477,000	295,000	6,671,000	6,849,000

(a) Less one day's production during New Year's week to equalize number of days covered for the two years.
(b) Subject to revision.

Workers' organization, to show the Americanization work which is now going forward. He reports that before the world war at least 65 per cent of the miners in the district were not American citizens and many had been residents of the country for 20 years or more. With the coming of war, union officials realized that those conditions could not continue and an amendment was made to the constitution of the state organization requiring all members to be citizens of America or at least declare their intentions of doing so. The result was little less than startling. Americanization classes sprang up in every locality, and American miners, who worked by the side of Hungarian, Slav and Pole workers, begun to teach them the English language. Principles of the American Government were also taught to the foreigners. Union officials were at the head of the Americanization work and many taught classes in the evenings. Union officials are quite proud of the record in the Cambridge district.

FAIRMONT

Complete Stagnation in Northern Fields —Mines Shut Off from Outside World —Assigned Car Practice Revived.

Complete stagnation of coal production in the Fairmont region and in certain other northern West Virginia regions during the week ended April 17, followed in the wake of the switchmen's strike. Cars were plentiful in the Fairmont and adjacent districts on Monday and coal still moved despite the strike on a number of roads; mines in northern West Virginia continued to mine and ship coal.

However, one outlet for northern West Virginia coal was cut off, when the Monongahela R.R. declared an embargo on all shipments north of Brownsville, Pa. By Tuesday 2,000 car loads of coal and coke had accumulated in the Brownsville yards and by Friday there were 2,600 loaded cars in those yards awaiting movement.

While embargoes debarring northern West Virginia coal from all tidewater piers had been imposed on Monday, there was still some coal moving eastward from this section during the first of the week. On Tuesday, however, switchmen and yardmen at the Keyser, W. Va., and Cumberland, Md., yards of the Baltimore & Ohio joined the strikers, when eastern movement of coal ceased.

Western movement was also affected to some extent even by Tuesday, through a walk-out of switchmen at Benwood, but there still remained an outlet through Holloway to the Lakes. By Thursday, the fifteenth, there was almost complete paralysis of mining operations in the Fairmont and other northern West Virginia mining regions, the outlaw strikes having shut off northern West Virginia mines from the outside world. Few if any mines were actually in operation.

Taking advantage of the assigned car decision of the Interstate Commerce Commission, under the plea of an emergency, it became apparent that the Baltimore & Ohio and other roads in northern West Virginia were bent upon working the old system for all it was worth, not only to secure an immediate supply but a future one also. During the week ended the seventeenth, most of the fuel loaded was that at mines under contract to furnish railroad fuel, and it was reliably reported that the Baltimore & Ohio was trying to induce operators to accept $3.00 a ton in order to secure a better car supply and an immediate market for fuel during the strike. It was predicted that if the fuel thus secured by the railroad during the strike were stored, it would be a contributing factor in a car shortage.

Middle Appalachian

CHARLESTON

Western Markets Closed to Mines Here —Coal Goes to Tide—Many Mines Idle —Much Coal Under Contract

Mining operations in this section were quite perceptibly affected by the "outlaw" strike of switchmen, owing to the marked curtailment of the car supply which followed in the wake of the strike, the supply of equipment from the West being totally suspended during the greater part of the week ended April 17. While mines in this area were able to secure cars from eastern sources this supply was insufficient to take care of the increased territory from which the usual number of cars had been cut off. The shortage of equipment grew more marked as the week progressed and by the end of the period mines were securing only about a 25 per cent quota of empties.

Conditions Still Bad on K. & M. R. R.

Conditions were even worse as to mines on the Kanawha & Michigan R.R. Cut off from the western sources of supply, mines in West Virginia on the road named were forced to get along with five or six cars a day. Of course all movement of coal to the westward was cut off from the very beginning of the week, both as to the Chesapeake & Ohio and the Kanawha & Michigan, there being an embargo on all shipments west of Russell, Ky. When strike trouble broke out at Russell on the thirteenth, that only aggravated matters.

With western outlets closed, all coal from eastern Kentucky and from West Virginia mines reached by the Chesapeake & Ohio was being shipped to tidewater, and at the end of the week there was grave danger of an embargo even on tidewater shipments, owing to the fact that coal was pouring in on tidewater points faster than it could be dumped. As a result of conditions created by the strike of switchmen much idleness at the mines ensued.

The strike, insofar as it affected conditions in this part of the state, came at a most inopportune time because it was impossible to begin deliveries of coal to Lake ports. The week ended the seventeenth was supposed to have marked the opening of the Lake season but comparatively little coal was moved from this part of the state to the Lakes.

A large proportion of the 1920 coal year output of the mines in this section has been placed under contract, the bigger companies assuming the lead. Exports were holding up well and were naturally somewhat stimulated by the heavy eastern movement of coal.

Production was steadily on the downgrade in the Kanawha region, during the week ended the seventeenth, as a result of the switchmen's strike and its tie-up of western connections. As showing just how seriously the output was affected in the Kanawha, Cabin Creek and Coal River fields, production dropped from 26,650 tons for the Kanawha field and 13,250 tons for the Coal River field on Monday, to about 10,000 tons for the Kanawha field on Friday and only 5,000 tons for the Coal River field. Taking the week as a whole it is believed that the output was not more than 30 per cent of normal All Kanawha coal during the week was shipped to eastern markets, principally to tidewater, western markets being entirely closed to the Kanawha producers.

The New River field had, during the week ended the seventeenth. just two days in which the run of cars was at all adequate, so that there was much idleness at the mines in this field Aside from Monday and one other day there was not more than a 30 per cent run of cars for the entire New River field. all because of the strike of switchmen. No coal whatsoever was shipped to western centers during the week, the entire output of the field moving to tidewater.

The most serious effect of the strike however, was largely to cut off the shipment of coke, since the greater part of the output of the New River ovens is sold in western markets. Export shipments continued on the up-grade during the week. Also it was estimated by operators that fully 60 or 70 per cent of the year's output of the New River region was under contract by the fifteenth.

BLUEFIELD

Embargo on Western Shipments—Big Surplus of Coal at Tide—Relief Soon or Shut-down of Mines.

A survey of the situation existing at mines dependent upon the Norfolk & Western R.R. for transportation facilities, reflected quite a serious condition of affairs, for which the "outlaw" strike was largely responsible. As early as April 10 the strike had necessitated an embargo on all western shipments, so that by the thirteenth absolutely no equipment was coming through the western gateway for use at Norfolk & Western mines. Hence mines were dependent upon eastern sources for a supply of empties.

There was just about half as many cars available as there had been during previous weeks, with the result that most mines were not able to work more than one or two full days out of the six. No coal whatsoever went to western markets, all fuel being diverted to eastern points — principally to tidewater.

The outlaw strike seriously interfered with the car supply in the Winding Gulf field during the week ended the seventeenth. No coal was moving west from that field, the entire output being shipped to tide, a part of it over the Chesapeake & Ohio. According to reports there were 600,000 tons more coal at tidewater piers than there were vessels chartered, leading operators to believe that there would soon be an embargo on everything to Hampton Roads unless the situation was relieved in the West. Of course, in such a contingency, it would mean practically a shut-down of all mines in the Gulf district.

Pocahontas Production Slumped

Pocahontas production slumped quite appreciably during the week ended April 17 as the result of strike conditions, the output being not more than from 40 to 50 per cent, principally because of the difficulty in securing cars. As all coal was moving to the East, it was hard to return empties with as much celerity as is usually the case.

It was possible during the previous week to use cars from the western gateway and cars coming out of shops in the Thacker field; the cars from the East went to the Pocahontas and Tug River fields; but as soon as such temporary relief was exhausted, the car supply dwindled quite perceptibly.

The heavy demand to tide resulted in an embargo, at least as to certain pools, about April 19. Coal coked during the week amounted to 12,632 tons. Cars furnished were equal to only about 40 per cent of requirements.

Tug River operators and railroad officials expressed the opinion, early in the week beginning the nineteenth, that there would be little coal loaded after the middle of that week. Western gateways, from the Tug River field, were entirely closed during the week ended the seventeenth both as to shipment of loads and the supply of empties.

HUNTINGTON

Guyan Output at Low Mark—Big Logan Decrease—Cars Scarce—Western and Northern Gateways Closed.

At no time in recent months has production in the Guyan field been at a lower ebb than was the case during the week ended April 17, that being one of the effects of the strike which seriously curtailed the car supply. The shortage of cars was due to the fact that no empties to speak of were received from the West at all during the week, all equipment coming from eastern points.

No Improvement in Car Shortage

As a result of such transportation conditions, the output for the entire week was little more than 150,000 tons, with car-shortage losses aggregating about 225,000 tons. As all western markets were cut off, the entire output of the field was shipped to tidewater. The demand was sufficient to absorb the greatly increased tidewater tonnage, but the sudden concentration of the entire output of southern West Virginia fields resulted on the nineteenth in an embargo on high-volatile coals at Newport News.

With Western and Northern gateways closed, there was no coal shipped to the Lakes, although the season was to have been opened and Logan operators had made arrangements to ship quite a considerable tonnage to such ports. Prices were still buoyant. As far as could be learned, much additional tonnage, covering the year's output, had been put under contract.

The switchmen's strike affected production on the Chesapeake & Ohio system to the extent of 100,050 tons. Whereas there had been a movement of 11,037 cars of coal over the Chesapeake & Ohio during the week ending the tenth, the equivalent of 551,850 tons, there were only 8,996 cars of coal handled during the following week, representing 449,800 tons, so that there was a decrease of 2,041 cars, or 102,050 tons. There was a decrease of 12,650 tons in the Logan field alone.

Morgantown—Announcement was recently made that the eighth annual short course in coal mining at the West Virginia University will open on June 21, and continue until July 31. This course gives mining men an opportunity to thoroughly prepare for the examination for mine foreman and fireboss certificates which will be held later by the State Department of Mines. There were but four men enrolled in this course in 1917, 23 in 1918, and last year there were 57 men in attendance. It is expected that at least 125 will attend the short course this summer. A report just received from Raleigh County indicates that there will be more than 25 men from that county alone. An announcement of this course is being mailed to all postmasters of coal mining towns, as well as to the officials of all the coal companies in the state. This poster gives full information of the various classes and subjects. Additional copies of this poster can be obtained from Prof. A. C. Callon, Morgantown, who will be in charge of the course.

Ivanton, W. Va.—Ivy Branch Coal Co., Ivanton, W. Va., is preparing to increase production of Block coal, by laying an additional siding, installing shaker screens and constructing a number of new miners' houses. The company expects to have a daily production of not less than 500 to 600 tons before June 1. Leo F. Moore is superintendent.

Southern Appalachian

Birmingham — The Sloss - Sheffield Steel & Iron Co. has placed in commission 60 of the 120 Semet-Solvay by-product coke ovens at its new $6,000,000 plant at North Birmingham. The other batteries will be in operation within a few weeks. The Sloss-Sheffield company will shortly abandon the four batteries of bee-hive ovens, at its City Furnace plant, which were built in 1882, and have been in almost constant operation for the past 38 years, being an old landmark of the city.

Morris W. Bush, who is president of the Alabama By-Products Corporation, and also of the Birmingham Coke & By-Products Corporation, made the following announcement of the transfer of the property: "The Alabama By-Products Corporation has acquired the property and business of the Birmingham Coke & By-Products Co. The Alabama By-Products Corporation will make coke, ammonium sulphate, tar and benzol, using the recently completed plant of 50 Koppers ovens of the Birmingham company. It will also engage in other lines of industry from time to time as may seem desirable."

These Koppers ovens were put in operation about two weeks ago. The work of constructing them began in the fall of 1918, but on account of the delays in the delivery of materials and machinery they have only just been completed.

The plant represents an investment of over $5,000,000.

Middle Western

Midwest Review

Contrary to general opinion, the car supply in southern Illinois coal fields has been much better this week (ended April 24) than last; the mines here probably operating on a 20 to 30 per cent basis, as the average for the week. This is an improvement, however, as the car supply for the week before was only 15 per cent or thereabouts.

All Terminals Embargoed

Practically all of the large terminals here are enbargoed. It was rumored during the middle of the week that the strike of the rebel switchmen had been settled, but this rumor proved a little previous as the deadlock is, at this writing, as tight as ever. Operators, of course, cannot ship their coal to Chicago, Peoria or any other distribution point, but as they have a big market for their coal in the West and South and in a great many rural districts, they are having absolutely no trouble in placing the meager tonnage they are able to produce. What seriously affects the coal industry more than anything else, is that practically all of the terminals are clogged with coal cars, which have been unloaded but cannot be returned to the mines on account of the strike.

Market conditions in the entire Middle West are quite strenuous, and we believe it is no exaggeration to say that coal is harder to get, anywhere in this territory, than it was during the war and when war-time conditions prevailed. The only coal being offered is more or less off-grade stuff, which is practically unsalable in ordinary times when ordinary competition prevails. This coal, by the way, is selling at prices in excess of Franklin County rates.

Duquoin—A new mine is being sunk 11 miles west of here near Cutler, located on the Wabash, Chester & Western R.R., by a company from Mt. Vernon, known as A. Wilson & Sons. The mine will be equipped with modern and up-to-date machinery, including electric mining machines. A new steel tipple will be erected over the main shaft. The mine is to be a large producer, having a capacity of 3,000 tons when fully developed. The Wabash, Chester & Western R.R., which will serve the mine, was recently sold to the Southern Gem Coal Co., and will be put in shape, as it is said that the owners intend to make it one of the foremost coal carriers in southern Illinois.

The Sunnyside mine near Herrin, southeast of here, was completely destroyed recently, following closely on the big disaster two weeks ago which burned the Jackson Coal Co.'s mine at Hallidayboro. However, the Sunnyside fire loss was estimated at $200,000, whereas the Jackson mine fire was only half of this amount. This takes two of the oldest mines in southern Illinois from the list of producers. The origin of the Sunnyside fire is unknown as in the case of the Hallidayboro disaster, and over 500 men are thrown out of work. Close by the tipple were several other buildings, including a large washer, all of which were burned to the ground.

Granite City, Ill.—The first unit of the St. Louis Coke & Chemical Co. plant at this place, comprising 80 coke ovens and one blast furnace, will be in operation about the middle of July, if there is no unexpected delay in the delivery of equipment. The blast furnace (says *Iron Age*) will have the capacity of 500 tons of pig iron per day. The coke plant will handle 2,000 tons of coal per day, and will produce about 1,500 tons of metallurgical coke from 100 per cent Illinois coal. Part of the coke output will be used in the company's own blast furnace.

Springfield—Approximately half of the coal mines in Illinois were reported idle recently and 45,000 miners have been forced out of employment by the strike of railroad switchmen, according to Frank H. Farrington, president of Illinois miners.

Clinton—The Vermillion Coal Co., operating a mine in the Clinton field, has leased 1,700 acres of fifth seam coal land from the United States Steel Corporation, and will sink a mine southwest of Clinton, on the Chicago & Eastern Illinois railroad switch. Bricks for the boiler house are here and steel and boilers are being shipped to the mine site. The Steel Corporation operates the Bunsen mines at Universal, and is retaining a large acreage of its own adjoining the leased tract.

Terre Haute—More Indiana coal mines were reported closed recently because of car shortage than ever before in the history of the Indiana Coal Trade Bureau, which has its headquarters in Indianapolis. There were 101 mines idle in the state. Operators stated that the railroad yardmen's strike was directly responsible for the increase in the car shortage, which has prevailed for several months. Thirty-seven of the closed mines are on the Pennsylvania R.R., 28 on the Chicago, Terre Haute & Southwestern, 16 on the Monon, 15 on the Chicago & Eastern Illinois, and five on the Big Four.

Johnston City—A deal has been consummated in Williamson County whereby the Old Ben Coal Corporation becomes the owner of the Johnston City mine of the Big Muddy Coal Co., known as the P. H. Holland mine. The mine lies adjoining this city and the property includes several hundred acres of coal lands. With the acquisition of this plant, the Old Ben company now has 15 operating mines in the Illinois field, and owns more than 60,000 acres of coal land.

Chicago—The coal industry throughout Illinois has felt the effect of the switchmen's strike on the railroads in no small degree. Due to the fact that the railroads are unable to get shipments through or around the city, the result is that the coal contracted for by firms in and beyond Chicago is held up seemingly indefinitely. This not only ties up cars, of which there is a shortage, but produces a great demand for coal with only feeble means of filling it. Coal men have been able to route but a small portion of their shipments around Chicago, but the pressure caused the following mines in the Springfield district to remain idle a few days: Auburn, Peabody, West, Selbytown, New North and Devereau. The fact that one of the loop belts in Chicago is able to run a small number of regular trains has been the only saving feature in the situation.

Missouri Valley

Des Moines—A number of prominent coal men of this place are interested in the newly organized Consumers' Consolidated Coal Co. This concern is capitalized at $100,000 and took over both the Consumers' Fuel Co. and the Park Coal Co. The following are the officers of the new company: President, F. H. Zook; vice president, E. L. Lloyd; secretary, Ellsworth Lloyd; treasurer, K. G. Carney.

Pittsburg — An almost complete paralysis of the Kansas coal industry is reported. An announcement at the headquarters of the coal operators as to mining operations said that only four steam shovels are at work. No deep mines are working. The report further shows that not more than 300 miners out of 12,000 or more in Kansas are at work. Coal operators stated that the suspension of operations was in protest against the sentencing to jail of Alexander M. Howat, president of the Kansas mine workers, and his colleagues. Union officials neither confirmed nor denied the statement.

Eagle Pass, Tex.—The International Coal Co. of this place announces that it expects to begin the shipment of coal within the next 60 days, or by the first of June. The work of overhauling the plant has been under way for several months, beginning when the mines changed hands. When this development work is completed the property will operate to full capacity. A railroad spur has been built from the Southern Pacific main line to the mines and cars will be loaded direct. Under the old arrangement the coal had been hauled overland from the plant to the railroad. New machinery for handling the coal at the mines has been installed and the plant will be thoroughly modern when this work is completed.

McAlester—Coal miners and operators of District 21, United Mine Workers of America, will meet at this place next week to settle differences growing out of working agreements. A new working agreement covering this district will be negotiated. District 21 embraces Texas, Arkansas and Oklahoma miners. The conference will apply the Washington Coal Commission's awards to the Southwestern fields. The new wage increase of 27 per cent is already being paid.

Western Fields

Gunnison, Col. — Opening of the Muncey hard-coal deposits in the Ragged mountains of western Gunnison County is announced here as one of many development projects to be undertaken in this county this summer. Coal of the same quality has been worked for 40 years in the Smith anthracite mine, and in the Peanut mine at the Buttes. It will be opened at another point there this summer through the General Pershing mine of the Colorado Fuel & Iron Co. The Ruby anthracite mine near Crested Butte has also been worked for many years, but the larger deposits, known as the Muncey banks in the depths of Dark canyon and on the western fringe of the Ragged mountains, has never been carried farther than the prospecting stage. In the early 80's parties patented hard-coal claims here.

Billy Muncey, a character of early days in western Colorado, who had been an express rider in and out of Salt Lake City, made the first discoveries in Muncey basin in 1880. Here he patented 320 acres and later acquired the Tuscarora claims of 640 acres, several miles west, near the McClure Pass between Somerset and Marble.

COAL AGE

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Only Greater Efficiency Will Retard Mounting Costs

TRANSPORTATION limitations, uncertainties of legislation and labor unrest are the questions that are foremost in the minds of coal men today. Efforts to get more cars from the railroads, proceedings to forestall further government control of the coal business and joint conferences with the miners consume the time of the active coal operator and the officers of the representative associations. But in these daily struggles to maintain existence as an industry of individual effort do not lose sight of the ever-increasing necessity of greater engineering efficiency in production as a means of retarding the rise in the cost of production. Every element of cost—labor, supplies, general overhead and taxes—is mounting. The only hope of even retarding this rise is in increased efficiency of operation.

When prices of coal began to go up (in 1917) and all through 1918 coal companies generally took advantage of greater net income to modernize equipment. The process of putting the mines on a thoroughly modern basis was far from complete when the slump in the market took place in November, 1918. Business was slack and conditions uncertain last year, but there is no lack of orders in sight now and prices are good. The coal operator who did not put his mine equipment in down-to-date order during the war, because perhaps he did not see how he could ever amortize the inflated cost, was at a disadvantage last year when demand was so slack that the lowest bidder got the business. A year or two from now he will be in the same position.

Increased efficiency is not necessarily a corollary of the installation of modern machines. These machines must be properly used. In how many coal mines is underground traffic handled with such regard to its possibilities as is traffic on the Harlem River division of the New York Central? How many of the laborious operations required to get coal from the face to the tipple have been made the subject of studies such as have put our systems of factory management in the forefront in the world of industry? Use engineers more as well as equip your mines with the best the mechanical industry has to offer.

Increased output means lower unit cost. Inadequate car supply limits the day's production of most mines. Comparatively few mines are so situated that they can load coal directly onto waterways. However, a larger percentage than most realize can dispose of coal by motor truck. Driven to necessity by the strike of railroad labor, consumers in St. Louis have been hauling coal from the mines to their plants by motor truck. The idea is spreading.

It will be remembered that in 1918 F. C. Honnold, the district representative of the Fuel Administration in Illinois, discovered that coal was being hauled into coal mining towns from other camps. In conjunction with the State Fuel Administrator this practice was prohibited and local communities were compelled to use their own coal, hauled by truck direct from the mine. An increase in production was thus obtained and precious railroad transportation was saved. According to the Geological Survey, 21,890,000 net tons of coal, or nearly 3.5 per cent of the total production, was sold locally or used by employees and not loaded into railroad cars, nor coked or consumed as mine fuel.

Motor Trucks as Open-Top Equipment Offer Possibilities

WE are told on good authority that the shortage of open-top equipment on the railroads will continue for several years. Why not push the use of open-top equipment that does not travel on steel rails? The opportunity obviously is limited but nevertheless it is of large proportions. Production now moves in the United States over 15,000 miles of canals and inland waterways, 250,000 miles of railways, 2,753,334 miles of highways, according to a statement by George M. Graham, general sales manager, Pierce-Arrow Motor Car Co., at the Increased Production Convention of the United States Chamber of Commerce at Atlantic City last week.

Ships, railroads and motor trucks, Mr. Graham holds, constitute the great transportation trinity which distribute production, each having an equally important place in the general transportation scheme. This authority sums up the relation of all three factors in respect to production as: First, our waterways are determined by nature's laws; for transportation with the outer world the merchant marine is supreme; second, the steel rail has ever been the herald of development, but locomotives and cars cannot travel beyond its bounds; third, the highways offer an infinite possibility of communication with points not to be reached by railway or ship.

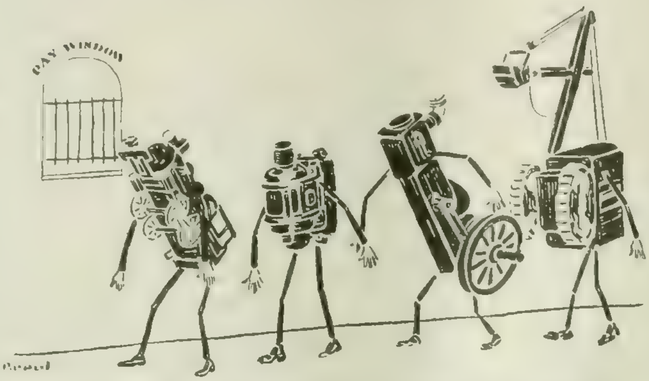
Increasing production rests largely on the development of highway transportation. It is estimated that on the Great Lakes and the Mississippi in 1918 90,000,000 tons of freight were carried. In the same year 1,200,000,000 tons were moved by motor truck, and 2,504,000,000 by rail. Much of this motor truck tonnage was haulage to railroad freight stations. Highways have fallen short of carrying their share because it is only within the last decade that a proper medium has been developed. Temporarily our railroads have reached the limit of their capacity. They can have no greater volume. *Railway Age* says they need 712.400 more freight cars, and only 300,000 can be built yearly. There is an estimated shortage of 50 per cent in locomotives. Five years is suggested as the minimum time in which railroad facilities can be brought to normal.

The railroad officials are at this time naturally more anxious than ever to meet the demands upon them, according to George F. Post, chairman of the Railroad committee of the United States Chamber of Commerce. Even if they had the money now, which they have not it would be some time before they could add substantially to their equipment. Some of the strong roads have already contracted for new cars and locomotives, but not for more than half of what they need, because of the restricted market and high cost for borrowings.

Conservatism in Regard to Machinery

CONSIDERING that to the operator coal is reasonably cheap, not being loaded down with heavy transportation charges, it seems strange how many there are in the coal industry who have shown little willingness to accept mechanical development. Much of the work around some tipples continues to be done uncertainly and inefficiently by gravity, "beef and brawn." Take for instance, the infrequent use of the coal haul. In many cases there is fall enough to bring the cars to the tipple, and all that is necessary is to lift a brake or remove a sprag and cars will run into the dump. But the use of gravity usually wastes much labor and time because of the necessity of going back for cars or having some one stationed to let the cars into the tipple. This also slows down dumping considerably.

They Work for You



BUT THEY NEVER STOP AT THE PAY WINDOW

But this is the least of its shortcomings, for the loss of elevation at the cross-over dump and the long, steady downgrade on the load tracks, with the further loss of elevation in the empty pit, puts the lowest point in that pit several feet below the elevation of the switch where empty and load tracks join. Consequently the empties have to be hauled up an unreasonably steep grade that limits the number of cars that the locomotive can start from the pit bottom.

In consequence the locomotive in starting toward the mine is heavily handicapped, and the length of trip both for loads and empties is cut down unless the grade on the main track is exceptionally heavy. Moreover, the necessity for getting a suitable grade for the loads on the load track will, in most cases, cause either undue steepness or undue flatness in the main track, both of which are undesirable.

One meets with places where to adjust the grade for the delivery of loads by gravity to the tipple the grade of the main track has been made level or unduly flat, and other cases less frequent where it has been made excessively steep. Had a car haul been introduced the grade on the main track from the empty switch to the drift mouth might have been made nearer the ideal, which is about six-tenths of one per cent, this being the grade which provides from the locomotive an equal tractive effort for loads and empties. Furthermore, the cars would have been saved from much deterioration, for many are the bolt holes that are enlarged by the bumping which the cars receive in the empty pit.

The car haul is part of the natural order of things, a mechanical aid to dumping almost as essential as the cross-over or the rotary dump, and its installation should not be avoided on the plea that it can be dispensed with.

Below the tipple it seems essential that the railroad cars should not rely on gravity, which is either inadequate in cold weather or only too greatly accelerating in warmer seasons. Gravity is at the mercy of snow or rain One day the cars move too easily, another they respond with difficulty to the pinch bar, the trimmer's shoulder or to the jolting he gives by jumping on the car end. Speaking loosely, the response of gravity is slow and uncertain because the resistance of standing bodies is so much greater than the resistance of those that are moving. Machinery can be arranged to be adequate, whereas gravity cannot meet successfully the change of resistance which varying conditions inevitably create. Space does not permit calling attention to the unsuccessful way in which the coal passes over pans and screens when gravity is solely relied on to provide for its movement. Stoppage and excessive speed alternate with each other and break the coal into dust.

The future will see a growing disposition on the part of the mine engineer to limit his dependence on the force of gravity and to rely on power as a more certain and controllable means of operation. The art of making gravity do the work has been pursued with such abandon that it has created almost an obsession and made us too often overlook the fact that only with machinery can a delicate adjustment be obtained such as is well typified by the steam hammer that cracks a watch crystal and leaves the delicate mechanism intact.

Tendencies Easily Discernible

THIS is the annual Equipment Number of *Coal Age.* In it an attempt has been made to describe some of the equipment that has been and is being used from day to day in the mines in order to render the production of coal easier, and more speedy and also more profitable to the operator as well as cheaper to the consumer. No effort has, however, been made to enumerate all of the devices of this nature. Any such attempt would require vastly more time and space than this or any other periodical could possibly devote to the task.

It is interesting at such times as this, however, to indulge in a short retrospect, discover what, if any, are the trends in the industry and then take a short glance at or into the future.

For many years there has been a pronounced tendency toward electrification. The last year has been no exception to the rule established by its predecessors and has witnessed the alteration of many coal plants from steam to electric energy. This change has possibly not been quite as rapid during the twelve months past as it has been during some similar periods in the past. This unquestionably arises from the constantly rising prices with which the last year has been afflicted. While accomplishment has been admittedly slow, the direction of the movement has been none the less pronounced.

For many years also there has existed a steady movement away from all forms of animal haulage toward mechanical haulage, usually in the form of electric locomotives, either storage-battery or trolley. The last year has seen no change from this course. The problem of tonnage movement in a coal mine is an extremely vital one on account of the vastness of the production. Mechanical haulage is not only cheaper than animal in most cases but what is, in the majority of instances, much more important, it is more reliable.

The electrically driven centrifugal pumps for installation both above and below ground appears to be gaining in favor. The old objection to these machines for use in the mines, namely, that foreign substances such as chips, small pieces of coal, rocks, slate and the like were liable to lodge in the impellers and thus not only cut down the efficiency but throw the machine out of balance, seems in large measure to have lost its force. This is doubtless due in part to improved design and in part to greater care in installation. In this connection it should in truth be said that the electrically driven multiplex plunger pump is running the centrifugal machine a close second in popularity for use underground.

Rotary dumping and skip hoisting have made great strides in the recent past. Some of the largest shaft mines in the world are now fitted with these devices. Wherever extreme outputs are necessary the skip takes the place of the multiple-decked cage, saving time at both top and bottom while introducing no caging problem whatever. It furthermore permits continuous dumping and lessens both the rope speed and the power consumed as compared with the usual single-decked cage. Probably the most vexing problem with which the coal operator has to deal is that of labor. The greatest labor problem of the mine is that of loading the coal into the mine car. A successful mechanical loader thus presents the greatest improvement that could possibly be made in the process of coal production. In the past many devices have been tried with more or less success, but there are now on the market several machines, that have become articles of commerce, that will load cars successfully. As a rule, however, they have not yet attained the preeminence and universal adoption that either their inventors or the rank and file of operators might wish and for which all sincerely hope in the future.

Why Not Let Them Be Buddies?

MACHINERY (SPEAKING): "Darned Hard Work, Isn't It? Let Me Lend a Hand"

Of all the many reasons for this lack of general adoption, two stand out prominently. First, most of these machines are large, therefore heavy, and consequent upon this their cost is not only high but they must secure a high rate of production in order to show a saving over present methods. This immediately introduces a factor, foreign to the machine itself but highly pertinent thereto—namely, keeping the machine supplied with cars. This has been partially solved in some models by a storage device on the machine itself.

The second shortcoming of any and all mechanical loaders lies in the fact that no machine, be it ever so skillfully designed and constructed, can be made to think. It will as a consequence pick up and load a piece of slate or rock as readily and quickly as it will a lump of coal. Of course this is by no means insurmountable. It, however, transfers the problem of slate removal from the working face to the tipple—from where it belongs to where it does not belong. This in turn introduces a rock-disposal problem that should be avoided if possible.

What is apparently wanted is a comparatively light machine, one that one or at most two men can handle and operate, the movements of which one man can control with ease and precision. The trend of invention along this line is in the right direction.

Trucks Relieve the Coal Shortage

COAL has determined the location of many modern cities. Some of the larger metropolises have centered about points where transportation by rail and by water brought large congeries of people and created accordingly many prosperous industries. Such cities are New York, Chicago, Boston, Buffalo, Cleveland, Seattle, Tacoma, San Francisco and New Orleans. But other cities have built themselves upon the basis of both transportation and coal. Such cities are Pittsburgh, St. Louis, East St. Louis, Birmingham, Cincinnati, Columbus, Terre Haute, They grew great first because of communication facilities, second, because of cheap coal and thirdly because the availability of coal made railroads through them important. These cities are so near the railroads that they can receive coal by truck. Their industries need not be paralyzed by a railroad strike if only the ship-by-truck possibilities are used as they were in Great Britain during the great strike of her railroad systems. It is stated that most of the coal now received in that central ganglion of the United States—St. Louis, East St. Louis, Venice and Granite City—is coming in by interurban railway service and by truck. True, about 20,000 men in the southern Illinois fields are idle, but much of the idleness in St. Clair, Madison and other counties could be cured if truck service to St. Louis and the river at that port were properly organized.

Designing an Electric Hoist to Meet Needs of a Long Mine Slope

Rapid Increase in Speed and Prompt Slowing Down Are Not so Necessary in a Slope as in a Shaft Hoist—Special Arrangement Provided for Passing Slowly Over Long Curve—Strange Rhythmic Pulsation in Current Is Noted

By Graham Bright
East Pittsburgh, Pa.

MUCH that has been written on the subject of hoisting systems for coal mines has dealt particularly with the vertical type of hoist. As the vertical hoist involves short cycles with short acceleration and retardation periods, the capacity of the equipment in many cases is largely determined by these periods. The large slope hoist, however, must meet a different set of conditions. The accelerating and restarting periods can then be readily lengthened, but they have little influence in determining the capacity of the equipment. A study of the operating conditions under which a hoist of this nature was recently installed at the Footdale mine of the H. C. Frick Coke Co. illustrates this point.

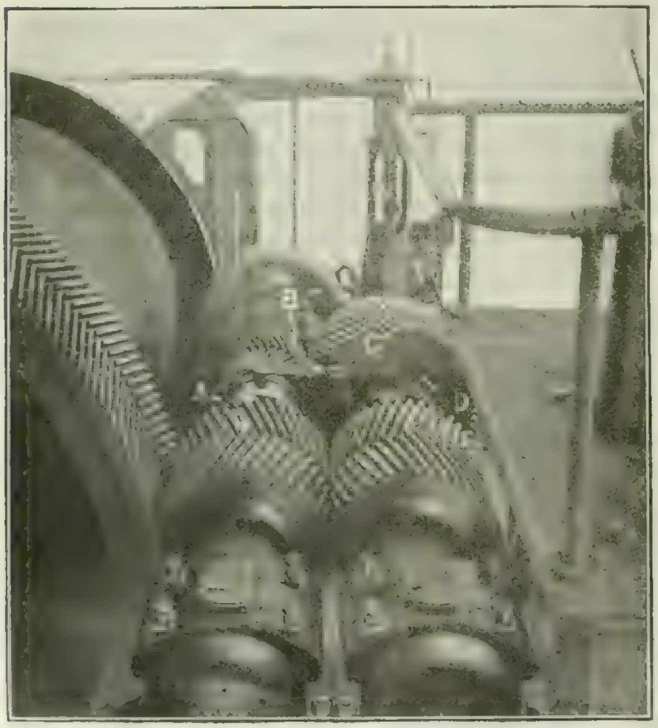


FIG 1 BACK GEARS AND CLUTCH

The hoist may be driven at full speed through pinion *A* or at half speed through all the small gears shown, pinion *A* then operating as an idler.

The service data upon which this hoisting equipment was designed are shown in Table I. The hoist consists of a single cylindrical drum 9 ft. in diameter, having an ultimate capacity of about 13,000 ft. of 1¼-in. cable. This drum is geared to an 800-hp., 2,200-volt, three-phase, 60-cycle, 24-pole, pedestal-type, wound rotor, induction motor. This motor is controlled by a magnetic type of controller which is full automatic and is operated by means of a small master controller located on the hoist platform. The main control and incoming line panel are placed in a separate room. The primary reversing switches are of a new type, designed for a maximum potential of 6,600 volts and a capacity of 500 amp.

Part of the coal to be hoisted is obtained from a level about half way down the slope and known as the River or Heading Road. It is here necessary to start the loaded trip slowly around a sharp curve until all the cars are on the straight track, when acceleration to full speed can take place. Equipment to safely accomplish this result with a low expenditure of power has been worked out and furnished by the Vulcan Iron Works. This device, shown in Fig. 1, consists of two sets of herringbone gears, so arranged that by means of air-operated clutches either full speed or half speed can be obtained on the main drum.

TABLE I. SERVICE CONDITIONS UNDER WHICH HOIST WAS DESIGNED.

Total length of haul.... 4,225 ft.	Maximum rope speed 1,500 ft. per min.
First 200 ft. is on 6 per cent grade	Maximum weight of loaded car 6,500 lb.
Next 1,975 ft. is on 6.6 per cent grade	Maximum weight of empty car, 2,500 lb
Next 1,750 ft. is on 6.2 per cent grade	No. of cars per trip..............5
Last 300 ft. is on 4 per cent grade	No. trips per 8-hr. day............ 25

This gear and clutch arrangement is quite simple, its operation (see Fig. 1) being as follows: For full-speed operation the pinion *A* drives the hoist gear directly. while the pinion *D* on the auxiliary shaft runs free. When half speed is desired, pinion *A* is allowed to run free on its shaft, and the drive is made through pinion *B* to gear *C* and from pinion *D* to the hoist gear, pinion *A* acting as an idler.

The power necessary to pull the trip around the

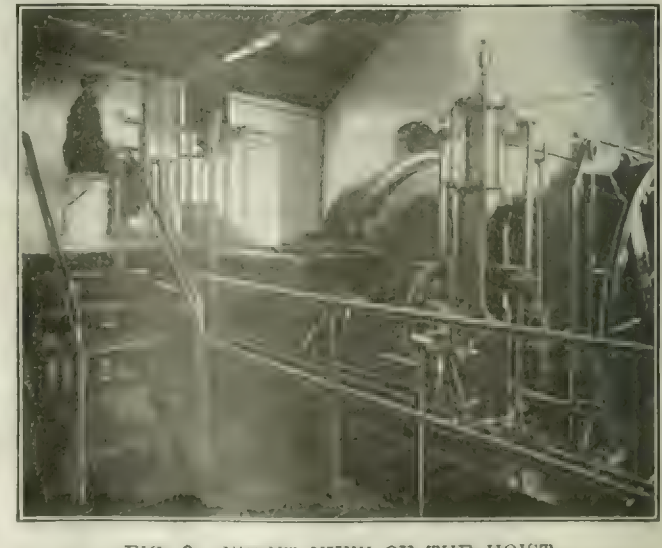


FIG. 2. FRONT VIEW OF THE HOIST

This view shows the brake and the device for preventing operation when the brake becomes worn.

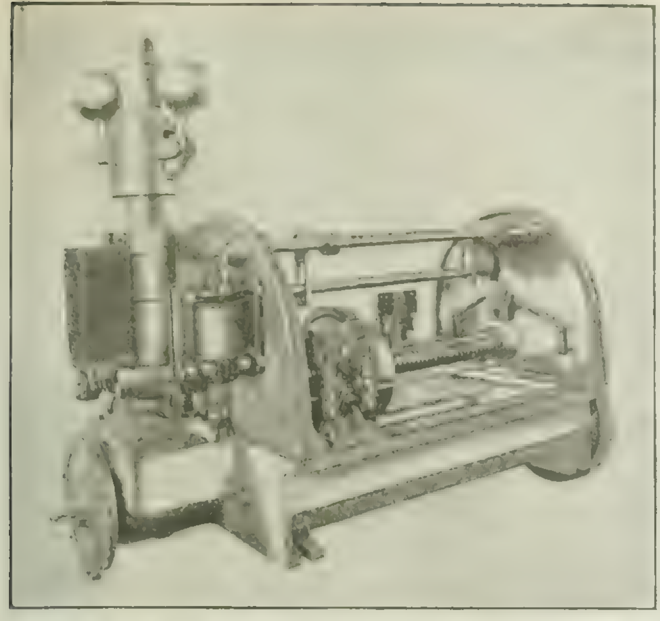


FIG. 3. SAFETY SPEED AND OVERWIND GOVERNOR
This device also embodies a mechanism for graduating the brake release

curve is thus halved. This greatly reduces the demand upon the electrical system, and in turn decreases the power bill by cutting down the maximum demand peak. Unless full capacity is required, such a hoist as this can be operated continuously at the reduced speed with a large saving in the power bill.

The trip is delivered at the ground surface, where it is taken care of by a storage-battery locomotive that switches the cars to a slow-moving, continuous type of incline hoist. This hoist delivers the cars one at a time at the top of the tipple, where the coal is dumped.

The hoist lets the trip of empty cars down the main slope at the same speed that the loads were brought up. In order to keep the hoist motor from attempting to push on the rope, the trip of empty cars is allowed to come up to speed by gravity, but when the speed meter shows that the drum is revolving at 300 r.p.m. the control is moved quickly to the full "on" position, driving the hoist in the direction in which it is already running. The speed will increase to slightly above synchronism, at which point the motor holds it constant and returns a small amount of energy to the power system. This method prevents any tendency to overspeed during lowering, increases the cooling of the motor on account of fairly high-speed operation at light load, and saves wear and tear on the brake system.

In Fig. 4 may be seen the flexible coupling and safety device. This view illustrates the value of the pedestal type of bearing for a large hoist motor. Fig. 5 is a view of the hoist from the opposite side and illustrates in detail the type of wiring around the hoist platform. All main and control conductors are installed in conduit, large sizes being necessary because the insulation of all control wiring was specified for 2,500 volts. This view also shows the small magneto generator belted to the motor shaft and connected to one of the meters on the hoist platform and calibrated in r.p.m. It also shows the master controller, emergency switch and air-brake handle on the hoist platform, in addition the dial indicating the location of the trip will be noted. The large index rotates three times during the complete trip, so that the exact position of the trip can be noted from the position of the small pointer on the dial.

The hoist platform is provided with meters which at all times indicate the current and speed of the hoist,

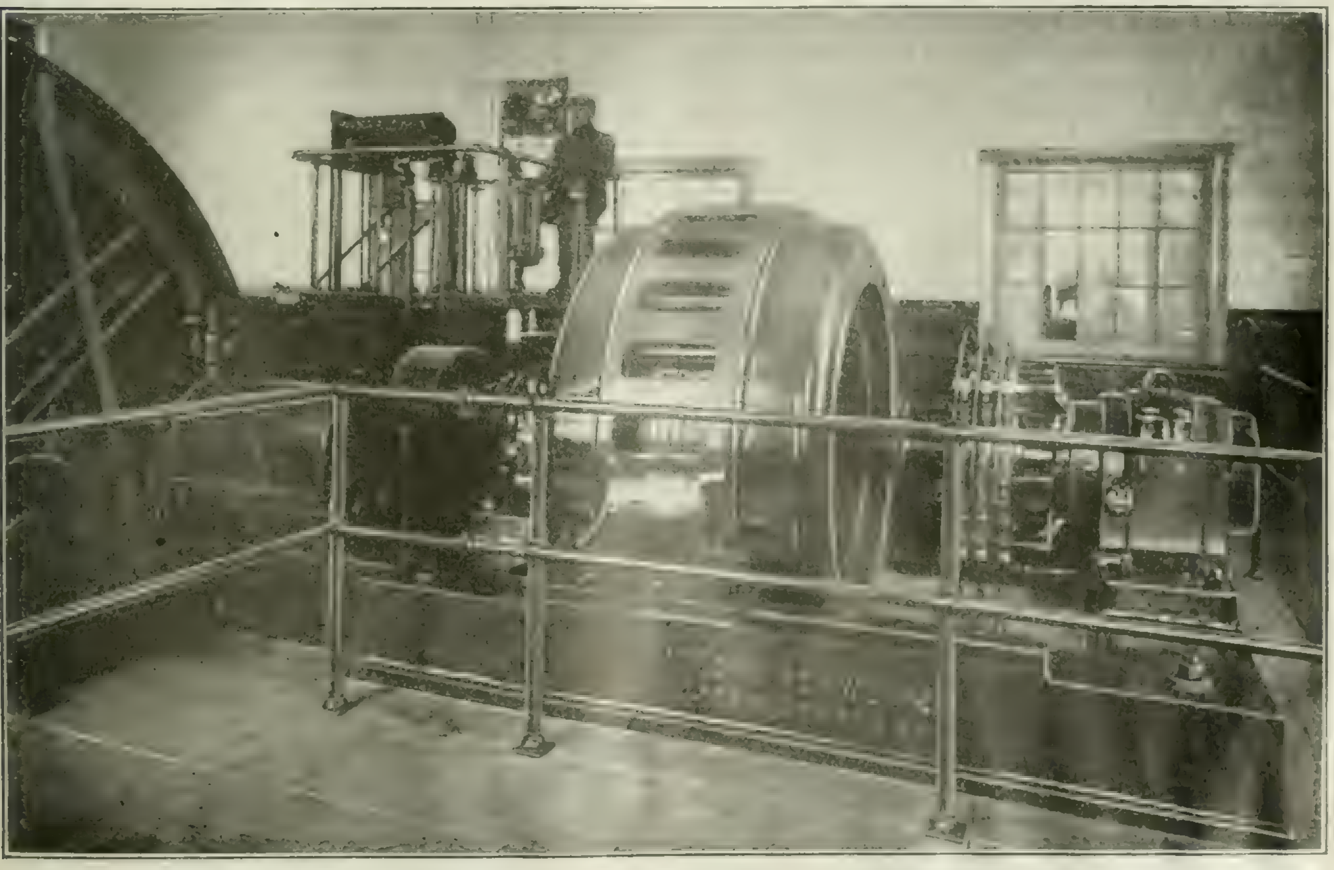


FIG 4 FRONT VIEW OF THE DRIVING MOTOR AND OPERATOR'S PLATFORM
Note the flexible coupling placed between the motor and pinionshafts and the sturdy construction of the entire machine

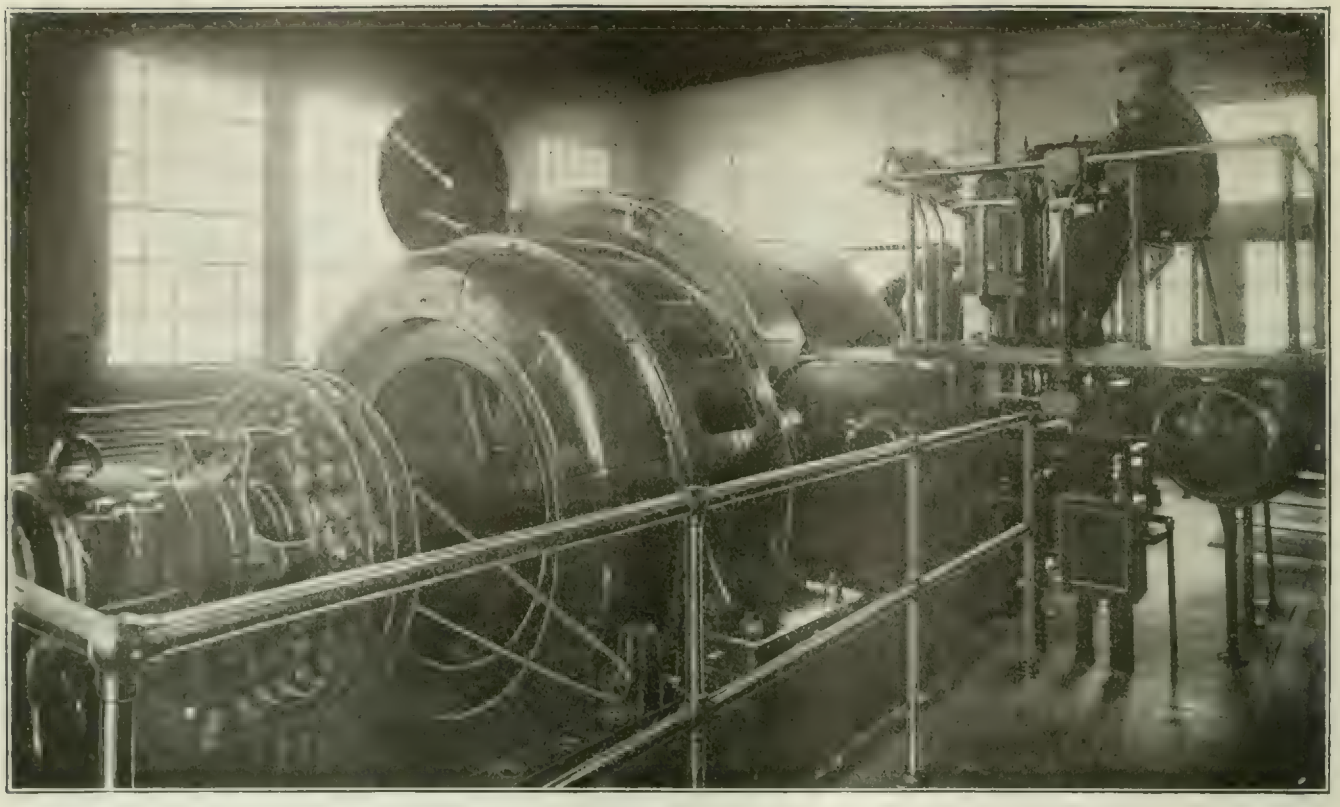


FIG. 5. MOTOR END OF HOIST, SHOWING OPERATOR'S PLATFORM AND POSITION-INDICATING DIAL

This view also shows a magneto belted to the hoist shaft. This machine is connected to a meter on the operator's platform and is calibrated in revolutions per minute.

with a safety switch to open the oil circuit breaker and stop the hoist in case of emergency, with a maximum-torque push button to cut out the automatic accelerating relays so as to enable the operator to obtain large torques in case of emergency, with a back-out switch to enable the operator to back out of an overwind, with a main control lever, a small air-brake lever, a small lever for the clutches and a telephone for communicating with points inside of the mine.

The main brake is of the post type operated by a weight and released by an air cylinder. It is controlled by a small air-brake lever on the hoist platform through a cataract system. A slack adjustment is furnished on the brake system, which automatically shuts down the hoist in case the brake wear becomes excessive. This insures the brake system being in first-class condition at all times. A Webb-type recorder is provided, which gives a graphic record of each trip and also records all signals. Fig. 2 illustrates the mechanical parts of the hoist and shows the type of brake system, including the countershaft brake, the bedplate for the motor and the hoist platform. In this figure also can be seen the brake magnet, cataract system, device for taking care of brake wear, the rear of the back-out switch and the telephone.

An auxiliary band brake is furnished on the pinion shaft. This operates in conjunction with the main brake and can be so adjusted that it takes care of the inertia effect of the motor rotor, thus relieving the main brakes and gears from unnecessary stress and wear.

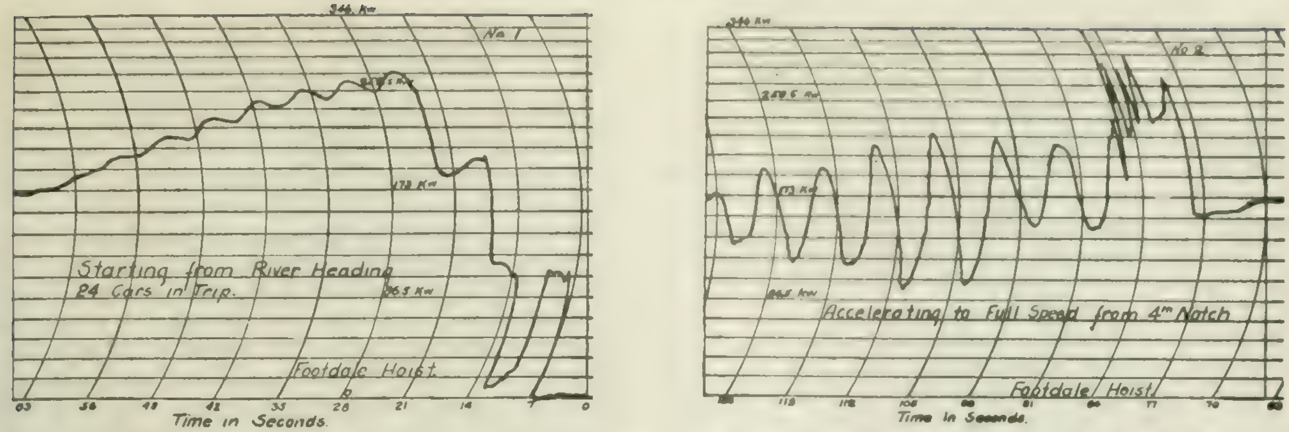
The safety device furnished by the Vulcan Iron Works consists of a fly-ball type of governor and a traveling-nut type of overwinding device. This apparatus prevents overspeed during any part of the cycle and will shut off the power supply and apply the brakes if the hoist operator does not retard the trip at the proper time. In case of overwind the power is cut off and the brakes applied. It is not possible to operate the hoist again until the back-out switch is thrown to the proper position and then movement can take place only in the proper direction.

A valuable feature has been added to this safety device. In case of overspeed or failure of power during the high-speed portion of the cycle it would be dangerous to apply the brakes suddenly because in such a case the hoist would stop quickly, while the trip would drift ahead and stop gradually, producing slack cable. The trip would then run back and cause serious damage by breaking the cable or bending the drum shaft. The safety device is so arranged that the brakes are gradually applied at any but the overwind position, in which case they are applied promptly.

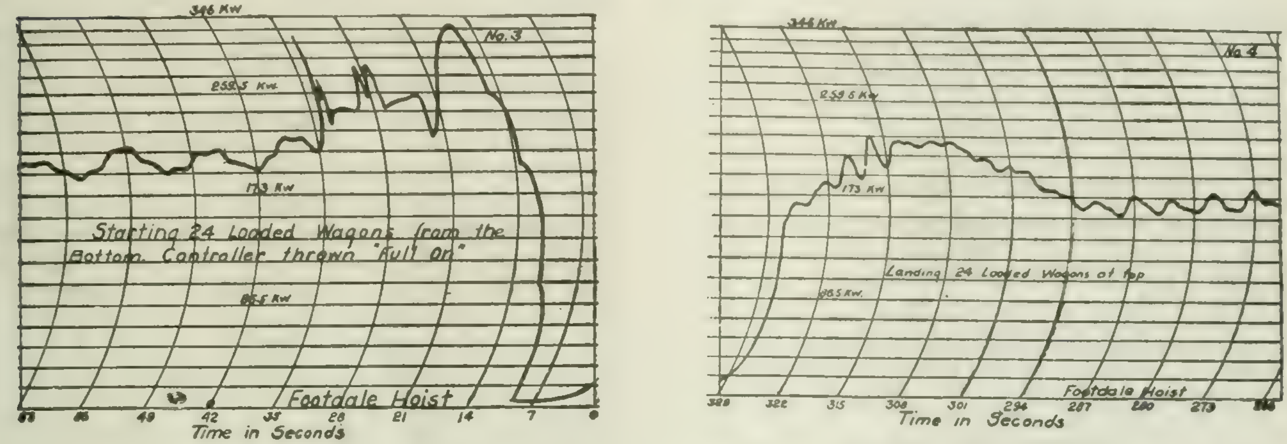
Fig. 3 illustrates the safety device and shows the

FIG. 6. CIRCUIT BREAKER AND SWITCHBOARD PANELS

The switches are designed for a maximum potential of 6,600 volts. They are arranged in groups of two each and sometimes operate several times per minute.



FIGS. 7 and 8. GRAPHIC WATTMETER RECORD OF HAULING CARS FROM RIVER HEADING
The start was begun at half speed and after straight track was reached the hoist was continued at full speed.



FIGS. 9 AND 10. RECORD OF HOISTING 24 LOADED CARS FROM THE BOTTOM
In this case the cars were pulled around the curve onto the straight track and there stopped. The controller was then thrown to the full "on" position and the record here showns made.

solenoid on the end next to the governor for the purpose of half-speed operation. In addition the overwind switches and the device for graduating the brake release according to the position of the trip can be seen.

The various safety devices on this hoist provide the following features:

(1) The hoist cannot over-travel in either direction.

(2) It is impossible for the hoist operator to start the machine in the wrong direction at either limit of travel.

(3) Protection is provided against overspeed arising from any cause whatever during any part of the cycle.

(4) Excessive peaks cannot be imposed on the power system because of careless handling of the controller. The power input to the hoist is held below certain predetermined limits through the use of automatic relays in the control system.

(5) Power will be interrupted and the brakes applied if the operator fails to retard the hoist at the proper time.

(6) The hoist cannot be started upon return of power or after the safety devices have acted until the operator has returned the control lever to the "off" position.

(7) If the operator fails to keep the brake system in proper adjustment, power will be interrupted and the brakes applied, and further operation cannot take place until proper adjustments have been made.

(8) There will be no delay in operation because of the functioning of any of the safety features. It will not be necessary for the operator to call for assistance in case of an emergency stop, over-travel or other contingency.

(9) Operation of the safety devices does not cause a movement of any of the levers on the hoist platform, that may endanger the operator.

(10) No safety feature depends upon the will of the operator.

(11) All electrical safety devices depend upon opening of electric circuits, not the closing of them.

(12) A safety switch is provided on the hoist platform to enable the operator to stop the machine at any time.

(13) The various safety devices give the operator complete confidence in his ability to control the hoist, thereby permitting him to run to its greatest output.

Fig. 6 shows the high-tension primary switches in the foreground. These switches are designed for a maximum voltage of 6,600 and a current capacity of 500 amp They sometimes operate several times during each cycle, and are much superior to any oil-immersed switch for such service. They are operated in three groups of two each. The individual switches are mounted on heavy channel iron frames and have porcelain insulators. Magnetic blow-outs and divided arc chutes are provided to protect the operator in opening heavy currents at high voltage.

A number of graphic wattmeter tests have been made with the hoist operating at half speed, the substation as yet not having sufficient capacity for full-speed operation. These tests show clearly the various resistance steps and illustrate the low starting torque necessary for this slope hoist. Because slack cable must be taken up and slow starts must be made the resistance is proportioned to give a low starting torque on the first notch. This low value is economically obtained by leaving one of the phases in the secondary of the motor open. The second notch simply closes the open phase. The resistance must have considerable carrying capacity in order to take care of pulling the entire trip at a slow speed around the curve at the bottom. The passage of the trip around the curve absorbs from sixty to eighty seconds of the hoisting time.

In Fig. 7 is shown a graphic wattmeter test, when handling a trip of twenty-four loaded cars from the River Heading at half speed. This curve shows that the first notch is used to take up the slack cable and then three more notches are employed to pull the trip slowly around the curve to the straight track. The finish of this haul is shown in Fig. 8, indicating that the trip reached the straight part of the track in about seventy-eight seconds, at which time the control lever was moved to the full "on" position and acceleration to full speed took place, the ninth notch coming in at eighty-six seconds.

Does the Whole Trip Vibrate Rhythmically?

This curve shows in an exaggerated form a pulsation that was noticed in all of the tests. It was thought at first that a rhythmic change in frequency might be the cause of this pulsation. From examination of the various tests it is now believed that the pulsation probably is due to a vibration of the entire trip caused by the large mass and great length of cable. A vibration of this kind is often noticed when using a first-motion steam engine, due to the pulsating tractive effort of the engine itself. In most of the other tests the vibration was much smaller.

The results of starting a trip from the bottom after it had been pulled around the curve into the straight track and there stopped is shown in Fig. 9. The controller was moved to the full "on" position from rest. The illustration shows that the first four notches came in promptly, after which the accelerating relays took care of the following notches. The last notch indicates that slightly too much resistance is cut out, and this can be readily adjusted. The same rhythmic vibration takes place as shown in Fig. 7, but to a much smaller degree. The time element is a little larger, probably because of the greater distance from the top.

In Fig. 10 is shown the finish of the trip started in Fig. 9. The time interval of vibration is lessened considerably because of the shorter length of cable. Tests of this kind show clearly the effect of varying grades and curves and provide a valuable check on the capacity of the electrical equipment.

The ultimate duty of this hoist will consist of lowering the loaded trips about 13,000 ft. to a point where the cars will be transported by rail to the Monongahela River, at which point the coal will be dumped into barges for river transportation to the large byproduct coke plant at Clairton.

Morrow Makes Mid-West Circuit

J. D. A. Morrow, managing director of the National Coal Association, is attending this week's meetings of operators at Terre Haute, Ind.; Evansville, Ind.; St. Louis, Mo., and Louisville, Ky.

Union Attacks Alabama Industrial Relations Committee Plan

A BITTER attack, impugning the motives and fairness of Federal Judge W. I. Grubb, in the appointment of umpires to settle differences between operators and coal miners in Alabama, has been launched here by William L. Harrison, international organizer of the United Mine Workers of America.

In a lengthy statement Organizer Harrison vigorously denounced the plan of the industrial relations committee which was put into effect by Alabama coal operators on April 1. He termed it "the most autocratic and undemocratic program that was ever inaugurated by employers to stamp out in this country a legitimate trade-union movement and to make impossible collective bargaining between employees and employers."

Judge Grubb was appointed by the Fuel Administration during the war and up to March 31 when the Garfield agreement expired, named the umpires in the Alabama coal fields. Organizer Harrison declares in his statement that no fairness may be expected by the miners from Judge Grubb on the grounds that Judge Grubb's three appointments of umpires have all been unsatisfactory to them and that Judge Grubb, himself, is a coal operator. When asked about this Judge Grubb stated that the facts of his ownership of coal stock had been communicated to the miners in each instance and that the miners, themselves, specifically waived such alleged incompetency to act. Judge Grubb, under the provisions of the new industrial relations committee, will appoint the umpires who, in disputed cases, will have the last word.

Organizer Harrison also brings out the long-standing fight in Alabama between operators and miners over recognition of the union. The miners want the union recognized, as a union, and demand that any settlement made to be in the form of a contract drawn up jointly by operators and unions in which the union shall be recognized.

Harrison Raises Six Points Against Grubb

Mr. Harrison objected to the plan on the following specific grounds:

1. That the proposal is patterned after the Rockefeller plan in operation in Colorado with the exception that the Rockefeller plan grants the right to organize "for protection" and this is denied in Alabama. 2. That there is no provision for a joint meeting of miners and operators as provided by the report of the Bituminous Coal Commission. 3. That the proposition is designed to destroy the United Mine Workers of America in Alabama and prevent the men from organizing. 4. That the increase in wages granted is not in accord with the recommendations of the coal commission in that day labor was increased only 69c. per day in the case of drivers and 60c. per day for tipplemen, instead of $1 per day for both. 5. That the election of representatives of the mine workers on the industrial committee will be completely under the influence or domination of the superintendents and foremen of the representative mines. 6. That Judge W. I. Grubb, of the federal court, is not satisfactory to the miners as the man to name the umpire who will finally settle all disputes that may occur hereafter between the mine workers and operating companies.

Gathering Locomotive with New Features To Lengthen Life and Save Power

Electric Braking, an Outside Frame with High Track Clearance, Leaf-Type Springs, an Improved Cable Reel and Demountable Tires Are the Chief New Features Embodied in the Construction of This Machine

BY JOHN LISTON
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THE new type of gathering locomotive here described and illustrated combines in a single two-motor unit five new features, all of which have successfully withstood such severe and long-continued tests in practical coal-mine service as to demonstrate fully their general utility.

By means of a new type of controller positive and graduated electric braking is secured. Heretofore much more effort has been expended in operating the brakes in gathering work than in handling heavy haulage locomotives. The haulage locomotive, as a rule, starts from some given point and stops only when it reaches the tipple or shaft bottom, a considerable distance away. En route there are few if any stops, and the motorman is therefore seldom required to operate the brakes on the way.

In gathering work the locomotive ordinarily starts and stops many times while the switches at the room necks are thrown and while couplings are made to each car individually. Consequently, while the gathering locomotive is lighter than the main-haulage machine the sum total of braking effort expended by the motorman is considerably greater.

The new controller was designed with a view to relieving the motorman of a large part of this braking and it operates so that the locomotive is stopped by its own momentum. This is accomplished by providing on the controller reverse cylinder a set of connections that turn the motors into self-excited generators, and the energy developed by them is absorbed in the main resistors. The amount of this energy, and consequently the degree of braking effort, is governed by the main cylinder of the controller. The more the resistance that is cut out of circuit, the more quickly will the stop be made.

The reverse cylinder of the controller is provided with four points, two for each direction of motion. For the first of these points the motors are connected in the regular motoring position. When it is desired to stop, the main cylinder is thrown off in the usual way and the reverse cylinder is through to the second, or braking point. The main cylinder is then turned on again and

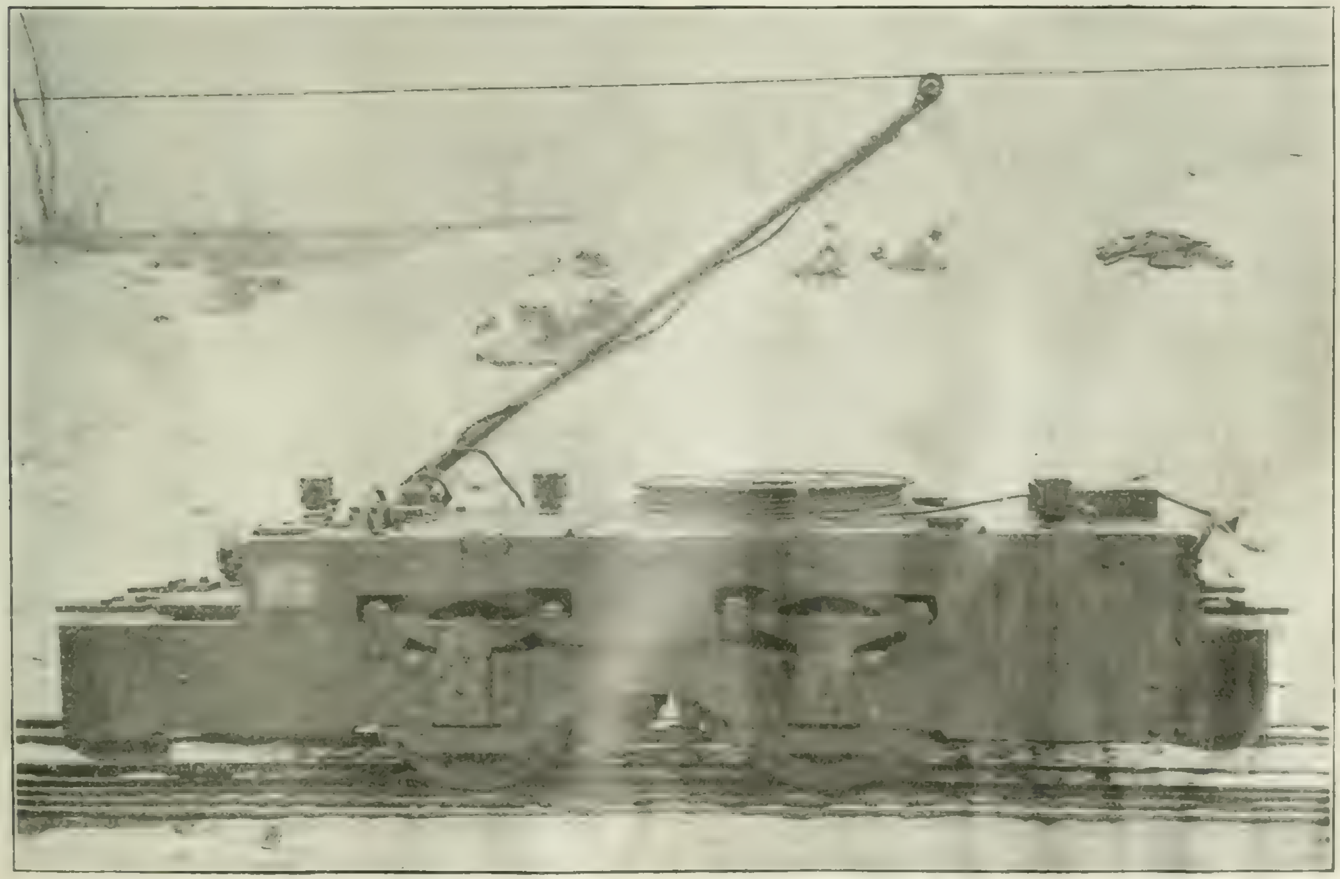


FIG. 1 SIDE VIEW OF THE NEW LOCOMOTIVE

Note high rail clearance, equalized suspension of leaf springs with accessibility of brake-adjusting mechanism

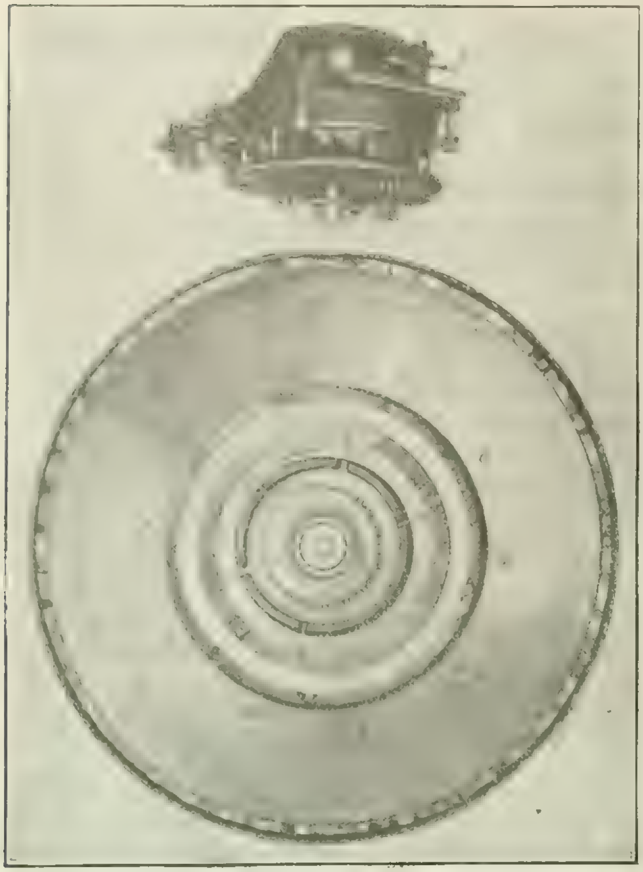


FIG. 2. REEL MOTOR AND BOTTOM OF CABLE REEL

The large size of the supporting ball bearing is one of the improvements in reel design.

the motors (or generators, as they now are) begin to retard the locomotive.

The degree of braking is under the motorman's control at all times, for if he finds that he is stopping too quickly, he merely has to throw off the main cylinder and permit the locomotive to coast. In numerous tests it has been demonstrated that with the trolley disconnected the residual magnetism of the motors, when acting as generators, is sufficient to insure as quick a trip stop as when the trolley is connected. This is an important factor in estimating the all-around serviceability of electric braking in gathering work.

On a level track the motorman can bring his train to a dead stop without using the ordinary hand brake at all. He also can bring it to a stop on a grade, but as there is no energy developed when the wheels have stopped turning, the locomotive will stop and start again, stop and start again unless the hand brakes are set. A runaway, however, is impossible so long as the train weight and grade are within the braking capacity of the locomotive.

With electric braking, therefore, the hand brakes need to be used very little, and as a result there is a great reduction in the wear on brake shoes and wheel treads as compared with hand braking. Furthermore, with electric braking, since the retarding effect is zero as soon as the wheels have stopped rotating, there is practically no skidding of the wheels, and consequently there will be few, if any, flat spots developed from this cause.

There is another incidental benefit with this type of controller. With the ordinary controller careless or indifferent motormen do not always use the hand brakes when they want to stop. In many mines it is a rather too frequent practice for the motorman to save effort by reversing the motors when a stop is to be made. When stopped in this way, the motors sustain a heavy rush of current and the gearing and other parts of the mechanical equipment receive severe shocks, all of which tend to shorten the life of the various parts and run up the maintenance costs.

This controller is different in another way from that employed upon the ordinary mine locomotive. Most controllers at present are arranged so that the locomotive will start with the motors either in series or in parallel. Here again the indifferent motorman will not use the series position when running slow. Instead he will leave the reverse cylinder in the parallel position and get slow speed by running on resistance. This increases maintenance costs of resistors and while on slow speed consumes twice as much current as if the motors were in series.

This question of additional current consumption may not in many cases represent a serious economic loss when one locomotive only is considered, but when a number of gathering machines are used the total amount of energy wasted in this way in a year is always a matter of serious consideration to the mine engineer who is desirous of maintaining a high over-all efficiency for the electric system of the mine.

The electric braking controller is a positive insurance against this particular form of waste as it is of the series-parallel type similar to that used on the ordinary street car and the first point is always "series-motors." Consequently the motorman cannot get to parallel operation until he has gone through all the series points.

In Fig. 4 the controller is shown with the arc chutes

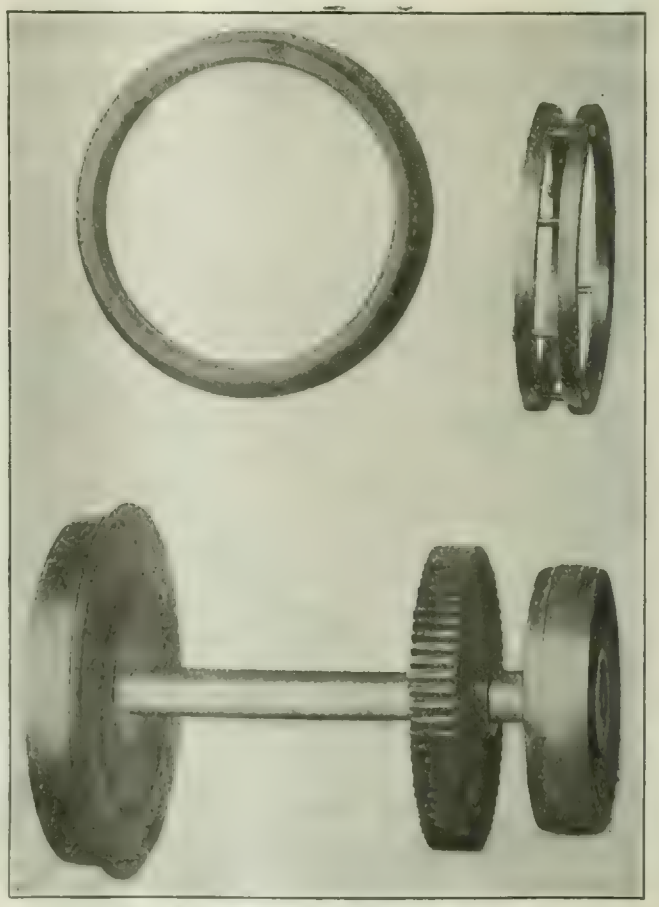
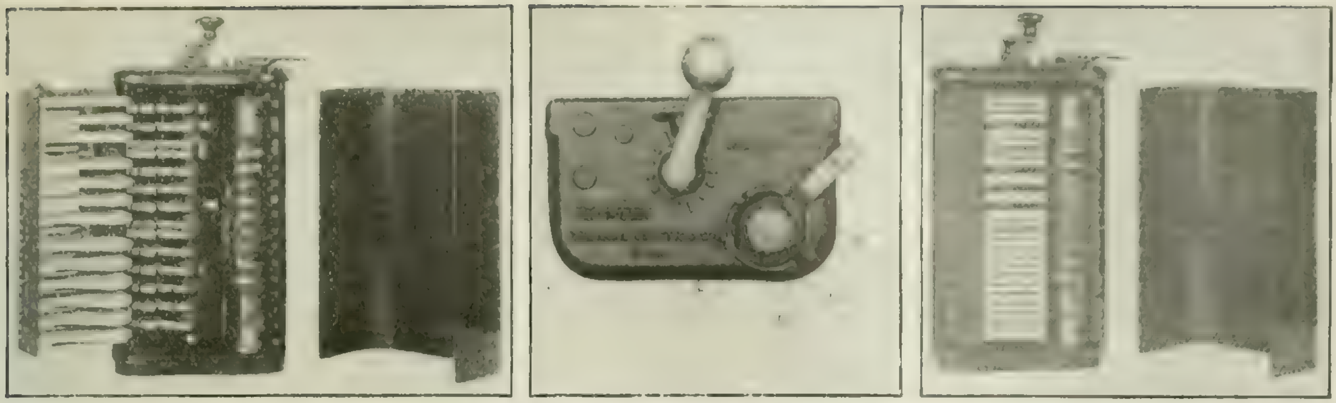


FIG. 3. DETACHABLE TIRE DRIVER

Tread is not shrunk on but held in place by two V'd rings drawn tight with bolts. Two men with wrenches can replace a worn tire in fifteen minutes ready for immediate service.



FIGS. 4, 5 AND 6. SOME DETAILS OF THE CONTROLLER

The construction of this controller is radically different from that of the ordinary type. The reverse cylinder is provided with four operating points and a neutral, and the arc-chute apertures are comparatively restricted

in normal operating position. It will be noted that the apertures are greatly restricted as compared with ordinary controller construction. This arrangement was adopted after exhaustive tests had demonstrated that by this means the arc could be extinguished in about one-third of the time required with the more open form of arc chute.

This detail insures longer life for the contacts since for all practical purposes their length of service is inversely proportional to the time of duration of the arc.

The outside frame construction adopted for the new locomotive is decidedly substantial. The side frames are cut from solid rolled steel plates, while the end frames are built up from structural steel channels, rolled slabs and wood bumpers protected by heavy face plates.

The outside frame in this case differs from the usual machine of this type in that the clearance between the rail head and lower edge of the side frame is high. Ordinarily an outside-frame machine would clear the rail head at this point by 3 or 4 in. When the locomotive is derailed, the frame settles down to about the level of the rails and prevents all access to the wheels. With this new construction the high clearance of the frame permits access to the lower part of the wheel so that blocking or other re-railing devices may be put into position, and the locomotive gotten back on the track practically as quickly as if the wheels were outside of the frame.

OUTSIDE FRAMES MECHANICALLY ADVANTAGEOUS

There are, of course, some mines where side clearance will not permit the extra width of the outside-frame type machine, but as a rule the main objection to this type of construction has been the difficulty of getting it back on the track in case of derailment. The high-clearance feature should remove this objection.

On the other hand, the outside-frame construction permits the use of a better journal box, one that is entirely inclosed at one end, while the other end can be fitted with a dust guard. With an inside frame both ends of the box must be open and bearings must also be made in two halves. This is not as good construction as the closed-end box either theoretically or practically. With the outside frame the greater space between the side frames allows more room for the equipment and permits the use of a liberal amount of space for the motorman's cab.

Heretofore practically all two-motor locomotives have been equipped with the round wire-coil type of journal spring, whereas the heavier three-motor machines were provided with leaf-type springs. These insured smoother running and better distribution of the weight on the drivers when operating on rough and uneven tracks.

As the result of operating experience gained with the three-motor units, the new locomotive was provided with a semi-elliptic leaf-type spring having an equalizing bar between the two journal springs on each side. Because of the limited space in the over-all dimensions of mine locomotives, the leaf springs can be designed with a much greater margin, that is, with much less of an approach to the elastic limits of the material used, than is the case with helical spring design. Consequently the leaf springs are mechanically stronger and less liable to breakage.

LEAF SPRINGS PERMIT WHEELS TO ACCOMMODATE THEMSELVES TO TRACK INEQUALITIES

By using leaf springs and equalizers the two-motor four-wheel locomotives will accommodate themselves to inequalities in track levels for the reason that any change in wheel load is transmitted through the equalizing levers to the other wheels, thereby practically evening up the weight on the drivers. Incidentally, the equalizing lever greatly increases the range of spring action and any tendency toward derailment is thereby minimized. Finally, the improved riding qualities of the locomotive tend to reduce the wear and tear on the track and roadbed.

The cable reel on this machine is an improved form of the vertical-axis motor-driven type that has been used successfully for a number of years. No change has been made in the ball-bearing motor but the bearing mechanism of the reel itself has been modified so as to secure greater stability and better wearing qualities. Instead of a large diameter of bearing made up of a considerable number of small balls, the reel now rotates on a heavy-duty type combination thrust and step ball bearing mounted at the center of the reel disk. The double-reduction driving train is made up entirely of forged-steel gears and heat-treated pinions.

The construction of the demountable tires is extremely simple, consisting merely of two wedge-shaped steel rings drawn together at suitable intervals by bolts. In drawing these rings into position the tire is forced to take its proper alignment with respect to the wheel hub and gage line, while the wedging action of the rings locks it securely in place.

It will be appreciated that the renewal of this tire is a much shorter job than is the case with the ordinary shrunk-on type. Socket wrenches are the only tools required, and the change can be made in the locomotive barn. With outside-frame locomotives it is only necessary to drop the axles, and with inside-frame machines the change can be made without taking the axle out of the frame.

The advantages of these demountable tires will be appreciated by anyone who has had to replace a shrunk-on tire. The complete replacement of the new tire can be effected by two men in about 15 min. for each wheel.

With the co-operation of W. A. Chandler, electrical engineer of the H. C. Frick Coke Co., a 6-ton gathering locomotive with an experimental braking equipment of the type here described was placed in service at the above-named company's coal mines near Uniontown, Pa. This has been in successful operation for the past two years, during which time the necessary refinements were worked out under actual service conditions.

A 20-ton main-haulage locomotive with similar braking control has been handling loaded trains on a 4,000-ft. line with 4 to 5 per cent grades for about one year. It is therefore evident that the principles embodied in the new gathering locomotive have fully demonstrated their value in actual service. The locomotive here described was designed by engineers of the General Electric Co.

Meeting Difficulties of Centrifugal Pumping By Suitable Construction

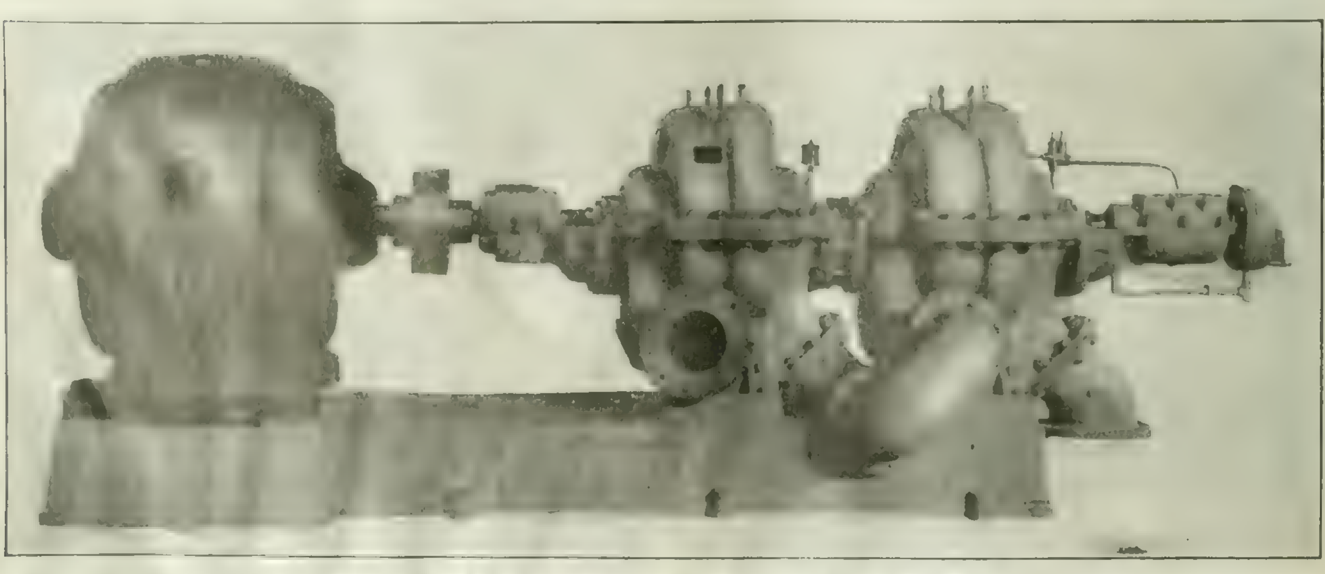
End Thrust is Met by Hydraulic Balancing—Diffusion Rings Are Omitted—Wearing Rings Reduced from Four to Two—Internal Parts Made Readily Accessible—Centrifugal Pumps Have Large Capacity

MANY mining engineers hesitate to install centrifugal pumps for handling mine water for two reasons—the high upkeep cost and the tendency of the machine to break down when most needed. Pumps designed for handling fresh water give poor service in mine drainage, even if made entirely of bronze. Quite satisfactory results can be obtained, however, with pumps especially built for the mines. Wear on the rotating parts in contact with the water cannot be avoided. A mine pump should, therefore, have few wearing parts in order to minimize the upkeep expense. Furthermore, the pump should be hydraulically balanced, since most shutdowns arise from end thrust.

Single-suction multi-stage pumps are particularly inclined to "shove." What causes the end thrust is sometimes hard to determine, especially when the impellers are surrounded by diffusion rings, that hamper inspection. It may be caused by blocked impellers or excessive wear of the impellor seal rings. Again the impellers may not be in line with the diffusion rings, or other slight imperfections or maladjustments may exist.

As is well known, single-stage, double-suction, volute pumps give excellent service in the mines because they have few parts and are hydraulically balanced. They are absolutely reliable if equipped with a bearing that will take care of end thrust. (Fig. 1) The Hazleton two-stage volute pumps are built along the same lines as the double-suction volute machines. The water enters the impellers from both sides (Fig. 2), but there are two volutes combined into one casting, the discharge from the first passing under the second volute and up into the eye of the second impeller, so that the volutes work in series and produce twice the head obtained in a single-stage pump. This arrangement obviates the necessity for diffusion rings, commonly used in two-stage pumps, and reduces the number of wearing rings from four to two. This not only means less upkeep cost but also less internal leakage and in consquence a much longer maintenance of the original efficiency than diffusion-ring pumps can show.

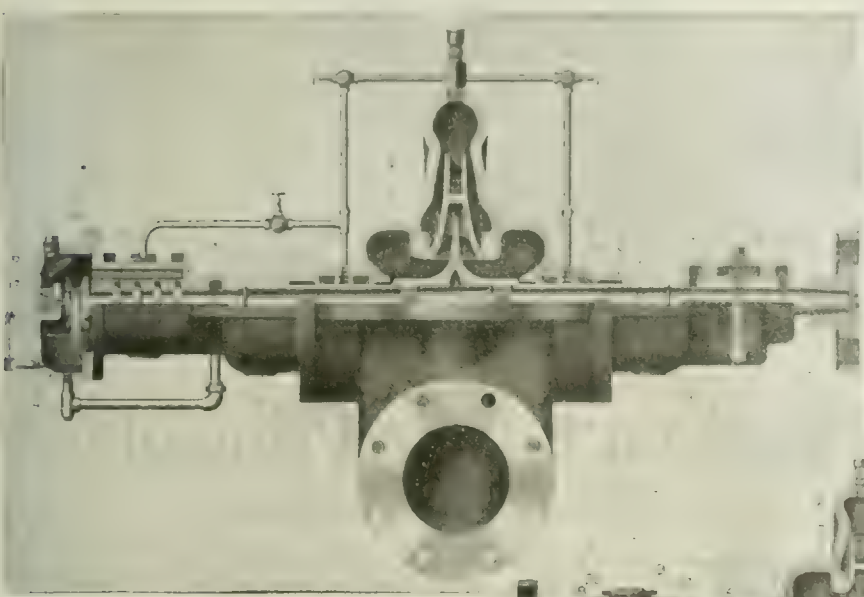
The absence of diffusion rings makes inspection easy, as all internal parts are readily accessible. The water is led from the first volute into the suction head of the



HYDRAULICALLY-BALANCED, ELECTRICALLY-DRIVEN PUMP
Discharge from one section of the unit is made to the suction of the other, thus compounding the effort.

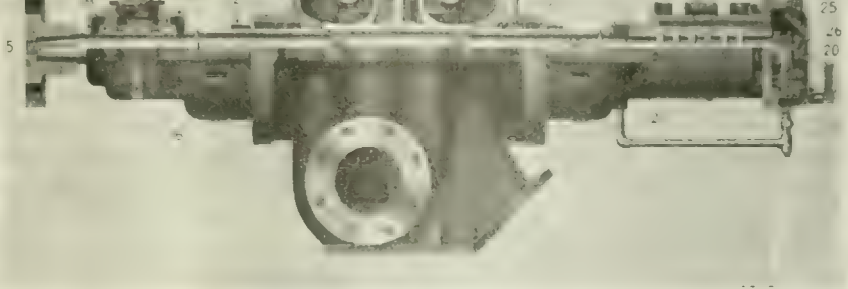
second through a carefully designed passage, so that good efficiency and a compact casing are obtained. This design is covered by patent. The pump is balanced like a double-suction machine. If two two-stage pumps are connected in series, a four-stage pump is obtained in which the impellors are mounted alternately opposed on the shaft, so that the first impeller balances the second and the third balances the fourth. Heavy end thrust is, therefore, not likely to develop, but should it do so the cause can easily be detected, as the casing "top halves" are comparatively light and can quickly be removed. The advantage of this construction is still more apparent in an eight-stage pump. Two men without the use of a hoist can easily lift off the top halves of a 500-gal.-per-minute machine of this type and four men the top halves of a 1,000-gal.-per-minute pump. A spare motor can be installed in a short time, and as the impellors have liberal clearance in the casings, fine lateral adjustments that have to be made in diffusion-ring pumps are not necessary. A four-stage pump has only four impellor sealing rings and the upkeep cost is low. The casing is fitted with removable casing rings. A rubber gasket is inserted outside of these rings, the rubber projecting slightly above the surface and preventing any leakage between casing and ring. The rings are so heavy that they will stand reboring, so that they will last twice as long as those commonly used.

Not only the internal, but also the external parts of the pump are specially designed for mine service. The thrust bearing is self-oiling and water-cooled. The cooling water is not under pressure and cannot leak into the bearing. The water jacket is open and can easily be cleaned, as water containing "yellow boy" soon clogs narrow passages. The cooling water valves and flanges are made of acid-resisting bronze, while the piping is of copper.



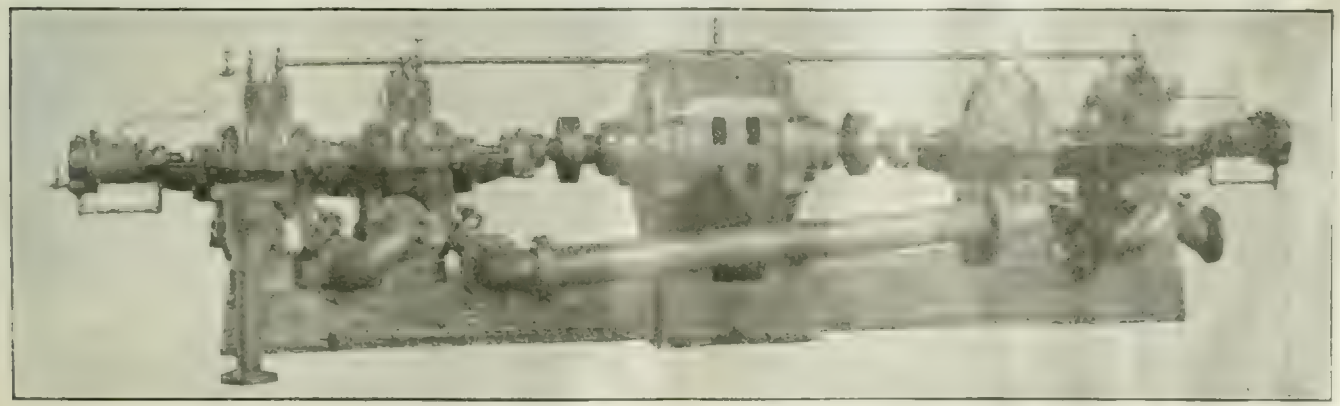
ABOVE—HALF SECTION OF A SIMPLE UNIT

Suction is made from both sides of the impeller, thus securing balance.



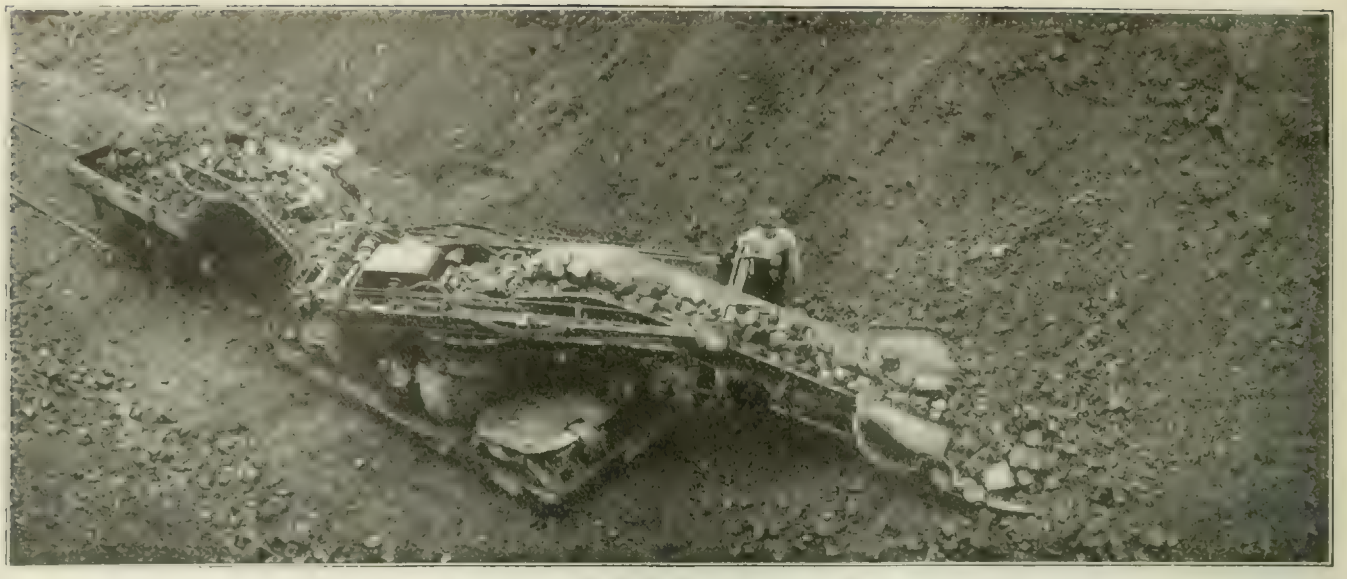
BELOW—HALF SECTION OF A DOUBLE UNIT

The effect or action of the two impellers is here opposite, thus tending to secure balance.



ELECTRICALLY-DRIVEN FOUR-STAGE PUMP

The various elements or stages of this machine are compounded thus securing a high working pressure while the arrangement is such as to secure hydraulic balance.



Coal Loader Based on a New Principle

Increased Production, Decreased Labor and Reduced Overhead Expense Are Goals of Operation—A Loading Machine with 100 Tons Per Day Capacity May Do Much to Attain Them

ONE of the devices developed during the war for the purpose of stimulating coal production was the Joy loading machine. This has only recently been perfected and is now offered to the industry. The inventor, J. F. Joy, is at the head of the Joy Machine Co., with main office in the Union Arcade Building, Pittsburgh, Pa. Development of the machine was fostered by the Pittsburgh Coal Co., and most of the tests necessary in perfecting the mechanical principles involved in the construction were made at the Somers No. 2 mine of this company. This operation, which is used principally as an experimental one, is located at Belle Vernon, about 42 miles south of Pittsburgh.

It is the dream of every operator to increase production, decrease labor and at the same time be able to reduce overhead expenses. Several factors of high economic importance may be effected by a loading machine. The most important of these is the fact that it would be possible to mine a given output from an area about ½ as great as where hand loading is employed.

The benefits to be derived from mining coal in a restricted area are obvious. There will be less track work to be done, fewer mine cars to be used, fewer haulage units necessary, more concentrated supervision of the mine and a more simple drainage and ventilation problem. In mines where a friable roof is encountered, machine loading permits of a more rapid advance of rooms and entries, with a consequent earlier drawing of pillars.

It was hoped that the new loading machine would be able to realize by practical results the theories mentioned in the above paragraph. From a series of tests conducted under severe mining conditions in the Pittsburgh bed, the outlook is indeed encouraging. Results of some of these tests, which were made at the Somers No. 2 mine, have been put into the form of tables and accompany this article. The data contained in them are indicative of the high efficiency of machine loading.

A short description of mining conditions encountered in the Somers No. 2 mine will show that this operation is no different from many others in which the Pittsburgh bed of coal is being developed. This bed carries a uniform thickness of 70 to 72 in., and with the exception of a few local swamps is practically level. At no place are grades encountered that exceed 7 per cent. The coal rests on a firm limestone floor but the roof is composed of draw slate which varies from a few inches to as much as 4 ft. in thickness. Considerable trouble is experienced with it as it usually falls as soon as the coal is shot down. In cases where this does not occur the roof is disturbed to such a degree as to make working extremely dangerous. Above the draw slate the roof is fairly strong and permits posting to be kept from 10 to 15 ft. in rear of the face.

The room-and-pillar method of developing the coal is employed. Entries 9 ft. wide are driven in pairs on 50-ft. centers. Rooms on 39-ft. centers are driven off these to a distance of 250 ft. The room necks are 9 ft. wide and 21 ft. long, after which the room is widened to from 21 to 24 ft., the actual room width depending, of course, upon the thickness of cover. The room pillars, which are from 15 to 16 ft. in width, are drawn after the room has been advanced to its full length of 250 ft. The track in each room is carried along one side and at a distance of 6 ft. from the rib. As the draw state is brought down it is gobbed between the track and the opposite rib. Twenty-five-pound steel rails are used in the room track, which is laid to a 42-in. gage on wooden ties, spaced 2 ft. apart.

The coal was undercut to a depth of about 7 ft. by means of Sullivan shortwall mining machines and shot down in the usual manner with black powder. The Joy loading machine was then employed to supplant the common method of hand loading.

A brief sketch of the machine was published in the Nov. 27 and Dec. 4 issue of *Coal Age*, covering one of the machines in operation on the surface. Coal was reloaded from a stock pile at the Montour No. 10 Mine of the Pittsburgh Coal Co. The details of operation at that mine will again be touched on and when perused in connection with the accompanying illustrations will show some of the mechanical innovations embodied in the machine's construction.

TABLE 1 SHOWING RESULTS OF OPERATION DURING DECEMBER, 1917

Date	Hours Worked	Cars Loaded	Tons	Hours Delayed	Causes of Delay and Remarks
1	8	37	74	0	Machine operated [illegible]
3	8	57	114	0	
4	1	3	6	7	Broke swing shaft
5	8	85	170	0	
6	6	49	98	2	Broke gathering arm
7	4	28	56	4	Broke gathering arm
8	8	61	121	0	
10	8	47	94	0	Short crew
11	8	63	126	0	
12	8	60	120	0	
13	8	56	112	0	
14	8	53	106	0	
15	8	57	114	0	
17	8	53	106	0	
18	5	33	66	3	All mine cars filled
19	6 5	58	116	1 5	Waiting for mine cars
20	6	54	108	2	Repairing storage hopper
21	8	70	140	0	
22	7	50	100	1	Waiting for mine car
24	7	50	100	1	Waiting for mine cars
26	3	23	46	5	Haulage locomotive broke down
27	6	41	82	2	Waiting for mine cars
28	6 5	58	116	1 5	Waiting for mine cars
29	8	53	106	0	
31	6 5	52	104	1 5	Repairing storage hopper.
	168 5	1,251	2,501	31 5	

SUMMARY

Working days	25 0
Hours machine operated	168 5
Cars loaded	1,251 0
Tons	2,501 0
Hours delayed	31 5
Hours delayed due to machine failure..	16 5
Working hours in month..................	200.0
Time lost due to causes other than machine failure	15 0

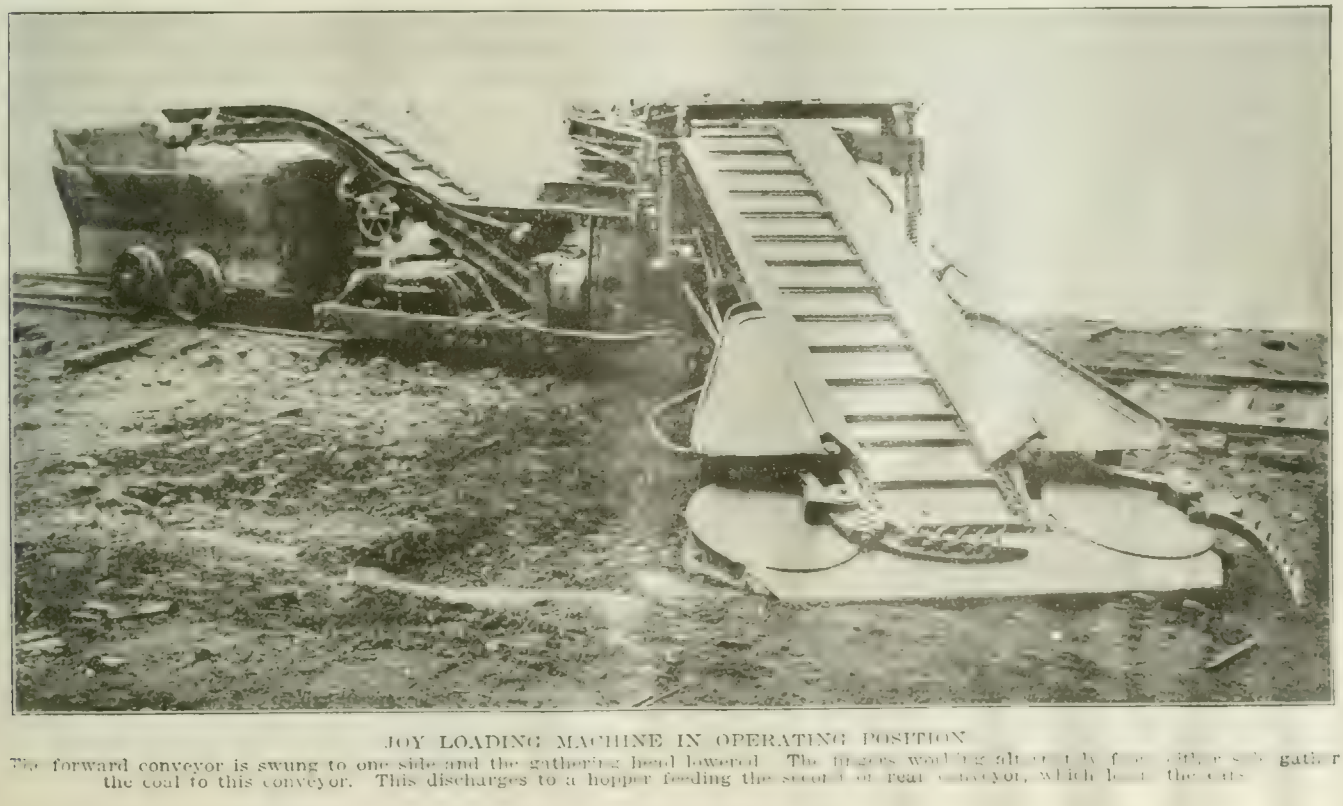
The machine, which weighs about nine tons, is electrically driven and is 29½ ft. long, 5 ft. wide and 5 ft. high. It is moved under its own power at a maximum speed of eight miles per hour, the speed of travel being at all times under the control of the operator.

As shown in the accompanying illustrations, two conveyors are embraced in the construction. One of these reaches from the gathering mechanism to a storage hopper that constitutes the body of the machine. A second conveyor is utilized to discharge the coal from the hopper into the mine car, which is located to the rear of the machine. Both conveyors are flexibly mounted on the supporting truck and may be swung to nearly any angle. This feature of construction permits the machine to traverse short-radius curves such as those at room entrances.

The gathering mechanism is placed at the forward end of the loading conveyor. Briefly, it consists of a pair of geared fingers that are arranged so as to be positively driven in a fixed orbital path. The initial movement of the fingers is forward into the coal, after which there is a raking motion across the coal face and then a rearward movement toward the loading conveyor. From this point the movement is a return to the starting position. The path of the finger tips is shown in Fig. 3.

After the machine has been brought into the room where it is desired to load the coal, the loading conveyor is lowered so as to bring the gathering mechanism at the front end into contact with the floor. The machine is then propelled forward until the gathering mechanism is in close proximity to the loosened coal, after which it is set in motion and the machine bodily moved forward on the track until the fingers in their orbital movement engage the coal and gather it onto the loading conveyor.

The gathering mechanism is of simple but rugged construction and with its undermining action is capable of loosening the coal from a semi-undisturbed state. Safety measures in the form of friction clutches are provided so as to prevent destruction of the gathering mechanism when the fingers encounter relatively immovable lumps of coal.



JOY LOADING MACHINE IN OPERATING POSITION

The forward conveyor is swung to one side and the gathering head lowered. The fingers working alternately from either side gather the coal to this conveyor. This discharges to a hopper feeding the second or rear conveyor, which loads the cars.

The principles involved in the construction of the machine are departures from any other attempts that have been made along this line. In the first place the gathering mechanism with its horizontal, penetrating, undermining action is effectual in winning coal from a semi-undisturbed state. This allows for a fairly conservative use of explosives. The storage hopper goes a long way in solving the transportation problem since it makes possible the changing of cars without interrupting the operation of gathering the coal from the floor.

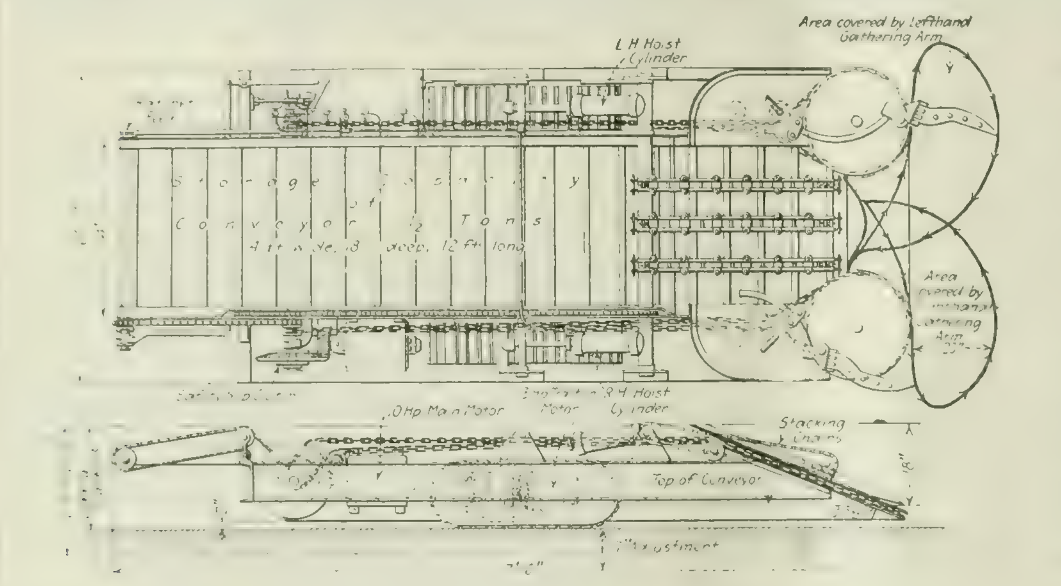
The new loading machine was first placed in service on Dec. 1, 1917, and has been operated continuously ever since. Several of the machines are now in operation, each of which is capable of maintaining an average daily production of 100 tons. This is really a highly conservative figure for an eight-hour day.

The machine crew consists of an operator, a helper and a car pusher. The operator's duty is to supervise the handling of the machine in its various operations and to oversee and assist with the cleaning of the coal as it passes up the loading conveyor and into the storage hopper. In this respect the loading conveyor is not unlike a small picking table, and with ordinary care exercised in the cleaning there should not be any further need for picking on the surface.

TABLE III. RECAPITULATION DECEMBER, 1917, AND JANUARY, 1918

Working days	51.0
Hours machine operated	314.5
Cars loaded	3,845.0
Tons loaded	5,689.0
Hours delayed	93.5
Hours delayed due to machine failure	27.0
Possible working hours	408.0
Average tons per working day	111.0
Percentage of time lost due to machine failure	6.6
Average tons per hour machine operated	18.0

The duties of the helper are to clean up the coal fragments that may be left by the machine in the corners of the room and to assist in separating the draw slate. He may also place such temporary timbers as may be necessary. The car pusher's duty is to place the empty car under the lip of the discharging conveyor after the loaded car has been removed by the driver. He also oversees the filling of the car by operating the secondary or discharging conveyor.



Area covered by lefthand Gathering Arm
L H Hoist Cylinder
Storage Capacity of Conveyor 2 Tons
4 ft wide, 18 in deep, 12 ft long
Area covered by righthand gathering arm
10 Hp Main Motor
Hoist Motor
R H Hoist Cylinder
Stacking Chains
Top of Conveyor
Adjustment

Plan of the Low Model Machine

The paths of the fingers are here plainly shown. In this low model the second conveyor serves for a temporary storage in place of the hopper used on the higher machine. This will carry when full a sufficient amount of coal to appreciably shorten the time necessary to fill a car upon the track behind the machine.

TABLE II SHOWING RESULTS OF OPERATION DURING JANUARY, 1918

Date	Hours Worked	Cars Loaded	Tons	Hours Delayed	Causes of Delays and Remarks
2	4	51	102	4	Waiting for mine cars, bad track.
3	7	90	180	1	Defective track.
4	4	52	104	4	Waiting for mine cars
5	6	75	150	2	Waiting for mine cars
7	4	34	68	4	Waiting for mine cars.
8	7	72	144	1	Defective track and waiting for driver.
[illegible]	7	74	148	1	Waiting for driver, 30 min. machine repr
10	7	76	152	1	Waiting for mine cars, defective track.
11	[illegible]	87	174	0	
12	[illegible]	45	90	5	All cars loaded.
14	[illegible]	29	58	5	Waiting for mine cars.
15	4	62	124	4	Waiting for mine cars.
16	[illegible]	61	[illegible]	2	Waiting for mine cars
17	[illegible]	71	142	1	Machine off track, defective track
18	[illegible]	41	[illegible]	3	Repairs on machine
19	[illegible]	74	[illegible]	2	Waiting for driver, defective track
21	[illegible]	[illegible]	[illegible]	[illegible]	Defective track, 30 min. machine repairs
22	[illegible]	64	[illegible]	[illegible]	Defective track, 30 min. machine repairs
23	[illegible]	69	[illegible]	2	[illegible]
24	[illegible]	[illegible]	122	[illegible]	Miscellaneous.
25	[illegible]	[illegible]	126	[illegible]	[illegible] track
26	[illegible]	[illegible]	110	[illegible]	[illegible] machine
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible], 1 hr. defective track
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
30	[illegible]	[illegible]	122	[illegible]	[illegible]
31	[illegible]	51	[illegible]	[illegible]	Miscellaneous
	[illegible]	[illegible]	[illegible]	62	

SUMMARY

Working days	26
Working hours	208
Hours machine operated	146
Cars loaded	1,594
Tons	[illegible]
Hours delayed	62
Hours delayed due to machine failure	10.5

In considering the production figures shown in the accompanying tables it must be remembered that the machine crew had to handle from 40 to 60 tons of draw slate in loading 100 tons of coal. In this respect the draw slate was a serious handicap in establishing any kind of a record. However, the tables are really of more practical value than if the machine had been allowed to work under ideal conditions and records made that would not convey any idea of operation under actual mining conditions. It is quite probable that if the machine had been operating in a bed free from troublesome draw slate the production would have been nearly if not quite doubled.

A machine for use in thin beds is being manufactured although at present there are none of this type in operation. The mechanical principles of construction, however, are the same. This machine will be but 30 in. high. It differs from the type that has been described in that it is provided with a caterpillar tread. Construction details of this type are shown.

Avoidance of Clinker When Burning Coal With Low-Fusing Ash

Under Ordinary Conditions Coal with a High-Fusing Ash Has a Marked Advantage Over a Fuel with a Low-Fusing Ash—This Superiority Disappears with Suitable Stoking

By T. A. Marsh
East Chicago, Ind.

MUCH interest has been evinced by the entire coal-producing and coal-consuming public in the data by Mr. Selvig of the Bureau of Mines covering the fusibility of coal ash from all districts of the United States, recently published in *Coal Age*. These findings will stand as the authority on this subject for many years to come.

Some of the earliest work along these lines was carried on by the late J. W. Sparrow, chief engineer of the New York Edison Co. Mr. Sparrow observed in his boiler room operation that frequently massive clinker formations would put boilers practically out of service. He therefore began investigating analyses of the coals which caused the trouble. Finding nothing in the proximate or even in the ultimate analysis that would unerringly indicate clinkering proclivities, he began working directly with the fusion point of the ash of each of the coals employed.

This investigation of the fusion point of ash opened up a wide field of inquiry, and the result of Mr. Sparrow's investigations was that out of about twenty possible fuels, a group of only five or six was found suitable as being free from clinkering, as indicated by the high fusion temperature of the ash.

Clinker Is Nothing But Fused Ash

To consider the practical application of Mr. Selvig's data and the correlation of laboratory with boiler room results we must consider exactly what clinker is. Clinker is nothing more nor less than fused ash. Ash fuses when it is brought to a temperature above its melting point. With some coals the melting, or fusion, point of the ash is as low as 1,800 deg. F., while the ash from others will not fuse until it has reached a temperature of 2,200 deg. The refuse from still other coals requires as much as 2,400 deg. and among the least fusible are those that require a temperature of 2,800 deg. F. before melting occurs.

Furnace temperatures as high as 2,200 to 2,400 deg. are frequently obtained. Temperatures beyond this point are seldom reached in practice, and consequently if coal whose ash fuses at a temperature below 2,400 deg. is used in a furnace which operates at a temperature in excess of 2,400 deg. the ash will melt if brought into that part of the furnace where the high temperature occurs. If the ash requires 2,600 or 2,800 deg. F. in order to melt, bringing it into a furnace temperature of 2,100 deg. causes no clinkering.

There are therefore two possible methods of avoiding clinker in furnaces operating at high temperatures: Either keep the ash cut out of the part of the furnace where the high temperature exists, or use only coal which has an ash fusing at a higher temperature than 2,400 deg. F. If all of the available fuels are low-fusible-ash coals, it becomes necessary to select such stoking equipment as will not bring the ash into the zone of high temperature in the furnace. If, on the other hand, a variety of high- and low-fusible-ash coals are available, it is possible to select only those which have high ash-fusion temperatures. This selection is actually being made throughout certain districts of the country, particularly in the East, where coals with high- and low-fusible ash are available in many markets. It inflicts serious handicap on the producers of coals with a low fusible ash, and is a condition which ultimately will be corrected as we learn to burn all of our fuels regardless of such characteristics as tendency to form clinker.

High Temperatures Are Desirable

In those markets where high-fusible-ash coals are not available, such as in the Middle West and West, coal consumers have learned to handle the low-fusible-ash, or clinkering, coals in a way to avoid all clinker trouble. The method of doing this is not to reduce the furnace temperature, as high furnace temperatures are desirable and necessary in order to secure high efficiency. It is not to change the coal and select only those fuels whose ash will not melt in the furnace, for such coals are not available; but the method employed is to keep the ash out of the zone of high temperature in the furnace. This is not as difficult to accomplish as might be supposed. It simply involves not stirring the coal or turning it over after it is once ignited.

Comparatively few coals west of Pittsburgh have ash with a high fusion point. Moreover, the quantity of ash in such coals is high. Therefore, where Mr. Selvig's paper indicates a high percentage of ash and a low fusion point, the common expression in describing such a coal would be that it "makes clinker and lots of it." This is the general characteristic of coals of the Middle West and the West. Some are a little better than the average, many are worse.

Fuel Agitation Must Be Avoided

To put these coals on stokers that agitate the fuel bed and which bring the ash up into the zone of high temperature is disastrous to economy, capacity and even to the continuous operation of the stoker and boiler. Practically all Western plants therefore must use stoker types which do not agitate the fire bed and which carry the fuel entirely through the furnace and continuously discharge the ash. The chain grate is an adaptable stoker in this field, and because of the characteristics of the coals here produced this type is largely used. In plants equipped with chain-grate stokers the question of fusibility of ash never arises, as the ash is always on the lower side of the fuel bed and is not disturbed or thrust up into the zone of high temperature. Consequently clinkering does not occur.

The selection of the right type of stoking equipment for the fuels tributary to the plant is highly important. If the entire fuel market is available, regardless of the fusibility of the ash, certainly the purchaser is in a position to obtain his fuel to better advantage than if he is limited to certain high-class coals. Furthermore, the producer is in a better position to offer a continuous supply and a more attractive proposition if all of his coals are desirable fuels for the plant in question.

One of the worst combustion-engineering errors possible is the selection of the wrong stoker for the fuel available. For instance, when a stoker which agitates the fuel bed is selected for a low-fusible-ash coal, it is only a question of time until live steam jets will be installed along the walls of the furnace to soften and disintegrate clinker. It is possible to accomplish this result to a marked degree, but the steam consumption is so great that it is now well known that the installation of such steam jets is a frank admission that the wrong stoker has been selected.

Coal consumers are interested in this problem as it is their business to select stoker types suitable for the fuels available. Coal producers are forced to be interested in the problem as many of them will, if they have not already done so, find their coals discriminated against because of clinkering characteristics as determined in practice and as indicated by the fusibility of the ash. From the standpoint of national economy we must certainly all work to the utilization of all of our resources in the most efficient manner possible, and the more thoroughly we understand the problem in connection with our coal characteristics, the fewer will be our mistakes.

Machine That Cuts Coal Without Alighting From Its Carriage

Turntable Type of Machine Cuts at Almost Any Level, Removing the Impurities Where Desired or Cutting the Coal so That a Safe and Even Roof Is Secured

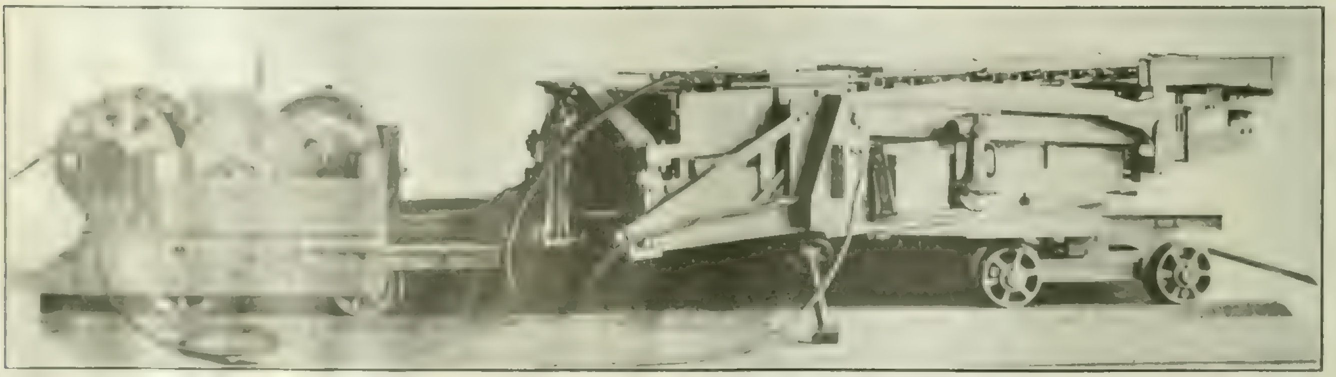
In the evolution of coal cutters every one of the practical machines has attained its present status not by wholly eliminating its predecessor but by meeting mining conditions for which other types were not entirely adequate.

In manipulating the pick machine, which was the first practical coal cutter, the operator had to direct every blow and his helper was required to shovel back the cuttings as fast as they were made. When the breast machine was perfected much of this labor was saved and more coal was cut yet with less effort, but the breast machine never entirely supplanted the pick machine because it was not adaptable to all mine conditions. To load and unload the breast machine from its truck, to bar it across the face, to set the jacks and to shovel the cuttings, all took labor.

This machine was followed by the continuous coal cutter or shortwall machine. The latter accomplished more cutting with less labor, as this machine was loaded, unloaded and moved across the face under its own power, but it likewise never completely supplanted its predecessor because conditions were encountered to which the breast machine was better suited than the shortwall type.

A number of experimental machines followed, but as they never reached commercial favor they cannot be considered as actual progressive steps in the development of coal-cutting equipment.

The turntable type of cutter of the Morgan-Gardner Electric Co. is the latest development. Here the labor of operating is further reduced, as there is neither loading nor unloading, nor yet shoveling of cuttings. Notwithstanding the fact that the field of usefulness of this machine is probably wider than that of any other type, it is likely that it will not entirely displace the shortwall machine.



TURNTABLE CUTTER AND ITS TRAILER

[illegible] the trailer pulls or pushes the cutting machine from place to place.

The turntable machine is particularly suitable for such work as cutting out dirt bands, cutting in the center of thick beds or near the top, leaving coal to protect the roof from weathering or to furnish strength and also safety under what would otherwise be a bad and dangerous roof, thereby saving timbering, the handling of fallen rock and other expensive dead work.

In one field where there is a 3 ft. bed of good coking coal overlaid with a soft brash coal from 18 in. to 2 ft. thick the brash cannot be allowed to mix with the coking coal because it practically ruins the coke. The machine, cutting just above the coking coal, brings out in making the cut virtually all the stratum of brash, leaving the lower bench separate and clean, so that it can be loaded without danger of contamination.

In another field the machine has pronounced usefulness beyond making the cut. Here a 5-ft. bed is overlaid by 2 in. of "cube bone coal," which makes a bad separation from the good coal when shot with it. Accordingly the cut is made in the bone coal and overlying slate, leaving the entire bed to be shot and loaded out. The quality of the coal thus is made better both by eliminating the bone and by producing a larger percentage of lump.

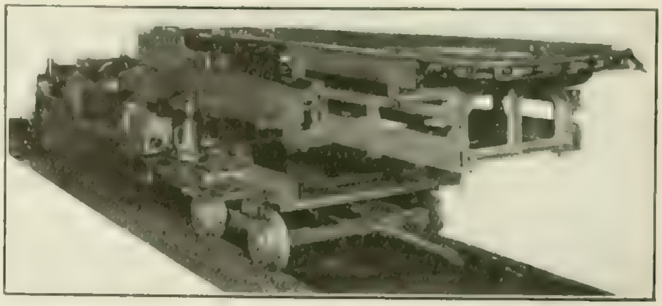
In a number of mines where the roof was so bad that it was almost impractical to mine at all, this machine came to the rescue by cutting in the coal a short distance below the top, making a good, smooth coal roof. Another machine has been built and with it an attempt is about to be made in a 9-ft. bed to make a cut 92 in. above the track, leaving enough coal to form a good roof.

There is a possibility that the new turntable type of machine will prove to be highly useful in thin beds where it is necessary to take up bottom to make height. In such work the truck and propelling motor equipment remain on the track in the space excavated, while the cutting element swings over the bottom in the space left by the removal of the coal. Within certain limits the cut can be placed at the top or bottom of such a bed, as may be desired.

This machine is composed of three principal elements —the propelling device, the turntable truck and the cutting machine proper. The propelling portion, which is really a small locomotive, carries part of the weight of the turntable truck and cutting machine, while the remainder of the weight is carried on a bogy truck under the turntable. This arrangement distributes the weight on eight wheels, so that the machine can travel safely on light rails. The propelling element is equipped with a motor, trolley pole, automatic cable reel, sand boxes, seat for the operator, tool box and supports for carrying the jacks.

The turntable element is flexibly mounted on the forward truck. It is composed of two plates pivoted together, the upper plate being free to rotate on antifriction rollers held in the lower plate. Provision is made for locking the plates together for each cutting position. To the upper plate are attached the adjustable supports for the cutting element. As this element is adjustably mounted at three points only, in can be raised and lowered to cut at various heights horizontally or to cut upward or downward through a wide angle. It can also be tilted laterally a short distance.

The machine proper is of the breast type but is designed and built for turntable requirements. This type lends itself well to the conditions encountered, as it feeds out and reaches a great distance from the track, yet its frame holds it rigid when the cut is being made. The whole machine is necessarily long, and it might well be expected that difficulty would be encountered in traversing short curves and in entering narrow places, but this is entirely overcome by automatically turning the cutting machine on its turntable whenever it travels around such turns. It actually overhangs the track less than does the ordinary breast or shortwall machine designed to cut an equal depth.



FRONT VIEW OF THE TURNTABLE MACHINE

The cutting element strongly resembles that of a breast machine. It may be raised, lowered or swung from side to side.

As this machine is a recent production, in its construction such effective modern devices as enclosed gears and motors, ball bearings, special alloy steels and heat-treated parts are utilized. The turntable machine is the product of nearly thirty years of experience in the design and construction of successful coal cutters. It therefore will be likely to hold a high place as a coal producer until the combined cutting and loading machine reaches its final perfection.

Violation of Statutory Safety Regulation.—A rule embodied in the Pennsylvania Anthracite Mining Act reads: "No person shall ride upon or against any loaded car, cage or gunboat in any shaft, slope or plane in or about a mine or colliery." In the case of *Petrowsky vs. Delaware, Lackawanna & Western Railroad Co., 250 Federal Reporter, 554,* the defendant unsuccessfully sought to defeat liability for injury to a boy 17 years old, sustained while riding on a loaded car in violation of this rule.

The United States Circuit Court of Appeals, Second Circuit, holds that if, as testified by plaintiff, he was riding on the car in obedience to instructions given by the driver boss of the mine, the slope runner, and the engineer in charge of the cable handling the cars, and if he had frequently ridden on the cars daily, the defendant mining company may be deemed to have been guilty of actionable negligence in exposing the plaintiff to the peril resulting in his injury. On the question of contributory negligence the court says:

"The fact that a boy of 17 by obeying an order given to him by one in authority over him violates a provision of this kind in the statute which he is not shown to have known cannot be an excuse as between him and the master, and especially is this true where the master, as in this case, did not post the rules as the act required."

Defendant also asserted that it should not be held liable in this case because the accident was shown to have resulted from a defective condition in the track, for which the mine foreman and not the company was responsible, but the court decided that the wrong in directing or permitting plaintiff to ride on the car was closely enough related to the injury suffered by him to sustain recovery of damages.

Mechanical Coal Loading as Adapted to Room-and-Pillar Work

Cost Data with Rooms 26 Ft. Wide—Loading Cost Is Halved—Investment in Loading Machinery More Than Counterbalanced by Saving in Other Directions Such as House Construction and Mine Development

BY WILLIAM WHALEY
Knoxville, Tenn.

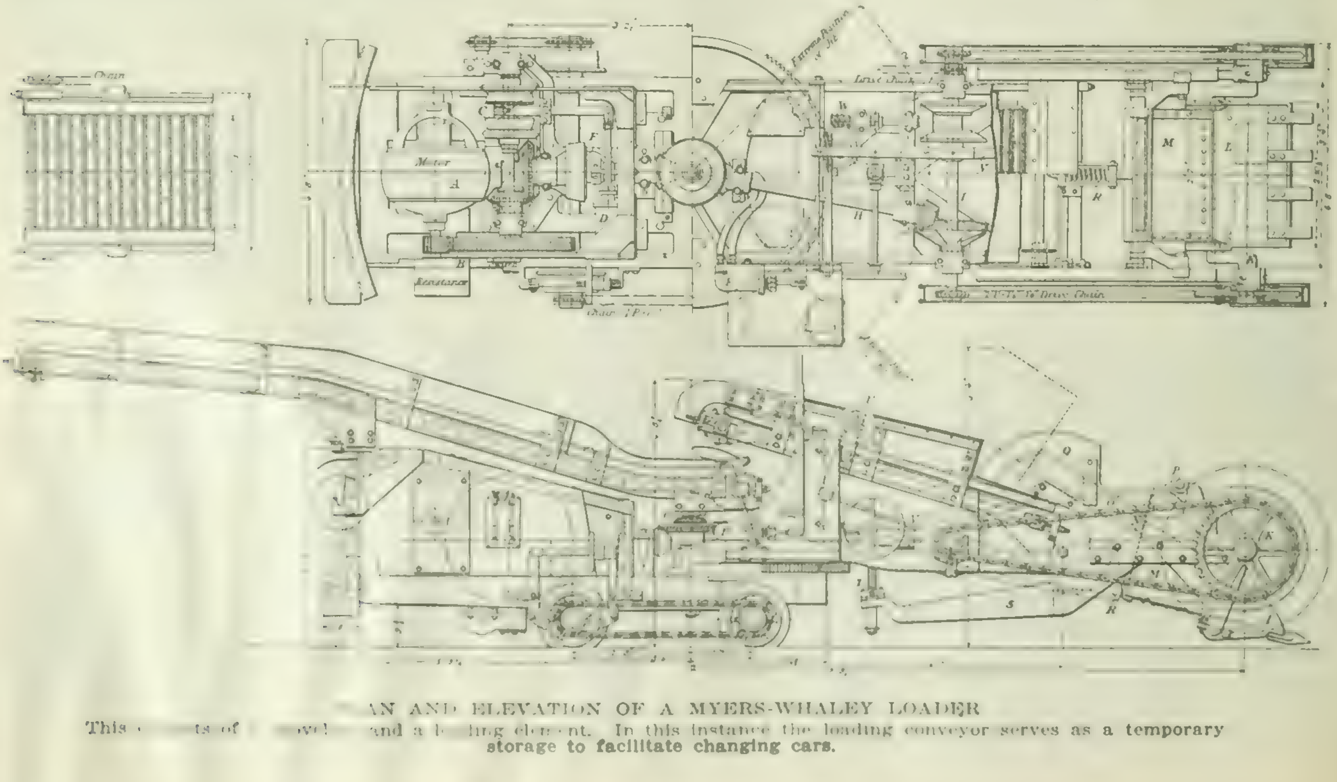
FOR a number of years leading coal operators have been more or less interested in the possibility of loading coal underground mechanically. At present interest in this subject is keen, as mechanical loading appears to be the missing link in the complete mechanical equipment of modern coal mines. As Van H. Manning, director of the Bureau of Mines, pointed out in a paper before the American Institute of Mining Engineers: "The drilling and loading of coal should, as rapidly as mechanical facilities are perfected, be done by power-driven machinery, thereby reducing the number of operatives required. The ideal mine installation of the future will be one mechanically equipped throughout and the mine force should gradually evolve into one required primarily for operating and maintaining the machinery employed."

A number of manufacturers are prepared to furnish machinery for loading coal underground. Some have machines to offer for cutting, breaking down and loading all in one unit; others have scraper outfits for low-bed work; others, again, have portable conveyors, upon which the coal is placed by hand, while others offer shoveling machines which employ an automatic shovel and load the loose coal from the floor into the mine car. Each type of equipment has its well-defined limitations. This paper deals with the shoveling machine as originated and developed by the Myers-Whaley Co.

The "Myers-Whaley" is the outcome of many years of development. The initial device was built twelve years ago and the development has progressed steadily until now these machines are in use for loading almost all conceivable materials in underground mining. An example of the use of this machine is contained in the following extract from a letter written by a coal mine manager in Utah:

"We have had this machine in operation since last January with satisfactory results. Our coal varies in height from 16 to 23 ft. Rooms are driven up about 12 ft. high, the balance of the coal, until pillar extraction begins, being left to support the roof. At the present writing we are using the machine in entries, as we have had some difficulty in getting men to drive our narrow work, and while we do not get the tonnage from the machine which we secured when working in rooms, we do get the development, which at present in our case is of more importance. It is handling four to five faces, the extreme distance traveled being about 1,200 ft. When working in rooms we use this machine in a panel where we have a number of places the length of which would average 300 to 350 ft. The machine cleaned up approximately 140 to 150 tons per shift of eight hours."

An example of the use of the machine in other materials than coal is found in the shale mine of a large



PLAN AND ELEVATION OF A MYERS-WHALEY LOADER

This consists of a shovel and a loading element. In this instance the loading conveyor serves as a temporary storage to facilitate changing cars.

manufacturer of portland cement. This mine is laid out on the room-and-pillar system. The rooms are driven on 49 ft. centers, 26 ft. wide and about 200 ft. long. The cars hold two tons. The track gage is 30 in., and power is supplied at 500 volts direct current. The first machine was installed in February, 1916. It loaded over two hundred tons of material per 8-hour shift as an average, with a big reduction in cost. The entire crew of the machine consisted of one operator, one helper and one car coupler.

The company that bought this machine has the reputation of being highly conservative in purchasing equipment, and absolute proof of the economy, reliability and desirability of the device is shown by its putting in a second machine in March, 1916, a third in the summer of 1917 and a fourth in the summer of 1919—all in the same mine. Similar satisfactory installations have been made in many other operations.

An analysis of existing conditions and results to be accomplished with these machines in coal mining is given below. This is taken from data concerning a new coal mine which is now preparing to begin operation and install shovels as initial equipment:

BED—6 ft. thick, clean coal, shoots well.
POWER—230 volts, direct current.
ROOMS—30 ft. wide, two tracks, 44-in. gage.
CARS—4-ton capacity, 35 in. high from rail.
RAIL—40-lb. on entries, 30-lb. in rooms.
MACHINES—No. 3 size Myers-Whaley shovels.
OUTPUT—1,000 tons per day.

Analysis of loading cost per day is as follows:

LABOR:		
One machine operator	$5.75	
One helper	5.25	
Two car men at $5	10.00	
		$21.00
OTHER EXPENSE:		
Power	$2.00	
Oil and supplies	.50	
Upkeep, 1½c. per ton, 210 tons	3.15	
Interest, $9,000 at 6 per cent, 250 days	2.16	
Charge off investment, 20 per cent per annum	7.20	
		$15.01
Shoveling costs		$36.01
SHOOTING COAL:		
Two men at $5	$10.00	
Powder	4.00	
		$14.00
Total cost shooting and loading		$50.01

Each room makes 60 tons of coal and with liberal allowance for operative delays 3½ rooms will be loaded per shift, or 210 tons, at a cost of 23.6c. per ton. The hand loading scale in this district is 55c. per ton and it would take about 20 men to load 210 tons of output.

In considering a new mine, however, the following "incidental" advantages of machine loading can be fully realized: For each machine installed the service of 14 men can be saved and a better class of men usually will be secured. Each machine will save the building of about five dwellings that would be required if hand labor were employed exclusively for the loading of coal. Thus the saving in houses will pay for the investment in machines.

With machines also the required tonnage can be reached with a much smaller development. This means that the operator will get his desired production at a much earier date than with hand loading. Entries for development can be driven three times as fast at one-third the cost. The latter two items reduce trackage and incidental expenses. A smaller operating territory is required for a given tonnage, and mine bosses can keep closer to their work.

For the benefit of those who are not familiar with the Myers-Whaley shovel an outline drawing in plan and elevation is presented herewith. The machine is equipped with an automatic shovel supported and driven by a crank. The shovel discharges onto the forward conveyor, which in turn delivers its load to the rear conveyor, which in turn discharges into the mine car. The shovel and front conveyor are mounted on a swinging jib, enabling the machine to shovel at a distance of 8 to 10 ft. to each side of the track center. The rear conveyor also swings laterally so that it can load cars on curves or upon a parallel track.

The jib and rear conveyor are pivoted upon a main frame carrying the motor and propelling mechanism. This main frame is supported by four track wheels solid on their axles and mounted in adjusting pedestal boxes to allow for any inequalities of the track. The machine is moved forward and backward under its own power and uses no jacks or clamps. It is as portable as a mine locomotive and travels readily from room to room. The operator is provided with a seat on the jib where he can see and direct the shovel to its work. These machines are standardized and the component parts are interchangeable.

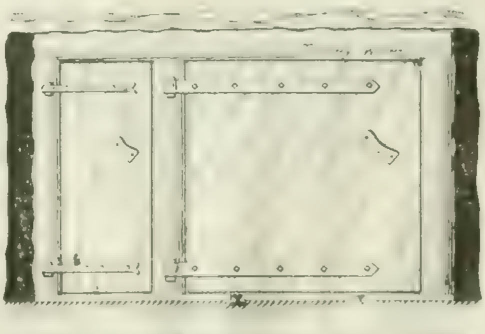
Separate Trapdoors for Men and "Motors" Obviate Accidents

BY G. E. DAUGHERTY
Pikeville, Ky.

TRAPDOORS are not the best means of distributing the ventilating current; but we find conditions where they are satisfactory and others where they cannot be avoided. An old saying that is particularly applicable to the hanging of doors and brattice cloth in mines is "Anything that is worth doing at all is worth doing well".

This point has not been lost sight of by the Northeast Coal Co., which operates a mine at Auxier, Ky., and which provides a small man-door in the same frame as the haulage door, but on the opposite side from the trolley wire. Ample clearance is left for a path along the roadway, which is kept clean, so as to make it more convenient for workmen to pass through the small door.

In this manner the company hopes to avoid, to a great extent, the possibility of accidents occurring, through men letting the main door stand open, or coming in contact with the trolley wire when passing through the door. The small door is pulled shut by a spring.



TRAP- AND MAN-DOOR IN ONE FRAME
Door for passage of men is placed at one side of the main door and is closed with a spring. A good walkway leads through this door.

Designing and Building Track to Avoid Trouble and Increase Capacity

Of the Great Multiplicity of Rail Sections, Fishing, etc., Only a Few Are in General Mine Use—Properly Designed and Fabricated Special Trackage in Many Instances Does Much to Aid Efficient Transportation

By Ira Dye
Hamilton, Ohio

THROUGHOUT their entire contact with modern civilization, coal and transportation are inseparably linked. So self-evident a fact would seem to require no elaboration, but the experiences of the past two years, both with coal and indeed with the problem of transportation in general, seem to indicate that the correlation is imperfectly understood.

The fuel producer depends on rail transportation for his supply of machinery, materials, tools and men required to operate his mine. Locally, in and about the works, he relies on rail transportation to move supplies, tools, men, coal and the waste material. Rail transportation carries the mine product to the consumer.

A chance is thus presented to make a careful study of conditions and so to perfect transportation at the mine itself, at least, that maximum production and minimum labor may go hand in hand. The whole history of American industry proves that it pays to provide equipment when such equipment will save labor. To remove drudgery from work and reduce the percentage which human muscular energy bears to the total energy expended has always meant progress, production and profit.

This article is concerned with the track structure upon which the car wheels roll, especially those parts controlling movements from one track to others. Practically all track plans are combinations of switches, switch stands, frogs, guard rails, crossings and curved and straight rails.

Various designs and types of these track specialties have been worked out to meet the conditions encountered in coal mining. Room turnouts, branches, sidings, main-line cross-overs, automatic switches, yard layouts, repair tracks, tipple and loader tracks, gravity switching layouts—each offers its peculiar problem, different, and yet similar, in each mine. Frequently the manufacturers of special track work, by reason of familiarity with the possible designs and with manufacturing problems, can save delay, expense and operating trouble if given a free hand in meeting a specific mine-trackage problem.

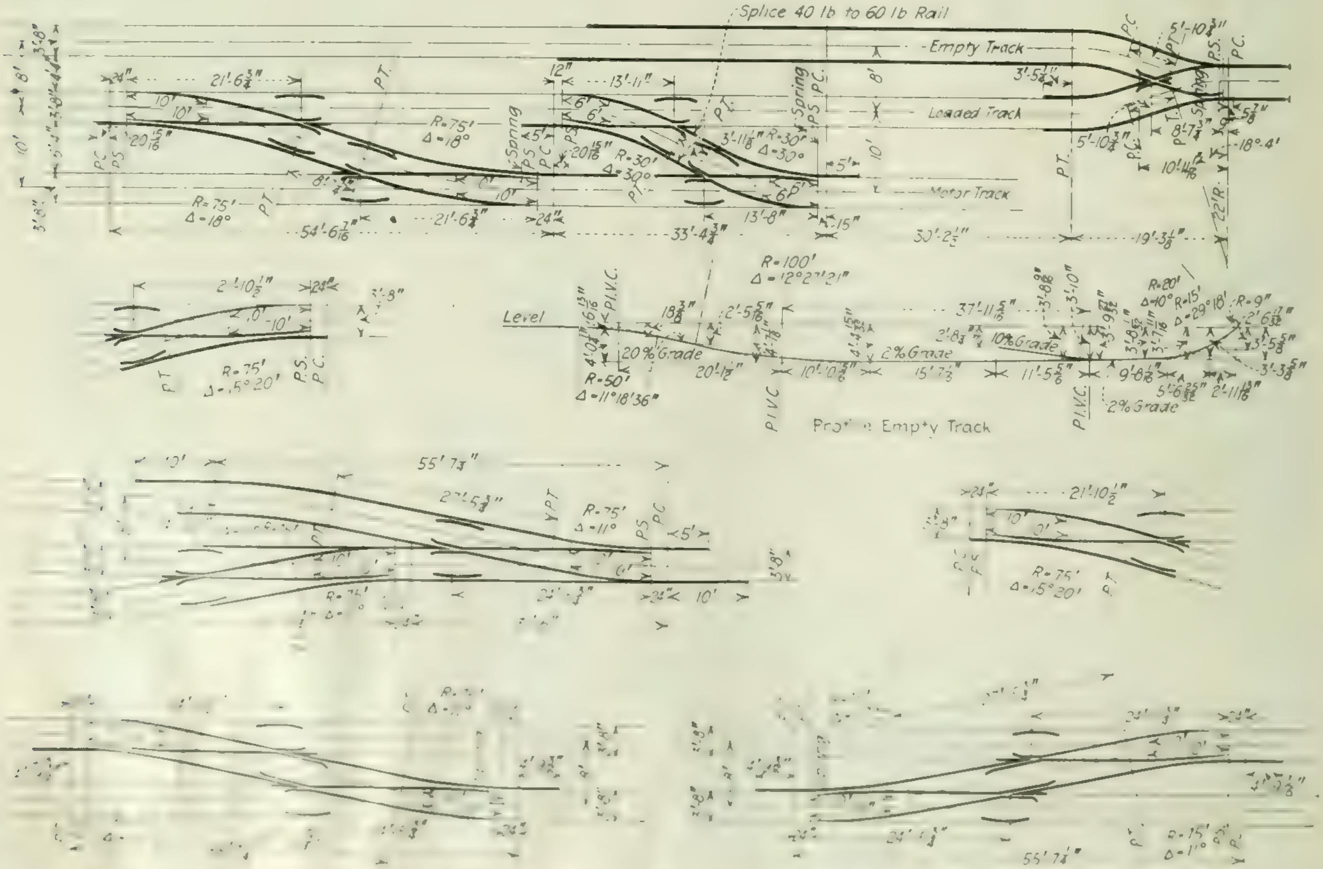


FIG. 1 TIPPLE TRACKS AT MONTOUR MINE NO. 10

This somewhat complicated layout was completely fabricated in the factory and erected on the job.

In beginning a track design the engineer or mine operator is confronted by the question of rail sections. These are in common use in the United States alone about 60 different non-interchangeable sections of rail. These vary in weight from 8 to 130 lb. per yard. Six different sections, properly designed for different conditions would meet every conceivable requirement, thus obviating an economic loss involved in the existing multiplicity of rail sizes which runs into millions annually.

Having decided on a rail section, the selection of connectons at the rail joints must be made. There are about 276 different combinations of holes for rail joints, varying from 2 to 12 in number per joint and making use of from ½ in. to 1⅛ in. joint bolts. In mining work only four styles of "fishing," or joint drilling, are common. There is no advantage whatever in using more than six for classes of rail and service. The remaining 270 styles are the result of experiments, accidents and differences of opinion.

Local conditions and the rolling stock available determine the gage of track. There are many variations, ranging all the way from 20 to 66 in. but the tendency is to standardize on the gages recommended by manufacturers of locomotives and cars in so far as conditions will permit.

In a general way the type of construction of frogs and crossings is determined by the rail section. It is not possible to secure a satisfactory flangeway depth on rails less than 3 in. high by using fillers between rails, and even on those over 4 in. high the riveted base plate seldom is as strong as the rail. Between 3-in. and 4-in. heights either filled-and-bolted or riveted-plate construction is satisfactory. The riveted construction is somewhat cheaper and the filled-and-bolted more rigid and durable.

For room turnouts of short radius with light rails, where falls of slate or other causes may make it necessary to abandon a piece of track, a frog of semi-steel cast in one piece has been found to be convenient and economical. When buried by débris or worn out, less expense is involved in leaving the frog buried than in digging it out. The cast frog has inherent weaknesses due to its form and is of doubtful economy on light rail work in the alloy or manganese-steel types, because these alloys are costly and of low salvage value.

A combination of frogs, switches, guard rails and curved rails designed and fabricated by the American Frog & Switch Co. for the Pittsburgh Coal Co. is here presented (see Fig. 1) as illustrating the uses of track work at the tipple of the Montour Mine No. 10. The various turnouts and vertical curves were assembled complete at the factory and afterward shipped and reassembled at the mine. Both 40- and 60-lb. rails were used while all frogs are of riveted-plate construction.

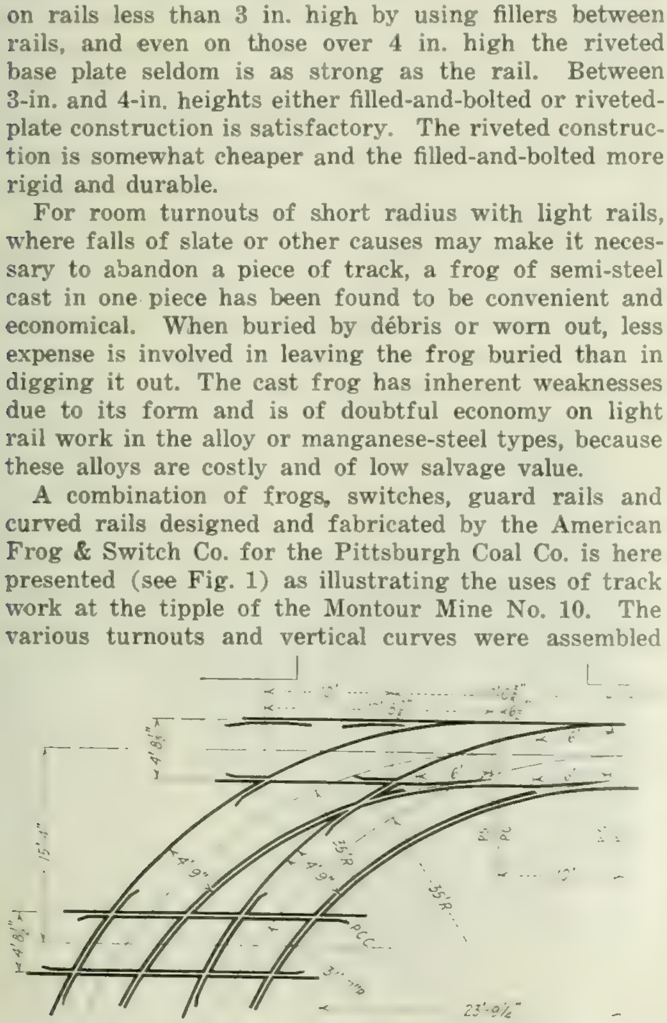


FIG. 2. INTERESTING INDUSTRIAL TRACK LAYOUT
A three-point frog is decidedly unusual yet this layout embodies one, as well as two curved crossovers.

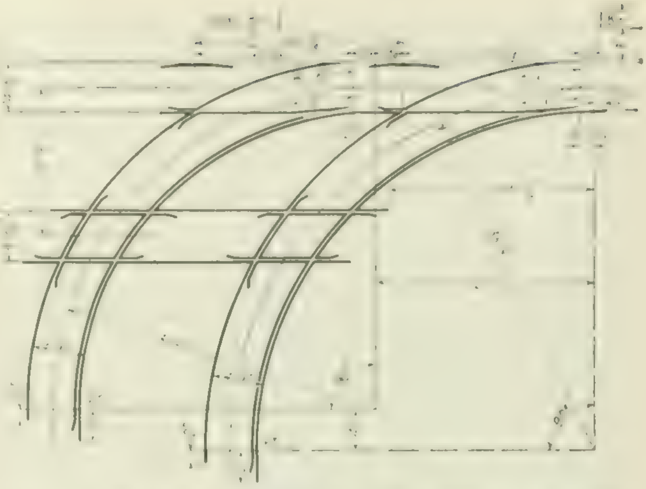


FIG. 3. ANOTHER LAYOUT FOR INDUSTRIAL TRACKS
Guard rails are used on all curves in this as well as the preceding track plan. Their utility is well worth their cost of installation.

Several switches are self-closing by springs in order to confine operation of facing-point traffic to one track, while trailing-point traffic may come through at full speed without a switchman. The double guard rails at each frog are essential to prevent derailment, but are replaced by a double-pointed frog in the automatic gravity switchback between "loaded" and "empty" tracks.

A combination of solid bolted crossings, special frogs and switches made by the same manufacturer that furnished the equipment mentioned above, but designed for the charging floor at the United Verde Copper Co.'s smelter at Clarkdale, Ariz., is shown in Fig. 2, illustrating the solution of a track problem in heavy rail. Here the sharp curves are protected by continuous guard rails and the crossings are guarded throughout. The special frog with three points gives rigidity and provides clear flangeways on all tracks.

While a special, complicated layout or crossing is frequently necessary, the great majority of problems are solved by frogs and switches. The manufacturer, if furnished with data on rail, fishing, gage and type of construction, and information as to clearances and special conditions, can meet many a complex track difficulty and provide simple and wreckproof layouts. The mining engineer, if he calls on the designing engineer for suggestions, may save considerable in delays, shop expense and operating troubles. And whoever, by invention or handicraft, permits one man to do what two or more men formerly did, and do it better and more easily, has beyond doubt contributed toward progress, production, profits and industrial peace.

Shares in Illinois Corporations.—A coal or other business corporation may take property appropriated to the corporate objects in payment for shares of stock issued. But payment with property for capital stock is no payment except to the extent of the true value of the property, and if property is taken at an overvaluation the stockholders are liable to make up the deficiency.

Capital stock of a corporation is a trust fund for the security of the company's creditors. (*Illinois Supreme Court, William E. Dee Co. vs. Proviso Coal Co., 125 Northeastern Reporter, 24.*)

Industrial Alcohol Can Be Made From Coke-Oven Gases

Ethylene from the Ovens Can Be Absorbed by Fuming Sulphuric Acid and the Product Hydrolyzed by Water, Liberating Alcohol

THE enormous expansion of the automotive industry in recent years has resulted in an unprecedented consumption of gasoline. In spite of vast increases in crude-oil production, it has been necessary to withdraw millions of barrels of petroleum from reserve stocks. In view of even further increases in consumption of gasoline and the consequent exhaustion of the crude-oil supply, new sources of motor fuel must be found.

In filling the need created by the rapidly depleting motor-fuel supply one can hardly overestimate the importance of motor benzol that may be, and is being, extracted from byproduct coke-oven gas. There is, however, another possible source of motor fuel in which coal men are much interested—alcohol. Its efficiency as a motor fuel has long been known, but not until recently has coal been considered a possible source of that valuable industrial product. Experimentation, in this country and abroad, seems to indicate that a portion of the so-called illuminants of byproduct coke-oven gas may be converted into alcohol. This alcohol may then be mixed with suitable quantities of motor benzol and gasoline, thus decreasing gasoline requirements.

Ethylene and acetylene are the principal illuminating gases in byproduct coke-oven gas that we can convert into alcohol. About 2 per cent of the former is present but only 0.1 per cent of the latter. For this reason the conversion of acetylene into alcohol will not be considered.

The process of recovering alcohol from ethylene is somewhat similar to the present method of extracting benzol. The most satisfactory absorbent for the gas is fuming sulphuric acid or 95 per cent sulphuric acid heated to a temperature of from 60 deg. to 80 deg. C. The ethyl hydrogen sulphate formed in the reaction is hydrolyzed by water, liberating alcohol. The latter is then distilled off by a superheated steam.

The above process will require enormous quantities of sulphuric acid. It is proposed, however, to concentrate the used acid and also to recover the sulphur dioxide lost in the process as well as possibly the sulphur in the hydrogen sulphide of the gas. The recovered sulphur will then be utilized in the manufacture of sulphuric acid.

Sulphuric acid will be needed for the alcohol-making cycle and part of what is used will be lost, but it appears likely that sulphuric acid will for many years be reasonably cheap and readily obtainable.

Assuming a 70-per cent absorption of ethylene and a 70-per cent conversion to alcohol, a yield of 1.5 gal. of absolute alcohol per ton of coal may be obtained. The annual carbonization in byproduct coke ovens of, say, sixty million tons of coal in this country, therefore, will produce ninety million gallons of alcohol, quite a fair sized product to be reckoned with.

This project is quite feasible, although it may not seem so at present. It may may be compared, however, with benzol recovery in America, which was practically unknown less than ten years ago. It brings home forcibly the profligate waste of the valuable ingredients of coal, which should be checked at once. Our petroleum resources will be gone long before our coal, and sooner or later we will have to save all the hundreds of valuable constituents from the coal that we use.

Makes Boiler-Feed Water Pure By Distillation

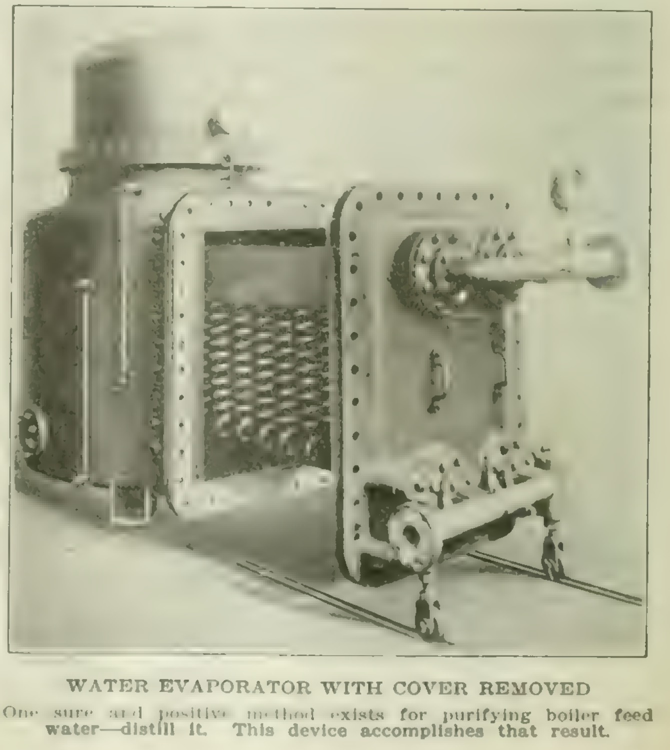
Heat Used in Distillation Is Returned to the System—Eliminates Boiler Scale and Saves Blow-off and Other Heat Losses

A LOCOMOTIVE taking water from a tank, as it has to do every hundred miles or so, is a familiar sight. This replenishing of water is necessary also on ocean-going steamers, but there are no friendly fresh-water tanks located at intervals in the ocean at which a ship can call and receive the necessary supply of water. Sea water cannot safely be used in boilers, so every ocean-going ship carries apparatus that purifies the salt water and makes it suitable for steaming purposes.

This necessity led to the development of evaporators. The type of apparatus at first used was extremely crude, but constant improvement has been made in the art until today we have devices of this kind that not only provide a constant pure supply of boiler feed but also furnish water for drinking purposes. The difficulty with the earlier types of evaporators arose from the scaling of the evaporating surfaces, but the submerged type of evaporator, now frequently employed, is actually self-scaling. This is a long step forward.

For over fifty years feed water has been distilled at sea, but stationary power plants did not use distillation to any extent till about five years ago. Many great power-plant advances have been initiated and fostered in marine work because marine conditions demand high-grade equipment, minimum shutdowns and maximum ease of repair.

A ship at sea is its own repair shop and the repairs must be minimized in order to insure constant operation of the ship's equipment. However, from time to time some of these marine products have been adopted in sta-



WATER EVAPORATOR WITH COVER REMOVED

One sure and positive method exists for purifying boiler feed water—distill it. This device accomplishes that result.

tionary power plant practice, and the past five years has seen the introduction of Reilly evaporators for purification of boiler-feed make-up in large central-station plants, as well as in plants of various sizes—even some extremely small ones.

This purification is accomplished in a similar manner to the established ship-board procedure with the exception that the refinements of operation are even greater, and plants are so arranged that practically all of the heat used in the evaporation of the water by the use of steam is returned to the system. In the actual operation, high-pressure steam is supplied to the coils of the evaporator, and in condensing these coils evaporates the body of water in the shell surrounding them.

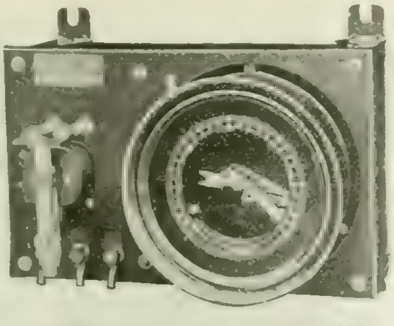
This purified vapor is in turn condensed and is ready for boiler feed. This is descriptive only of the basic feature of the plant, and it is the plan of utilizing the contents of the hot-well as the condensing water and other features which make the system not only a valuable means of purification but also permit the apparatus to pay for itself in actual saving in from six months to one year.

The pioneers of the development of evaporators for marine service were the Griscom-Russell Co., of 90 West St., New York. This firm has been manufacturing this type of equipment for more than fifty years, and was also a pioneer in the development of the "high-heat level evaporator plant" for stationary power houses. This latter development, even though a revolutionary one, has come to stay. The particular features which commend it to the plant owner are that it provides pure water, eliminates scaling in the boiler tubes, eliminates the necessity of blowing down the boilers, and that it actually pays for itself in a short time through the heat saved.

A Regulator for Motors on Pressure Systems

Provides Automatic Means of Controlling Pilot Circuits of Starters for Pump or Compressor Motors

TO REPLACE its former types of alternating and direct-current gage-type regulators the Cutler-Hammer Mfg. Co., of Milwaukee, Wis., is manufacturing a new type of pressure regulator. The new device consists of a pressure gage and relay mounted on a slate panel carried on a wall-type frame, and may be used on either direct or alternating circuits. The manufacturer claims that it is more durable and cheaper than the former types of regulators. This device is used as an automatic starter employed with motors operating pumps, compressors and the like. It can also be used on pressure systems above or below atmosphere. As the pressure falls or rises the needle indicator in the pressure gage makes contact with one of two adjustable contact points, thereby starting or stopping the motor. The two contact points can be set as close as 5 per cent of the total reading shown on the gage, and yet give practical results. They are accessible for adjustment through unscrewing the glass cover of the dial.



PRESSURE REGULATOR AND RELAY

A simple device to so regulate the motor as to automatically hold the pressure (or vacuum) on any system between predetermined limits.

The pressure inlet hole in the gage cover is tapped for ⅜-in. pipe. The gage can be supplied with dials reading in various capacities. Gages for ammonia service are of material that resists ammonia fumes.

The relay used in connection with the gage has solid copper contacts and will operate on either direct or alternating circuits. The relay provides low-voltage release and will operate to start the motor when the voltage returns.

Pressure regulators of this type must always be mounted in a vertical position and should be connected to an independent pipe from the pressure tank or else to the discharge line from the pump, with an air chamber interposed between to prevent the fluctuation in pressure reduced at each stroke of the pump from seriously affecting the gage needle.

New Drill-Steel Sharpener Has 200 Uses

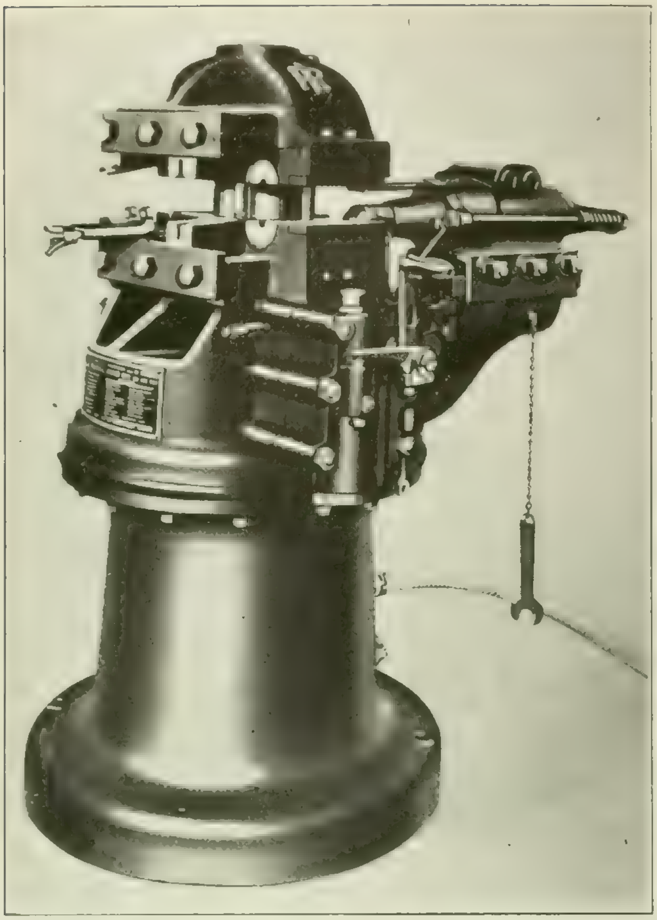
Will Forge Bolt Heads, Pins and Stanchions and Sharpen Drill Steel of Many Sizes and Shapes

A NEW compressed-air-operated drill-steel sharpening machine known as the I-R No. 50 sharpener has been developed by the Ingersoll-Rand Co., 11 Broadway, New York. This machine was designed primarily to rapidly and accurately sharpen and shank drill steel such as: Cruciform steel up to 2 in. in diameter, or round, hexagon, octagon, quarter-octagon auger or spiral steel up to 1⅞ in. in diameter. However, it has performed so many other tasks that the name "drill-steel sharpener" is almost a misnomer. When fitted with special devices it will force bolt-heads, pins, stanchions, etc.; in fact, nearly two hundred different products have been made by this machine.

The single lever which controls all of the operations of the machine is fitted with a safety locking device. This prevents accidents because of the impossibility of operating the machine unless the lock is released. The throttle valve, which is of the balanced spool type, operates easily and quickly and is positive and instantaneous in its action.

The hammer cylinder is an improved valveless type of hammer-drill cylinder. This construction permits the free-moving hammer to deliver exceedingly rapid and powerful blows against the end of the dolly, upsetting the steel, thus forming the bits and shanks with extreme rapidity. This may be more easily understood when it is stated that its capacity is about 20 per cent greater than the Leyner No. 5 sharpener.

The base must have sufficient strength to withstand the severe stresses and shocks met with in everyday work. Sufficient attention has not been given to this in the past, with the result that base breakage—while not usual—was all too common. A glance at the accompanying illustration will show how substantial and rigid the base of this machine has been made. It needs no foundation with the exception of a few planks to level it properly and need not even be bolted rigidly to them.



IMPROVED DRILL SHARPENER

In addition to sharpening drills this machine may be employed for heading bolts, making machine bits and for many other purposes.

Poor lubrication in the case of sharpeners is due most frequently to the ordinary exposed sight-feed lubricator being accidentally damaged or broken. The No. 50 sharpener has no sight-feed or other exposed devices of this kind. Efficient and positive lubrication is provided for the entire machine by the Ingersoll-Rand "Heartbeat" lubricator. This is embodied in the throttle valve chest casting and works automatically whenever the machine is in action. It is provided with adjustment for regulating the quantity of oil desired.

Every part of this machine is made for long, hard, continuous service. An example of this is the absolute elimination of all cup leathers; only accurately machined snap piston rings are used. This means much to the man who has used a sharpener.

E. J. Mehren to Investigate European Conditions

E. J. Mehren, editor of *Engineering News-Record*, sailed for Europe on the "Adriatic," April 24. He will study conditions in the civil engineering field in England, France and Germany and will be abroad until the latter part of August.

Mr. Mehren has also been appointed special agent for the U. S. Bureau of Public Roads, in order to secure certain information while abroad for that organization. Mr. Mehren in his travels will keep in mind the interests of *Coal Age* readers in the export of coal, and on his return will give the editors of this publication the benefit of his observations.

Dump Cars and Dump Wagons as Aids in Coal Stripping

Where Stripping Coal Is Loaded Direct into Railroad Cars Sidedump Equipment Can Be Used for Clearing Up Shovel Wastes

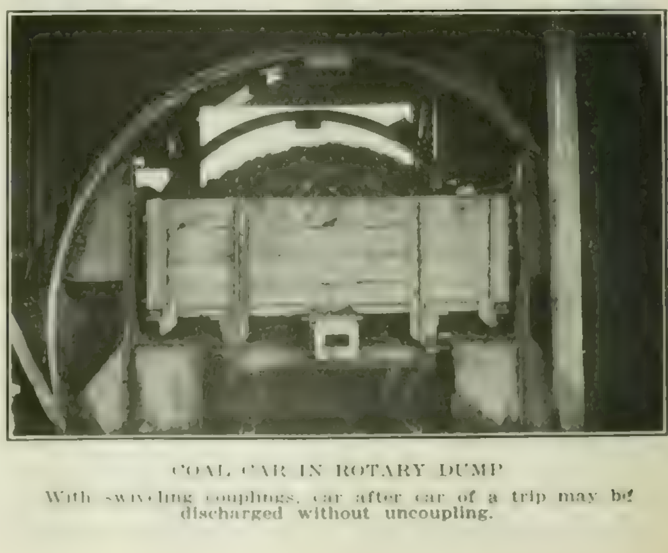
An acute labor situation and the need for increased unit production present the coal operator with a problem that must largely be solved by machinery and equipment. Where coal stripping is practicable this problem is at least partially so solved. In the Pittsburgh-Hanover operation at Hanlin Station, Pa., for example, thirty-seven men with steam shovels have been getting out as much coal as 300 men ordinarily would mine by undercutting. At this operation some 9,000 cu.yd. of spoil is handled, and about 2,400 tons of coal is loaded each day in two working shifts.

It is the purpose of this article to describe two somewhat novel applications of equipment to the coal operator's problem—one for the elimination of waste and the other for the increase of production. The device for the conservation of coal seems to have originated at the Parlette stripping of the Wayne Coal Co., and it has since been adopted by the Pittsburgh-Hanover people; possibly by others. In steam-shovel loading scattered heaps and chunks of coal unavoidably are left by the dipper—to be covered, in ordinary operation, by the stripping shovel in making its next cut.

At Parlette the experiment was tried of picking up this scattered coal by hand, throwing it into Western dump wagons and then trap-loading the salvaged fuel into railroad cars. The experiment proved so satisfactory that in a single year 700 cars were thus loaded with coal that otherwise would have been wasted. This was accomplished at a cost of 75c. per ton. Moreover the salvaged material was hand-picked coal, commanding the highest market price.

An installation designed for obtaining maximum production and saving labor is that of the R. L. Culbertson Coal Co. at Cadiz, Ohio. A few equipment details may prove interesting.

A well-constructed 36-in. gage track of 90-lb. steel comes out of the strip pit, curves on a 100-ft. radius and continues on a 3-per cent grade through a dumping shed. Here is installed a rotary dump that tips a loaded



COAL CAR IN ROTARY DUMP

With swiveling couplings, car after car of a trip may be discharged without uncoupling.

TRESTLE TO PERMIT CAR LOADING

Odds and ends of coal pushed to one side by the loading shovel are loaded by hand and discharged to the car from dump wagons.

car upside down and spills the coal into a bin holding about 40 tons. The objection to the rotary dump as a substitute for side-dump cars, of course, is the cost of moving the extra weight involved. It is claimed in this case that the speed gained makes the rotary dump profitable and that there is less breakage of coal.

The cars used are of 5-cu.yd. capacity, specially built by the Western Wheeled Scraper Co., without the side-dump feature. The cars are so low in consequence that when loaded the crown of the coal stands even with the box of a standard 5-cu.yd. dump car. The loads, in two trips of eight cars each, are pushed up the 3-per sent grade and through the dumping shed. The small locomotive is then detached and the cars are permitted to roll back by gravity through the rotary dump. Each car in turn is spotted in the revolving cage and held there long enough for it to be inverted and righted again. The cars are fitted with swiveled couplers and in this way an entire trip can be dumped quite rapidly, one car at a time, without uncoupling.

The maximum haul is one-half mile and the average is about a half of the distance. The two small locomotives are supplied with coal from improvised tenders made from standard 5-cu.yd. dump cars. From the bin under the rotary dump the coal is fed by a reciprocating feeder onto a 48-in. conveying belt and picking table, 181 ft. long. This travels at the rate of 100 ft. per minute.

As the coal passes along six or eight men pick out the foreign material and throw it down a chute. By suitable arrangements at the tipple, coal can be loaded into railroad cars below as slack, ¾-in. and 2-in. coal, or the whole output can be switched to another belt, sent through a crusher and reduced to the required size at the rate of 250 tons per hour.

Small Portable Electric Hoist With New Features

Machine Is Simple in Design, Economical, Easy to Control, Readily Lubricated and Effectually Safeguarded

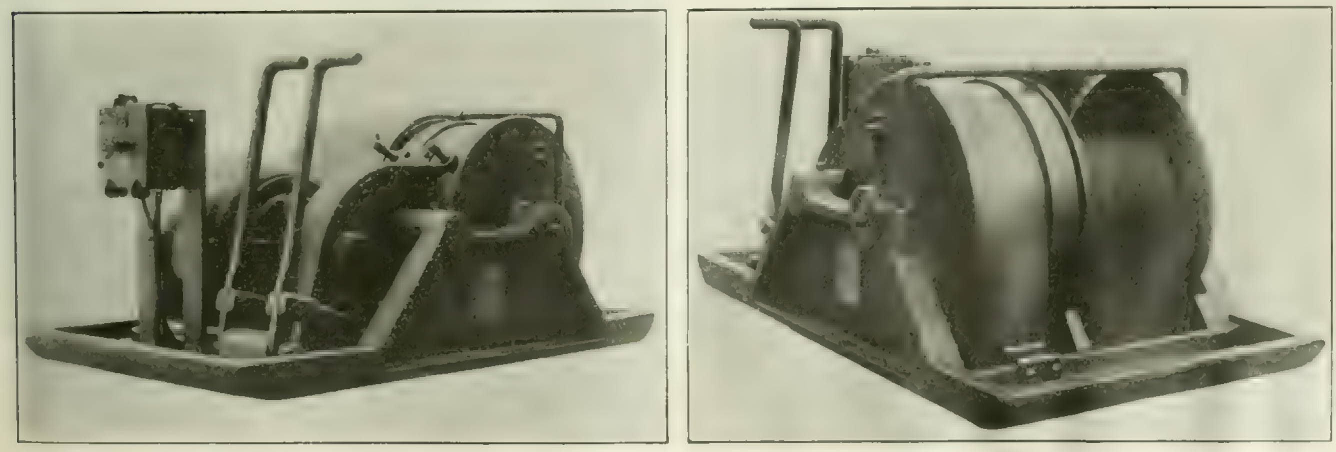
CONSTANTLY increasing use of electricity in coal mining has resulted within the last few years in the development of small portable electrically-driven hoists for moving mine cars in rooms, headings, etc., with greater ease and economy than could be done by man or mule power. Many of the machines that have been marketed for this work are reproductions on a small scale of larger hoists. Few attempts have apparently been made to design these machines for the particular requirements they are expected to meet.

In room hoists of this kind double-reduction spur gearing has been commonly employed in conjunction with a simple form of positive clutch. The Cherry Tree Machine Co., among other manufacturers, had been building a hoist of this type for a number of years, but, realizing the limitations of this design, recently perfected what it has called the "Brownie" room hoist, embodying entirely new working principles. In designing this hoist the manufacturers were guided not only by their experience in this field but by the recommendations of many practical mining men who were consulted as to the requirements of an ideal machine of this character.

Because of the nature of the work it performs and the conditions under which it operates, a room hoist must fulfill the following requirements:

It must be light in weight, so that it may be easily moved from place to place; it must be small and compact, in order that it may be located where desired without requiring extra space; it must be rugged in design and construction and capable of operating satisfactorily under all conditions; its control and manipulation must be simple and effective, so that it may be successfully operated by unskilled workmen, and it must be possible for the operator to vary the rope speed at will. These requirements have all been completely satisfied in the design of the "Brownie" hoist, while in addition special attention has been given to lubrication and the safeguarding of the working parts.

The most important feature of this hoist is the patented type of transmission and control utilized. This control makes possible variable rope speeds, ranging



OPPOSITE QUARTERING VIEWS OF THE ROOM HOIST

Two levers, seen in both cuts completely control all movements of the machine.

between zero and the maximum attainable at the will of the operator, the motion of the rope drum being under absolute control at all times. One advantage of this type of control is that the motor is never started or stopped under load. As a consequence any self-starting motor may be used, a high starting torque being unnecessary. A safety-inclosed switch fully meets all requirements for starting and stopping the machine, thus obviating the necessity of a controller. The compactness of the gearing used in this hoist permits the weight and over-all dimensions to be held to a minimum.

The rope drum is driven by means of a gear train, two members of which are internal spur gears having smooth flanged exterior surfaces arranged to be gripped by friction bands. One of these friction bands may be used as a brake to retard the motion of the rope drum as desired while the other is used as a clutch. The speed of rotation of the rope drum depends upon the degree to which the clutch band is tightened.

The rope-drum speed will be maximum when this clutch gear is held stationary. The brake and clutch bands are each connected to a handle pivoted to the base of the hoist. They thus become the brake and clutch handles respectively, and by their manipulation the rotation of the rope drum is controlled.

Effective lubrication has been particularly considered in designing this hoist, as oiling is one detail in the care of machinery that is frequently neglected in mines. All the principal moving parts of this hoist rotate on the drum shaft, and by making this hollow the lubrication of these parts is effected from one point.

The rope guard employed on this machine is another excellent feature. This guard makes it impossible for the rope to get off the drum, foul, or to cause injury to the operator in case of breakage.

The base and side frames of the hoist are all included in a single grey-iron casting, so shaped as to permit the machine to be easily skidded from place to place and anchored where desired. All parts have been designed with an ample factor of safety; all gears have cut teeth and are guarded to industrial safety committees' standards.

The manufacturers of the "Brownie" hoist recommend it for a maximum duty of 1,500-lb. rope pull, such as would be required, for instance, to haul a total load of 6 tons up a 10-per cent grade. Many of these machines have been placed in service within the last year, and the favorable comments of those using them.

Railways Would Replenish Equipment from Revolving Fund

TO CONSIDER recommendations for the use of the $300,000,000 fund provided in the Transportation Act the Revolving Fund Committee of the Association of Railway Executives held a meeting recently. The Interstate Commerce Commission requested the association to send queries to its members, and the report will be forwarded to the commission soon.

Many railroads lacking large reserve funds are having trouble in financing their equipment needs. Much equipment business is being held back because roads cannot see their way clear to finance orders which should have been placed months ago. Many of the managers hope that the commission will approve spending the bulk of the $300,000,000 for equipment for those carriers.

Ball-Bearing Mine Locomotives Need Few Repairs

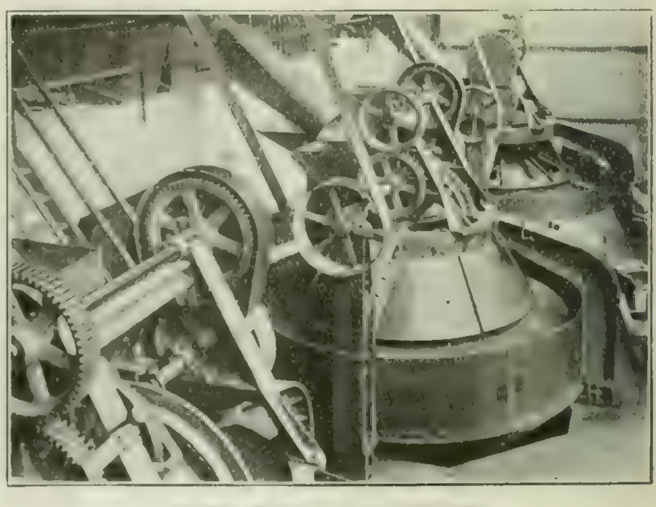
Reliability Under Hard Service, Minimum Lubrication and Little Attention Required Are Material Aids to Heavy Production

INCREASING use of mechanical equipment in mines arises from the necessity of greater production of coal. The steady demand for more coal and the high cost of labor have made it imperative that machinery shall be used whenever possible. To be of real value, however, such equipment must be efficient and reliable.

Systematic and adequate haulage is recognized as one of the most important factors in coal-mine operation. Furthermore, mechanical haulage has greatly increased coal production and improved working conditions. The production possible through the use of mechanical haulage can be appreciated when it is realized that a large locomotive can haul loads up to or even exceeding 400 tons in weight on the level.

The outstanding feature of mechanical haulage, of course, is the use of electric and gasoline locomotives instead of mules, with a resultant saving of around 60 per cent in haulage costs in addition to other advantages. By promoting uninterrupted service, however, the extensive use of anti-friction bearings on mine locomotives has greatly increased their haulage capacity. Electric locomotives are the more popular for mine work, although under certain conditions the gasoline locomotive is extremely useful. Electric locomotives as a rule are provided with two motors, as better results have been obtained with this arrangement than with single-motor machines. In some makes of mine locomotive motors ball bearings have been standard for several years and have been installed on the heavier as well as the lighter machines, for past performance has demonstrated that ball bearings will withstand heavy loads and shocks, that they are reliable under severe conditions and that they require a minimum amount of attention. Mine locomotives being subject to hard service, which imposes severe stresses upon the motor and its bearings, particular attention must be paid to these parts in order to insure freedom from breakdown.

An important feature of ball-bearing motors is the maintenance of a uniform air gap between armature

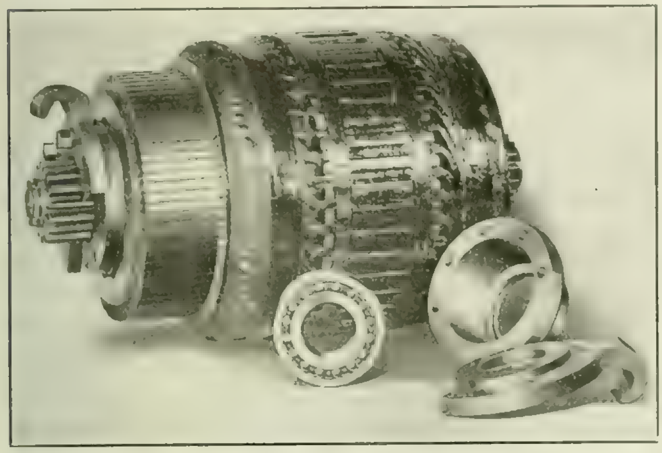


CENTRIFUGAL COAL DRIERS

The use and advantages of ball bearings are by no means confined to the mine rolling stock.

and poles, which insures uniform commutation. The armature never rubs on the pole pieces, and the armature bands and coils are therefore never injured. The proper centers are always maintained, which insures longer life to the gears, as they are always held continuously in proper mesh, as well as higher efficiency.

Plain bearings are subject to a continuous rubbing action, which causes wear on the bearing surfaces, frequently allowing the shaft to settle out of the true magnetic field. This calls for frequent inspection and gaging and constant renewal of the bearing brasses. Repairs of this nature mean extra expense, while the delay involved reduces the earning capacity of the locomotive. Locomotives with ball-bearing motors are rarely out of commission. The output of coal therefore is more nearly continuous, which insures high production. Furthermore the cost of repairs arising from worn-out armature bearings is eliminated.



A LOCOMOTIVE ARMATURE AND ONE OF ITS BEARINGS
Ball bearings have done much to reduce armature repairs.

As ball bearings are almost frictionless they are subject to practically no wear, which accounts for the maintenance of the uniform air gap. Balls and races are of course made of hardened steel and rolling action is substituted for rubbing. Ball bearings at both ends of the armature shaft carry it in perfect alignment and allow it to accept sudden changes of load without binding and consequent heating. The self-aligning bearing insures the best possible load distribution on the balls.

This type of bearing has the inner surface of the outer race ground in the form of a hollow sphere, whose center is in the axis of rotation. Thus all points on this surface are equidistant from the center of the bearing. The balls and inner race are free to rotate at any angle within the spherical outer race without being subjected to undue stresses. The bearing therefore will take care of any spring or deflection that may be found in the armature shaft.

Another important feature of ball-bearing motors in mine locomotives is the saving they insure in lubrication and attention. Ball bearings require little lubricant as they need to be oiled only three or four times a year, the housing being designed to retain an ample supply of lubricant. The end caps are provided with sealing grooves which prevent the oil from leaking out and getting onto the commutator and windings. These parts are thus kept clean and short circuits or grounds are greatly reduced in number. With a clean commutator dust will not accumulate and cause bad commutation.

Car Handling at Valley View Plane

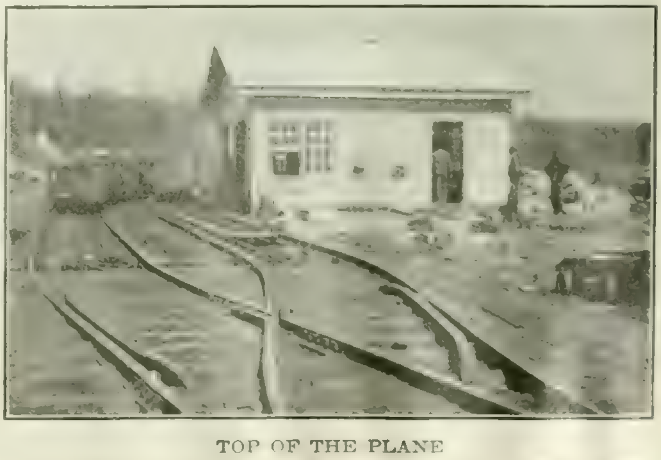
Mine Wagons of 9,000 lb. Weight Are Handled from Head of Plane to Locomotive by Rope and by Barney

By E. G. Markley
Bangor, Pa.

AN INTERESTING feature of the Philadelphia & Reading Coal & Iron Co.'s plant at Valley View, near Good Springs, Pa., is the unusual method of transferring or handling cars at the head and foot of the new plane. The plane is 2,700 ft. long. On each trip three loaded cars, weighing each 9,000 lb., are hoisted and three empties lowered by a 400-hp. electric winding engine at a speed of about 700 ft. per minute. The cars are transferred to and from the head and foot of the plane by four-drum electric hoists.

FOOT OF VALLEY VIEW PLANE
The barney used for moving cars to and from the incline may be clearly seen in the central foreground.

The breaker is located about three miles from the top of the plane. Empties are brought to the siding and loads taken from it to the breaker by a steam locomotive at the rate of about thirty cars per trip. When a trip of loaded cars reaches the head of the plane an attendant attaches a grip or, as it is here called, a "sling" to one of the cars and also to the endless rope running from the transfer hoist. The cars are then pulled away from the head of the plane to a point just beyond the transfer barney. Here the barney "picks up" the loads and moves them ahead about 150 ft. into position for being coupled onto the locomotive.



TOP OF THE PLANE
The barney, its rope and track here also may be readily seen.

The empties are brought forward by the same barney upon its return trip, to be transferred to the head of the plane by the transfer rope. As the loads come up and the empties go down the plane upon either side alternately, a crossover switch is necessary. The loaded cars are generally placed on the right-hand switch track ready for removal to the breaker, with the empties on the left for delivery to the plane for lowering.

The barneys travel on auxiliary tracks laid inside of the turnout tracks. They are controlled by friction drums on the transfer hoist. A rope is attached to each barney and they are connected by a rope which passes over guide sheaves. The whole forms a positive reversing mechanism. Throwing one drum into friction, the barney connected to it moves forward and the connecting rope pulls the other barney in the opposite direction, thereby giving the operator any movement desired on the track. A weighted brake on the drums prevents the ropes from running off too freely on the reverse movement.

The endless rope for the transfer of cars to the plane from the barney is operated in practically the same manner, the grip in this case taking the place of the barney. Rings are provided in this rope by means of which the sling, with a hook at one end and a ring at the other, is attached. The ring on the sling is larger than that provided on the transfer rope and consequently will not pass through it. In both cases the two ends of each rope are connected to separate drums on the hoist, making the movement of the rope positive

VIEW OF THE PLANE FROM ITS FOOT

[illegible]

Two men—one to operate the hoist and the other to handle the car sling—receive and deliver all the cars to and from the plane. The operation at the foot of the plane is practically the same as that described as taking place at its head and the same kind of hoist is used. These four-drum electric hoists were furnished by the S. Flory Manufacturing Co. Similar machines and equipment are in use by the Lehigh Coal & Navigation Co. and the Alliance Coal Co., and the transfer of cars is made at their operations in practically the same manner.

Centrifugal Pumps of Value as Auxiliaries to Meet Emergency

By W. H. Lesser*
Frackville, Pa.

RECENTLY the operating departments of the anthracite coal mines have been called upon to cope with an influx of water in volume and stubbornness seldom, if ever, exceeded. The comparatively few serious suspensions for this cause that took place in producing mines speak well for the installed pumping equipment as well as the machines hastily put in place to meet the emergency.

No doubt all the men in direct touch with the mechanical or electrical department of the mines have been called upon to quickly install pumps in order to prevent some slope or shaft from "drowning out" or to save the main pumping plant. An experience of my own may be of interest and perhaps of some help to others under similar conditions.

Two electrically-driven reciprocating pumps with a total capacity of 2,000 gal. per minute against a head of 800 ft. were unable to handle the water produced in a certain mine, and it became necessary to install an emergency pumping plant. This consisted of two electrically-driven pumps with a total capacity of 2,500 gal. per minute placed on the slope and a pump of the same type in a narrow breast containing the discharge pipe lines from the main pumping plant. This equipment soon "held the water" and prevented a complete inundation of the mine.

When it is stated that the slope was 12 ft. wide and 7 ft. high it will be realized that no other type of steam- or electrically-driven pump with a similar capacity could have been placed in it with the same amount of labor. For emergency pumping in times of high water experience has demonstrated that centrifugal pumps are certainly to be preferred to reciprocating machines.

As to the advisability of using centrifugal pumps for continuous service throughout the year there seems to be some doubt. Few authentic figures are available regarding the relative cost of pumping acidulous mine water by the modern steam-driven, compound, condensing, reciprocating pump, the electrically-driven reciprocating machine or the electrically-driven centrifugal pump. Data regarding these matters, I am sure, will be appreciated by those engineers who are held responsible for the installation and operation of the large dewatering plants common in the anthracite region.

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*Mechanical Engineer, Harleigh-Brookwood Coal Co.

Features in Track Planning That Will Aid In Securing and Increasing Output

Entries and Air Courses Are Carefully Planned, but the Haulage System Is Often Neglected—Transportation in Most Instances Is the Neck of the Bottle That Determines the Volume of the Output.

By Charles H. Partington
Cincinnati, Ohio

BEFORE track is laid insufficient thought is too often given to its proper planning, and frequently after it is put in place the track is grievously neglected. Some people seem to think that anything is good enough to pull cars over. The fact is that speedy uninterrupted dispatch of loaded cars to the cage, as well as a prompt return of empties, is the main factor in securing large production. Strange it is then that little or no attention is given to the perfection of the haulage system, the track equipment and its design. To illustrate this the following data are offered, which I hope will prove of interest and assistance to mine operators, superintendents, foremen, trackmen and the like.

Before a shaft is sunk one of the important items to be considered is how coal can best be brought to it in large tonnage after the main entries, cross entries and air courses have been driven. Until development has made some progress, the amount of coal taken from the rooms is, of course, small, and the meager tonnage of coal produced can readily, and is generally, hauled upon temporary track. This makeshift arrangement is usually followed after a short while by the installation of heavier trackwork, quite usually, however, without proper thought being given as to how the cars are going to be handled. As a consequence at many a mine improperly located cross entries and intersections are revealed having branch-offs interfering with proper placing of turnouts, crossovers, etc. This results in cramped installations of trackwork, short radii for curves, inefficiency in trip making and dilatory placing of cars for caging and an ineffective distribution of empties.

Proposed mine development usually is carefully plotted and planned, but it is seldom that the haulage system is considered at the same time. An illustration of how a layout was actually made and how it should have been constructed, if proper consideration had been given the problem before construction was commenced, is shown by Figs. 1 and 2. In making such a design the trackwork must be plotted to a small scale because of the large area to be covered, and consequently such drawings are not carried farther than the beginning of the development of the rooms. Much can be done to handle cars effectively beyond the points shown, but, owing to the lack of space, the plans for such additional track must be omitted.

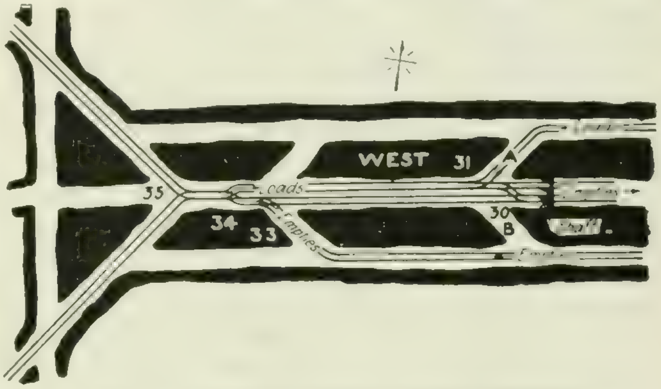

FIG. 1. POORLY-PLANNED SHAFT BOTTOM

Track facilities are so congested as not to afford adequate means for switching the locomotive.

Fig. 1 is a map showing a development planned without any consideration of the track layout. True the method of handling cars to and from the cage was predetermined but no consideration was given to the problems involved in the installation of track, especially with regard to the space which the track facilities would require. This resulted in the unavoidable installation of short curves, short-lead turnouts and jammed crossovers. Cross passages between main and side entries were driven without any regard to the position they should properly occupy for the effective placing of track and handling of cars.

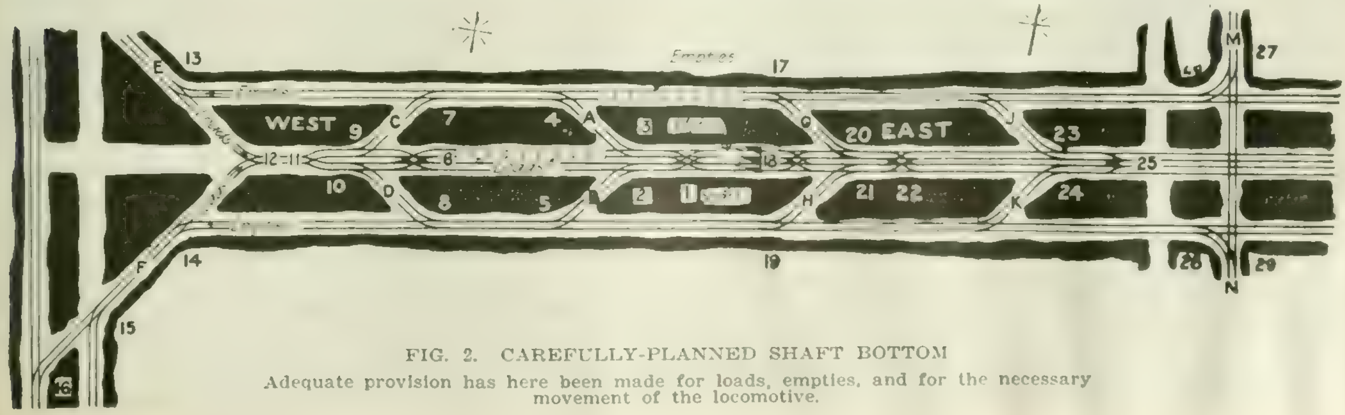

FIG. 2. CAREFULLY-PLANNED SHAFT BOTTOM

Adequate provision has here been made for loads, empties, and for the necessary movement of the locomotive.

Beginning our investigation at the foot of the shaft we see that the loads are delivered to the cage from the west side. It is obvious at once that the first cross entries, "A" and "B," were located too close to the shaft. Turnouts installed at the intersection choke off the space available for the double crossover, which not only necessitates that this be built with curves of small radius but leaves no room for passing the locomotive to a free space between the crossover and the cage.

Short radius in a cross-over means improper construction, short switch points and the binding of car wheels, and this results in the use of extra power and retards the movement of cars to the cage. As the main function of the cross-over is the delivery of loaded cars either to the right or the left cage, as desired, a space should be provided to enable the locomotive to pass beyond the cross-over switch and return by way of the opposite track without difficulty or loss of time. Placing the cross-entry switches improperly gives the motorman little chance to return the locomotive to the rooms for another trip, and that spells delay.

The double-track system in the main lead greatly tends, of course, to prevent congestion, but if too much is expected of this arrangement and the double track is not laid out properly, it will prove useless. A common cause for failure in this particular is the provision of an insufficient length of double track. The double road changes too soon to a single track or the handling of cars may be crippled by inadequate space being left between cross entries. The cramped space resulting leaves no room for placing a number of loaded cars on either track, hence there is difficulty in keeping the cages moving. Shifting the loaded cars is practically impossible, as there is little or no room to accommodate an extra crossover.

The angle at which the cross entries are driven is often responsible for lack of space. If the direction of the cross headings in which track is to be placed is given proper consideration an important gain in space will be made where they intersect the main leads and this will be secured even without changing the position of their starting points in the side leads. With a distance of even 30 ft. between the leads and with cross entries cut at 45 deg. it can readily be seen that a gain of 60 ft. is possible if the angle of the cut is modified. Thus more cars can be placed in line and continuous cage feeding secured.

Ten or twelve cars in a string may be sufficient to meet the needs during early development but when the mine has reached such a size that cars are being assembled from a large number of rooms additional space is demanded because several loads will have to be accommodated on the landing. With no space available, caging is slow, and the only alternative remaining is a re-arrangement of the track. This may work out to some advantage, but in most cases it proves only a makeshift in comparison with the efficient haulage system that might have been planned in the first instance before the possibilities of design were limited by the work already injudiciously performed.

When the transportation system is poorly planned locomotives are held idle on sidings or on passing tracks. In many instances this hold-up is considered a necessary condition, with the result that more locomotives are installed to relieve the idle ones, only to reveal later that this extra expenditure helps but little. Two and even three locomotives are not infrequently required to do the work that could be accomplished by one if due attention had been given in the beginning to the gathering and placing of loaded cars and to means whereby locomotives could be enabled to go back without delay for other trips.

Not only may the track system cause trouble but the track itself may be of poor design and delays will be experienced because of the binding on curves of cars and locomotives, the frequency of derailments, and other like difficulties. Short switch points, lack of alignment, absence of guard rails or their wrong position all contribute to the difficulty in keeping things moving. Short-radius curves and especially those with reverses put an extra load on the locomotive, which, although capable of pulling fifteen cars on a straight track, may be held down to four or five when bad curvature is encountered. The strain thus placed on the locomotive and the added number of trips that this strain entails mean waste of power and loss of time.

Careful consideration of the tonnage to be handled will enable us to avoid troubles of this sort. The larger the output we desire to attain, the more space it is necessary to provide for the stringing of loads and empties, for locomotive returns, for passing tracks, and for other purposes, and in this connection reference to Fig. 2 should be made.

As already stated, the first consideration in laying out the tracks for loads is to provide a space between the crossover and shaft sufficient to accommodate the locomotive and allow the switch to be thrown for its transfer to the opposite track. The cross-over should have curves of large radius so as to allow the locomotive to pass over it easily and to permit of the pushing of cars by hand. Sufficient distance should also be provided to turnouts Nos. 2 and 3 to allow cars that are being pushed into the main leads to straighten before entering the switches. The angle of cross entries "A" and "B" should be in the direction shown, for if cut in the opposite manner it would be necessary for the locomotive after passing over the turnout to back-track in order to get to the side leads.

LAYOUT IS ADAPTED TO ALL CONDITIONS

A string of nine loads is shown, but this number can be increased by arranging in the beginning for a greater distance from turnouts Nos. 2 and 3 to crossover No. 6. The limits of the diagram prevent showing a larger trip.

This trip is left standing on a straight track, the grade of which assists in the delivering of cars to the cage, while the locomotive has room, if necessary, to return over the crossover and through cross entry "B." As shown, however, it would only be necessary to pass over turnout No. 3, then back through entry "A" and pick up empties where shown. These empties can then be hauled straight ahead through turnout No. 13 and along entry "E" to rooms, or by passing through "C" and over turnouts Nos. 11 and 12, delivery can be made to entry "F."

Crossover No. 1 not only serves for the return of the locomotive but is useful in sending loads alternately to the left or right cage from either of the straight storage tracks beyond crossover No. 6. The latter serves the purpose of splitting trips to load both tracks for delivery to the cage. Should it be necessary to get the locomotive to a point behind the loads, crossover No. 6 again comes in handy.

If there is no question as to placing the loads for the cage, the proper track is easily approached by means of turnout No. 11. Turnouts Nos. 9 and 10 should be placed at such a point as to allow the laying of a straight section of track similar to that which has been planned and provided in the case of turnouts Nos. 2 and 3. This provision should be made at any point where curves precede the beginning of a turnout. Care also should be taken to give sufficient room at the rear of frogs to insure that the joints will be kept clear of switch points.

The above explanation and description of the simple haulage system illustrated could be greatly lengthened, but with the salient features set forth there should be little or no trouble in planning the methods to be followed in meeting similar problems. After a little study of the diagram, numerous possibilities in the handling of imaginary trips of loads, caging, returning the locomotive, replacing, gathering empties, etc., will be revealed. No claim is made that such a layout as this will be ideal or meet all conditions, but as a sample case I hope it will prove helpful to those contemplating the installation of new haulage systems or the replacement of old ones. Cross-overs and turnouts can be shifted, taken out or put in, as may be necessary to suit individual needs.

The portion of the diagram showing the delivery side of the shaft and the return of empties deserves consideration also, as conditions here are not the same as those governing loads.

The first cross-over, No. 18, serves the purpose of delivery to either track and as no locomotive is required here, extra space near the shaft for a locomotive cross-over is not required. The importance of large radii applies here for the reason that most of the transferring is done by man power, and the binding resulting from the use of short curves must be avoided. The width of radii for turnouts Nos. 20 and 21 also should be controlled by the same consideration, as it may be necessary to direct the empties to the side leads by man power also.

The other turnouts shown may be utilized to take care of the locomotive transfers, the collection of empties and the distribution of loads from the return side to the caging side.

Application of the main principles involved in the diagram shown will form an excellent foundation for any haulage system. The initial work should be preceded by proper consideration of each detail, and the time spent in planning as well as the cost of the track equipment will prove well worth while. Detail work is absolutely essential and drawings must be made accurately to scale, for if dependence is placed on sketches trouble is sure to result.

The size of cars and locomotives as well as the dimensions of wheels, wheelbase, etc., all enter into the solution if distances and curves are to be properly provided for. The engineering department of the firm* with which I am connected has had much experience with both large and small systems, new and redesigned, and is therefore thoroughly familiar with the details involved. Special attention is given to the design and construction of mine track. Proper consideration of mine haulage seldom fails to yield gratifying results.

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*The Cincinnati Frog & Switch Co.

Effective Hot-Process Water Softener

Most Chemical Reactions Proceed Much More Rapidly at High Than at Low Temperatures—The Hot-Process Softener Thus Accomplishes Results Much More Rapidly Than Cold-Process Systems

IN ITS present form the hot-process softener is a recent development. By taking advantage of the fact that chemical reactions are more rapid and complete in hot water than in cold it claims to secure a more efficient removal of the scale- and sludge-forming substances in water than is otherwise obtainable. The apparatus performs the functions of the open feed-water heater usually found in boiler plants, in addition to those of a softener. Less space, lighter foundations, less housing, less piping and fewer fittings are thus required than for a cold-process softener, with which an independent heater is necessary.

There are several reasons why scale-forming matter is more completely removed from hot water than from cold. In most instances chemical reactions are much accelerated by heat. This is a well-known and generally recognized fact, and was taken advantage of in households for ages before it assumed the dignity of a law of chemistry. Everyone knows that dishes and clothes are washed more rapidly and thoroughly in hot water than in cold.

The exact law connecting temperature and rapidity of chemical reaction has never been determined accurately, some chemists stating that the speed of reaction doubles for each 10 deg. C. added to the temperature, and others that chemical reactions are speeded up approximately as the 20th power of the absolute temperature. These formulas are not in agreement, but everyone concedes that there is as a rule an appreciable increase in speed of reaction with a rise in temperature.

Some years ago experiments were made in the chemical laboratory of the Harrison Safety Boiler Works to determine the effect of temperature upon the reactions which take place between softening reagents and scale-forming matter in boiler-feed water. The results are shown graphically in Fig. 1.

It will be seen that the reduction in hardness—that is, in content of calcium and magnesium salts—is much greater at the end of 10 min. in water at 210 deg. F. than at the end of 5 hr. in water at 50 deg. F., in fact, a 24-hr. treatment in cold water does not bring the scale-forming matter down as much as does a 10-min. treatment in hot water. Subsequent heating to the boiling point of the sample which had stood at 50 deg. F. for 5 hr. reduced the magnesium hydrate to less than one grain per gallon, but the same result was obtained in hot water in 10 min. In performing these experiments only a sufficient quantity of softening chemical was added to completely combine with

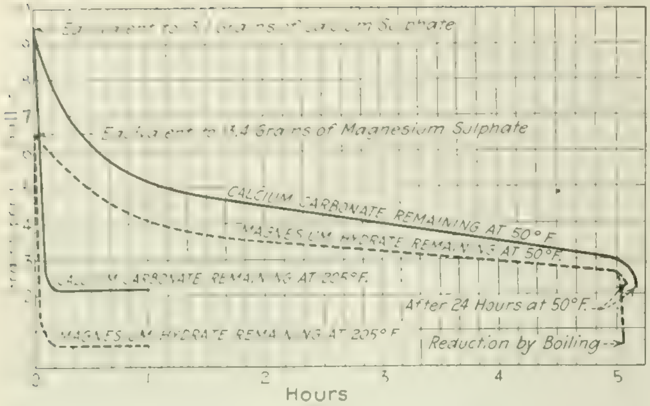


FIG. 1. ACTION OF HEAT ON THE SOFTENING PROCESS
Ten minutes in hot water is more effective than five hours in cold.

the scale-forming substances. In practice a slight excess is used, which reduces the hardness to still lower figures.

The effect of heat upon chemical reactions can be verified in a rough way by performing the following experiment: Place one pint of cold, untreated boiler-feed water in each of two beakers; bring one of them up to the boiling point, but allow the other to remain cold. Add to each the amount of reagent theoretically required for transforming the scale-forming substances. Stir thoroughly the contents of each beaker and note results. The reaction and sedimentation in the hot water will be much more prompt than in the cold water.

After precipitation has ceased in the cold water, decant the clear liquid and heat it to the boiling point. A marked after-precipitation will result, showing that the reaction in cold water was not complete. Do the same with the clear liquid from the hot-water beaker. No after-precipitation will occur. It is thus conclusively shown that the reaction is not only more rapid in the hot water but is also more complete.

The substances which result from the transformation of scale-forming matter are more nearly insoluble in alkaline hot water than in cold water, hence less of these substances are carried into the boilers in solution by water which has been softened hot.

The precipitates resulting from the transformation of scale-forming substances settle more rapidly and completely from hot water than from cold. Solid particles suspended in water settle to the bottom if their density is greater than that of the water; they rise to the top if their density is less than that of the water. The force tending to draw a particle downward is its weight less the weight of water displaced, and the force by which this descent is resisted depends upon the extent of the surface of the particle, the viscosity of the fluid in which the particle is suspended and the velocity of fall. Of course, a velocity is soon attained such that the force resisting the fall is built up till it prohibits further acceleration, and a uniform rate of settling results.

At the freezing point the viscosity of water is over six times as great as at the boiling point, and the velocity of fall at 212 deg. F. will be four times as great as the velocity at 68 deg. F.

Now consider how this applies to what takes place in a water softener. Suppose we have a large tank full of absolutely quiet water. A particle of any given size will descend four times as far in an hour in hot water as it will in cold water.

Next, suppose we have a continuous softener in which the water is constantly flowing through the sedimentation tank. In a hot-process softener a rate of flow can be allowed which is four times as great as is permissible in a cold-process softener without particles of a given size being carried to the pump supply pipe. Or, to put it in still another way, with a given rate of flow through the settling chamber much smaller particles can be separated from the water in the hot-process than in the cold-process softener. The further fact that the particles formed in a hot-process softener are larger than those formed in a cold-process softener renders the advantage of the hot process still greater, since the velocity of fall increases as the square of the radius of the particles.

It is therefore plain why the preliminary heating of the water, a feature peculiar to the hot-process softener, gives more complete chemical reactions and more thorough removal of the resulting precipitates.

The completeness with which scale-forming matter is removed from water treated in the hot-process softener may be shown by the following analyses of water before and after treatment in a commercial installation. In considering these results it should be borne in mind that a grain is $\frac{1}{7000}$ of a pound, or $\frac{1}{58,415}$ of the weight of a gallon of water. The small amount of solids remaining in the treated water coming from a hot-process softener does not form scale in the boiler, but gathers as sludge, which is easily blown out:

	Grains Per U. S. Gallon	
	Before Softening	After Softening
Calcium sulphate	13 00	none
Calcium carbonate	12 30	0 36
Magnesium carbonate	5.36	0.94
Silica	0.82	0.35
Iron and aluminum oxides	trace	trace
Total incrusting solids	31 48	1 65
Organic and volatile	6.32	2.98
Sodium carbonate	....	4.80
Sodium sulphate	0 64	12 60
Sodium chloride	2.28	1.92
Total non-incrusting solids	9 24	22.30
Free carbonic acid	2.45	

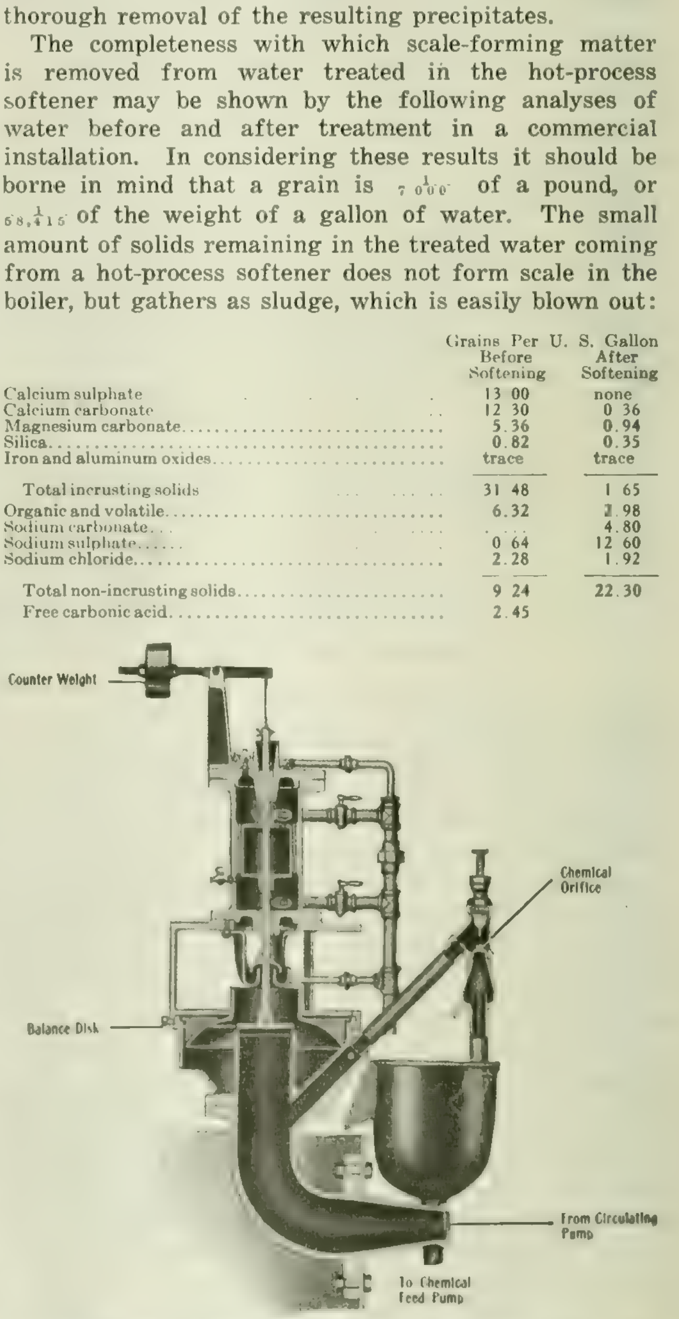


FIG. 2. CHEMICAL PROPORTIONER
This device, accurately, automatically and in proper proportions, feeds chemicals to the softening apparatus.

The chemical reagents must be fed to a softener in accurate proportion to the amount of water and to the impurities contained therein, so that the treated water may not deposit scale on the one hand or contain an excess of the unused reagents on the other. For proportioning the reagents to the raw-water supply various mechanical arrangements have been devised.

In some softeners the raw water flowing to the softener turns a wheel or operates a tilting bucket, which in turn operates dippers by which the reagents are ladled out to be mixed with the raw water. Such appliances, widely used with cold-process softeners, are usually located above the reaction chamber of the softener, involving the lifting or hoisting of the reagents 15 or 20 ft. or more above the ground level.

In other softeners a certain portion of the water, divided from the main supply by means of orifices or weirs, flows through chambers containing the reagents. In such a proportioner the water in flowing through the reagent tank becomes saturated. This method is faulty, however, since solubility varies greatly with temperature.

In another form the water displaces the reagent from a tank, at the same time diluting that which remains. Elaborate means for adjusting the orifices progressively as the reagents become more and more diluted are therefore required.

None of those methods is well adapted for feeding chemicals to a hot-process softener, which should be designed for operation under a slight pressure, since it is necessary to carry a few pounds back pressure upon the exhaust steam, in order to insure a temperature of at least 205 deg. F. in the treated water at all times. With the methods just mentioned it is necessary either that the chemical-feeding equipment be inclosed within the steam space or else that the chemical and raw water, after being proportioned, be pumped into the softener against the back pressure.

If the water wheel or the tilting bucket is inclosed so that the reagents can flow by gravity directly to the reaction chamber, steam finds its way into the chemical tank, where it condenses, diluting the reagents and rendering the feed inaccurate. The divided-flow method involves an additional pumping of both the raw water and the reagent, and is therefore complicated and expensive.

In another arrangement the raw water is passed through a hydraulic motor, of either the reciprocating or the rotary type, and this drives a small chemical pump. This method is defective because it is practically impossible to prevent slippage past the valves and packings of such motors and pumps, which renders the proportioning inaccurate.

The chemical proportioner used in the Sorge-Cochrane hot-process softener to regulate the feed of chemicals in proportion to the flow of raw water is a true flow proportioner. The chemical to be fed to the softener is forced through an orifice by a pressure just equal

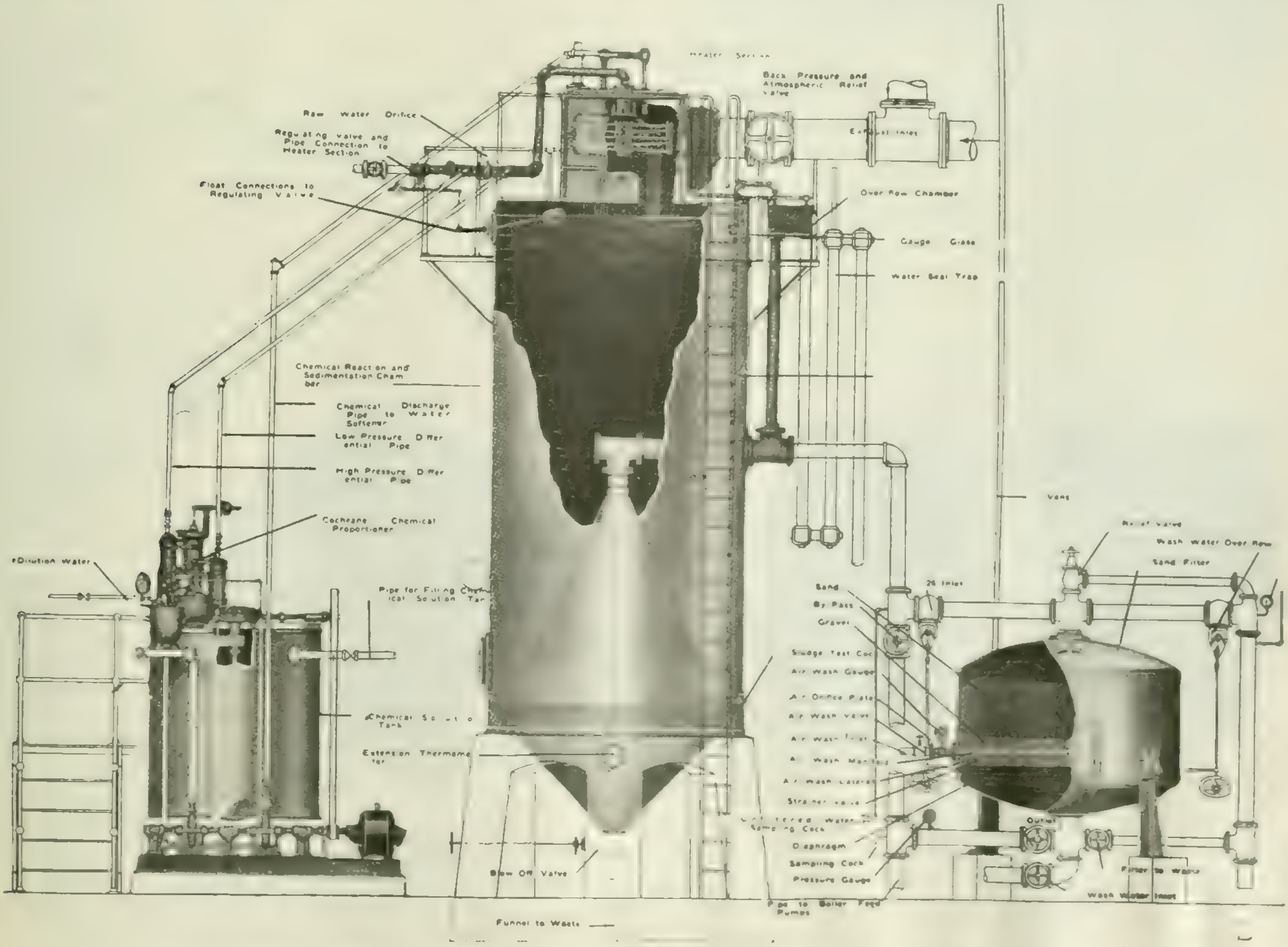


FIG. 3. SORGE-COCHRANE HOT PROCESS WATER SOFTENER COMPLETE

This apparatus consists of a chemical-reagent tank, together with its pump and reagent proportioner, the softener proper and a sand filter.

to the differential pressure set up by the flow of the raw water through an orifice in the supply pipe.

To understand how the device works reference may be made to Fig. 2. Between two flanges in the pipe through which the raw water flows to the heater at the top of the softener is placed a thin orifice disk. From the two sides of this orifice small pipes lead to the opposite ends of a cylinder containing a piston. The piston is thus acted upon by the differential pressure set up by the flow of water through the orifice.

The vertical piston rod extends through water glands at each end of the cylinder. On the lower end of the rod is a valve disk, which closes over an opening through which a fluid mixture of the reagents is constantly being forced by a centrifugal circulating pump. The weight of the piston, rod and valve disk is counterbalanced.

The differential pressure acting upon the piston pushes the disk down upon and tends to close the opening, while a pressure builds up underneath just sufficient to balance the differential pressure. The pressure of the chemical solution is therefore directly controlled by the differential pressure resulting from the flow of water through the orifice in the raw-water pipe. Through a simple pipe connection, this pressure acts directly at the chemical orifice, insuring an effective pressure thereon at all times equal to the differential pressure on the raw-water orifice.

Most of the chemical solution supplied by the circulating pump flows out from under the disk, through a strainer and thence back into the chemical-solution tank. The proportioned chemical flows through the chemical orifice into a funnel from which it is taken by a chemical feed pump, lifted to the softener and forced in against any back pressure that may exist therein. The back pressure in the softener thus does not affect the proportioning.

As the chemical before escaping through the small orifice is not in contact with air, no incrustation occurs upon it, but to provide for dislodging any obstruction a cleaning needle is so arranged that it can at any time be forced through the orifice by the pressure of the hand.

Besides being accurate this arrangement has these additional advantages: Only one chemical-solution tank is required, which is at the ground level, where it can be charged without hoisting of chemicals or inspected without climbing a ladder.

The motor which drives the circulating pump also drives agitating paddles in the tank. Milk of lime can thus be kept in suspension and fed as well as purely fluid reagents. The large saturator tanks necessary where lime water is used are eliminated and the difficulty due to the fact that lime water varies in strength according to temperature is avoided.

Solutions of caustic soda or sodium carbonate, lime water, milk of lime or any mixtures are all handled equally well and fed accurately. The accuracy with which the solution is fed is well within 2 per cent, which is closer than attendants will measure out chemicals into the chemical tank. Representative test results are shown in the following table:

Rate of flow of raw water gallons per hour	Rate of flow of chemical, gallons per hour	Chemical per gallon of water	Variation, percent
1740	134.6	0 0773	0.28
1590	122.2	0 0769	0 22
1410	108 4	0 0769	0.22
1160	88 8	0 0766	0.71
710	54.6	0 0769	0.22
411	31.8	0.0773	0.28
290	22.4	0 0773	0.28
290	22.5	0 0775	0.52
184	14 3	0 0771	0.03

The chemical treatment is controlled by drawing off a sample of the treated water from time to time and titrating with a standardized solution, the whole operation requiring about 10 min. By locating the titration readings thus obtained upon a chart the operator sees

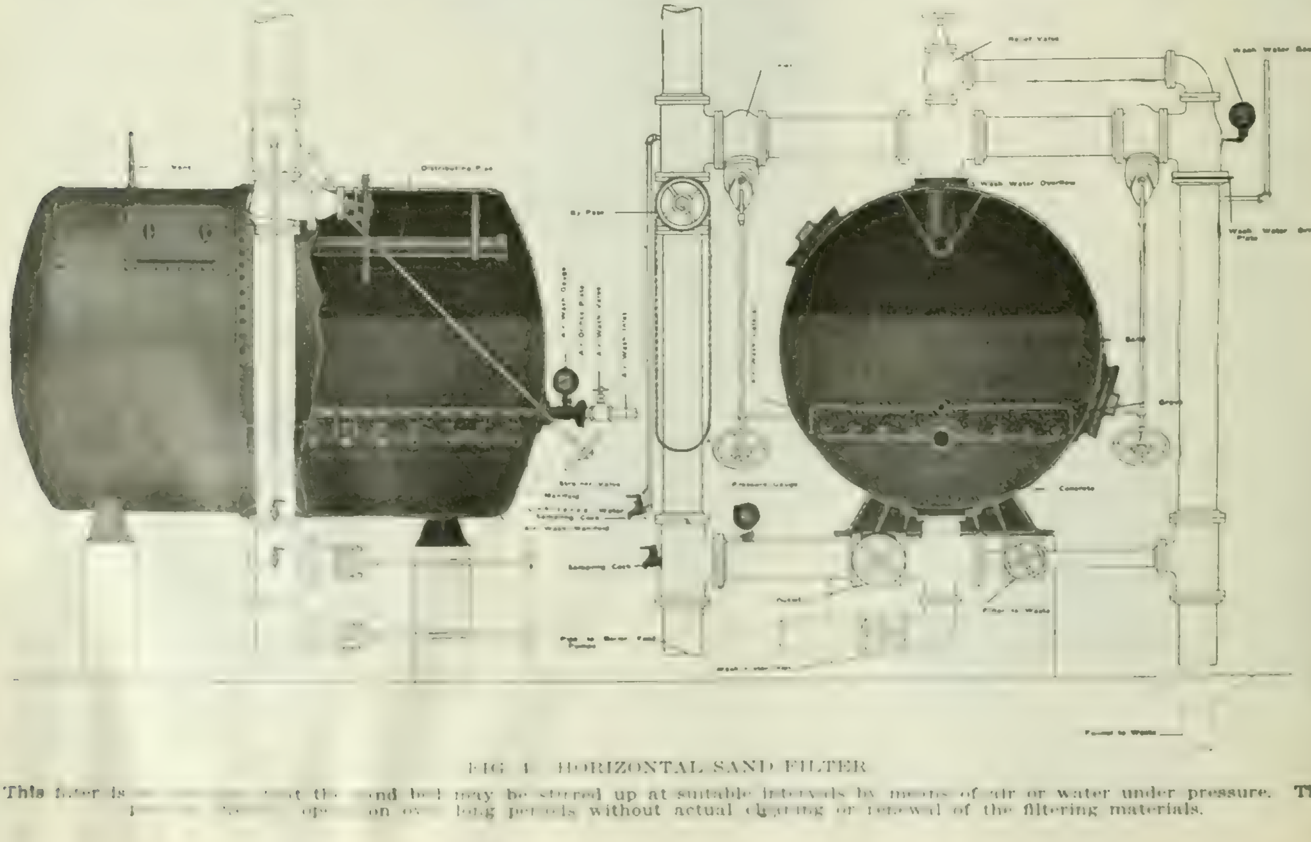


FIG. 4 HORIZONTAL SAND FILTER

This filter is [illegible] that the sand bed may be stirred up at suitable intervals by means of air or water under pressure. This [illegible] operation over long periods without actual cleaning or renewal of the filtering materials.

at a glance what change, if any, is required in the amounts of the chemicals.

This apparatus, as may be seen, is quite simple and compact. The open heater, with an oil separator attached for purifying the exhaust steam which is used for heating the water, is mounted directly over the reaction and sedimentation chamber. The water is heated to steam temperature by spraying it over trays.

The precipitated matter deposits in the conical bottom of the sedimentation chamber. From there it can be quickly washed out by the opening of a single valve. In order to eliminate convection currents the hot water and the softening reagents are delivered at the top, and travel slowly to the bottom, whence the clarified water is drawn off by an inverted funnel. The precipitates formed when the water is first mixed with the chemical settle through the water below, thus securing a screening effect and a gathering together of the smaller particles.

The removal of scale-forming matter at high temperature by sedimentation is so effective that for many waters and plant conditions it is entirely practicable to dispense with filters. Many softeners are accordingly installed without such devices and are successfully protecting the boilers from scale and corrosion, even though the softened water contains a small amount of suspended matter.

Arc-Welded Bonds Eliminate Moisture and Defy Corrosion

Bonds Can Be Arc-Welded Without Disturbing Traffic and Equipment Is Available for Other Arc-Welding Such as Every Shop Demands

By W. P. Bovard,
Mansfield, Ohio

SEVERAL methods of mechanically joining metals, such as clamping and riveting, have been used since the inception of track bonding as a means of electrically and mechanically connecting copper bonds to track rails in order to insure an electrically continuous return path for the haulage current. From the mechanical standpoint the clamping of the channel pin and the riveting secured by the terminal compressor or the expansion pin appeared to be satisfactory. From the electrical standpoint, however, these methods have not always proved entirely desirable because of irregularities and carelessness in installation.

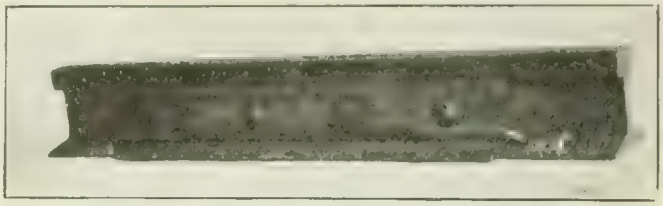
The channel-pin method of bonding never proved adequate electrically because of the impossibility of excluding moisture from the contact. The compressed and pin-expanded copper terminals show less tendency to deteriorate, but under the strong corrosive agencies encountered in mine service it is difficult to maintain a perfect contact between bond terminal and rail.

One of the many successful applications of electric arc welding of much service to industry has been in the construction of tanks and boilers. Welding of seams is rapidly superseding riveting because of the greater ability of the welded seam to withstand corrosion and pressure. It is just as obvious that the welded contact should supersede the mechanical in the track bonding of mines. The metallic electric arc has proved itself the most adaptable means to this end.

ARC-WELDING TERMINAL WITH ELECTRODE IN PLACE

The switch operates a remote control that cuts off the entire cable, thus rendering possible easy and safe adjustment of the electrode.

In mine service it is desirable that track bonds should be of such design as to be able to withstand the severe conditions imposed by frequent derailments. The accompanying illustration shows a type of rail bond which has been widely used, being designed for application to the base of the rail. This bond is provided with steel terminals which are welded to the rail by the aid of a soft-steel electrode, thus insuring a permanent connection of low resistance. Being placed, as shown, low on the rail and underneath the joint bolts the bond receives maximum protection. Installation is made without removing the joint plates or disturbing the ties. Consequently the cost of the work is reduced to a minimum.



BOND WELDED IN POSITION

The copper cable spans the rail joint below the heads of the joint bolts. It is thus in a degree protected by them.

Owing to the limited space available underground, it is advantageous to use welding apparatus for the work, and this may be handled by the bonding crew without interference with traffic. A type of resistance welding apparatus which has met the bonding requirements of mine service satisfactorily has control features which insure ample welding current under the varying voltage and also furnishes the operatives with full protection from electrical shock. This latter feature is secured by means of a remote magnetic switch under control of the operative.

Corporation President's Powers.—The president of a business corporation has no power to bind the company by executing notes in its name without the consent of, or consultation with, the board of directors. The circumstance that the president may own nearly all the stock does not affect the case. A corporation is a distinct entity under the control of its directors, and the president may not exercise the authority of executing promissory notes thereof on his own motion or otherwise than as empowered in the articles or by-laws or by the managing directors of the company. *(Iowa Supreme Court, Goodman Manufacturing Co. vs. Mammoth Vein Coal Co., 168 Northwestern Reporter, 912.)*

This Electric Drill Will Quickly Cut Holes in Hard Mine Roofs

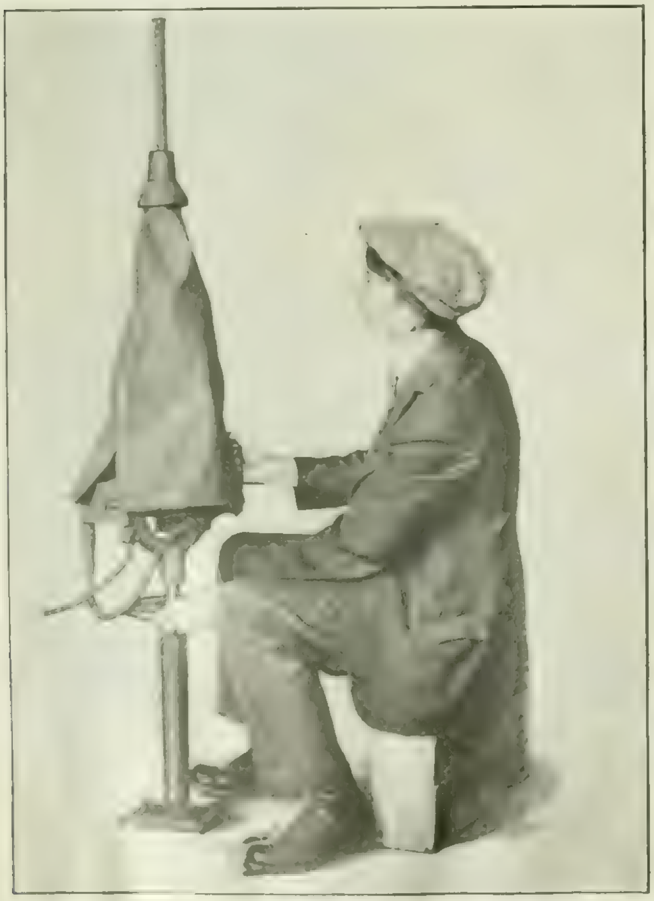
Has a Capacity of from Six to Twenty Holes in Hard Rock—Adjustable for Roof Heights of from Five to Six Feet

By E. M. Backie
Syracuse, N. Y.

DRILLING holes in entry roofs for trolley-wire hangers, feed-wire insulators or trolley-guard boards is an awkward and expensive operation even under favorable conditions. In soft-rock top or slate the holes can be drilled with a hand auger, but when the top is composed of a hard-rock formation this work has to be done by other means, as the auger has its limitations.

A machine electrically operated and of light weight, designed and built a few years ago, does this work rapidly and cheaply. It was tested for several months in different mines and under severe conditions. The result of these tests was a reconstructed machine, which has been made in large numbers and is now operated in many mines throughout the coal fields with quite satisfactory results.

This machine is a simple mechanical device operated by an electric motor. It is easily handled and operated by one man or a man and helper, while its drilling capacity is large. In average hard-rock mine roof, 10 to 20 holes $1\frac{1}{4}$ in. in diameter, 5 in. in depth, have been drilled in one hour. In the hardest kind of rock six to ten holes have been drilled in the same time.



PORTABLE ELECTRIC DRILL FOR WORK IN THE ROOF

This drill and its mounting may be easily carried about the mine. Mounting may be made to suit the height of roof encountered.

The accompanying illustration shows the machine as it has been developed and is now used in many coal mines throughout the country. The outfit consists of the drill proper and its mounting. The weight of the drill is 55 lb. It is separable from the mounting to afford an easy carry. The mounting consists of a fork-shaped yoke and a feed screw which telescopes into a pipe support. This pipe can be made of any length, but the standard adopted is suitable for roof heights of from 5 to 6 ft.

The drill bit is made from a 1-in. round bar of rock-drill steel. One end is forged square $\frac{7}{8}$ x $\frac{7}{8}$ in. to fit the chuck. The other end is the regular six-point rock-drill bit, which is readily shaped by the mine blacksmith with the aid of a forming tool furnished by the maker as part of the equipment.

When the machine is in drilling position a canvas hood or jacket protects it from the dust which drops from the drill hole. The power consumption is only 600 watts, or less than one electrical horsepower. The Pneumelectric Machine Co., of Syracuse, N. Y., the builder of this tool, has placed it on the market under the name of "Plugger."

Portable Gasoline Air Compressor Suited to Scattered Work

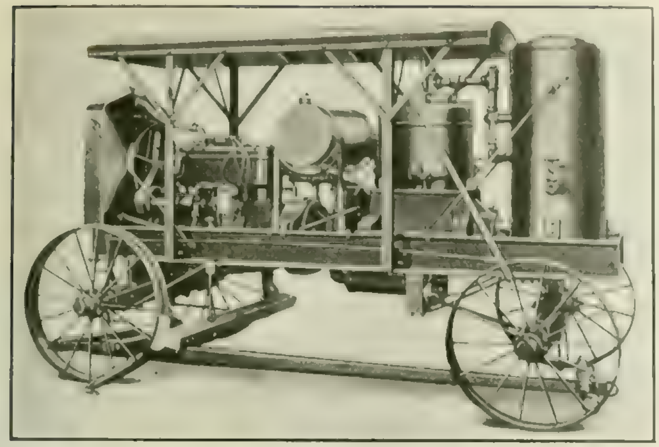
Driven by a Four-Cylinder, Four-Cycle Gasoline Engine—Cooling of Cylinders is Secured by Open-Hopper Jacket

WIDESPREAD application of compressed air to industrial purposes has increased the demand for a portable aid compressor—an independent, easily movable unit. Such a compressor has proved highly useful for the operation of drilling tools for rock or other minerals wherever the work is scattered and too small in quantity to warrant a fixed compressor and drill plant at any one point. Of course, such a portable unit can in many instances be used advantageously for riveting, in the construction of steel tipples, trestles or buildings, or for driving wood augers and other construction tools and appliances.

The portable outfit here illustrated, made by the Sullivan Machinery Co., of Chicago, is an entirely new development, based on the company's experience with similar outfits during the last eight or ten years. This rig includes a specially designed two-cylinder vertical air compressor, driven by a Buda four-cylinder four-cycle, heavy-duty tractor gasoline engine, through a gear and pinion.

The compressor and engine, together with a vertical air receiver, gasoline supply tanks, radiator and fan, are mounted on a truck body made up of heavy channel irons, strongly braced. The truck body is mounted on heavy steel wheels or, if desired, the entire rig can be set on a flat car or other more substantial mounting. The outfit is protected from the weather by a steel canopy top which is provided with canvas curtains.

The air compressor employed has a displacement of 150 cu.ft. of free air per minute, and requires 32 hp. for operation against 100 lb. pressure. The air is admitted and discharged from the cylinder by means of Sullivan improved wafer valves. These valves are placed radially with respect to the axis of the cylinder and close to its upper end. They are held in place by flat circular leaf springs. Both valves and springs



PORTABLE COMPRESSOR AND ITS TRUCK
Compressor, receiver, engine, fuel tank and radiator are all mounted on a truck that can be hauled readily from place to place.

are made of the finest tempered steel and the valves open against specially-designed guard plates intended to give a wide port opening with small clearance loss.

Cylinder cooling is secured by an open-hopper jacket into which water can be poured from a bucket or through a hose. This type of cylinder cooling has proved particularly effective on portable compressors for many years and does away with the complication of a circulating pump and piping.

Power economy is effected when air is not required by an unloading device and pilot valve connected with the air receiver. This raises the inlet valves from their seats when the demand for air temporarily ceases. Lubrication is secured by a force-feed oil pump inclosed in the crankcase and delivering oil under pressure to all bearings. Baffles and wiper rings prevent an excess of oil from working up past the piston and collecting on the valves and seats, with danger of carbonization.

The drive, as stated above, is by gear and pinion. A heavy-geared flywheel with cut internal teeth is mounted on the compressor shaft and engaged by a pinion on the engine shaft. A disk clutch placed on the shaft between the pinion and the engine is thrown out when starting until the engine is up to speed.

The engine adopted for driving this compressor is of an extremely rugged and reliable type. The cylinders are cast *en bloc* and provided with a removable head. The machine has three-point suspension and all mechanism is inclosed and adjustable. The camshaft is hardened and ground. The crankshaft is of special design, securing accurate running balance, and is supported by three babbitt-lined bronze bearings. The accessories, such as the magneto, impulse starter, carburetor, speed governor, starting switch, spark control and hand throttle, all combine simplicity with effectiveness and reliability. The gasoline supply tank will hold 23 gal., which is sufficient for a day's run.

Contributory Negligence of Injured Miner.—The provision of the mine safety laws of Iowa, requiring miners to examine their working places and to make the same safe before commencing work, extends to an employee engaged in reconstructing an entryway to a mine. An operator need not warn an employee of dangers that are as obvious to the latter as to him. (*Iowa Supreme Court, Holmes vs. Bloomfield Coal & Mining Co., 162 Northwestern Reporter, 820.*)

Roller-Bearing Wheels Ease the Way from Face to Tipple

Modern Car Wheels Effect Savings in Lubrication, Power, Time and Length of Service — Anti-friction Bearings Save 58 Per Cent of the Power

By D. B. Turner
Knoxville, Tenn.

Most coal men are familiar with the old solid-hub wheel having a lynch pin that passed through the axle and held the wheel in place. In order to secure proper lubrication this wheel required oiling at frequent intervals. This device was soon supplanted by a type of wheel provided with a hollow hub forming an oil reservoir with passages leading to the journal. When properly fitted and equipped with felt washers this type of wheel would operate for several weeks with one charge of lubricant.

Numerous attempts were made to improve upon this general scheme and in 1908 the Sanford-Day Iron Works of Knoxville, Tenn., brought out what it now terms its old style Whitney roller-bearing wheel. This was familiarly known as the "R-B" and is shown in cross section in Fig. 1. The hub of the wheel was lined with a special grade of steel and the rollers operated between this lining and the axle.

A cage held the rollers in their correct position while a thrust washer, interposed between the pedestal box and the inner end of the wheel hub, served as a buffer and took up wear. Felt packing made the joints tight and permitted lubrication with oil. The wheel was held on the axle by locking rivets or bolts that passed through the pedestal box on either side of the axle and engaged in a groove in the wheel hub. The wheel was oiled through a hole at the end of the hub and a sizable oil reservoir was provided. A plug closed the oil hole.

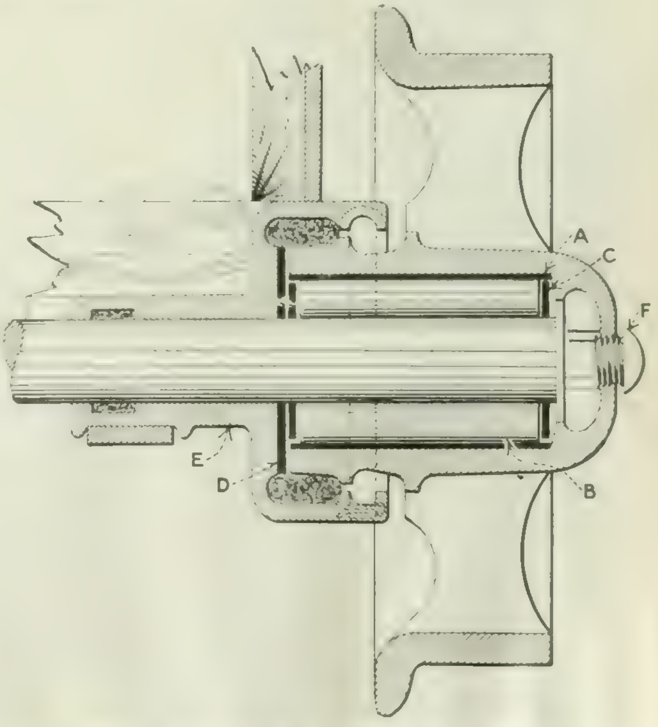


FIG. 1. OLD-STYLE WHEEL AND BEARING
This bearing was felt packed and showed a decided improvement in service over previous journals.

This wheel gave much satisfaction and it was found that it might be operated six months on one lubrication. Instances are known where these wheels were run on one oiling for two years or more without appreciable wear of any of the parts. They can be run under water without danger of sediment or grit finding its way into the bearing.

In the quest for further simplification, the Whitney Wonder roller bearing was placed upon the market in 1913. This wheel is shown in cross section in Fig. 2. As is evident upon inspection, this wheel is extremely simple and efficient.

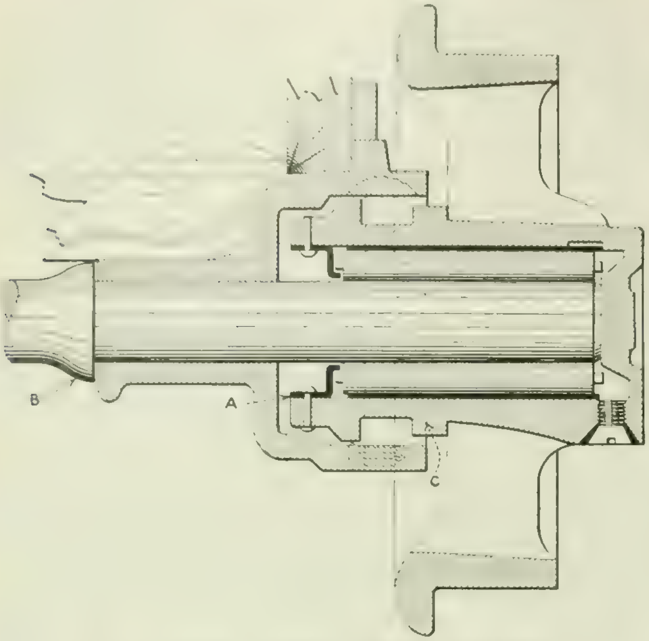


FIG. 2. NEW WHITNEY WONDER WHEEL

This journal retains the good features of its predecessors as well as certain later improvements.

The method employed for holding the old-style wheel to the axle as well as the hub lining is retained in this model. The outer end of the wheel hub, however, is made solid and arched to receive the thrust of the axle. The rollers are fitted on the ends with projections which fit into the arch of the hub on one end and into a steel stamping on the other. This latter is lightly riveted inside of the wheel hub, holding the rollers in place when the wheel is removed from the axle.

This steel stamping or cup washer acts as a dam, forming a reservoir for the retention of whatever lubricant is employed. A collar upon the axle transmits side thrust to the arched end of the wheel hub. Grease is introduced by means of a gun through a hole in the side of the hub until it starts to come out at the point "C." This signifies that the internal portion of the wheel is completely filled. If of the proper consistency this grease acts as a packing, preventing dirt or grit from working into the bearing. About 1 lb. of grease is required at each filling.

In one instance four trucks provided with these wheels operated for two and one-half years under hard service on grease which was in the wheels when they left the factory. Upon examination at the end of this period no appreciable wear was apparent upon the rollers.

The savings arising from the use of anti-friction bearings accrue from four different sources—lubrication, power, time and length of service. The cost of lubrication is an important item. This expense is variously estimated at from $6 to $15 per car year, according to the cost of lubricant and the type of plain-bearing wheel with which the wheel is compared. With the price of oil high this saving of course is proportionally large, while if a car greaser is employed this man may be cut off the payroll when the change is made to the roller-bearing equipment.

Actual tests have shown a saving of as much as 58 per cent on the power consumed in haulage as the result of substituting anti-friction for plain bearings. This means that three cars with improved bearings can be hauled with less effort than two plain-bearing cars. Each operator can figure what this means to him in dollars and cents. Of course, the saving effected in power consumption varies widely with conditions, but there is always a big margin in favor of the roller-bearing wheel.

TIME IS SAVED BY ROLLER-BEARING CARS

The saving in time is almost a direct result of the saving in power. As the result of such power conservation a locomotive can move more cars per shift, while the ease with which these cars can be pushed to the face gives the miners more time to load coal or to perform other duties. For a given output this of course results in having fewer men on the payroll.

A roller-bearing wheel if properly designed and constructed should outlast, under normal conditions, at least two plain-bearing wheels. The plain-bearing wheel usually finds its way to the scrap heap because of a worn hub, when the tread might be good for many years of additional service. If the roller-bearing wheel is kept properly lubricated the tread determines the life of the wheel. Any damage occurring to the bearing may be repaired through replacement of damaged parts at a trifling expense.

With most operators seeing is believing. Most of them also are "from Missouri." Such operators may well secure a sample set of roller-bearing trucks and conduct their own experiments.

Limits of Switching Service.—The following language used by the Minnesota Supreme Court the other day in the case of *Commercial Club of Duluth vs. Northern Pacific Railway Co., 165 Northwestern Reporter, 270,* throws some light on the question as to how the line is to be drawn between switching service and actual transportation carrying a distance tariff, in the movement of shipments between a city and one of its suburbs: "The limits of a shipping point are not necessarily coincident with the limits of a city. They may be more extensive. Perhaps they may be less extensive, but usually not.

"The important question is whether the district is a single industrial center. This is usually a question of fact. * * * In determining that question, the extent of the district, the industrial relation of one part to another, the nature of the traffic are things to be considered. Whether the traffic is handled by train crews or switching crews, and whether on way bills or switching orders, are matters to be considered, but the manner of handling is not decisive. The fact that the railroad and the public have acquiesced in applying a switching tariff is important when that fact appears, as it does here."

Gasoline Mine Locomotive Operates with Efficiency Despite Heavy Grade

Provides Transportation on a 5-Per Cent Grade-Delivering Five to Eight Cars Per Trip, the Return Trip Being Roughly a Mile Long

By A. C. Paul
Milwaukee, Wis.

NOT only are gasoline locomotives rapidly replacing other forms of haulage for surface work but they are also meeting many of the problems of mine haulage, for, being self-contained units, none of the complications inhere to their installation that are found when introducing for the first time electrical, steam or compressed-air locomotives. Gasoline is not always the correct solution of haulage problems, and conditions sometimes present themselves where some other form of motive power would be more advantageous.

A good example of the efficiency of the gasoline locomotive may be found in the No. 2 coal mine of the Stewart Iron Co., Ltd., located at Coolspring, near Uniontown, Pa. This is a shaft mine tapping a field of 120 acres of 5-ft. Sewickley coal. While classed as one of the smaller operations, its production attained such proportions some time ago as to demand a more modern and economical method of haulage than that furnished by mules. Furthermore, a grade of nearly 5 per cent against the loads required the installation of a system of sufficient power to overcome such adverse conditions. On the other hand, the comparatively small acreage forced a careful scrutiny of the first cost as well as of the probable upkeep of the prospective transportation system.

Superintendent Thomas W. Keighley spent considerable time in detailed study of this haulage problem, as well as in careful analysis of the merits of the various systems available. He finally selected a type "L-30" 6-ton gasoline locomotive manufactured by the Milwaukee Locomotive Manufacturing Co. This was installed Dec. 15, 1918, and an inspection of the Stewart mine on April 8, 1920, found the motor doing more than had been expected of it and showing for sixteen months' service a highly satisfactory record for reliability and upkeep.

This locomotive is in constant service six days a week, and up to April 8 of the present year there had been no occasion for any delay. The daily tonnage is hauled in trips of from five to eight cars, weighing with load from twelve to nineteen tons. The length of one-way haul is 2,400 ft., and the grade on about 1,000 ft. of this distance is approximately 5 per cent.

In operation this locomotive has proved itself economical and represents a notable saving in time and money over the old haulage system. In addition to this there has been a marked improvement in working conditions, as the old delay in the placng of empties has been avoided and the loaded cars have been moved more promptly. This has resulted in a general speeding up of the mining operation and in bringing about a bigger tonnage as well as a shorter day.

When questioned regarding his opinion of the service rendered by the gasoline locomotive, Superintendent

GASOLINE LOCOMOTIVE AND ITS TRIP
Installation of this machine greatly facilitated operation, because of the increased reliability in car placements.

Keighley was enthusiastic. "I am thoroughly converted to the gasoline motor for mine haulage. Our machine was installed only after considerable debate and investigation, and was chosen largely on account of its economy. Its first cost was less than half that of an electric haulage system, and its maintenance has been extremely satisfactory. I thought when we bought it that it would do the work, and now after a year's test, and under operating conditions that are about as hard as can be found, I am an enthusiastic booster for this machine. We would not now consider its replacement with any other form of mechanical haulage. It represents the most simplified form of power. There are no trolley wires to string and watch, no rails to bond, and the motor itself is so free from mechanical adjustments that we consider it 'fool-proof.' Best of all is the effect on the men. They regard the locomotive as their best friend and if the substitution of another form of haulage were suggested, I know they would vote it down if they were permitted to express themselves."

Extended Air Lines Giving Way To Portable Compressors

Which "Make Air Where It Is Used"—A Drill That Can Be Suited to the Work Regardless of the Hardness of the Materials

By D. E. Dunn
New York, N. Y.

A PROGRESSIVE step in the coal-mining industry was the linking of the motor, compressor and percussive drill into practically one compact, portable unit. This was accomplished by the Ingersoll-Rand Co. when it perfected the portable mine-car compressor and the mounted or unmounted jackhamer that could be used with either hollow hexagon or twisted concave auger steel.

Previous to the introduction of this apparatus the work now performed by it was accomplished by means of cumbersome, specialized machinery. This was costly, slow in operation and not easily adapted to local conditions. It was deceptive, too, in that despite its sturdy appearance it was easily and frequently put out of working condition.

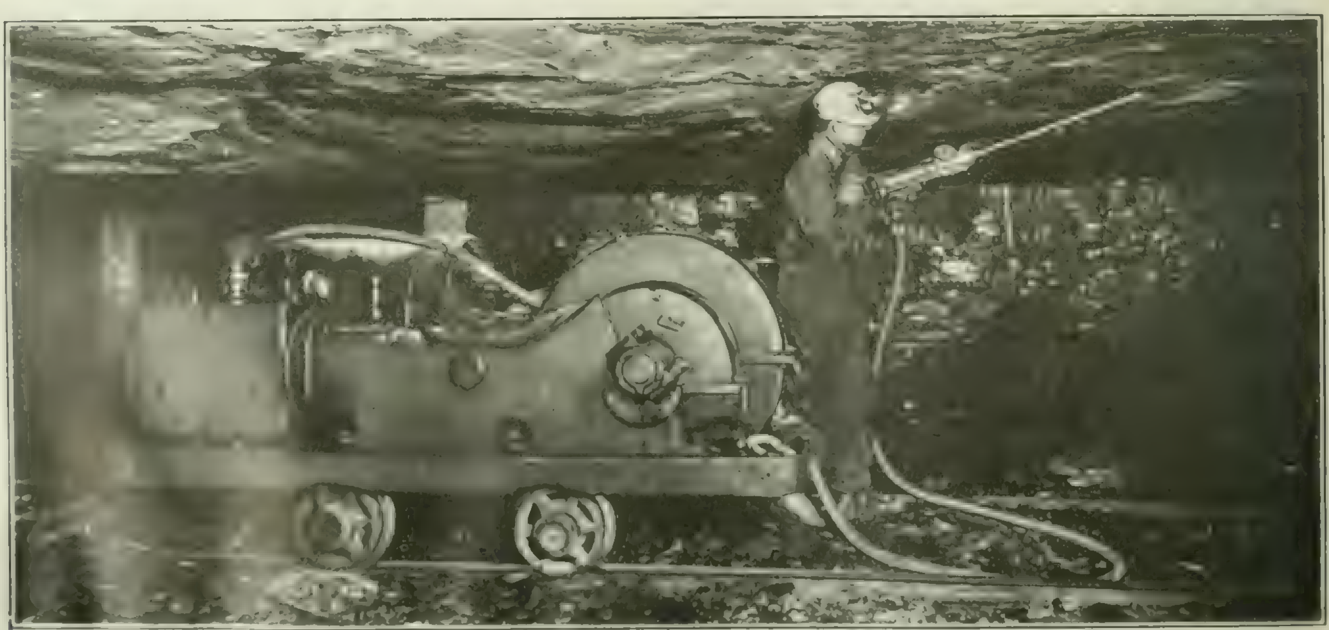
The term "specialized" employed above is used advisedly because the machine that did the entry cutting through hard rock was seldom adapted to the general work of mining coal. Hence another special machine had to be purchased.

To operate the old type of machines an elaborate surface plant and extensive underground pipe lines were needed. This meant large initial cost and high operating expense. Poorly-proportioned and leaky pipe lines alone have in a number of instances caused an outlay by operating companies of sums of money running into several figures. The additional expense of the greater numbers of skilled men employed on the old-fashioned machines need hardly be mentioned.

The mine-car compressor is a self-contained unit, consisting of a compressor with automatic unloading device, an air receiver with pressure gage, a safety valve, drain cock and service valve, electric motor with complete control, and herringbone gear drive. All this equipment is mounted on a cast-steel frame with steel wheels and axles. It is fully equipped and needs only to be connected to a source of electric power.

The jackhamer is built in five sizes, the one used most frequently in coal mining being a 35-lb. machine. In entry cutting through hard rock or in picking out rock bands a hollow hexagon steel is employed. For drilling coal concave auger steel has been found more satisfactory.

The combination of these two machines forms what might be termed a universal coal-mining unit. Were it not that one man is required to run it, it might be called an automatic unit. However, one man can and does operate the outfit. The saving it has effected both in initial cost and expense of upkeep as well as the advantage secured through "making the air where it is used" has been greatly appreciated by progressive coal-mining men.



MINE CAR COMPRESSOR AND JACKHAMER IN OPERATION

This compressor is portable. It may be taken anywhere in the mine, connected to the current supply and put to work. Pipe-line losses are thus avoided.

Toronto Is Briquetting River Anthracite

Great Care Is Taken to Thoroughly Mix Coal and Binder; a Mixer, Malaxeur and Masticator in Turn Working to Secure Complete Intercompounding of the Materials—Water Cooling Prevents Adherence of New-Made Product

By A. L. Stillman
New York City

PROFOUNDLY concerned over the recent and long-continued shortage in domestic sizes of anthracite fuel, official and financial Canada, as well as "the man in the street" have been seeking some substitute for hard coal. Being "the most distant market, and the last applicant at the source of the fuel . . . Canada can only ask for consideration. She has no voice in any proposals for developing or conserving production for her future necessities; no control over efforts to expand this industry; no means to compel any change in policy, and no authority to enforce her needs."*

FIG. 1. TANKS IN WHICH THE OIL BINDER FOR THE BRIQUETTES IS STORED

A good grade of binder, which will not run in warm weather, is used. Each tank holds 20,000 gal. A 2-in. steam coil carries live steam which keeps the oil from hardening into a solid. The pump which fills the tanks from tank cars also delivers the oil to the device where it is mixed with the coal.

FIG. 2. DRIER INSTALLATION. ONE OF THE ROTARY SINGLE-SHELL DRIERS CAN BE SEEN IN REAR

Driers are 4 ft. in diameter and 45 ft. long and revolve ten times every minute, the terminal temperature being about 250 deg. F. A blower forces gases through the drier in the opposite direction to that taken by the wet coal, so that heating is progressively increased. Two per cent of moisture is allowed to remain.

The Canadian government is actively investigating the fuel resources of Canada, is vigorously planning the utilization of the Eastern and Western coal fields, and through the Lignite Utilization Board, is contriving how she may commercially, from the great lignite fields of Saskatchewan, obtain byproducts and then make briquettes of the residual carbon. The Canadian Pacific R.R. has for the last few years maintained a commercial briquetting plant at Bankhead, in Alberta, working on Canadian hard coal, but it remained for the enterprise of a private citizen, H. F. Slater, of Toronto, to provide a means for obtaining a coal supply for populous Ontario.

Early in 1919 Mr. Slater conceived the idea of producing better fuel for less money. Hardly less important was the companion idea of securing the co-operation of the people in financing his manufacture and selling his output. The Nukol Fuel Co., then organized, began an active campaign to secure that co-operation. To bring the proposal before the people the methods of the popular War Loan were adopted. It was realized that a new product appearing on the market needed a host of friends and "boosters." Many shareholders meant many users. Fuel production, to an extent at least, was to be placed in the hands of fuel users—a working out of modern ideas in industrial co-operation.

The product — yet to be made — was christened "Nukol." A survey of the fields of artificial fuel revealed the fact that the boulet plant of the Lehigh Coal & Navigation Co. was at that time being enlarged

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*The *Canadian Mining Journal*, April, 2, 1920.

from 200 to 1,000 tons per day capacity after two successful years. There was no time or opportunity to experiment. The Nukol company needed a proven process to start immediate advertising with a reasonable guarantee of a successful issue. No time was lost in acquiring a license to work under the Dutch process of fuel briquetting (the process used by the Lehigh Coal & Navigation Co.). The General Briquetting Co. of New York was engaged to design a briquetting plant, and put it into successful operation. The work was assigned to J. B. McGraw, fuel briquetting engineer of that company.

Pending the successful outcome of experiments in byproduct production from the various fuel sources of Canada (which in time will presumably yield quantities of residual carbon ideal for briquetting purposes) the Nukol company obtained contracts and options on large supplies of Pennsylvania river coal, a low ash product and one excellent for the purpose. Shipments were begun immediately to the company's site at Toronto, and continued throughout the summer of 1919. The analysis of the river coal secured was as follows: Moisture, 2.18; fixed carbon, 76.30; volatile, 6.76; ash, 14.76; B.t.u., 12.329.

An advertising campaign unique to the fuel industry in its scope and character was inaugurated. Full-page advertisements in the newspapers began it. A house organ, "Nukol Nuggets," followed periodically, and incidentally was distributed by aeroplanes to the crowds assembled at the county fairs in Ontario. The trade character "Nukol Ned," a blackamoor of amusing characteristics, became a familiar figure in advertising cartoons. A song, "Nukol Sparks," was widely distributed. In short the advertising methods of the patent food product were successfully applied for the first time to artificial fuel. The appeal "Nukol is made in Canada, by Canadian labor and Canadian dollars," proved successful. Popular subscription financed the construction and ere long the multitude of shareholders were clamoring for their fuel allotment.

The selection of a site involved careful thought and the inspection of a great many offerings. Accessibility to transportation facilities and fairly large storage capacity for raw material were of prime importance. It was contemplated that a large part of the winter supply of raw fine fuel would be delivered to the plant by water during the summer months. Upon the close of navigation the heavy season for the briquetting industry begins, and certainty of rail communication was vital. The plant of the Toronto Shipbuilding Co., Ltd.—Cherry and Villier Streets—finally was purchased, fulfilling most completely all desirable requirements. This plant has a private wharf. Upon the ground adjacent thereto there is available open storage for between 20,000 and 30,000 tons of coal fines. Distant about 80 ft. from the water is a railroad siding, and just beyond that the mill building, 85 x 65 ft. Another railroad siding runs between this building and Villier St. The property has, in addition, smaller buildings adaptable to offices, machine shop and power plant.

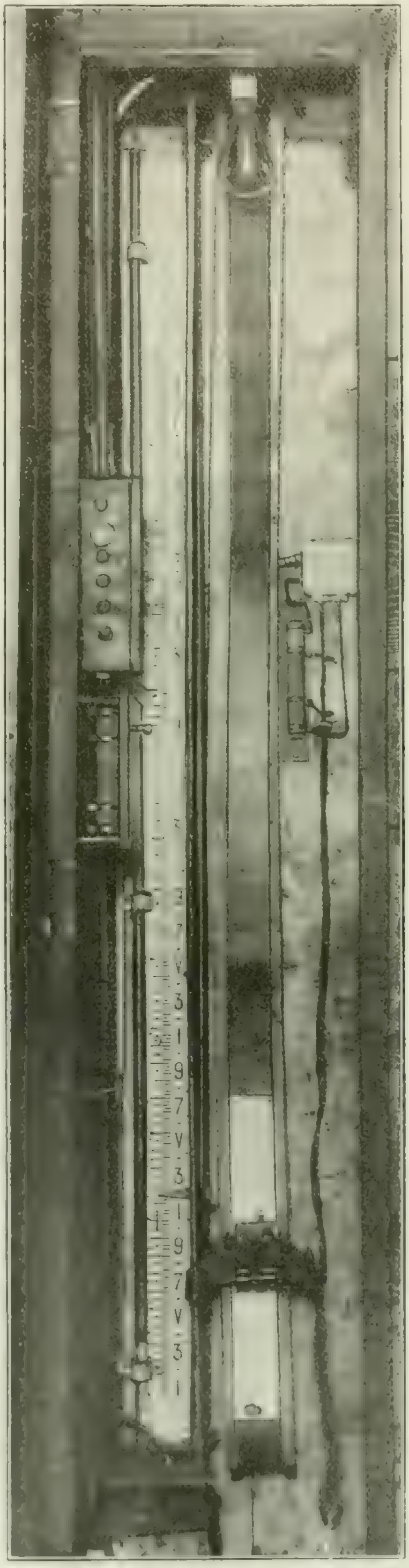


FIG. 3 AUTOMATIC DEVICE FOR REGULATING OIL-BINDER FEED

This apparatus also records automatically the operation of the press

It was expected that the machinery would be installed and the plant would be ready for operation on Sept. 1, 1919. It is needless to detail the various troubles experienced in obtaining shipments of machinery and parts during that summer. The plant was finally ready in December. It had a capacity of 15 tons 7-oz. size egg-shaped briquettes per hour.

The process of manufacture may be divided under the following headings: Drying and screening raw material, handling of binder, mixing of the coal and the binder, mastication of the mixture, pressing, final screenings, cooling.

The coal is quite wet, containing sometimes as high as 17 per cent moisture. That is the amount that coal of this size will hold hygroscopically. The culm may be taken directly from cars or boats as received, or from the stockpile. It is handled by a locomotive crane and dumped into a hopper, from which it is carried in a bucket elevator to a large bin, and from that conveyed to the apparatus for moisture removal (Fig. 2). The removal is accomplished by two rotary single-shell type driers, 4 ft. in diameter and 45 ft. long, operating at 10 r.p.m. (Fig. 3). The temperature at the end of the drum is about 250 deg. F.

An extremely fine size of coal is burned in the drier furnace and the gases are forced through the shell by the action of the blower, the speed of which can be varied in accordance with the varying moisture in the coal. The wet coal enters at the cool end, and is dried by coming in contact with gases at increasing temperatures while passing through the shell. With the process used it is not essential to dry the coal absolutely, and 2 per cent of moisture is allowed to remain.

Economically speaking, this is a great advantage, as the final 2 per

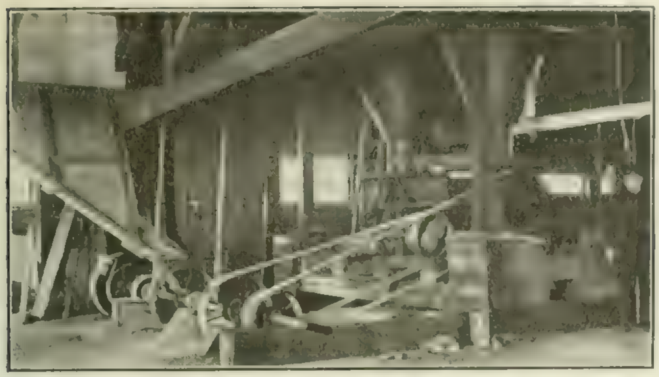


FIG. 4. FEEDING BINS AND PROPORTIONING TABLES

Here the coal is sent in measured flow to the paddle mixer. Between the bins can be seen the binder feed line delivering the requisite oil to the paddle mixer.

cent of moisture is by far the most difficult to remove, and its retention obviates any risk of overheating in the drying operation. The arrangement whereby the gases at their highest heat come into contact with the coal nearest to dryness and successively meet wetter coal as it proceeds through the drier tubes, insures a maximum efficiency of operation, the gases being discharged to the atmosphere in a saturated condition.

From the drier the coal is carried on a 12-in. steel-encased bucket elevator to a trommel screen, which removes all oversize (¼ in. and over). Practically all foreign material in the dust is over the size passed by this screen, so the screening at this point may be considered a cleansing operation.

J. B. McGRAW

Designer of the Toronto plant

The final coal, dried and screened, is carried to the feeder bins (Fig. 4), so called because from them are fed the tables whereon the proper quantity of coal is measured for mixing. These are storage bins built of steel plate and designed to hold ten tons each. It is desirable that these bins be kept full to secure a proper flow through the measuring device at their base, where there is an adjustable gate set at the will of the operator to provide a given quantity of coal per hour. The coal is fed from each bin to a revolving table, thence to the horizontal mixer, where it meets the oil binder. The oil binder is delivered to the plant by tank cars which are equipped with steam coils for melting down the contents, which are solid at ordinary temperatures.

The oil is an asphaltic residuum, commonly known as oil pitch, manufactured by the Imperial Oil Co. at its Montreal refinery. The tank cars delivering the oil each contain about thirty tons. A belt-driven 2-hp. Kinney pump is installed on the oil line in such a way that it can be used to pump the oil from the cars to the oil tanks, and from the tanks to the mixing device, where it is fluxed with the coal.

The capacity of each of the oil tanks is 20,000 gal. (Fig. 1). At the base of the tanks a 2-in. steam coil is installed, carrying live steam to keep the oil in the tank liquid. The filling of the tanks from the cars is done on overtime, when the plant is not running. Before entering the pump the oil is carefully strained through a steam-jacketed strainer. Over the mixing device is placed a small horizontal feed tank, fed from the large tanks by the same Kinney pump as is used to unload the cars. This tank is kept full, and the overflow sent back to the storage tanks by a return pipe.

This circulation contributes to the continued homogeneity of the oil. With each oil pipe is carried a ¾-in. steam pipe, the two being wrapped together in a magnesia insulation material to prevent the oil from solidifying in the pipes. From the small feeder tank the pipe line runs to the mixing device, where it is delivered at about the same point as the coal. The melted oil is delivered in a fine stream, the rate of flow under present practice being adjustable by a valve. The operator sets this valve and adjusts the gate over the tables admitting the coal in such a way as to give a mixture of 95 per cent coal and 5 per cent oil.

An automatic adjustment for the binder feed is in course of installation (Fig. 3). A pointer is set on a scale adjusted to run by clockwork parallel to the decreasing surface of the oil in the binder tank. The speed of the descending pointer is set at the rate at which the proper binder proportion is to be fed. A salt-water column is placed parallel to the pointer showing the actual level of the binder in the tank.

As long as the salt-water column and the pointer descend at equal speeds and maintain their relation unchanged it is known that the proper binder percentage is being carried to the mixer. If the oil is fed too rapidly or if the pipe is clogged a disparity between the two rates of speed occurs immediately. An electro-magnet is set so as to close a circuit the instant this condition occurs, and an alarm is automatically rung, so that a correction can be made immediately.

This is of extreme importance, for a variation in the binder percentage either way is fatal to the quality of the final product. Too much binder, aside from being wasteful, gives a soggy and smoky briquette; too little binder gives briquettes incapable of shipment without disintegration. In addition to the regulation of binder feed this apparatus carries a traveling-time sheet, which records automatcally the hours of press operation.

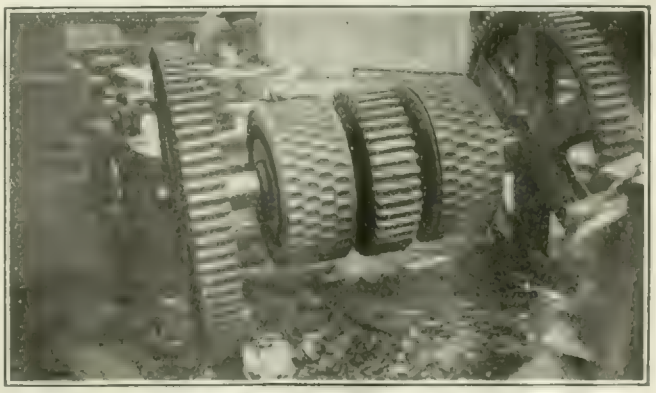


FIG 5. ONE OF THE ROLLERS OF THE EGGETTE

Note the egg-like depressions in the rollers by which the briquettes are formed.

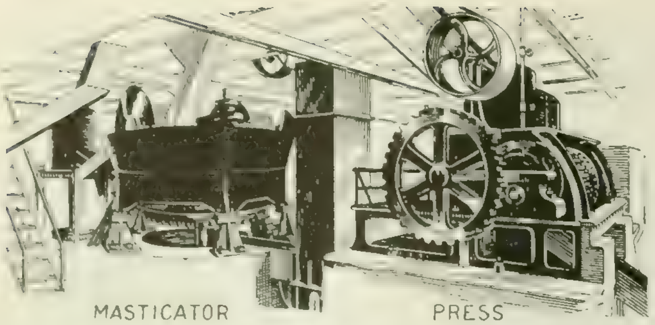


FIG 6 MASTICATOR AND EGGETTE PRESS

The masticator weighs 47½ tons and its operation requires 55 hp. It receives its feed from the malaxeur. The movement of the rolls completely incorporates the coal with the binder. In the press this mix is subjected to a pressure of from 1½ tons to 2 tons per sq.in.—a pressure equalling 200 or 250 atmospheres. No wonder adherence is secured.

The dried culm and the binder properly proportioned meet at the head of a 15-ft. paddle mixer (Fig. 4). The function of this machine is the thorough mechanical mixing of the two ingredients. Seventeen sets of paddles revolving in a horizontal trough force the mixture forward, at the same time imparting a thorough agitating and mixing effect. The viscosity is preserved and improved by the injection of a supply of live steam throughout the operation.

To complete the mechanical mixing the coal-oil mixture which, for the sake of convenience, may be designated a flux, is delivered into a vertical, cylindrical malaxeur. Again steam is injected into the mass, which is kept in constant agitation by a revolving shaft carrying radial arms. Now the flux is ready for mastication.

In the briquetting of fine coals or other comminuted material, the most important factor in the entire operation is proper intercompounding of the binder. The developed theory has been that a coating of the minute particles with a thin film of the binding substance was sufficient, and various types of mixing machines—usually having some arrangement of moving arms—have been brought out to perform the work. This method, however, has never been entirely satisfactory, because it requires an excessive percentage of binder.

The originators of the Dutch process devised a machine to overcome these difficulties. This machine is known as a masticator (Fig. 7). It is not only a most efficient mixing device but is really something more, because by its action it causes a remarkable intercompounding of the coal and binder. The masticator at the Nukol plant is a ponderous machine consisting of a stationary bed 10 ft. in diameter, upon which two heavy rolls rotate at 18 r.p.m.

The base or bed is cast in one piece and is liberally reinforced by substantial ribs on the under side. It is set upon six pedestals bolted to the concrete foundation. Renewable wearing plates of cast hard white iron are provided and held in place with bolts that are easily accessible. A step bearing supported by radial ribs is cast in the center of the bed. It is lined with high-grade babbitt and carries the upright shaft. The driving gear is located beneath the working bed.

The vertical shaft is a hammered steel forging of ample diameter accurately turned and finished. The cranks and roll shafts are forged in one piece. The ends are threaded and provided with heavy nuts which secure them in the driving hub and also serve to hold the rolls in place against the centrifugal force generated by their rotation. The horizontal drive shaft and countershaft are cold-rolled steel. The driving head to which the cranks are connected is cast in three pieces to facilitate assembling. These pieces are securely held together by four steel bolts.

The rolls are of 60 in. diameter and 36 in. wide. The weight of each roll is 22,000 lb. The body or core of the rolls is of ordinary gray cast iron. The rims or tires are a special mixture hard white iron of great wear-resisting quality. The roll bearings are cast-iron bushings lined with high-grade babbitt. They are held in place with bolts and can be readily withdrawn for rebabbitting when necessary. Lubrication is provided by grease or oil forced through a channel cut longitudinally through the center of the shaft.

The masticator is compound-geared. The crown gear and bevel pinion are cast iron with molded teeth of heavy pitch and designed to transmit safely the required horsepower. The intermediate gears are cast steel with cut teeth. The machine weighs 95,000 lb. and its operation requires 55 hp. The flux is fed into it continuously from the malaxeur, and is thoroughly kneaded and masticated by the revolvng action of the rolls. Adjustable plows or scrapers carried on a supporting arm follow each roll, continuously stirring up the material so that the mastication is complete. At the same time the material is gradually forced to the center of the bed, where it is automatically discharged into an elevator, which delivers it to the feed box of the press.

This treatment causes an intimate intercompounding of the coal and binder to such an extent that, speaking practically, a homogeneous compound is created. The binder no longer exists as a mere glue on the surface of the minute particles, but by partial absorption has been incorporated into the material that forms the briquette, which in consequence, for hardness and strength is equal to the original lump coal.

The highest possible binding efficiency is thus obtained, with a saving of 2 or 3 per cent in binder, with a corresponding reduction in manufacturing cost. The extent of intercompounding in the briquette is proportionate to the viscosity of the binder and the length of time the mixture is subject to mastication. In all cases the masticator is adjusted so that the flow of material through it is continuous. It is essential that pressing follow mastication without delay.

From the masticator the flux is elevated directly to the feed box of the press. The feed box consists of a vertical cylinder with openings in the bottom over which feeding arms rotate. These arms deliver the flux

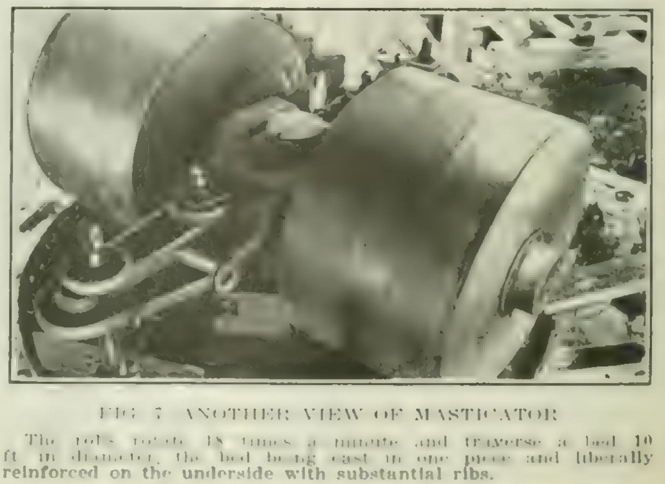


FIG 7 ANOTHER VIEW OF MASTICATOR

The rolls rotate 18 times a minute and traverse a bed 10 ft in diameter, the bed being cast in one piece and liberally reinforced on the underside with substantial ribs.

to the press in proper quantity and incidentally break up any caking developed in any of the masticated material.

The press (Fig. 5) proper is of the Belgian roll-eggette type. The rolls are duplex, with the driving-gear wheel between them. The diameter is 33¼ in.; the width of each roll 14¼ in. Each roll contains four rows of molds, staggered to afford the minimum of wasted space (which also means wasted power). The pressure at which the briquette is made is between 3,000 and 4,000 lb. per square inch. The pressing operation is, speaking generally, entirely in line with former briquetting practice, the changes and improvements being minor in importance.

For the highest efficiency in the pressing operation the rolls are set an appreciable distance apart. The flux falling between the molds cannot form part of the "egg," which is the real briquette, but becomes a "fin" at the sides, which from the standpoint of appearance at least is objectionable. Accordingly, the briquettes, coming from the press in a bucket elevator, are delivered to a revolving screen. The tumbling of the briquettes in the screen removes all "fins." The waste thus formed is delivered back to the masticator.

The briquettes as they come from the press are hard but still warm. Under ordinary circumstances passing over a cooling belt 30 ft. long at the rate of 30 ft. per minute is sufficient to provide ample cooling. The briquettes set and are hard enough for the usual subsequent handling. For extraordinary circumstances (such as exist in extremely hot weather) provision has been made to pass the briquettes through a water-cooling system. This system consists essentially of a water tank divided by a partition into down-flow and up-take compartments.

The briquettes drop into the down-take, sinking through the water, their path being lengthened by a series of inclined baffle plates. The base of this compartment is, in effect, a small bin with floor inclined at 45 deg. so that briquettes can feed by gravity through a gate to an elevator operating slowly in the up-take. The up-take elevator delivers to a storage bin. When this system is used the briquettes are cooled so thoroughly that by no possibility can they "run together" in the bins, as will uncooled briquettes through the softening of the binder caused by excessive interior heat.

So far the briquettes at the Toronto plant have been made in the 7-oz. size only, a size that parallels common egg coal. It has been planned to install a second press that will give the more familiar 2-oz. size, the equivalent of stove and nut. However, the 7-oz. briquette has, in the domestic market, proven entirely satisfactory in replacing all three sizes, and the proposed addition may prove unnecessary.

The cost of manufacture is well below the acceptable market price of the briquettes (between $11 and $12 per ton delivered). To provide an excellent binder of low penetrability, high melting point and one that will make a minimum of smoke involves a large expenditure of money, but the manufacturer actuated by a desire for more than mere cheapness feels well repaid for the size of this item of cost. The product has proven adaptable to practically all classes of domestic consumption, furnaces, cooking ranges, heaters and stoves. A portion of the factory is devoted to bagging, and a large bag trade has been built up.

Welded Bond That Resists Violence

Can, However, Be So Welded That It Can Readily Be Removed by a Chisel and Used Elsewhere

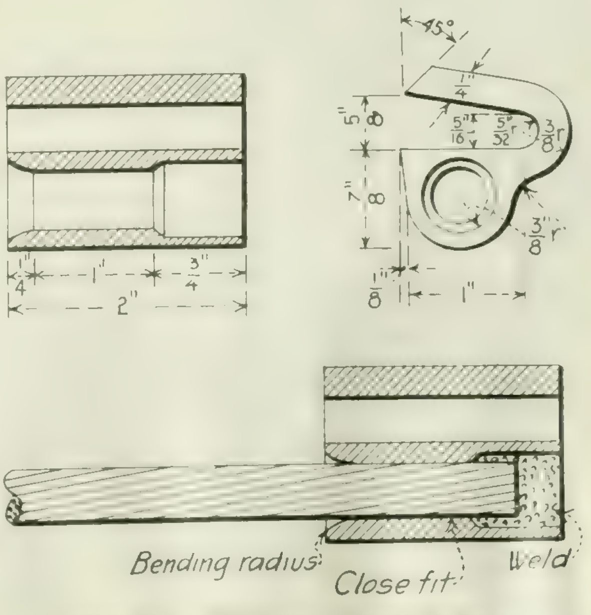
THOSE who pay for the loss of power, the repairs to equipment and sustain the other losses caused by inefficient track bonding, as well as those whose duty it is to install and keep rail bonds in repair, will be interested in the "Everlast" bond recently perfected and placed on the market by the Flood City Manufacturing Co., of Johnstown, Pa. This bond embodies certain details that tend to give it exceptionally long life.

Ever since the introduction of a practical arc-welding outfit embodying a portable bank of resistance it has become practical to weld bonds to mine track. This now can be done easily without in any way interfering with the operation of the haulage equipment. By welding, the metal of rail and terminal blend together and at the contact amalgamate as one. If the welding is properly done, therefore, there is no possible chance for the joint to become loose or for corrosion to occur between the surfaces in contact.

This advantage is common to all welded terminal bonds. It remained, however, for some one to perfect a means, without sacrificing other advantages, whereby bonds might be protected from injury after their installation. This, it is claimed, has been accomplished in the new bond, while certain features have been incorporated that make it easy to weld to the rail.

The bond is made up of a flexible cable with terminals welded to either end. These terminals are so designed that they can be driven tightly onto the edge of the base of any size of rail. The terminals may then be welded to the rail without the use of a holder of any kind. The welding is performed upon the top of the rail base, this being the point where this operation may be most easily performed.

Since the terminals are of generous proportions and the weld to the rail is well removed from the weld of terminal and cable there is no danger of loosening the cable weld in making the rail weld, no matter how inexperienced may be the operator of the arc-welding



TERMINAL FITS OVER FLANGE OF RAIL
It is easily put on, readily welded and of rugged construction.

machine. It will thus be seen that the copper cable is under the base of the rail and consequently well protected. The exposed portion of the terminal is in a measure protected by both the ball of the rail and the fishplate.

In installing this bond where a tie is placed under the rail joint this tie is moved slightly endwise until a notch to receive the bond cable may be cut in its top. The cable is then placed in this notch and the tie slipped back into place. The terminals are then driven onto the base of the rail and welded. This greatly increases the safety of the bond as the cable is held close under the base of the rail throughout its entire length.

In manufacture the terminals are first drilled to a snug fit on the cable. The corner at one end of the hole is then rounded off, the other end is counterbored for about half the length of the terminal and the cable is inserted and welded into place. This makes a strong permanent connection between cable and terminal.

After the terminal is welded to the base of the rail little short of a sledge and chisel will ever remove it. The conductivity, therefore, always remains high and there is no reason why the bonds should not last as long as the rails they join.

Where track is of a temporary nature the terminals may be lightly welded along the long side only. This makes a good contact that will last indefinitely but which may be removed by cutting off the edge of the terminal just back of the weld. The bonds may thus be installed again and again. In this way the bond may be used repeatedly.

The makers believe that, considering the durability of this bond, the trade name—Everlast—under which they have chosen to introduce and market it is both descriptive and appropriate.

Fuel, Heat and Light Advance Least Among Living Costs

National Industrial Conference Board Shows That Cost of Living Has Increased 95 Per Cent Since July, 1914

EXPENDITURES for fuel, heat and light form an interesting feature of a preliminary announcement by the National Industrial Conference Board on the increased cost of living for American wage earners. The average cost of living rose 7 per cent between November, 1919, and March, 1920. This marks a total increase of about 95 per cent since July, 1914, and an increase of 21 per cent within the last year. These figures are the result of the board's sixth survey of changes in the cost of living in the United States, a complete report of which will be available within a few weeks.

Increases between July, 1914, and March, 1920, in the cost of each of the five major items making up the family budget were as follows:

All items	94.8%
Food	100%
Shelter	49%
Clothing	177%
Fuel, heat and light	49%

Increases in the last four months, since November, 1919, were as follows:

Sundries	8.3%
Clothing	17.9%
Fuel, heat and light	7%
Sundries	4.6%

A number of reliable investigations, including some by the United States Bureau of Labor Statistics, have shown that before the war annual expenditures were apportioned approximately as follows: for food, 43 per cent of the total; for shelter, 18 per cent; for clothing, 13 per cent; for fuel, heat and light, 5 per cent; and for sundries, 20 per cent. These weights were used by the board in estimating increases in the cost of living since 1914.

While families differ somewhat as to the proportion of their incomes spent for the several items in the budget, any reasonable distribution of the income based on pre-war standards would show practically the same percentage of increase for the budget as a whole as that here given. Conditions in any specific locality, however, may in some instances be slightly unrepresentative, as, for example, in communities where very large or very small rent increases have occurred. Local rates for coal and light, street car fares, and the cost of other sundries items differ also, but in combining them in the total budget such discrepancies tend to disappear unless they are very unusual.

The combined cost of fuel, heat and light advanced less than one per cent between November, 1919, and March, 1920, although the total average cost was 49 per cent higher than in July, 1914, and 5 per cent higher than in March, 1919.

Coal prices were secured from 121 dealers in forty-four cities representing all sections of the country. The largest increases for anthracite were in the cities of the East, where advances in the neighborhood of 60 per cent since November, 1919, were reported from Providence, Bridgeport and Boston. Baltimore, Buffalo and Pittsburgh, on the other hand, had not raised prices.

In the Middle West the average increase for anthracite was less than one per cent, due to the fact that there had been no advance whatever in Cincinnati, Detroit, Duluth, Indianapolis, Louisville, Milwaukee, Minneapolis, Omaha, St. Louis or St. Paul. In Louisville, Columbus and Cleveland, as well as in Memphis, Little Rock and Seattle, the price of bituminous coal had fallen since November, 1919.

Less complete information regarding rates for gas and electricity indicated that the advance for these items since November, 1919, had been very small.

A summary of changes in the cost of living as estimated in the six studies thus far made by the board is given below:

INCREASE IN THE COST OF LIVING FOR WAGE-EARNERS IN AVERAGE AMERICAN COMMUNITIES BETWEEN JULY, 1914, AND MARCH, 1920, BY SEPARATE BUDGET ITEMS

(National Industrial Conference Board)

Budget item	July, 1914, to June, 1918	July, 1914, to Nov., 1918	July, 1914, to March, 1919	July, 1914, to July, 1919	July, 1914, to Nov., 1919	July, 1914, to March, 1920
All items	52.2%	65.0%	60.5%	72.2%	82.2%	94.8%
Food	62%	83%	75%	90%	92%	100%
Shelter	15%	20%	22%	28%	38%	49%
Clothing	77%	93%	81%	100%	135%	177%
Fuel, heat and light	35%	40%	42%	42%	48%	49%
Sundries	50%	55%	55%	63%	75%	83%

To Demonstrate Advantages of Hauling By Motor

FOR the purpose of demonstrating to the people of Massachusetts the possibilities of motor trucks for the movement of all sorts of commodities through various stages from producer to consumer, Ship-by-Truck Week is to be observed in that state from May 17 to 22.

Successive Stages in the Development of the Storage-Battery Locomotive

Several Steps in the Improvement of the Accumulator Locomotive Have Been Made in the Last Few Years—They Probably Foreshadow Still Further Developments in the Immediate Future

By J. Appleton
Ironton, Ohio

DEVELOPMENT of the storage-battery locomotive during the last five years has been rapid and marked by enduring improvement. This applies not only to the locomotives themselves, which have been bettered in design and broadened in facilities for operation, but also to the methods of applying them to the gathering and hauling of coal in the mines. Consequently operators have come to look upon these machines in a different light from that which they formerly entertained and have enough confidence in them to consider their employment well worth investigation when any extension or development is contemplated. The early mistake of applying these locomotives to uses for which they were not suited has been corrected, and valuable lessons have been learned from this experience.

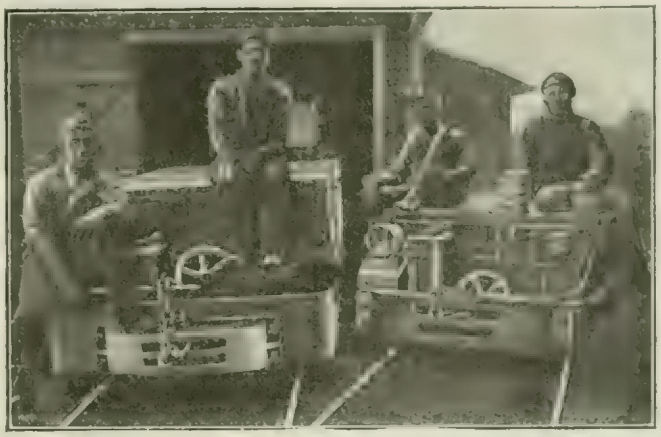


FIG. 1. TWO EARLY STORAGE-BATTERY LOCOMOTIVES

After nearly five years of operation these machines are still giving good daily service.

Those who desire to keep up to date concerning modern practice in gathering and hauling coal should find much to interest them in a brief story of this development as shown by the experience of one of the several manufacturers in this line. From this can be obtained a good idea of the present and future status of the storage-battery locomotive in coal-mine service.

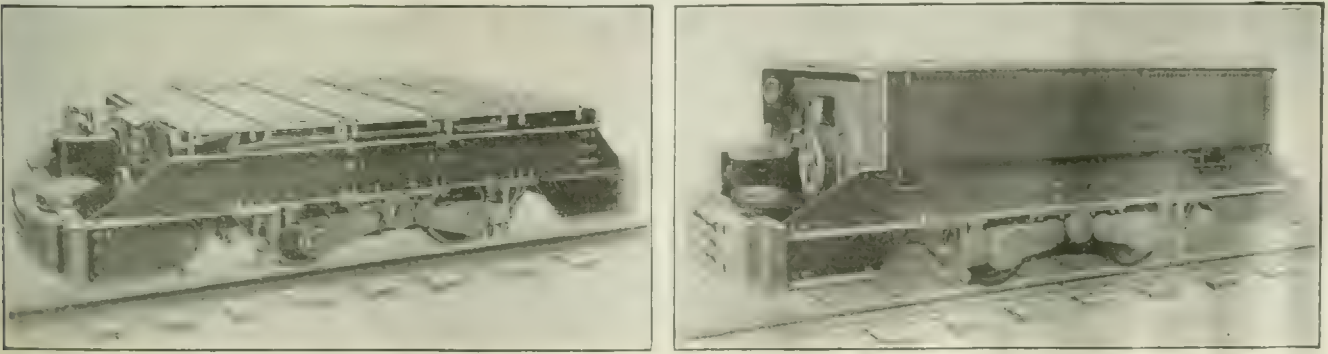
The storage-battery locomotive carries its own supply of power into the rooms and entries where no other source of energy is available. As the amount of energy that can thus be carried around is necessarily limited by the weight and chiefly by the space available, that is by the over-all dimensions of the vehicle, this machine must be so designed as to obtain the maximum results from this limited supply of power. Hence combined efficiency, mechanical and electrical, is of the utmost importance.

Operating where trolley wire cannot be strung or where the expense of its installation is prohibitive, the storage-battery locomotive replaces mules to great advantage. In some cases an additional saving is secured through not having to take down top or lift bottom to give the necessary height for these animals and their drivers.

For the purpose of this article the development of the "Ironton" storage-battery locomotive will be considered typical of what has been accomplished by manufacturers during recent years in perfecting this means of applying electric haulage to the transportation of coal.

Fig. 1 shows two of the first Ironton machines of the storage-battery type. They were built in 1915 and are still in daily use and giving as good service as when they were installed. Of course, the batteries, which were of the lead type, have been renewed. This picture shows both the low and the high machines. Both are chain-driven but are without the later improvements that eliminated from this drive the difficulties and objection arising from lack of uniformity in the tension on the chain.

This difficulty existed whenever the locomotive was traveling over uneven track and other irregularities, for the warping of the support caused the distance between centers of the sprockets to vary. These latter refinements also provided an easy and rapid method of taking



FIGS 2 AND 3 LOW AND HIGH TYPES OF MACHINE

These machines are equipped with radial housings and chain adjustment to compensate for wear.

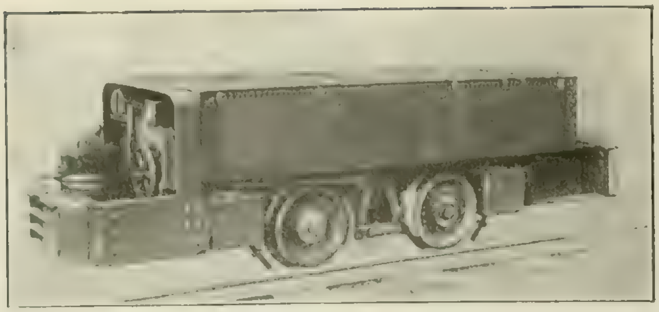


FIG. 4. NARROW LOCOMOTIVE FOR USE IN RESTRICTED PASSAGES

The outside driver is also advantageous whenever it becomes necessary to remove a wheel.

up the slack as the chain gradually stretched from use and wear. These improved features are illustrated in Figs. 2 and 3. Both the low and high type of machine are again shown. The radial housings for the axle bearings and the eccentric adjustment for chain tightening are quite noticeable.

With increasing use of the storage-battery locomotive in gathering work, conditions were met which called for a type of machine that could be used in narrow entries or where timbers had been placed close to the track. The outside-wheel design met this situation admirably. It is shown in Fig. 4. The total width of this type is only a few inches greater than the track gage.

Where the height will permit its use the outside-wheel type has become popular largely on account of the greater facilities for removing the wheels from the axles when such removal becomes necessary. Fig. 5 shows a type of storage-battery locomotive which introduced an entirely new feature—that of enabling the battery to be recharged while the locomotive is operating in an entry where trolley wire is strung. This type of machine must not be confused with what is usually termed a combination locomotive, wherein a 250-volt trolley-type motor is used, both when the machine is operating with current from the trolley and when running on the battery.

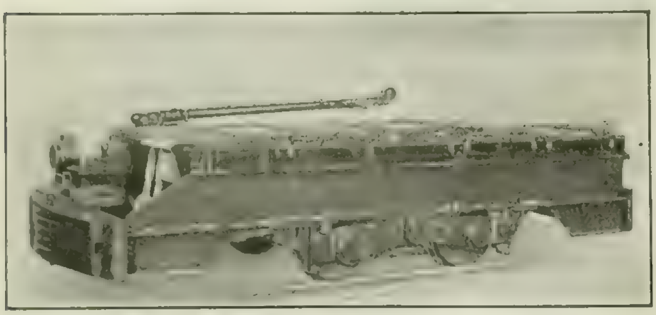


FIG. 5. TROLLEY-RECHARGING STORAGE-BATTERY LOCOMOTIVE

This is not a combination machine but operates continuously on the battery even though drawing current from the trolley.

In the type illustrated a trolley-charging attachment is added to the storage-battery machine. This enables the battery to be replenished while running under a trolley. There are two advantages in this type of locomotive. Besides being able to do a limited amount of work on the trolley its scope as a straight accumulator machine is increased because of the additional battery capacity which is available.

This type of locomotive meets conditions under which the work is beyond the capacity of a gathering locomotive and yet is not of sufficient amount to warrant the installation of main-line trolley locomotive. There also is the advantage of being able to charge the battery to some extent during working hours, thus reducing the time required to charge it afterward.

Another type of storage-battery locomotive which was designed to meet the requirements of haulage rather than gathering is shown in Fig. 6. This machine has two motors, each axle being driven by a separate motor through spur gearing. Large battery capacity is available as the over-all dimensions have not been restricted to suit low coal or narrow entries. Accumulator locomotives in which the axles are driven individually by separate motors do not develop the drawbar pull or tractive effort that can be obtained from machines wherein the axles are connected and all four wheels are driven simultaneously.

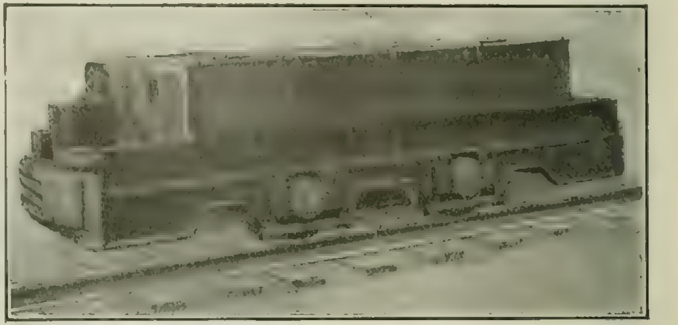


FIG. 6. A TWO-MOTOR STORAGE-BATTERY LOCOMOTIVE

Each pair of drivers is actuated by its own motor.

Under unfavorable conditions individually operated motors do not divide the load equally, and yet it is under just such circumstances that the maximum tractive effort is desired. Experience having demonstrated the superiority of the connected four-wheel drive, the problem of designing a one- or two-motor type of storage-battery locomotive for entry hauling and gathering was taken up. The result is shown in Fig. 7. In this locomotive either one or two motors can be used, but as the axles are connected by gearing, the power is applied simultaneously on all four drivers. The result is a provision of maximum tractive effort under all conditions.

It is not expected that this type of machine will supplant the chain-driven gathering type, which has been quite generally adopted. It will, however, be used in service where the chain drive is not as suitable as is the gear drive and in larger sizes where two motors are necessary. This type of locomotive is a notable advance in design and will undoubtedly open the field to still further improvement.

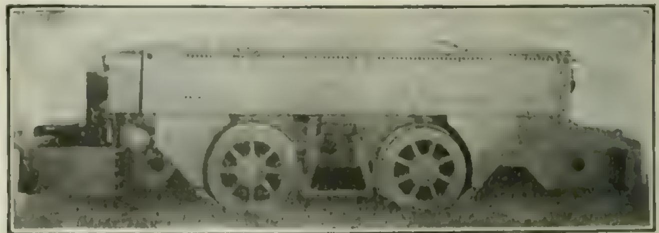


FIG. 7. A LOCOMOTIVE THAT USES EITHER ONE OR TWO MOTORS

The drivers are connected by means of gearing so that all four operate together.

Steam Shovel Has Rendered Operable Many Properties Not Hitherto Worked

Three Large Bituminous Stripping Areas as Well as Many Smaller Ones Now Exist—Steam and Electric Shovels of Special Pattern Have Done Much to Render Profitable Stripping Possible

BY F. H. KING
Cleveland, Ohio

MORE than 50 years ago a famous English coal-mining authority said, "Our industry will certainly last and grow until our mines are sunk 2,000 or even 4,000 ft. deep. But when that times comes the states of North America will be working in the light of day, quarrying coal along the banks of the Ohio and running it into boats alongside."

Many foreign mines have now been sunk to a depth of 3,500 ft. or more and are approaching the limit of profitable operation. And the fact that coal is now being "quarried" on the banks of the Ohio bears out the prediction above quoted.

Even now the industry of quarrying or coal stripping is still in its infancy. The introduction of modern methods and machinery into coal-stripping, or open-pit mining, however, combined with the natural advantages of this process over underground mining, is advancing this industry by leaps and bounds.

The history of the development of coal-stripping in this country parallels that of modern labor-saving machinery. Almost since the days of the early settlers stripping has been practiced in a primitive, limited way. Gradually, as the country has become more thickly settled and machinery has been developed from one stage to another various devices have been employed in an effort to make commercial coal-stripping practical and profitable.

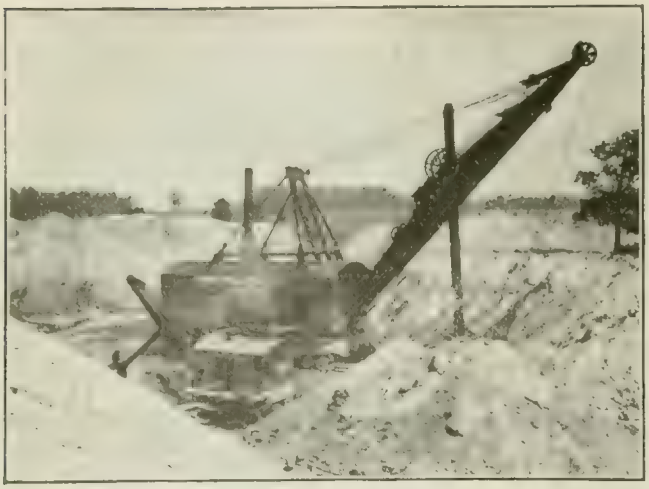
During the past twenty-five years scores of methods for removing the overburden from coal have been tried. Among others were aerial tramways, machine scrapers, land dredges and orange-peel excavators. These devices, however, proved so slow and expensive as to afford little real progress toward large-scale production.

Not until the spring of 1911 was a really successful coal-stripping machine built. This was a model 250 Marion steam shovel that was shipped to Patterson & Hartshorn of Oakwood, Ill. This machine had a 65-ft. boom and carried a 3½ cu.yd. dipper on a 36-ft. dipper handle.

Stripping operators were greatly interested in the "experiment" with this machine. The news that really "did the work" spread rapidly, and coal stripping methods soon underwent a complete change. The steam shovel thus made hundreds of thousands of acres of coal land available for profitable mining.

A MODERN ELECTRIC STRIPPER IN OPERATION

Electricity where available has many advantages over steam for actuating stripping shovels. The electric shovel requires much smaller crew for its operation than does a steam machine of equal size and capacity



TWO SHOVELS AT WORK IN A PIT

This combination, a stripper and a loader, is advantageously employed in many operations. In many cases the big shovel has some difficulty in keeping ahead of the small machine.

Today, coal operators everywhere are studying open-pit mining, and "strip" properties have been developed in districts where a few years ago such possibilities would have been scarcely considered. Numerous concerns are centering their efforts in this field, with the result that many operators have acquired stripping territory for immediate or future development.

As a rule, of course, coal mined from shafts or drifts is too deep for profitable stripping, though interesting exceptions have been noted. For example, one company plans to strip a large abandoned mine, estimating that enough coal can be salvaged from the old pillars to pay a profit.

Coal stripping or open-pit mining is coming increasingly into favor wherever conditions encourage its practice, because:

(1) The strip mine yields large production much earlier than does the shaft or drift. (2) Hour for hour, more coal is produced by open-pit mining than by any other method. (3) Practically all of the coal deposit is recovered. (4) Much better supervision of the work is made possible. (5) Since no ventilation or underground drainage systems are required strip-mining saves large sums otherwise needed for purchase and maintenance of such equipment. (6) No danger is incurred from underground explosions, fires, falls of roof or ribs or haulage accidents. The explosives hazard is extremely low in strip properties by comparison with underground operation. (7) Shutdown, when necessary can be made with minimum expense.

Coal-stripping operations, while requiring good organization and business methods, depend largely for their success on the size of the shovels used to remove the overburden. The larger the shovel the quicker the stripping is performed and the sooner the coal is moving to market.

One Indiana operator employs the following equipment in his plant, which has a capacity of 18 to 24 standard railroad cars per day—the tract worked covers 200 acres and the coal bed, averaging 6 ft. in thickness, lies beneath overburden ranging from 8 or 10 to 30 ft. deep:

One Marion shovel of the large revolving type for removing overburden; one small revolving Marion shovel for loading coal; one portable Ingersoll-Rand electric air compressor to operate the drills for sinking holes to shoot the coal; one mile of track and two dinky locomotives with trains of pit cars are installed for bringing coal to the incline; a feed-water pumping plant supplies the boilers, locomotives and shovels; the gravity incline has two 10-ton cylindrical gunboats or monitors for receiving the coal from the pit cars and delivering it to the tipple, which is electrically operated. High tension 3-phase electric power is available from public-service lines extending along the Ohio River. Approximately fifty men are employed in the operation of the plant.

In addition to steam shovels, electric shovels are meeting with favor among coal-stripping operators. Conditions determine which of the two types is the more advantageous to employ.

As to initial price, the electric type is, of course, the more costly. However, this is largely offset by greater production under favorable conditions and a smaller labor crew. A large electric shovel requires a crew consisting of one operator, one oiler and four or five ground men, making 6 or 7 in all. The same model and size of steam shovel needs as crew one operator, one crane-man, one oiler, one fireman, two coal handlers, four or five ground men and one water-supply man, making a total of 11 to 12 men.

The two chief drawbacks to coal-stripping are: Lay-offs necessitated by bad weather and destruction of land for farming. The first objection is overcome largely by good planning and by shovels mounted on crawling, or caterpillar, trucks which enable them to work readily on a yielding footing. The second objection is met, partly, by the fact that, in some sections, farms had been about completely worked out before mining operations were begun. Still other properties are located in the hills where grades are so steep that equipment has to be dismantled and taken up piecemeal. Here, of course, the question of the destruction of productive farm land does not enter seriously.

Nature Will Hide Landscape Disfigurement

While the strip-coal operator does not take pride in disfiguring the landscape, he senses a justification for it that he feels the public at large should share. The world needs to be warmed as well as fed. The unsightliness of a scarred landscape is but temporary, since Nature will soon cover many of the cuts with her mantle of living green. Meanwhile, the owner has received a good price for a property that still retains a certain value for other uses. This, argues the strip operator, is real conservation.

At present there are three distinct bituminous fields in which open-pit mining predominates: (a) The Kansas-Missouri field lying in the vicinity of Pittsburg, Kan., and Joplin, Mo.; (b) the Illinois-Indiana field, reaching from Danville, Ill., to Terre Haute and Brazil, Ind.; (c) the Ohio-Pennsylvania field between Pittsburgh, Pa., and Steubenville, Ohio, and extending as far west as Zanesville, Ohio.

Contracts for Sale of Coal.—Where a contract to sell coal provides for delivery upon the buyer's order within a certain period, time is presumed to be mutually intended as a vital condition of the contract; and if the buyer refuses to order delivery within the stipulated time, the seller will be under no obligation to make delivery on a belated order. *(Georgia Court of Appeals, Lee Bros. vs. Bewley-Darst Coal Co., 97 Southeastern Reporter, 99.)*

Machinery as an Aid to Labor Conservation and Increased Production*

Relief of Conditions Due to High Prices, Labor Shortage and Curtailing of Working Hours Can Only Be Accomplished by Devices That Will Emancipate Labor

By Rumsey W. Scott

AMERICA has never been found wanting in an emergency. The opportunity for progress in business is as great as at any other time in the history of the country. Resourcefulness, adaptability and the ability to organize and carry on in spite of any difficulties, at any time, have placed America in the forefront of world affairs.

While we have for several years enjoyed unprecedented prosperity, there are many indications that give cause for apprehension as to the near future. The reaction after every great war has brought higher prices of commodities, and in an endeavor to meet the cost increase there has been an advance in wages. It is not in the least surprising that after the greatest of all wars—the most destructive to both life and property—there should be a shortage of both the products of labor and of the hands required to do the world's work. The greatest shortage is in unskilled labor.

Tremendous Labor Shortage To Be Made Up

In a recent statement, William H. Burr, president of the Inter-racial Council, said that there is at present a shortage of four million to five million unskilled workers in this country. He said that the average reduction of the workday from ten to eight hours has resulted in an approximate loss in "production hours" representing the labor of from one million to two million foreign-born workers. Only a comparatively small part of this is likely to be compensated for by an increase in immigration, and the loss must therefore be made up in some other way, or there will follow a slowing down of industry with its consequent hardships.

It is patent therefore that the output per worker must in some way be increased. There has no doubt been a slackening of effort on the part of some workers since the war, but this, I think, is true more of the unskilled than the skilled worker. I have great respect for the intelligence and capability of the skilled American workman, and an unbounded confidence in the resourcefulness and ability of the American employer of labor. There has been, especially in the last few months, an awakening to their responsibility by the employer and the worker, and I am not in doubt as to the successful solution of our great industrial problems through concerted effort and co-operation.

The rapid growth of our country is largely due to the introduction of machinery as an aid to labor in the development of the natural resources with which the United States is so richly endowed. It has been estimated that the use of power and machinery has multiplied the productive capacity per man ten times. It would be difficult to conceive of our not having the railways, the steamship, the electric motor and the dynamo, the telephone, the electric light and the automobile, and the hundreds of mechanical agencies that today contribute to our commerce and comfort. Their use has become commonplace. The widespread use of machinery has completely changed our human relations, and it is my belief that science and invention will play a most important part in the solution of our present and future problems.

Reconstruction Hastened by Machinery

After the Civil War the Southern States possessed far less machinery than the North and a superabundance of cheap labor. The trials of the South during the reconstruction period of many years were great, and rehabilitation was much slower than in the North, largely due not only to the insufficiency of capital but also to the lack of efficient machinery. Modern inventions have almost annihilated time and space in the matter of communication.

Transportation has been revolutionized. While machinery has advanced civilization, it has brought greater individual responsibilities and while it has probably made possible causes for disagreement and dissension, it has also made possible what to us now is most important—means for quick and certain readjustment. It is not only necessary in the present emergency to employ agencies that will rehabilitate industry but ones that will as soon as possible overcome the labor shortage and increase unit production, and in addition enable labor at all times to receive equitable return for its effort.

It is very fortunate that labor in general no longer displays the opposition to the use of machinery that was so evident when the first so-called labor-saving machinery was introduced. Even now we occasionally hear of labor opposing the introduction of machinery and in a few cases causing its destruction, but such cases are now rare and solely due to ignorance, and the opposition is usually from unskilled foreign labor.

Labor Unions Favor Labor-Saving Devices

The following is quoted from a statement made by Samuel Gompers, president of the American Federation of Labor, in an interview with Samuel Crowther, recently published in *System*: "There is an impression that the unions are against machinery and against better ways of doing business, and against scientific management, and in favor of stringing out every job to the greatest possible extent. That, it is true, was the attitude of the old country. It is not the attitude of the American labor movement. The unions at one time opposed the introduction of machinery because both the workers and the employers saw labor-saving machinery not as an aid to production but simply as a substitute for men.

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*Address delivered at the meeting of the Chamber of Commerce of the United States at Atlantic City, N. J., Wednesday, April 28, 1920.

"I am in favor of every possible mechanical device that can substitute for human labor, but if the employer looks at the machine solely as an instrument to take employment from men he is bound to fail, just as are workers who oppose machinery because it is going to cost them their jobs. This is the short-sighted view. The workers can break the machines and they can destroy the blueprints, but the idea remains, and if it is a good idea it will be put into force. Otherwise we bar the economic progress of the world and encourage instead of prevent waste."

This statement, coming from the recognized head of the better element of American labor, is of great importance. To hold to any other view would point to retrogression and decadence.

In my opinion it is a mistake, especially at this time, to use the time-worn phrase "labor-saving machinery." The labor we have should be conserved and released for the work that only human hands can perform, and to direct the machine that has not "saved" but emancipated labor.

INTERCHANGEABILITY AN AID TO PRODUCTION

In every manufacturing industry there has been a great development in the construction of machines to aid labor and increase productivity. The making of tools for the building of accurate machinery led to the system of "interchangeability," and this marked a great advance in the increase in output of the individual and a lowering of the cost of production. The manufacturers in the United States were the first to establish this practice, one which other countries have not been slow to adopt.

The next important advance came in certain lines where it was practicable to standardize the product. Probably in no field is this so successful as in the manufacture of motor cars. Following standardization came the use of one-purpose tools and automatic machinery. This has greatly speeded up production and reduced costs, and has enabled labor attending these machines to soon become skilled in their operation, and at much higher rates of wages.

In the last few years manufacturers and employers of labor have recognized the necessity of devoting thought and attention not only to the perfection of methods and machinery, but to the welfare and development of men. Probably no element of business is now receiving—certainly there is none that should receive—more careful attention and thought than the satisfactory relation of employer and employee. This is a subject so fertile and vast in its scope that the time at my disposal does not permit of its discussion.

ECONOMY OF PROGRESSIVE PRODUCTION

Attention has thus far been principally directed to the aid of the machine in the conservation of labor and increased production. May I now ask your attention to an element in manufacturing which offers great opportunity for improvement and economy?

A new phrase of comparatively recent origin is descriptive—"progressive production." This has been highly developed in certain industries, such as paper making, the manufacture of automobiles, of machinery, the steel industry, packing industry, etc. This involves not only the placing of the different processes of manufacture and the machines in their proper relation but the proper routing of materials and the employment of efficient means for their transference. The greater the possibilities of standardization of product, the more readily adaptable is the system to use.

Machines for the conservation of labor in the transfer of materials are of many types and have been highly developed. Many of them have dispensed with large numbers of laborers. Machinery of this type relieves labor of its drudgery, and its use is almost indispensable.

The handling of bulk materials has been perfected to a remarkable degree. Huge machines which are capable of automatically raising and dumping 110 tons of ore from railroad cars into steamers are operating at the amazing low cost of from ½ to 1½ c. per ton. Machines operating scoops holding seventeen tons are now removing ore from steamers and unloading it into freight cars at the rate of 520 tons per hour at a cost of approximately 2.4 c. per gross ton.

Coal conveyors are in use in great numbers at terminals, at public utility plants and at manufacturing plants, and are remarkably efficient. At a number of plants coal is now being loaded into colliers by car unloading machinery which automatically lifts, overturns and dumps a car of 110 tons of coal. Automatic machinery is used in coaling ships, almost entirely eliminating labor. Each machine is capable of delivering 100 to 150 tons per hour from a lighter to the ship, making it possible to coal the Leviathan in a single day.

Cranes and hoists are built for almost every purpose. The traveling shop crane is indispensable in plants where heavy loads are to be handled. There was recently completed at the Philadelphia Navy Yard a lifting crane of the tower type capable of lifting 350 gross tons. Electric hoists swift in motion are used for hoisting and transferring machines and materials in plants. Electric cranes and hoists of many types are used in economically and quickly loading and unloading ships and railroad cars.

ELECTRIC TRUCK REDUCES TRANSFER COSTS

The electric industrial truck has come into very general use at railroad stations, terminals and in industrial plants, and with its aid the opportunity for speeding up and reducing the cost of transferring goods is very great. Trucks are now made which not only carry the load but elevate the goods so as to permit of stacking, which reduces labor and increases the storage capacity of the floor. The industrial truck used as a tractor in connection with a train of four wheel trucks provides an excellent means for the handling of materials and commodities. It is a system that gives flexibility and has the advantage that trucks can operate over an area and are not restricted to a line, as in the case of continuous conveying devices.

Only a few of the more important of material handling machines have been referred to to show the possibilities in this field alone in increasing production and conserving labor. Machinery is now available to perform almost every duty now performed by human hands. Machinery will be constantly perfected to meet new requirements. The possibilities are almost without limit. Economic necessity absolutely demands the use of machinery wherever possible.

By contact we learn of what others are doing and what may be accomplished. By confidence we learn better understanding and a greater respect for the viewpoint of others. By co-operation we learn how to plan and work together and bring about mutual understanding. In closing may I leave the thought expressed by these three words: contact, confidence and co-operation.

Cagers at Shafts Facilitate Hoisting

Cagers, Both with Single and with Double Pairs of Horns, by Feeding Cars Regularly to the Hoisting Cage, Tend to Make Mine Operation Steady and to Reduce Labor Cost

BY N. L. HARMON
Bowerston, Ohio

IN order to cope successfully with the larger outside difficulties in the market, operators must be freed from unnecessary annoyances at the mines. If they can produce more coal, lessen the cost of production and avoid delays and wrecks by wider use of labor-saving machinery, granted only that they have railroad cars on the switch, they can be assured of meeting advantageously all the problems of distribution. Among devices that are being installed to increase production and lessen cost may be mentioned the automatic safety mine-car cager invented by James A. Nolan, manager of the Mining Safety Device Co., of Bowerston, Ohio.

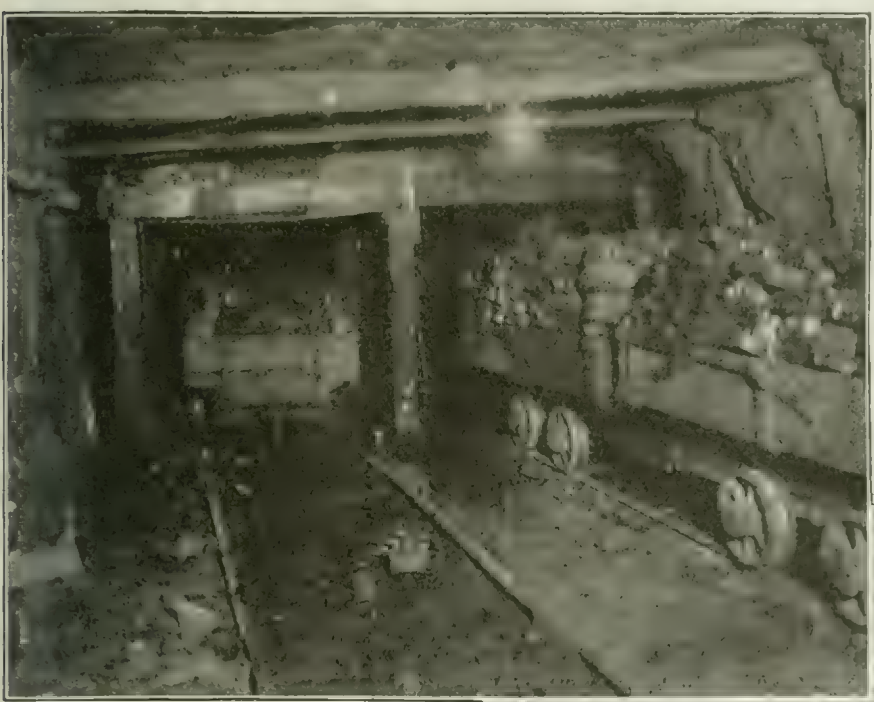


FIG. 1. SHAFT BOTTOM OF THE COAL RIDGE MINING CO., LINTON, IND.

The left hand cage is down and a loaded car is in place upon it, ready for hoisting.

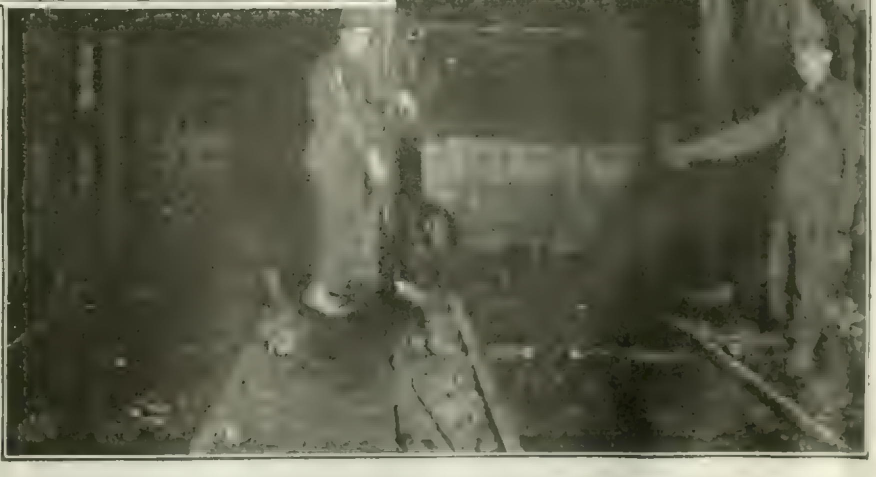


FIG. 2. ANOTHER VIEW OF THE SAME INSTALLATION

Note the cager horns on both tracks, the one pair open for decaging and the other closed against the passage of cars.

While this cager is developed along the lines of others of the same firm, yet in many respects it is a departure in that class of construction. Fig. 1. shows the equipment at the mine of the Coal Ridge Mining Co., of Linton, of which B. O. Rook is general manager. Mr. Rook was the first to install this type of cager at a shaft bottom, though it must be admitted the Johnston City Coal Co., in the town of Johnston City, had given the matter of installing the cager earlier consideration and had placed the order a day before Mr. Rook. The delay of that company arose solely from the fact that it was not ready to install its cager as soon as it arrived.

Several details of this machine which distinguish it from others assist in the solution of the problems of automatic caging. Instead of a round rocker shaft with bell cranks keyed and pinned to it, the rocker shaft in this case is square and the bell crank is made with a square hole to slide on the shaft, carrying the turnbuckles with it.

Long buffer springs are used to cushion the horns

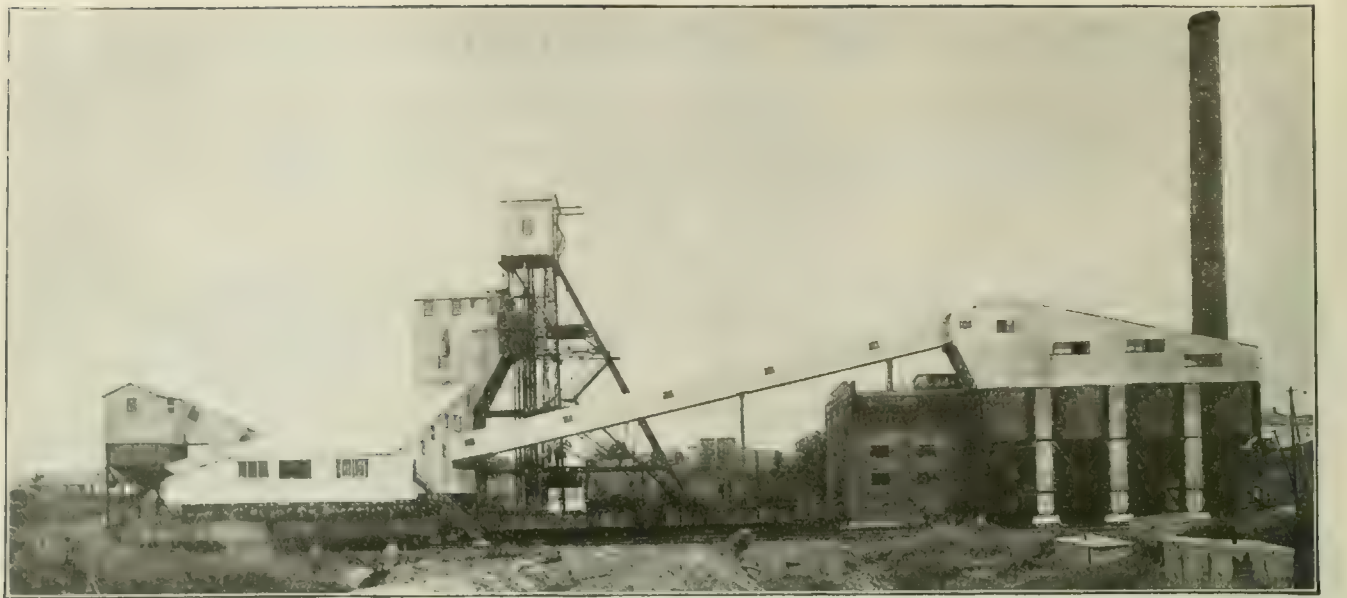


FIG. 3. UPPER WORKS OF THE ORIENT MINE OF THE CHICAGO, WILMINGTON & FRANKLIN COAL CO.
This operation holds the record of 6,777 tons in eight hours. The shaft bottom is shown in Fig. 5.

and absorb the impact of the loaded cars. At some mines the car axles are weak, but even the weakest of axles cannot be bent by coming in contact with the horns of this cager. Neither is it possible for the cars to climb the horns or telescope bumpers. The cager is operated both by the cage and the car. The descending cage opens the horns by depressing the trip crank attached to the rocker shaft. The loaded car passes to the cage and in so doing moves the reset block from the rail, revolving the rocker shaft and closing the horns just back of the next advancing loaded car. In order to close the horns before the cage leaves the landing, a novel feature is employed, namely, a two-piece trip crank, instead of the usual one-piece crank. A pin on the cage depresses the trip crank and then passes beyond it. The closing horns bring the trip crank back into place and when the cage rises the two portions of the crank separate and allow the pin on the cage to pass by. The double-acting tension spring attached to the rear of the rocker shaft assists in throwing the shaft into either of its operative positions. Moreover, it carries the trip crank past the point where it is released by the pin on the cage

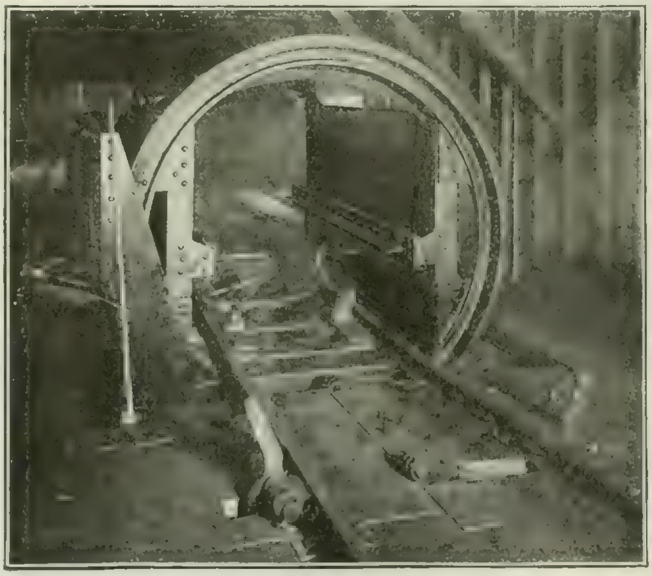


FIG. 4. ROTARY DUMP INSTALLED AT CASSIDY'S SIDING, VANCOUVER ISLAND
Horns of the cager in the foreground, admit cars to the dump or prohibit them from entering.

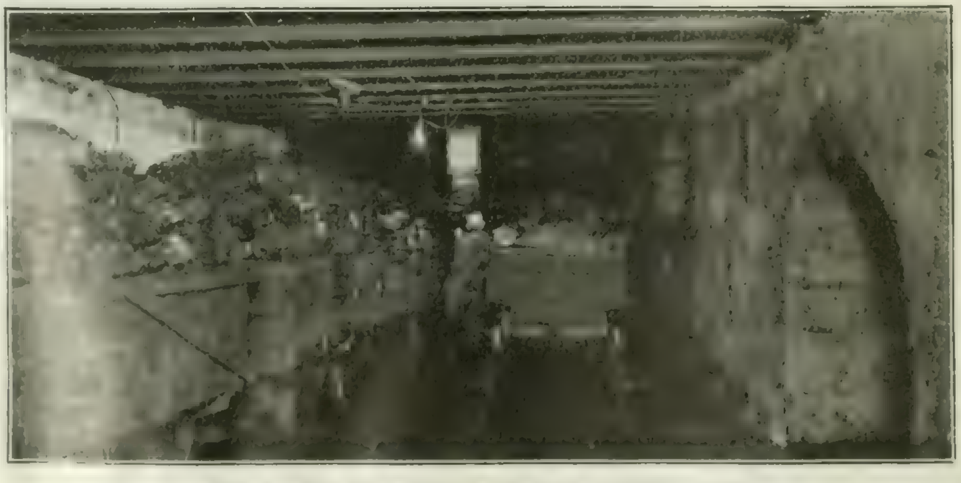


FIG. 5. SHAFT BOTTOM OF THE ORIENT MINE
Everything must be "shipshape" and automatic to enable a mine to secure and hold the world's hoisting record. The cager horns on the right having permitted the passage of one car are now set against the approach of another.

At Last, Heavy-Duty Quintuplex Mine Pump Driven by Condensing Steam Turbine

Will Raise 2,100 Gal. of Water Per Minute in Kingston Coal Co's Shaft —Lift Will Be 700 Ft.—Steam Consumption Under 14.7 Lb. Per Horsepower Hour Guaranteed—Large Saving in Room Required

By Erskine L. Solomon
Kingston, Pa.

IN THE never-ending quest of economy a number of coal companies decided a few years ago to replace wasteful pumping and generating units with more modern equipment. In some cases, however, ease of installation appears to have been sought rather than economy, for in few of the pumping stations have the best results been obtained.

High-duty pumping engines of the corliss or poppet-valve type operating condensing are ideal from an economical point of view, but the space required for their installation renders them unfitted for use in the mines. Steam turbines, on the other hand, require but a small amount of space as compared with corliss engines of the same horsepower, which with a guaranteed low steam consumption presents a combination that no other prime mover can match.

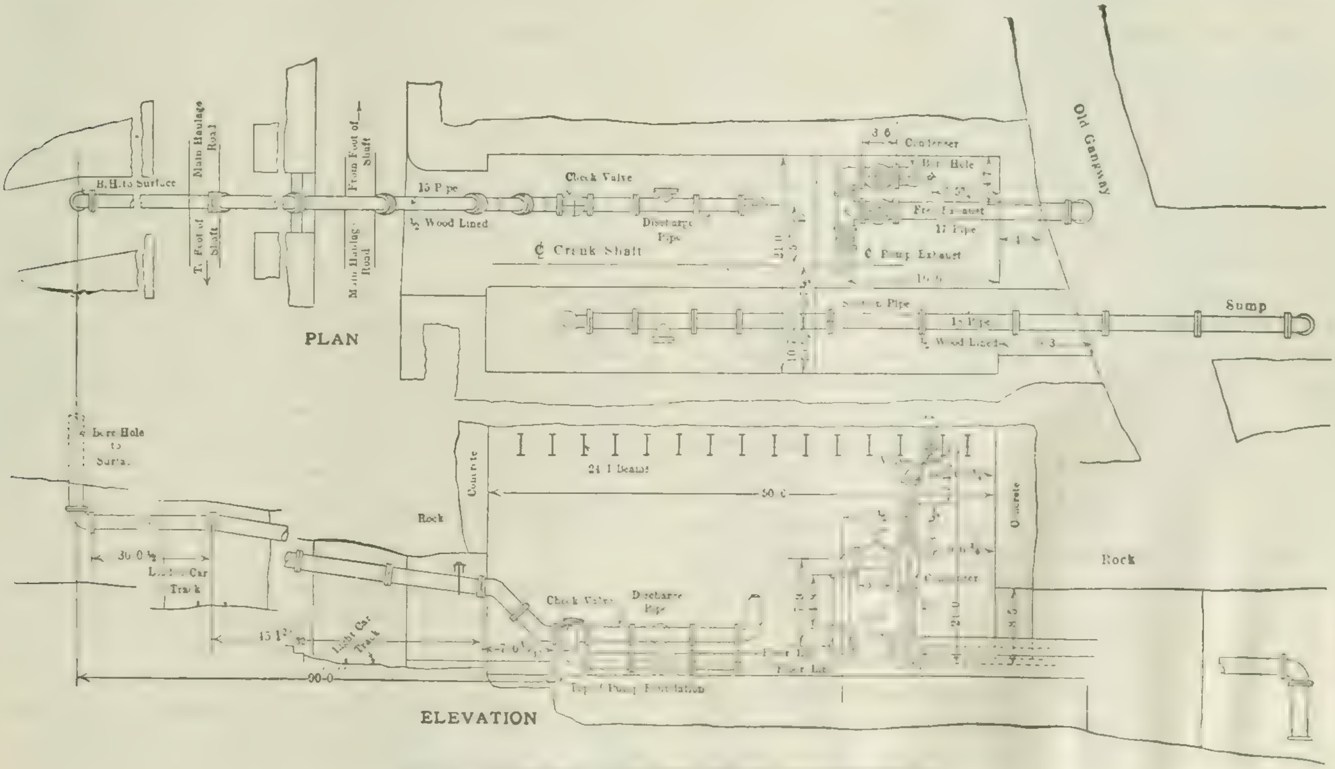
To apply a machine of this type to a mine pumping unit was a radical departure from usual practice, and the combination for a time could not be effected because of the high speed at which turbines operate. With increased perfection in reducing gear, however, means were provided whereby steam turbines could be attached to certain types of pumps, whereupon the Aldrich Pump Co. was requested to furnish a quintuplex pump arranged for steam-turbine drive.

A satisfactory arrangement finally was devised and a unit ordered, but the delivery of the turbine was delayed because all equipment of this kind was taken by the Government during the war. As a result the complete unit was not delivered until a few months ago. Recently this combination operating condensing was placed at work in the No. 4 shaft of the Kingston Coal Co. in the Red Ash bed at Kingston, Pa.

The pumping unit consists of an 11 x 18-in. Aldrich vertical, quintuplex, outside packed plunger unit, of the pot-chamber, water-end type. Its capacity is 2,100 gal. per minute against a 700-ft. head. This pump is driven through Falk herringbone gears and an Aldrich flexible coupling, by a 500-hp. Kerr economy, horizontal, multi-pressure stage, steam turbine operating at 4,800 r.p.m. This machine has horizontally split casing, diaphragms and bearings.

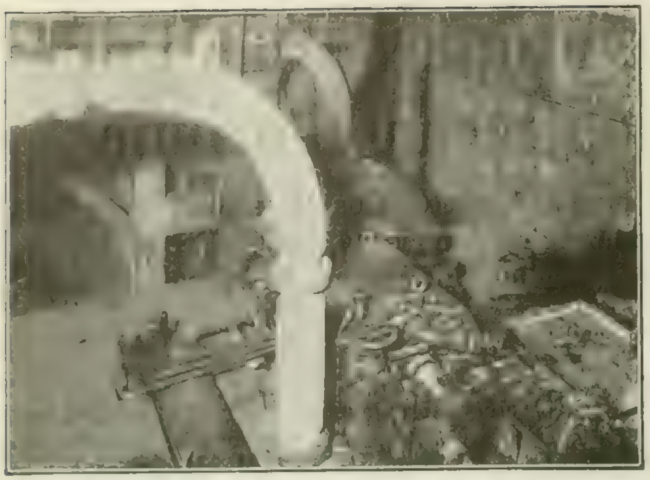
The turbine is equipped with a standard governor of the latest type, an oil pilot control for operating the governing valve, also an overspeed governor, and quick-closing trip and throttle valve. A hand-operated overload valve for non-condensing operation is provided as well as a speed-changing device that permits varying the speed 10 per cent while the machine is in operation.

The turbine is connected through a flexible coupling



PLAN AND ELEVATION OF PUMP CONNECTIONS

In the discharge line "dutchmen" have been used to secure small changes in direction



PUMP AND ITS DRIVING TURBINE
Compare the diminutive size of the prime mover with the bulkiness of the machine it drives.

of the pin-and-bushing type to double helical herringbone reduction gears that reduce the speed from 4,800 to 600 r.p.m. The entire unit is lubricated under pressure, the oil being pumped to all main bearings, gears, etc. Guarantees has been given that the steam consumption, including gear losses, will not exceed 14.7 lb. per horsepower-hour.

The condensing equipment consists of a 20-in. Eynon & Evans barometric condenser with iron body and white-metal water combining and discharge tubes. These parts are made of a special metal so as to resist the acidulous action of the mine water used for condensing. The condenser is supplied with water through an 8-in. bore hole from the coal bed above. An automatic balance valve is provided for free exhaust.

Illinois Mines and Minerals Director Dies

JOSEPH C. THOMPSON, director of the State Department of Mines and Minerals, of Illinois, died recently at the home of his son, Fred Thompson, at Ward, Jackson County, Ill. He was ill only a short time and his death was attributed to heart failure. He made his headquarters in Springfield since becoming director of mines and minerals.

Mr. Thompson was one of the mine experts of the Illinois coal fields. At one time he was mine manager of the Majestic mine at Duquoin, owned by the Equitable Coal & Coke Co., of Chicago; later he became general superintendent of the Jackson Coal Co., at Hallidayboro. Resigning the position of general superintendent, he was appointed as state mine inspector and established headquarters at Murphysboro; he remained there until he was appointed successor to Evan D. John, who was then director of mines and minerals.

Mr. Thompson was an expert on mine gases and methods of handling them and in this work he probably had no superior in the state. He was 65 years of age at the time of his death.

In view of the difficulties being experienced by the Government fuel yards in obtaining coal supplies, J. D. A. Morrow has arranged with members of the National Coal Association to give priority to sufficient consignments to take care of the Government requirements in that respect.

Export Association Discusses Foreign-Trade Prospects

SPEAKING for a group representing manufacturers of coal and oil, H. M. Payne, assistant to the president, Bertha Coal Co., at the "Commodity-Group Luncheon" of the American Manufacturers' Export Association held at the Hotel Pennsylvania, on April 21, replied to seven questions which had been presented to each group that the consensus of its opinion might be secured. The coal-and-oil group consisted of seven coal men and four oil men. In answer to the first question: "Have the foreign exports in your line been absolutely or materially curtailed by the present condition of foreign exchange?" Dr. Payne replied that the unfortunate condition of foreign exchange has not materially curtailed the coal-export trade. The countries take whatever they need and are able to get.

As to the second question, to wit, whether any anticipation existed in the mind of the committee that foreign exports will be stopped or materially reduced in the next six months, the answer of the coal group was that the demand is so great that the exportations of coal are limited solely by the capacity of the piers over which the coal is loaded. The committee declared that it confidently expected that the coal men would be operating at the maximum capacity of the tidewater piers within the next year.

In reference to the question—In which countries do your customers show evidence of financial recuperation? the committee replied that both the groups were unanimous in the opinion that England has recuperated most, but there is a difference of opinion as to whether Belgium or Italy should take second place and France third.

When considering the problem of whether it is advisable to accept deposits abroad against invoices, the committee replied unanimously that it was not advisable. The fifth inquiry—Do you require, or are you advising your foreign customers to purchase "future" of exchange? was also unanimously answered in the negative, the committee saying that it was purely a question of credit, whether business is done or not.

The attitude of the coal and oil groups is best expressed by the words: "You may take it or leave it. We have the oil or the coal. If you want to pay it in established New York credit, all right; if not, we do not care whether you establish credits or not."

In reply to the inquiry—Do you anticipate any general increase on duties or embargoes against your products to foreign countries? the answer was No, and when the commmittee was asked, Has your company allocated to its foreign business a definite percentage of its established total products? that question was also answered by a negative.

Must Prepay Freight Charges on Coal For Canada

G. N. Snider, coal traffic manager of the New York Central lines, has issued the following notice to agents in that company's coal traffic department:

"Because of the existing rate of exchange, on and after May 1, 1920, freight charges (including advance charges if any) must be prepaid on all freight shipments destined to points in Canada originating in the United States."

Outlaws and Profiteers Have No Place In Retail Coal Trade*

Favoring a House Cleaning by Retail Coal Merchants, Officer of Association Would Welcome Accurate Definition of What Constitutes Profiteering—Merits of Each Case Should Be Considered

By Ellery B. Gordon†
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THE Attorney-General of the United States, A. Mitchell Palmer, had an article in the October, 1919, number of *The Nation's Business*, in which, after making the statement that "profiteering probably has existed since the beginning of commerce," he attempted to give his idea of what profiteering is.

He admitted that the term as commonly used is not susceptible of exact definition. It cannot be said that a man who makes 10 per cent, 20 per cent, or 30 per cent, or more profit is profiteering. "Anyone who makes more than a just and reasonable profit is a profiteer. Whether he does this must be separately determined in each case, taking into consideration the conditions in the locality, the nature of the commodity, and the other facts relating to the particular transaction." Aside from the difficulty raised by the use of the word reasonable, we believe this is a very "reasonable definition."

A United States Senator recently stated in a committee hearing that anyone is a profiteer who makes more than 6 per cent if his business involves no risk, and 10 per cent of it does involve a risk. He meant "on the turnover." As a matter of fact, however, there are many operators and retailers who would like to approach even half way to this limit.

The retail coal merchant has been interested in this question as to what a reasonable profit is perhaps more than in any other one point. While the Fuel Administration was controlling retail prices the state fuel administrators exhibited almost as many opinions regarding profits as there were administrators.

Legitimate Business Entitled to Fair Profit

Without going too much into past history let me cite the practice in New York State. The Fuel Administrator at the start was a business man and most of his county and local administrators were business men. They recognized the fact that legitimate business enterprises were entitled to a fair profit.

It was urged upon the state administration that 50c. per ton was a fair profit. Offhand this sounds reasonable. As a matter of fact, however, it was only on tonnages of medium size that this profit was permitted, while in large communities, where the average retailer handled a large annual tonnage, the net profit aimed at was about 25c. to 30c. per ton. In small towns, the other extreme, where the dealer is just as necessary, even 50c. a ton would not have been a fair return.

But that was two years and more ago. The current capital necessary to conduct a retail business today has increased over two years ago by 20 per cent to 30 per cent. Mine prices advanced under the Fuel Administration and freight rates advanced under Mr. McAdoo, and yet we are still talking of 50c. and 25c. Let us right now recognize the general price advance—it is but fair; where 50c. was a fair profit two years ago, 60c. is certainly no more than fair now.

Of course, the question of the return on investment was taken into consideration in the case of the medium and large sized tonnages. The very small merchant, however, who must at least make a living, must not be held to a small percentage return on his investment. If he handles 2,000 tons a year or 3,000 or 4,000 tons a year, his investment may be so small that even 100 per cent return on it would not mean living wages. Return on investment must, therefore, be ignored in many cases. A 2,000-ton annual business means, in dollars, probably upward of $20,000. A 10-per cent profit on *sales* would be less than present wages.

Coal Business Is One Involving Risk

While we are speaking of profits in concrete terms it is to be remembered that the figures mentioned may be called "paper profits." They represent the amounts that were added to the ascertained cost of doing business for a past period of six months or a year; but they didn't actually pan out. For instance, with gross margins fixed to produce a net profit of 50c. per ton on domestic sizes, and 25c. on small sizes, with the intention of averaging about 35c. per ton net profit, the result at the end of the year during which this order was in force was a net profit of only about 18c. per ton in a representative case.

To say that the retail coal business involves no risk is not true. While an investment in equipment, storage facilities, etc., is essential, an additional capital is needed to handle accounts receivable, which in some cases known to the writer amount to an average of over one dollar per ton of annual business the year round. There is the same business risk that other retail merchants are exposed to. Unquestionably there is not as great a risk as mining involves. On the other hand, most mining operations result in a business of tens of thousands of tons, while the average retail coal business is less than 7,500 tons per annum. The factor of volume cannot be overlooked in considering profits.

What Is a Fair Profit Per Ton?

The question has been asked repeatedly in conventions of retail merchants, "What is a fair profit per ton?" Some have been assumed to answer the question with a flat figure such as 50c. or $1. This makes me think of the remark of a railroad president regarding some rules that had been worked out and presented to him for approval. After looking them over he said, "Yes, very good. I have only one thing to say. Rules must be flexible to succeed." No rule for profit-fixing can be successfully applied everywhere.

Under the Fuel Administration in Massachusetts, according to a statement made in conference by the New

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*Address delivered at the annual convention of the Indiana Retail Coal Merchants' Association, at Indianapolis, April 28 and 29.

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England Fuel Administrator, the retailers were permitted just enough to "keep body and soul together." The Chicago gross margins were based on an intended net profit of 25c. to 35c. per ton. The New York basis is outlined above. Nothing like excessive profits were permitted under the fuel administration, generally speaking. In fact not even war profits were permitted. Here in Indiana, I understand, net profit was considered entirely unnecessary!

The retail coal merchants generally did not increase their margins during 1919. In many cases of which I have detailed record the margins decreased slightly and in other cases where margins were increased they did not keep pace with the increase in cost and profits. In some instances they decreased or even disappeared.

RETAILER FORCED TO INCREASE MARGIN

The retailer therefore in the beginning of the new year, facing additional wage increases in nearly all parts of the country, has been obliged to increase his margin. No fair-minded person would ask him to do otherwise. We have run into a perfectly natural temporary upheaval or disturbance in the coal market due to the removal of restrictions that have been in force practically during the last three years. The situation is not nearly as alarming as a great many calamity howlers would like to have us think. The only alarming feature of it is the fact that there is a small percentage of the trade, including the operators, the jobbers, and the retailers, who are not only their own worst enemies but are enemies of the entire coal trade.

We are in a way on trial. There is no question about it. We have hanging over us now very drastic legislation. Let us not deceive ourselves into thinking that it is so drastic that it cannot possibly pass. It can very easily be revised and passed, unless during the next few weeks and months the coal trade itself shows that it does not need such regulation.

I want to make a few very plain statements of opinion.

First. I know that 95 per cent of the retail trade is honest and fair and wants to take no advantage whatever of market conditions. Ninety-five per cent of the trade is convinced that it is entitled to a fair profit and that is all they are going to take. I believe the same is true of an overwhelming percentage of the operators and of a large percentage of the wholesalers. It is the other 5 per cent that worries us.

FAVORS HOUSE CLEANING BY COAL MEN

That 5 per cent among the operators, who because the demand is heavy sit back and say "I can get $5 for my $3.50 coal and I won't sell it for any less," and the wholesaler who knows that from certain buyers who are overexcited he can get $10 at the mines for his $7.50 anthracite coal; and that retailer who because his consumers are alarmed asks $4 gross margin when $3 or $3.25 is a fair margin; all these are outlaws. They are just as much enemies of the coal trade and of the public as are any other profiteers.

Let us clean house!

Let us make it understood in no uncertain manner that we as organized coal merchants do not condone or tolerate speculative coal prices on the part of the operator and wholesaler, nor profiteering upon the part of the retailer. There is more than one way of being a profiteer. The retailer who allows himself to be stampeded into encouraging high mine prices by bidding against the market, and the operator who permits himself to accept these bids simply because they are offered, are just as guilty as those who deliberately figure that now is the time to make a killing and set about doing it.

Now is the time to keep our heads!

Let those who have the high-priced coal to sell keep it. Let the consumers who are overexcited wait. Explain to them as well as possible. Let the man who sees fit to buy his high-priced coal sell it at excessive prices. But let him be the only one in your market who is doing it. Then if a crash comes those who are to blame will be easy to find.

I said, "Let us clean house!" I meant let us clean our own houses. I didn't mean to invite the operators to come and clean our houses for us. It has become a great game this "passing of the buck" on account of the high prices, and the coal trade, which is notorious for a lack of unity and co-operation, is dividing itself again in the same way. Let us all recognize that all but 3 per cent or 4 per cent or 5 per cent of all branches of the trade are honest and fair. Let us not make general accusations. If we know of specific instances let each branch take care of its own troubles.

I have in mind a warning to coal retailers which I saw in the *West Virginia Mining News* about two weeks ago. It said that "Evidence is before us that some retailers of coal are charging more than is justified by the price at the mines, plus freight and expense of handling and a fair profit. If this practice is continued this paper will publish the names of those doing so, and all facts in connection; then will circulate bulletins in the communities where such retailers do business, exposing their methods. In other words, retailers are not going to 'get by' with laying the blame for high coal prices on the mine operators—not this year." The editor of the *West Virginia Mining News* is Mr. Wightman D. Roberts and its office is at Charleston, W. Va.

OPERATOR IGNORANT OF FAIR RETAILING PROFIT

In the first place, Mr. Roberts may know mining but I doubt very much if he has any idea what a fair profit for retailing is. I am sorry I am not personally acquainted with him. Anyway, if he knows of any retailers who are getting more than a fair profit, we should be just as glad to have them exposed as anybody else. If he should publish any names, however, we should be obliged to see that the invoiced prices for the coal which they bought, together with the names of the shippers, also were published. If there is going to be any exposure it will have to be complete.

Now I may have used some pretty strong language, but it is time that the coal trade took itself in hand and stopped kicking about conditions when a considerable part of the blame, for the price conditions at any rate, is strictly up to the trade itself. It is time that we settled down to manage our own business in a businesslike way, and let those whom the profiteering coat fits put it on.

As long ago as last September I tried to impress the retail branch of the trade particularly, but it applies also to the entire coal trade, with the fact that our destiny is in our own hands. I remember telling a story that illustrated what I have in mind, and it is worth repeating.

I stated at that time that we cannot afford to be like the man in the grocery store who was approached by an old gentleman with a stick in his hand, with the following question:

"Did you drive up here in a cart?"

"Yes, I did," was the answer.

"Was it an old white horse?"

"Yes."

"And an old woman on the seat?"

"Yes."

"And can she manage that horse?"

"I should think she can."

"Then it's all right," said the man with the stick. "The old horse is running away and the old woman is hanging to the tailboard, shouting 'Murder!' with all her might; but if she can manage it there is no use of anybody getting excited over it."

We are trying to be sure that the old horse does not run away and get us into trouble.

Central Pennsylvania Decides On Wage Scale for 1920-1922

AFTER sessions continuing over a period of three weeks and held in Philadelphia, representatives of the Central Pennsylvania bituminous operators and mine workers agreed upon and signed a wage agreement on April 27. The contract is for a period of two years, from April 1, 1920 to March 31, 1922, and runs as follows:

OUTSIDE DAY-WAGE SCALE.

Occupation	Rate per Day
Car cleaners	$5.10
Pushers	5 18
Trimmers	5.36
Dumpers	5.42
Ram operators and Firemen now working on change shifts of eight hours each	5.60

INSIDE DAY-WAGE SCALE.

Occupation	Rate per Day
Trappers	$3.18
Wiremen's and Tracklayers' helpers	5.77
Scrapers	5.85
Pipemen	5.92
Spraggers, Skilled wiremen in charge of work, Tracklayers, Bottom cagers, Drivers, Trip riders, Water and Machine Handlers, Timbermen	6.00
Motormen	6.10
All other inside day labor	5.77

TONNAGE RATES.

Work Performed	Rate
Pick mining per gross ton	$1.2428
Pick mining per net ton	1 1096
Machine loading per gross ton	0.8434
Machine loading per net ton	0.7531

INCREASES IN TONNAGE RATES OVER PRICES IN EFFECT OCTOBER 31, 1919.

(Less 5 per cent bonus on 1916 contract prices).

Work performed	Advance in rate
Cutting, scraping and loading per gross on	$0 2688
Cutting, scraping and loading per net ton	0.2400
Cutting and scraping per gross ton	0.0511
Cutting and scraping per net ton	0.0456

All rates on deadwork and yardage in effect Oct. 31, 1919, shall be reduced by the amount of the 5 per cent bonus granted in the 1916 contract prices and then shall be increased 20 per cent.

All other outside able-bodied day labor, excepting the men herein above mentioned, shall work the same hours and at the same rates as at present, plus an advance of $1 per day over the prices in effect Oct. 31, 1919, based on the present standard number of hours now constituting a day's work under such employment at each operation.

All boys under eighteen years of age receiving on Oct. 31, 1919, less than a man's wages, shall be advanced 53c. per day based on the present standard number of hours now constituting a day's work under such employments at each operation. All monthly men shall be advanced $1 per day over the prices in effect Oct. 31, 1919, based on the present standard number of days and hours constituting a month's and a day's work under such employments at each operation; provided, however, that this clause shall not apply to mine foremen, assistant mine formen, firebosses or bosses in charge of any class of labor inside or outside the mine, or to coal inspectors or weigh bosses.

All labor engaged in the manufacture of coke shall be advanced at the rate of $1 over and above the prices in effect Oct. 31, 1919, with the exception of boys under the age of eighteen years, who shall be advanced to a minimum wage of $3.53 per day. The application of said advance in both cases mentioned in this paragraph to be based on the present standard number of hours, average ovens drawn, and average cars loaded per man, now constituting a day's work in such employments at each operation.

The advance in the price of all house coal shall be 27 per cent. At all mines where cars are pushed both ways by the miner, the operator shall pay for this work the sum of 5c. per gross ton or its equivalent net. Whether the operator reduces the car pushing work to a one-way push, the direction being at the choice of the miner, the compensation shall cease. This clause shall not be taken to authorize an adverse charge where cars are now being handled by the company one or both ways.

Want a Seven Per Cent Advance

DRIVERS in a number of East-Side coal mines ne East St. Louis are seeking by a strike to obtain a 27-per cent increase in wage in place of the 20 per cent increase which was granted them by the Bituminous Coal Commission. It is an old practice of union men to play up the wrongs of a certain class of men who have profited least by past wage increases and then seek to extend their advances over the whole body of workmen regardless of the fact that in the recent past most of them have received larger increases than those that have been complained of. Thus it was the hope of the union that the wages of all union men would be increased considerably because the pick miner, and only he, could make just claims to such an increase.

The day workers would have bygones be bygones and have their wages as generously advanced as those of the miners. The union has given its approval to the decision of the commission and cannot therefore allow the drivers to demand more than the commission awarded. It is, therefore, prepared to take away the union cards from the drivers who have left their work, laying the mines and their co-workers idle. An increase of $1 per day is all to which they can lay claim and they have no right to demand more nor, by refusing to perform their accustomed work, to lay off thousands of miners in Madison, Macoupin and St. Clair counties.

Company Gets $300,000 Damages

AS THE RESULT of a suit charging a violation of the Sherman Act, the Pennsylvania Mining Co. has obtained a verdict at Fort Smith, Ark., for $300,000 as against District No. 21 of the United Mine Workers.

Seasonal Coal Freight Rates Supported by Government Officials

Hearings on Frelinghuysen Bills Have Developed Support of Operators in Middle West and of Federal Officials, But Have Shown Opposition of Eastern and Far Western Operators and Railroads

HEARING on the seasonal freight rate and the Coal Commissioner bill were concluded, as far as bituminous coal is concerned, by Senator Frelinghuysen on Thursday, April 29, after two days' hearings at which further testimony opposing the bill was introduced. The strongest proponents of these measures to stabilize the coal industry heard last week were Chairman Clark of the Interstate Commerce Commission and Director Smith of the Geological Survey.

Chairman Clark put the entire Interstate Commerce Commission on record as unqualifiedly in favor of immediate legislation providing for seasonal freight rates on coal and he appeared in favor of the engineers' bill. His testimony was mainly directed against the objections of the Lake dock operators, who the week before presented strong objections to any measure that does not provide reductions on lake coal moving to Lake Erie ports. Mr. Clark does not believe that Illinois coal will make any large inroads on the market territory of the dock men in the Northwest as a result of seasonal rates.

He pointed out that no new measure can be undertaken or progress made that does not in the beginning tread on the toes of some people. There is so much competition in the coal industry that any change that affects delivered prices will certainly meet with disfavor on some side. He made the interesting statement that two years will be required for equipment builders to make up the war losses and current obsolescence in open-top cars, if the building program is not speeded up.

Iowa coal operators are very much opposed to the seasonal rate, George Heaps of the Iowa Coal Operators' Association told the Frelinghuysen committee on April 28. He expressed the opinion that the low summer rates would give practically all of the coal business in Iowa to Illinois. This would necessitate the closing of the Iowa mines in the summer, he declared.

IOWA OPERATORS WILL SUFFER NO LOSS

On account of the poor roof and soft bottom Iowa mines must be kept going, Mr. Heaps testified. To close them during the summer virtually would mean that the Iowa industry, which already has a hard time to keep its head above water, would be killed, in the opinion of Iowa operators. It would be impossible, it was pointed out, to compete with Illinois in providing coal for storage since it has been demonstrated that Iowa coal, on account of its sulphur content, cannot be stored. Spontaneous combustion often results before the coal has been in the pile for a week.

Senator Frelinghuysen told Mr. Heaps that he was not at all convinced that seasonal rates would put the Iowa operators out of business, but he asked if it would not be justifiable in the interest of the general welfare, to close some of the mines producing inferior coals under great difficulties. Mr. Heaps explained that his testimony was intended only to point out just what would happen to the Iowa industry and he made no attempt to say what would be the best national policy.

George H. Cushing, the managing director of the American Wholesale Coal Association, concluded his testimony with the following recommendations:

That no attempt be made to regulate this complex situation by any statute.

That, seeing the need is more for men and leadership than for the passage of any new laws, the sub-committee on Interstate Commerce of the United States Senate undertake, during the summer and fall, to stimulate production, as it did in 1919, by gathering facts from producers, wholesalers and retailers and then by trying to get cars to move the coal, and to get the consumers in the backward districts to buy and store coal.

LINE HAUL AND INTERLINE HAUL CARS TO BE GROUPED

That an effort be made to divide the coal cars of all originating roads into two groups—those allotted to the line haul and those allotted to the interline haul—to the end that each group of consumers may be independent of the bad practices of the other group.

Other points in favor of eliminating seasonal coal traffic made by Mr. Cushing were as follows:

First—One-third idle time at the mines doubles the necessary investment in mining property and results in a great financial loss to the nation.

Second—No business in summer and periods of boom in the fall result in giving the coal industry a highly speculative character, which always serves to invite into the industry the worst element in any business.

Third—Allowing mines to lie idle for one period, but always in expectation of being called upon to produce, serves to attach to the mines an unnecessarily large working force and to cause, due to the uncertainty of the working time, a dangerously large labor turn-over. Specifically, in the prewar period it subtracted annually sixty thousand workers from our total immigration to supply the demands of the mines. Today it is keeping tied to the mines fully one hundred thousand workers who should be released from the bituminous coal industry to other industries which need workers.

Mr. Cushing also advanced the idea that the stabilization of coal prices could result only in either universal bankruptcy for the coal mines—which would defeat the purpose of the reform—or universal prosperity for the coal business—which would also defeat the purpose of the reform by inviting an increasing flood of new producers into the field. In a word, the business cannot be stabilized unless and until there is control of the coal land itself in some such way as will make it possible for someone to say when and where new mines may be opened.

DIRECTOR SMITH SUMS UP

Director Smith of the U. S. Geological Survey reviewed the facts upon which the proposed relief was predicated. The seasonal fluctuation in coal output comes from a seasonal fluctuation in demand. The consumer must be hitched on to the problem of giving the mines more orders for the spring and early summer months and of relieving both mines and railroads of their extra heavy burden in the fall and winter months. In a normal year the country over this seasonal inequality of demand calls for 35 per cent to 60 per cent more coal being mined in November, the peak-load month, than in April, the usual month of greatest slump in mine operation.

In Eastern coal fields the difference is less than this average and in Western fields much worse. Uneven demand thus requires more mines and more miners, both working a 75 per cent year, and conditions of unequal seasonal demand are also bad for the railroads, especially when combined with crop movements and winter interference with traffic.

The legislation proposed seeks to induce summer buying of coal by freight reductions in the spring months and increases in the fall and winter months. What statistics are available indicate that the rate differentials proposed by the committee of mining engineers are timed to influence buying in what are now the months of lowest production, yet taking some of the Appalachian fields, provision might well be made for some adjustment by the Interstate Commerce Commission. In fact, the principle of the remedy seems correct, but discretion may be required in its application.

It must be admitted, moreover, that this legislation is not a cureall and may be expected to make conditions even worse locally, but on the whole the coal business will be helped and miners, operators, and consumers eventually benefited by surer supplies of cheaper coal. To allow present conditions to continue is to invite an industrial paralysis, which has been averted rather narrowly several times in the past few years.

Public Utilities Are Seasonal Consumers

Public utilities and factories use much less coal in the summer than they do in the cold winter months. Recent power statistics regarding public-utility power plants of the United States, having a total annual consumption of 35,000,000 net tons, show that the daily production of electricity by these plants depends quite markedly on the season of the year, the consumption of electricity during the spring and summer being quite strongly contrasted with that of the winter. The daily output of electricity from April to July is about 100,000,000 kw.-hr., whereas it reaches nearly 13,000,000 kw.-hr. in the month of January.

C. E. Lesher, editor of *Coal Age*, formerly in charge of mineral-fuel statistics of the Geological Survey, while agreeing that it was desirable to equalize coal production and distribution throughout the year, doubted whether seasonal rates alone would accomplish this purpose. Three things were needed to stablize the coal industry: even rate of production, price policy which would prevent fluctuations, and a steady and satisfactory labor supply. He instanced steel as a stabilized industry, evidenced by the fact that for years prices on steel rails have been even. The anthracite industry is more stablized than the bituminous because the former has been able to produce a summer as well as a winter demand.

The steel industry is stable because it is in large units—not caused by legislation—and can control the situation. Larger companies in the coal fields would benefit the industry, as small producers starting operations when prices are high tend to upset business in winter. Seasonal rates would benefit some fields and injure others. Some bituminous sections require no stimulus for summer production. Movement of bunker and tidewater coal is independent of rates being regulated by world prices. He thought seasonal rates would simply transfer car shortage and high prices from winter to summer in some Eastern fields.

Senator Frelinghuysen Warns Coal Operators

No harm can come to the coal trade or the operators if they will only co-operate in an effort to equalize distribution, and you are losing sight of the fact that coal prices are advancing instead of declining, and they are advancing at the present time because the operators and the railroads cannot supply the needs. That is all, and the public do not propose to stand it any longer. Something is going to be done and all the theories in the world will not cure the situation, and if it is not applied in a mild and ministerial way it will be applied in a drastic control by the Government, and it is arising very rapidly; and I think it is a very poor policy to furnish nothing but criticisms and not make some effort to do something constructive.

Industrial Leaders Make Move for Amendment of Tax Laws

With the endorsement of the American Petroleum Institute and the American Mining Congress, the National Industrial Conference, composed of thirty national and state manufacturers' organizations, called a national conference of business organizations in the Blackstone Hotel, Chicago, Friday, April 16, for the consideration of a plan for readjustment of the revenue laws, which as now existent have become burdensome and in a sense impossible of administration.

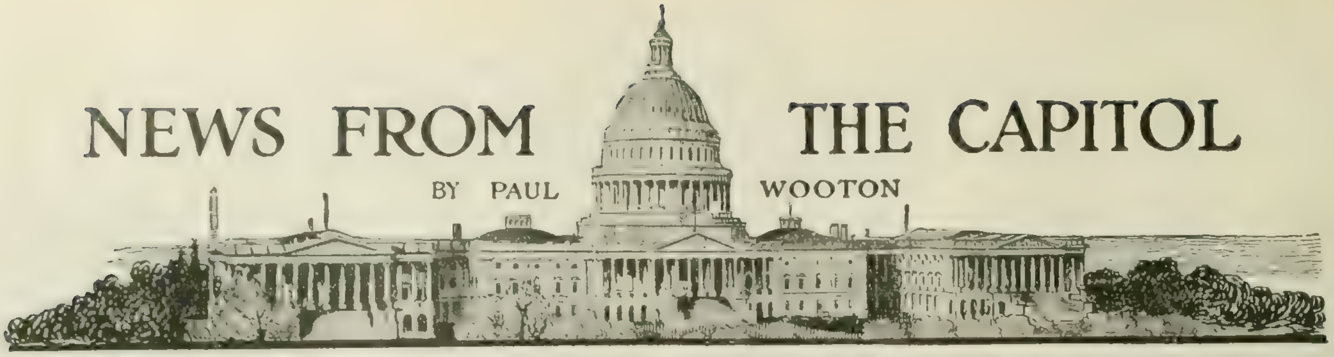
There were present 150 representatives of sixty organizations and the entire day was given to discussion of proposals to eliminate the excess profits tax, readjust the clauses based upon the high brackets of the surtax, simplify the general income provisions, establish a more workable and equitable scheme of direct tax through either a consumption or sales tax, etc. The coal industry was represented by Rush Butler, general counsel of the National Coal Association.

The National Industrial Conference as a research organization had worked out and presented for consideration certain proposed amendments to the present law based upon suggestions of Dr. Adams and Secretary Houston, but the conference voted to refer all resolutions to the Taxation Committee composed of five members of the National Industrial Conference and eleven members to be elected by the non-member organizations represented in the meeting.

A general committee which was named was authorized to meet in two weeks, consider the advisability of adding needed members and act upon amendments presented to the conference.

NEWS FROM THE CAPITOL

BY PAUL WOOTON



National Coal Association Will Resume Issuance of Price Reports

DURING 1919, from April until November, the National Coal Association published weekly summaries of prices of bituminous coal as reported in closed and past transactions. These reports were very valuable records of the level and course of current coal prices. They did not, however, give any information concerning the effect on price averages of considerable volumes of coal moving on long-term contracts.

During the present year it is planned to publish weekly averages based on weekly reports of the prices realized by the operators from total shipments each week, including both current sales and shipments on old orders and contracts, as called for by the new form of the Bureau of Coal Economics. Reports for the first few weeks in April have already been received from three associations in the Middle West fields, and several associations in the Eastern territory have begun to collect the information from the operators on the new form.

Index figures on coal prices derived from these weekly reports will be published by the National Coal Association as soon as a sufficient number of associations have furnished the information on the new form.

Will Investigate Super Power Project

WHILE only one-nalf of the amount of the estimate was carried in the Sundry Civil Appropriation Bill, just reported, for a survey of power production and distribution, the item is regarded as being of especial importance in that the committee recognizes, in this period of retrenchment, the need for such an investigation. The cut in the appropriation is not vital because the bill permits contributions from private concerns interested. There is a marked tendency on Capitol Hill to congratulate the Appropriations Committee in bringing out this bit of far-seeing, constructive legislation. It indicates that Congress is thoroughly interested, that this engineering investigation is a wise step in the effort to keep the United States equipped adequately for its future industrial needs.

The need for such an investigation became all the clearer when during the past winter the peak of electrical output was 10 per cent higher than during the war period. As explained by George Otis Smith, director of the U. S. Geological Survey, which will be in charge of the work, the investigation will cover the possibilities of power production at the mouth of coal mines, linking with those the water powers that are available.

There are certain places with water power available in the East, but they cannot stand alone, Dr. Smith points out. "They must be hitched up with the steam plants," he says. "Some of those steam plants must be put in at tidewater and some up near the mines. We will study the power requirements of the different parts of the Washington-Boston industrial area with the idea of distributing the new sources of power supply in terms of the demands. Probably half of the coal that is used for power generation will be saved.

"The small plant oftentimes has only one-third or one-fourth of the efficiency of one of these big modern plants. Then, of course, there is the application of electricity to our railroads. The big consumption of coal in the East is by the railroads. By electrifying them one ton of coal can be made to haul a train twice as far as it can if used in a locomotive. In addition, railroads would be relieved of a back-crushing load. Coal is the poorest freight they have. It is the most burdensome."

President Nominates New Commerce Commissioners

HENRY JONES FORD, Professor of Politics at Princeton University, and James Duncan, of Quincy, Mass., a vice-president of the American Federation of Labor, have been nominated by President Wilson as members of the Interstate Commerce Commission. A third new member has been selected and his name will be sent to the Senate as soon as he consents to serve.

Mr. Ford was nominated to succeed Commissioner James S. Harlan, and his term would expire on Dec. 31, 1925, Mr. Harlan's term having ended on Dec. 31, 1918. Mr. Duncan was appointed to one of the two new positions on the Commission resulting from its enlargement to nine members by the Transportation act. His term would end on Dec. 31, 1924, and that of the member yet to be appointed expires on Dec. 31, 1923.

Prof. Ford is a graduate of Baltimore City College. He has been professor of politics at Princeton since 1908 and has written a number of books on political science and related subjects.

Mr. Duncan was born in Scotland, was educated at Aberdeen and for many years worked as a statue granite cutter. He was editor of the *Granite Cutters' Journal*, served successively as secretary and president of the Granite Cutters' International Association and was a member of the commission sent to Russia in 1917 by President Wilson.

Director of Bureau of Mines Resigns

VAN H. MANNING, director of the U. S. Bureau of Mines, at Washington, has resigned, effective June 30. He will become director of research of the newly organized American Petroleum Institute, composed of the leading petroleum producers of the country.

New Cargo-Coal Provisions Made at Hampton Roads

AS the Tidewater Exchange, Inc., will operate only at the ports of New York, Philadelphia and Baltimore, steps have been taken to provide for the proper handling of coal through Hampton Roads, at which point the volume of business is greater than at any two of the other ports mentioned. The plan whereby coal was borrowed and loaned as before the war has been restored on the Norfolk & Western Ry. That railroad has issued an embargo, which became effective on May 1, against all tidewater coal except such as is duly authorized by a numbered permit issued by E. S. Moore.

Application for the permit must show the name and tonnage of the vessel to be loaded, the date when its arrival at Lamberts Point is expected, the amount of the tonnage that will be shipped from the mines daily, the name of the mines shipping, as also the names of the consignees under which the coal will be shipped if the source of the coal is not already arranged.

Permits will not be issued where the volume of shipment from the mines will not provide for a reasonably prompt accumulation of the coal for cargo, for car equipment will be delayed if the shipment has to be made more than ten days in advance of the date of the expected arrival of the vessel. Clearly in such a case it will begin to cumber the port before coal shipped for another cargo or cargoes has been unloaded if a vessel should fail to arrive in time or if road, pier or yard capacity or other conditions will not admit of prompt handling. It is understood that the Norfolk & Western officials are negotiating with coal operators for a permanent arrangement.

At Sewalls Point the Virginian Railway will have no pool whatsoever, but will continue to handle tidewater coal. More or less borrowing and loaning will be sure to take place, but no arrangement has been made for absorption of demurrage.

The Chesapeake & Ohio Co. has announced the establishment of the Newport News Coal Exchange. The pooling of coal will be continued during May under railway management and expense. The exchange will be operated under the supervision of E. I. Ford.

Kentucky Managers Will Gather in Lexington on June 4 and 5

ADMIRABLE is the program that H. M. Ernst, the president, and C. W. Strickland, the secretary-treasurer, have prepared for the members of the Kentucky Mining Institute, which will meet in the State University at Lexington on June 4 and 5 and be addressed by the most interesting of speakers.

George Eshrick, Jr., fuel engineer of the International Coal Products Corporation of New York, will describe the carbocoal process in an article on "The Future for Bituminous Coal." The company has a plant at Irvington, N. J., and is constructing, at the instance of the Government, an extensive plant at Kiser, Va.

"The Present Economic Situation" will be discussed by Charles H. Chase, research expert, Council of National Defense, Washington, D. C. To George H. Cushing, who will be toastmaster at the banquet, has been entrusted the subject "History of the Coal Industry." There is but one Cushing in the coal trade, namely the managing director of the American Wholesale Coal Association, Washington, D. C.

John Callahan, traffic secretary of the National Coal Association, Washington, D. C., will discuss "The New Transportation Act—The Cummins-Esch Bill." C. E. Lesher, editor *Coal Age*, will throw new light on "Wage Problems," while J. B. Hicks, assistant superintendent power and mechanical department, Consolidation Coal Co., Jenkins, Ky., will further amplify the article presented by General Manager Appleton of the Ironton Engine Co. at the midyear session of the institute. His address will be entitled "Practical Use of Storage-Battery Locomotives in Coal Mines."

Colonel Warren R. Roberts, who is chairman of the Committee on Standardization of Mining Equipment of the American Mining Congress, Chicago, Ill., will present the subject "Standardization of Mining Equipment," and the important problem of "The Rehabilitation of Industrial Cripples" will be presented by W. C. McMurtrie, the director of the Red Cross Institute for Crippled and Disabled Men, New York.

Another paper to be presented is that by Herbert M. Wilson, director department of inspection and safety of the Associated Companies, Pittsburgh, Pa., the subject being "The Practical Operation of Coal-Mine Compensation Insurance under the Kentucky Law."

The banquet in the evening of Friday, June 4, will be addressed by Henry Laviers of the Paintsville district; John G. Smyth, of the Elkhorn district; K. U. Meguire, of the Harlan district; Alex Bonnymen, of the Hazard district, T. E. Jenkins, of the western Kentucky district, and J. E. Butler, of the Stearns district, the subject for discussion being the effect of the labor report of the Bituminous Coal Commission on the respective fields represented. A first-aid contest will take place on June 5.

Seeks to End Car Shortage

Chairman Clark of the Interstate Commerce Commission on May 1 requested R. H. Aishton, president of the American Railroad Association, and Guy M. Freer, executive secretary of the National Industrial Traffic League, to appoint committees from their respective organizations to meet as a joint committee to devise means of reducing car shortage and congestion.

Chairman Clark also addressed a notice to all carriers and shippers asserting that individual and concerted action was needed for prompt restoration of better operating conditions and that only the greatest efficiency in transportation could prevent widespread economic loss.

Denver to Hold Concurrently Four Mine Conventions and a Contest

AS IF to save editors from excessive dining—their wining troubles are already ended by the Volstead Act and by certain changes in the Constitution—the Rocky Mountain Institute, the Colorado Metal Mining Association and the local chapters of the American Mining Congress and the American Institute of Mining and Metallurgical Engineers will hold their conventions at Denver on Sept. 9, 10 and 11 at the same time as the International First-Aid and Mine-Rescue Contest is held.

The Labor Situation

Edited by

R. Dawson Hall

Anthracite Conference Moves to Washington, D. C.

Operators and Mine Workers Are Still at Capitol City Trying to Bridge the Gap Between Them—Operators Reported to Have Made Offer of From 12 to 15 Per Cent

AT LAST something is stirring in the scale sub-committee for the anthracite region. The operators have offered a rate of increase ranging between 12 and 15 per cent and the mine workers have rejected it. As a consequence the operators and mine workers have been called by the Secretary of Labor to Washington to confer with him and have accepted the invitation. The sub-committee is still in the Capitol City.

On April 27 the operators made their counter-proposal to the sub-committee. What this was is not known exactly, but it is understood that it lay between 12 and 15 per cent. The official statement issued at the conclusion of the session read:

"The operators' representatives on the sub-committee of anthracite operators and mine workers have presented to the mine workers' representatives a written answer to the demands of the miners which the mine workers' representatives have now under consideration and which will not be made public until after the meeting of the sub-committee tomorrow night. The committee will meet at 7 p.m. tomorrow."

The promise to the press was, however, not fulfilled and even today just what the anthracite operators offered is not known.

On the next day the offer of the operators was considered by the full wage-scale committee of the mine workers at their headquarters in the Continental Hotel and they decided to reject it. This action was reported to the sub-committee of operators and mine workers that evening (April 28) and after a session lasting four hours this statement was handed out:

"The sub-committee of miners and operators met tonight. The mine workers replied to the operators' proposals as to the increase in wages and in reference to arbitration and declined to accept them. Pending further meetings of the conference, statements of both parties are withheld. The committee will meet tomorrow at 12:30 p.m."

Later in the evening the resolution offered by the operators, which called for arbitration of the differences by a commission of three representatives of the general public to be appointed by President Wilson, was given to the press. It ran as follows:

"Whereas, under date of March 9, 1920, at a general conference of anthracite operators and anthracite mine workers the workers presented to the operators certain specific demands covering wages and working conditions in the anthracite industry upon the expiration of the contract of May 5, 1916, and at that general conference four representatives of each party were appointed a committee to take under consideration the demands presented by the mine workers and to negotiate a new contract, and whereas, during the session of the said committee the mine workers modified two of their demands, to wit: the demand covering wages and the demand covering hours per day and days per week, and whereas, the committee after several weeks of earnest effort has been unable to reach an agreement, and whereas, it is to the public interest that there be no cessation of work and that anthracite coal shall be supplied to the consumer without interruption,

"Therefore be it resolved: That the President of the United States be requested to appoint three men unaffiliated with any anthracite operation or with any labor organization and representatives of the public who shall sit as arbitrators with this committee and decide all questions at issue based on the demands before the conference, the decision of the arbitrators to be final and binding on the parties to this submission."

While no official statement came from the mine-workers officials it was understood that John L. Lewis, International President of the United Mine Workers, had been in telephonic communication during the week with Secretary of Labor Wilson and it was said that the latter had been kept informed of the progress being made by the sub-committee.

That nothing was accomplished at the session held on April 29 toward conciliating the differences between the operators and miners was made known at the conclusion of the session. The offical statement reads:

"In recognition of the request of the Secretary of Labor, Hon. W. B. Wilson, the sub-committee of anthracite operators and mine workers will hold its next meeting in Washington, D. C., on Saturday morning at the office of the Secretary of Labor."

Must Pay "Check-Off" or Be Idle

SOME trouble has been experienced of late in the coal fields of the Province of Alberta because of the government's ruling that only miners acquiescing in the "check-off" for payment of dues to the United Mine Workers of America shall be permitted to work. This order was issued last January, but at first was not strictly enforced by the operators. Recently, however, the Minister of Labor agreed to accept responsibility for the regulation. This brought about an effort at its enforcement, with the result that the miners left work at two camps at Coleman, Alta., and at Blairmore and Canmore in the same province.

Thus are workingmen compelled by the Government to take part in conspiracies against the public whether they are or are not willing.

Texas Tonnage Rate So High That Increase Is Forty Cents Per Ton

TENTATIVE agreements affecting the wages of coal miners in Texas, except as to the apportionment of pay to machine crews, were reached at a conference of representatives of the coal miners with coal operators at Fort Worth, Texas, last week. The question of pay for machine crews was left for a conference on May 3.

The changes on which agreement has been reached will be effective for two years and will include:

An advance to all day and monthly men of $1 a day, except trappers and boys receiving less than men's wages, who shall be advanced 53c. a day; an increase in pick-mining rates of 40c. a ton, and in yardage, deadwork and room-turning of 20 per cent. These advances are added to the scale in effect on Oct. 31, 1919, and to be effective from April 1, 1920.

Among the coal operators present were: Gomer Gower, Ed. Britton, Judge E. B. Richey, Mier C. Johnson, W. H. John, A. J. Clendennin and W. F. Nance. Representatives of the miners were: John P. White, Cleveland, Ohio, appointee of President Wilson on the Bituminous Coal Commission: John Wilkinson, Muskogee, Okla., president of the United Mine Workers of District 21, embracing Texas, Oklahoma and Arkansas; G. H. Sparling of Gordon, Texas, board member of the United Mine Workers; Ed. Autry, Mat Rossato, Ed. Tidwell, Lawrence Santi, Joe Vietti and O. James, all of Thurber, Texas.

All points in the two-year working agreement between the coal miners and operators of District 21, United Mine Workers of America, which comprises Oklahoma, Texas and Arkansas, have been settled in accord with the recent award of President Wilson's commission, and harmony rules between miners and operators.

Wage Scale Granted Mine Workers of Northern West Virginia

IN Monongalia, Marion, Harrison, Preston, Taylor, Barbour, Randolph, Upshur, Lewis, Gilmer, Braxton and Webster counties and in the portion of Nicholas county containing coal or coal mines being operated along the line of the Baltimore & Ohio R.R. a new wage scale was granted to the mine workers on April 20, which is to be effective until March 31, 1922. It has been accepted by fully empowered representatives of the United Mine Workers of America and by the scale committee members of the Northern West Virginia Coal Operators of America, who were given power by the several operators of that area to make an agreement.

The International Union, the district officers and those of the subdistricts in the counties and the half county named guarantee the "fulfillment of this agreement . . . both in letter and spirit. The memorandum declares:

"Free rent, free powder, free coal, free light or any extra compensation paid in time or money, or otherwise, is hereby mutually construed as a bonus and is condemned, and it will therefore be assumed in operation under this contract and for future joint conferences convened for scale-making purposes that all such bonuses or advances in excess of wages provided in this contract were paid because of physical conditions in or around mines where such methods are practiced and the bonuses and wages as paid in whatever form shall constitute a part of the basic rates for such mines.

"The mining rate for entries shall be applied to all headings not more than 12 ft. wide and not less than 8½ ft. wide and to all cross-cuts not more than 14 ft. wide."

OUTSIDE DAY LABOR RATES

Occupation	Cents per Hour	Dollars per Day
Pickers and slate boys (where employed)	48¾	[illegible] 90
[illegible] on tenders	50	4 00
[illegible] Car [illegible] and Car [illegible], Greasers, Blacksmiths' helpers, Machinists' helpers [illegible]	63	5 05
[illegible]	66	[illegible]
[illegible]	67	5 41
[illegible] helpers	68	5 48
[illegible]	68	[illegible] 50
[illegible], Car repairmen, Machinists [illegible], Conductors on engineers and firemen	72	5 80
[illegible] generators [illegible]	81	6 50
[illegible]	85	6 80

INSIDE DAY-LABOR RATES

Occupation	Dollars per Day Open Light	Dollars per Day Closed Lights
Trappers	3 53	3 61
Machinists helpers (inside) 65c hourly	5 20	5 20
Timbermen helpers, Wiremen helpers, Pumpers, Brattice men helpers, Greasers	5 24	5.32
Cagers [illegible]	5 28	5.32
Cager's helper	5 44	5.53
Trackmen helpers	5.56	5.64
Pipemen	5.68	5.76
Drivers, Gathering-locomotive helpers, Tripmen, Ordinary trackmen, Slatemen, Timbermen, Wiremen, Brattice men	5 76	5.84
Motormen, all classes, Motormen helpers, Gathering locomotive men, Main-line trackmen	5 86	5 94
Shotfirers, Cagers	5 92	6.00

RATES FOR MINING PER NET TON COAL FIVE FEET OR OVER

Type of Work	Open Lights	Closed Lights
Pick Mining		
Room and pillar	$0 8760	$0 890
Entries	0 9360	0 950
Electric Machine Work:		
Loading, hand drilling, in entries	0 6470	0.660
Cutting, without drilling, in entries	0 1690	0 175
Loading, hand drilling, in rooms	0 6270	0 640
Cutting, without drilling, in rooms	0 1523	0 155
Loading, machine drilling, in entries	0 6270	0.640
Cutting, electric chain-machine drilling, in entries	0 1790	0.185
Loading, machine drilling, in rooms	0·6070	0.620
Cutting, electric chain-machine drilling, in rooms	0 1623	0 165

RATES FOR MINING PER NET TON COAL UNDER FIVE FEET.

Type of Work	Open Lights	Closed Lights
Pick Work:		
Hand drilling, room and pillar	$0 9500	$0.9640
Hand drilling, in entries	1.0650	1.0790
Loading, hand drilling, in entries	0 7575	
Cutting, hand drilling, in entries	0 1948	0.2008
Loading, hand drilling, in rooms	0 7000	0 7130
Cutting, hand drilling, in rooms	0 1583	0.1610
Loading, machine drilling, in entries	0.7375	0.7500
Cutting, machine drilling, in entries	0 2048	0.2108
Loading, machine drilling, in rooms	0 6800	0.6930
Cutting, machine drilling, in rooms	0 1683	0.1710

Mine-Run Base and Pay for Slate Cause Break in Eastern Ohio

AFTER being in session three days at Wheeling, W. Va., the joint conference between about forty operators representing all sections of eastern Ohio and the official of sub-district No. 5, United Mine Workers of America, adjourned on Wednesday, April 21, without any agreement being reached.

Because of the inability of the miners and operators to agree on the forty-one different points of contention it was decided to appoint a special scale committee of ten operators and ten miners to consider the various demands presented, that committee beginning its sessions on Thursday, April 22. The two most important demands of the miners were: Payment for all coal on mine-run basis, and payment for all stone moved.

Kansas Industrial Relations Court Held Constitutional in District Tribunal

Judge Curran Declares Divine Right to Strike Is Like the Divine Right of Kings, as Dangerous as It Is Untrue and That the Court to Limit It Was Formed in Lawful Exercise of Legislative Authority

JUDGE ANDREW J. CURRAN declared the new Kansas Court of Industrial Relations to be constitutional in a decision announced in the Crawford County District Court, April 30.

Judge Curran then granted a temporary injunction forbidding Alexander Howat and other district and local union officials of the Kansas district of the United Mine Workers from calling a strike.

The decision was rendered on a demurrer offered by the defense to the application of the State. He quoted legal authority from Blackstone to Chief Justice White in support of the broad police power of the State.

"I am not concerned with the wisdom of the Legislature in passing this law," Judge Curran said. "Whether the law is economically wise or unwise is not for the court to say. The one question to be considered by me is whether the law is in conflict with the Bill of Rights, the Constitution of the United States or with the Constitution of the State of Kansas."

Judge Curran said he did not believe that the Fourteenth Federal Amendment curtails the police power of the State or that the State has ever surrendered any part of that power to safeguard the health, morals and general welfare of its citizens.

He declared that the State was paralyzed by the mining strike last December; that cities were dark, schools were closed, the sick and afflicted in institutions threatened with freezing, and the means of moving food interfered with.

"If the State should stand by and not correct such conditions it would be a reproach to organized government and to civilization," the Judge asserted.

"The conditions that prevailed last December give an idea of the purposes and intent of the Legislature in enacting this law, and of the object sought by our State through this legislation.

RIGHT TO WORK AS SACRED AS RIGHT TO QUIT

"A great deal has been said of the divine right to strike and the divine right to quit work," Judge Curran said. "In stressing the divine right to strike, the divine right to work, the right of the man to have employment so he can provide for his wife and children has been sadly overlooked. The divine right to strike, where it affects the health and welfare of the public, must be relegated to the realm where the divine right of kings has been sent."

As the workers in the Kansas mines are now largely at work, Judge Curran did not make the injunction mandatory, as the State had asked. He said that he would make the injunction mandatory if a showing were made during the life of the injunction that the mines were idle. The temporary injunction will be in effect until May 12, when the application of the State to make it permanent is set for hearing.

As already stated, when the district leaders of the United Mine Workers of America were summoned to appear before the Court of Industrial Relations of Kansas, which is comprised of George H. Wark, a lawyer, Clyde M. Reed, a newspaper publisher, and Mr. Huggins, by whom the law for the establishment of the court was framed, they refused to appear and were committed to jail. Whereupon the mine workers of Kansas went on strike to force the hands of the court by which their leaders were committed.

Judge Curran, of the Crawford County district court, on April 15, overruled a motion for a retrial, which was asked by Alexander Howat, Thomas Harvey, August Dorchy and R. B. Foster. Phil H. Callery, the attorney for the arrested men, questioned whether to appeal the matter to the Supreme Court, seek a release of the men under a habeas corpus action or give bail. The last consideration won, but meanwhile the attorneys for the prosecution prepared for a new move.

They made, late on April 16, a motion to amend the injunction suit so that the petition would require "the defendants, who are members of the district board of the United Mine Workers of America of District 14, to issue an order legally and properly signed and to publish the same in accordance with the rules and practice of said labor union, directing all members and workers to return to work in said mines and to continue to perform labor therein in the manner reasonably necessary to enable the owners to continue the normal productions during the pendency of such litigation."

Despite the protests of the counsel for the mine workers, who argued that the hearing in this new phase in the case could just as well be left till April 27, when the whole matter was to be heard, the court made its decision on the following day, April 17, ordering Alexander Howat and other officials of the Kansas district union to instruct the mine workers to go back to work, informing them in his decision that if they did not heed his instructions they must be prepared to show cause on April 27.

At that time all the mines in the state, except one shaft and three steam-shovel pits, were idle. In fact, it is estimated that 11,700 mine workers were "taking a vacation."

Much of the friction was removed, however, that same day, for bonds were presented to Judge Curran for the union officials and were accepted by him, orders being given by the court that the men be released from prison. A. B. Kellar, county attorney, immediately notified the sheriffs at Ottawa and Iola that they should not only release the men but offer them transportation to Pittsburg, Kan.

The district officers sent out orders, on April 19, requiring the men to go back to work. Some did, but thirty mines did not. In the Franklin region all the mines remained closed. Mines in other regions also remained idle, but volunteered the explanation that they were on strike because the price of explosives was too high and not because they desired to make trouble for the Court of Industrial Relations and for Judge Curran.

Discussion by Readers

Edited by
James T. Beard

Proper Methods of Erecting Trolley-Wire Guards in Mines

Referring to the inquiry, *Coal Age*, Mar. 11, p. 506, as to the requirement, in compensation-insurance regulations specifying a width of 5 in. between the guard-boards protecting a trolley wire, in a mine, permit me to say that my experience is that the boards or guards protecting the trolley wire should be wide enough apart for the trolley-wheel and harp to have ample room when the wheel happens to jump the wire.

The reply to this inquiry said that reducing the width between the boards will give less opportunity for the trolley to jump the wire. My experience is that there is more danger in having the boards too close together, than when they are spaced further apart. The narrow space within the boards is more liable to cause an accident to the trolley.

In practice, I have seen a trolley jump the wire just as it was entering the guard-boards, with the result that the boards were torn out by the trolley-wheel and its harp striking the ends of the boards and failing to enter the narrow space between them. In another instance I witnessed, the harp was pulled off the trolley-pole, and the pole broken, because the space was too narrow.

Therefore, I prefer spacing the boards a sufficient distance apart to leave ample room for the trolley between the boards and the wire. In my opinion, this very much reduces the chance of an accident.

Oak Hill, W. Va. **William Dickinson, Sr.**

An Unpractical Mine-Rescue Searchlight

Kindly allow me the privilege of referring to the brief article that appeared in *Coal Age*, in the department Ideas and Suggestions, March 4, p. 429, describing what appears to be a home-made contrivance that the designer claims to believe would provide an effective searchlight to be carried into a mine by a rescue party. The statement is made that "ordinary safety lamps or the small electric flashlights are or may be inadequate for the purpose intended."

The proposed device or apparatus, as illustrated, consists of a half-dozen drycells or batteries connected in series with an automobile spotlight. The cells are set in a rough wooden box to the end of which the spotlight is attached. A bail is attached as a handle for carrying the box. It is stated that this device will furnish "a portable light of high power that can be safely used in a gasey or dust-filled atmosphere."

No one will deny that the most important work of a rescue party when entering a mine after a disaster is to take every precaution to avoid further danger or injury to themselves or to those who may have survived and are still alive in the mine. No one who would suggest carrying such a device as this into an atmosphere supposed to be explosive and dangerous could be accused of applying even the first principles of "safety first."

Exploring a mine after an explosion is not only hazardous work but requires strenuous exertion where the explorers must crawl over high falls, squeeze through timbers and drag themselves through narrow holes, all of which calls for the most simple and reliable equipment possible both to light their way and enable them to breathe a supply of pure air when surrounded by poisonous gases that may also be explosive.

Why the Device Should Be Condemned

One can easily imagine what would happen to this collection of drycells contained in a bulky wooden box, which would with the greatest difficulty be carried through entries filled with débris and fallen timber. A loose wire or connection and a spark across the gap would cause the ignition of gas and a second explosion that would kill the rescuers and any possible survivors of the first disaster.

It is to be hoped that there are no mine owners or superintendents living who are so far behind present mining practice as to fail to provide apparatus that is essential to safety when the work of rescue must be performed, following a disaster in the mine. Such equipment includes not only the necessary breathing appartus to permit the rescuers to enter and work in a poisonous atmosphere, but modern electric mine lamps that have been tested and approved by the Bureau of Mines for such work.

Surely, no one familiar with conditions following a mine disaster will hesitate, for a moment, to condemn such a sucidal apparatus as illustrated and described in the short article to which I have referred. The description of such a device in a standard publication like *Coal Age* is sufficient, in itself, to cause some men to try it without considering its dangerous possibilities. I want to ask, would not a censorship be justified?

Victoria, B. C., Canada. **James Dixon.**

Avoidable Degradation of Coal

Letter No. 4—In order that the operator may obtain the largest possible percentage of lump coal, with the least admixture of dirt and slack, both in the anthracite and the bituminous districts, he must make every effort to plan out his scheme of mining to that end.

The mine must be equipped with modern appliances for the transportation, handling, conveying, cleaning, washing and preparation of the coal. In the equipment of the mine, the chief aim of the operator is to secure the largest possible yield of high-priced marketable coal, from the product loaded into the car by the miner. Bearing this in mind let us study briefly some of the conditions affecting these desired results.

We will start with a solid face of coal in the mine chamber. The coal may have laminated seams of slate or bone interstratified with the coal. In some cases, the slate is thick enough and so situated in relation to the coal that its separation therefrom is easily made. At other times, the refuse is in thin slabs that adhere to the coal and which are difficult of separation. Still again, there is a solid face of clean coal.

As the coal lies in its bed, there is 100 per cent of lump coal. The physical conditions just mentioned, and the skill of the miner coupled with his desire to produce a car of coal of the highest value are the chief factors that determine the maximum yield of lump and other marketable sizes of the coal. But, while it is true that the physical conditions existing in the seam cannot be changed, it is possible to so plan the mining of the coal as to take advantage of the peculiarities present.

Considerations That Must Be Taken Into Account When Laying Out a Mine

Efforts in this direction must begin with the laying out of the mine: determining the proper direction of driving the entries and rooms; deciding the correct width of pillar and opening; and adopting a suitable method of extracting the coal, at the working face. All of these bear directly on the ease with which the coal is broken down and the percentage of coal that can be recovered in a marketable condition from the pillars, which must be of sufficient size to prevent the coal from being crushed by excessive roof pressure, before it can be properly mined.

In my experience, it is possible to teach the miner to use more judgment and skill in the performance of his work. This can be done by employing mining instructors for that purpose. Better results, however, are obtained by employing high-class assistant foremen, each of whom should have charge over a limited number of men. Instances have come under my observation where good results have been obtained through instructing the miner in the proper use of explosives, topping their cars and shooting the coal. Not only is the coal mined in better shape, but the labor of breaking up the lumps and loading them into the cars is made much easier where the work is performed according to the instructions given.

It is quite evident that the majority of miners do not exercise their best efforts in the production of a clean car of lump coal. This is not from lack of skill, but from a want of desire on their part. In other words, like the most of mankind, the miner gets away with all he can, not realizing that his neglect injures his own interests as it does those of his employer.

Effect of the Contract System in Mining

I cannot agree with William Wesnedge, *Coal Age*, Feb. 26, p. 416, that the contract system is so largely responsible for the loading of inferior coal. It is true that the contract system puts a premium on *quantity* rather than on *quality* of production. However, we have found, in Pennsylvania, that it is practically impossible to get a day's work from a miner in cases where he is paid by the day.

In some sections of Alberta, and possibly the same may be true in British Columbia, the day-wage system has proven not only popular but productive of good results. In my opinion, this situation is covered very well by the present system of testing cars for refuse, and docking the miner for loading slate and bone with his coal or where his car is not up to the standard. This system, however, has its weak points and by no means solves the problem.

In my opinion, a policy of co-operation on the part of the management, combined with some profit-sharing scheme, would go a long way toward affording a practical solution. Such a scheme would eliminate many other difficulties besides, in the mining game. It appears to me that the hearty co-operation of employers with their men, and a well-thought-out scheme of profit sharing are the determining factors in securing desired results.

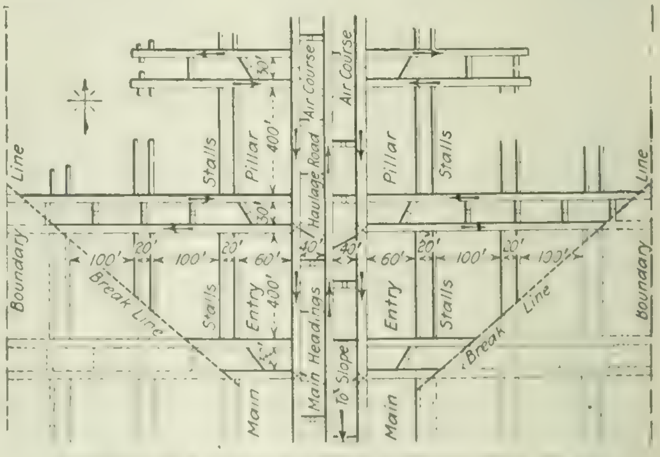
The amount of money involved in the payment of bonuses would be well invested. Some individual coal companies have worked out a scheme of bonuses by contract system, while others have tried to accomplish the same results by encouraging competition between sectional foremen in charge of different sections of the mine. However, this scheme has not been given as fair a trial in the mines as in some manufacturing establishments. I am confident if the right man—one who was trusted and had the confidence of his men—started such a scheme, the result would be encouraging.

Scranton, Pa. MINE SUPERINTENDENT.

Working Kanawha River Coal

Letter No. 5—Referring to the problem presented in the inquiry of Arthur L. Sheldon, *Coal Age*, Feb. 26, p. 419, regarding the extraction of the coal from three overlying seams in the Kanawha River District, permit me to commend the good judgment shown by Mr. Sheldon in desiring to secure the practical views of others regarding the best method to adopt in the working of that coal. It is with pleasure that I offer the following suggestions, hoping that they may be of some benefit to him and assist the solution of his problems.

For the ventilation of the subsequent workings, I would sink a shaft that would penetrate all three of the seams. This shaft would be used solely for ventilation, and the coal would be taken out through a slope as I have indicated in the sketch submitted herewith. The mine should be opened by sinking a slope having a grade of about 25 per cent. The slope should be started from a point convenient for loading and shipping the coal, say somewhere between the railroad and the base of the mountain. It should be driven in the direction of the hills and away from the river. Not knowing the points of the compass in this Cedar Grove locality, I will call the direction of driving the slope



MINING THE COAL ON THE RETREATING PLAN

north, ana assume that the river runs east and west, which will enable me to more clearly explain my method of working.

Assuming that the slope and its air-course have been driven to the lower seam, starting at the top. main headings should be driven, three abreast in each seam, thus dividing the mine into two sections or sides, in each seam or lift. As these main headings are advanced, cross- or butt-headings are driven to the right and left. These are driven two abreast on 400-ft. centers. Again, as the butt-headings are advanced, -10 ft. stalls are driven north and south off the butts. The stalls are driven in pairs with 20-ft. pillars between them, and leaving 100 ft. of solid coal between each pair of stalls. As the stalls from consecutive pairs of butts are driven up they hole into each other. Crosscuts are driven in the 20-ft. pillars, on 40-ft. centers, which provides for the good ventilation of the stalls.

EXTRACTION OF THE COAL IS STARTED AT THE BOUNDARY ON THE RETREATING PLAN

When the stalls have been completed in the first and second butt-headings, the work of drawing back the 100-ft. and the 20-ft. pillars of coal, between these headings, is started by cutting across the 100 ft. pillars separating the several pairs of stalls. These pillars are worked out on the retreating plan, the extraction being started at the extreme east and west ends of the butts. Starting at the north end of a 100-ft. pillar, it is possible to work 4 or 5 men, and to stand from 8 to 10 cars on that face.

This plan of working possesses a positive advantage over the room-and-pillar method of working. The motor is able to pull out a trip of 8 or 10 cars from this face in almost the same time that it would take to pull a single car from the face of a room. Such being the case, it will be readily seen that from six to seven times more coal can be put out by this method than is possible in the room-and-pillar plan of working.

In respect to the system of haulage on the main slope, I very much prefer rope haulage to any conveyor system. A good rope haulage in a slope is better, in my opinion, than hoisting the coal in a shaft. I do not approve of dumping coal in the mine and, for that reason, would not use either skips or conveyors as was suggested by Mr. Sheldon, in his inquiry.

CONNECTING THE SLOPE WITH THE MAIN HAULAGE ROAD IN EACH SEAM

In order to make sure of a good connection where the slope passes through each seam, I would start a sufficient distance back on the slope and widen out so as to provide sufficient clearance for a second track leading into the seam. The work should be secured by a concrete arch over the haulage slope and further supported by a concrete base for the sidetrack leading to the seam. This arrangement would enable me to pull coal from any one of the three seams, by means of the haulage rope in the main slope.

Regarding the order of working these seams, it is my experience that the work, in each overlying seam, should be kept about 200 ft. in advance of that in the seam next below. This plan should be followed, until the extraction is complete up to the main barrier pillars protecting the main slope and air-courses. The extraction of the coal in the barrier pillars and the slope pillars should not be undertaken until the last, and when these pillars have been drawn back, the mine will be abandoned. In my opinion, the plan I have suggested will insure a greater daily tonnage than what is mentioned in the inquiry as being desired. I believe this method is not as expensive a one to install and equip, as would be a shaft, or a skip-hoist. C. W. ATKINS.

Switchback, W. Va.

Present-Day Industrial Democracy Compared with That of Former Times

Many interesting articles have appeared in *Coal Age*, on Industrial Democracy, Co-operation, Co-ordination and kindred themes relatng to the mining industry; but I consider that the editor has given what is by far the most graphic illustration of them all in his Foreword, in the issue of February 26, which to my mind explains clearly the present-day situation that confronts all classes. I fear that the article was passed over by many who may have failed to grasp the true thought expressed. If so, I hope such will turn back and read the article for the good of their fellowmen.

We need not go back many years to recall the pleasant understandings that existed between the bosses and the workmen and the extreme cordiality that was manifest between all classes. As the editor states "the workmen discussed matters with the Boss" and many questions concerning the work itself were handled by the workers. It is needless to mention that workmen were trusted by their bosses and vice versa. A knowing confidence existed between the men that engendered that spirit of reliance on each other and naturally their problems were readily handled. But today, that confidence is somewhat wanting. Work is placed before the men with definite plans for each little detail, and originality and individual instinct is left out. Plainly, it is all mechanical. We truly need some of the old time-honored co-operation.

CONTRASTING THE PRESENT WITH FORMER TIMES

A few years ago, a boss when making his rounds would invariably talk over the problems of the day with his men, and his meaning was more clearly understood than is possible in the rush of today. In those days, the boss did not have so much "red tape" to carry around in his pockets and to overtax his brain. He was care-free, in many respects, and able to follow his work more closely—a man of the hour and always on the job. While the present-day boss must keep busy and be ever on the job, yet his accomplishments do not seem to be as great as in the old time. The reason is, I believe, because he has too many "straight-line" methods to follow and is not given enough freedom. I do not wish to be misunderstood, as I am speaking from a practical standpoint and for the good of all concerned.

The "mutual understanding" referred to by the editor, which existed in the olden days was undeniably the rock upon which success was founded. There was plenty of work and everybody was busy. The work was accomplished with more ease than seems possible today and there was less grumbling. Patience was a manifest element. The boss listened attentively to community and industrial matters alike, giving his opinion whenever asked and for the best interests of all. He was always clearly understood, as he talked in a language familiar to the men.

Again, I remember the days when the bosses would get together and talk over their problems with the general boss. At these meetings, he could show a boss what his haulage, pumping, tipple or other work was costing, and compare the same with previous work. He would help to figure out a possible way in any difficulty. The general boss, on his part, would ask for opinions and weigh them carefully. Thus they compared everyday problems and worked out a method for all to adopt; or, at least, give to each a general idea, leaving the details to be worked out to suit the different conditions.

This plan increased the efficiency at the different mines, and a particular scheme was not adopted for all the mines, regardless of conditions, as is so general at present.

It is too true that many orders given today do not suit the conditions in a particular mine. The order, no doubt, has been successfully adopted at one mine; but that does not mean it will be equally successful at another. To thus force an impractical plan onto the shoulders of men who know by experience a better way will naturally cause dissatisfaction. To have this occur often only increases the resentment on the part of all concerned, which retards production in the mine. Then, what happens? Simply, the management wants to know why! The man gets a notice, "Please explain," and he is fortunate if he can do so with satisfaction.

FRIENDLINESS IN MINE MANAGEMENT

I am a firm believer in friendliness and personality, as suggested by the editor. I pity a man without a friend and, to have friends, one must be a friend himself. To my mind, discipline should be founded upon friendliness, at least to a great extent, as discipline will surely fail of actual worth, unless friendliness is upheld. What man will listen to discipline and be satisfied, in body and mind, unless a friendly attitude is also extended. Therefore, I do not feel that friendliness undermines discipline, but I do know that discipline will undermine friendliness, if it is not properly used. To such an extent will this be true that the industrial activity of a mine or plant will be materially lessened; and unless friendliness is engendered there will ever be a charge on the hands of the employers.

But the old personal touch with the old friendly characters will do more to take up the lost motion that now exists, than any method I know. Industries seem to be built around too much "young blood," who have too many new and "castle" ideas. Some of the old stock should be added to this young blood to hold them down. Not the old ways of doing things at the mines, but the new and efficient methods, with the old tried-and-true Industrial Democracy, as it is termed today. "BEN."

W. Va.

Shifting the Worker

Letter No. 6—The incident cited in the inquiry signed "A. H." *Coal Age*, Feb. 12, p. 327, makes me wonder that a superintendent could treat a fellow workman with such contempt and with so little consideration for the man's well being. I hope that this type of superintendent is in the great minority.

In my opinion, it would have paid that mine official far better if he had taken a few moments to look over the circumstances and had regarded the matter from an unselfish standpoint. A man must put himself in the other fellow's place before he can appreciate his position. Had this superintendent done so, he would not have lost a good man, who had probably performed faithful service but who was compelled to move by reason of the treatment accorded him.

Having filled every kind of position about the mine, both above and underground, my experience compels me to think that "A. H." did not receive fair treatment. He would probably have been glad to have continued his duties at the substation, until the superintendent could find a man for the place. In my judgment, the language used by the man's superior was uncalled for and showed bad taste on the latter's part.

There is little wonder that there is so much unrest among mine workers at the present time, when they receive so little consideration in the struggle to better their condition. A superintendent who will treat his men in the manner described can never hope to get from them anything better than eye service.

It may be that the superintendent in question was born with a silver spoon in his mouth; but, unless that is the case, he could hardly look back on his own career without recalling a time when some one gave him an opportunity for stepping higher, such as he refused to the man in his employ.

It would be well for ourselves and those we employ if we could, periodically, take account of stock in ourselves, so to speak, consider our manner of dealing with our men and its results. There would be better feeling all around and, at the same time, better service would be given. It goes without saying that treatment such as this man received can never do otherwise than breed dissatisfaction among workers.

EXPERIENCE OF AN EFFICIENT TRACK BOSS

Speaking of ill treatment of men, I recall an experience that was my own some 27 years ago. At that time, being in charge of the tracks on the main haulage road in a mine, I drew the mine forman's attention, one day, to a bad section of roof over a switch, and asked him to have the place timbered, at night, as it was impossible to do the work in the day when the mine was running. The foreman neglected to do this, however, and I was not surprised when coming out of the mine, a few days later, and approaching the place, I was suddenly halted by a heavy roof fall, while the man a little ahead of me narrowly escaped being killed.

Finding the mine supetrintendent and foreman at the bottom, I reported the circumstance to the former, only to be told that I was to blame in the matter. I informed the superintendent that I had reported the bad condition of the roof to the foreman a few days previous. In reply, I was told to study the mining law, a thing with which I was already familiar, having studied it carefully, in preparation for examination.

My surprise can easily be imagined when, the next day, I was instructed to call at the office where the payclerk gave me my money and told me I was "fired." He could give no reason for the act. However, as the result proved, it was the best thing that could have happened to me. Like "A. H.," I found a better place, with another company, where I received good treatment and a year later was made superintendent at the mine, which adjoined the one where I formerly worked.

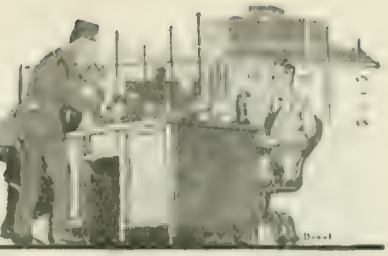
In the course of time, I accidentally met the superintendent who succeeded the one who fired me. In the course of the conversation that followed our meeting, he told me the reason I was fired was that I knew too much to suit the former superintendent, who blamed me for reporting things to the mine inspector, because that official found much in the mine that needed attention.

————, Pa. FAIRPLAY.

Inquiries of General Interest

Answered by

James T. Beard



Contract System of Mining Coal

We are desirous of obtaining some information regarding the contract system, which we understand is in use in some Pennsylvania mines. Can *Coal Age* or any of its readers explain who has supervision over the work, and what is the basis of settlement. Is the coal mined paid for on a tonnage or a yardage basis? How large a portion or section of the mine is let out on contract, and who furnishes the mules or other means of haulage, and supplies the timber, trackage, etc.?

Akron, Ohio. MINE SUPERINTENDENT.

This question was submitted to a practical mining man who has had much experience in that class of work, and the following reply was received:

Prior to the advent of the United Mine Workers organization, in the anthracite coal fields, some of the coal companies made a practice of letting a contract to a miner to mine the coal in certain sections of the mine, or in a certain number of working places. For example, a miner would take a contract for mining the coal in all the places on a certain gangway. He hired his own miners and laborers, and in a few instances employed the drivers, car-runners and door-tenders working in his own section or gangway.

The contract system of mining proved very satisfactory and developed a high efficiency, per man. I wish to emphasize what may seem a peculiar fact; namely: greater results are obtained, per man, where the work is in charge of a contractor, or the mine is worked by a small individual operator, as compared with a large corporation. This fact was clearly proved by the results of the contract system where the work was closely supervised by the man most deeply interested.

The advantage peculiar to the contract system is that the contractor is in a better position to control all matters affecting the cost of production. In this respect, he has the advantage of the most capable mine foreman, whose authority is largely handicapped by his superiors in office, and who cannot, therefore, exercise the same control over the many details that affect the cost-sheet. On the other hand, the contractor can arrange the work and move his men from place to place as conditions may require. He is also able to secure a greater recovery of coal and protect his men from danger to a greater extent than would be possible if he were acting as foreman of the mine.

The contract system, however, is not without its objectionable features. A large contractor frequently becomes prosperous and exercises an overbearing manner toward his men, thereby breeding a jealous contempt among them. The contractor is also generally favored by the company in their distribution of cars. In a slack time, the contract miner will be given steadier work and have fewer idle days than the company miner, which increases his earning capacity.

This manifest favoritism of the company toward the contract miner, aroused much opposition when the miners' union became fairly well established in the region; and the result was that at the termination of an agreement between the miners and operators, the demand was made by the union that no miner be permitted to work more than one place or employ more than two laborers. This grievance has been repeatedly presented to the Board of Conciliation, and it is my impression that the decision has finally been reached that all miners are entitled to an equal distribution of cars. The fixed award of the Anthracite Coal Strike Commission reads as follows:

> That mine cars shall be distributed among miners, who are at work, as uniformly and as equitably as possible, and that there shall be no concerted effort on the part of the miners or mine workers of any colliery or collieries, to limit the output of the mines, or to detract from the quality of the work performed; unless such limitation of output be in conformity to an agreement between an operator or operators and an organization representing a majority of said miners in his or their employ.

At the present time, the mine foreman has general charge of all persons employed in the anthracite mines of Pennsylvania. The individual miner is considered a "contractor." He cuts and loads the coal for which he is paid on a stipulated basis, per car, or per yard, as the case may be. In the comparatively flat fields of the Lackawanna and Wyoming Valleys, the miner is paid by the car and he, in turn, pays his laborer one-third of the price for loading. In fairly big good coal, six or seven cars, containing from 80 to 100 cu.ft. is generally considered a shift.

Recently, the laborer has taken advantage of the miner and has insisted on the payment of a full shift for each day that he goes into the mine, regardless of the number of cars loaded. This has naturally worked a hardship on the miner who is frequently obliged to load his own coal, and the physical condition of many of the older miners is not equal to the task. It will be readily seen that miners working in the thinner seams can better afford to meet this condition and pay the laborer a full shift, because if he fails to get cars he can arrange to take up bottom or blow down his roof, as the case may be.

In the Lower Valley, the coal lies at a much greater angle or pitch and is generally mined by the yard and loaded from chutes by company loaders. The miners usually work as partners and divide their earnings on a 50:50 basis. The gangway miners, in this field, also drive the airways or what are known as "chutes" and "headings." This is essential to the safety and efficiency of the operation. Both in the upper and lower fields, the miner is paid for lifting bottom, blasting down roof standing timber and building brattice.

The work is supervised by the mine foreman and his assistants, each assistant being given a certain section, the size of which depends on conditions. Each miner furnishes his own supplies of powder, oil and tools, for himself and his laborer. All other material is furnished by the company. Under favorable conditions in these valleys, the chamber or breasts are driven on 60-ft. centers and opened to a width of 30 feet.

Examination Questions

Answered by

James T. Beard

Mine Inspectors' Examination, Held at Pottsville, Pa., March 30, 31, 1920

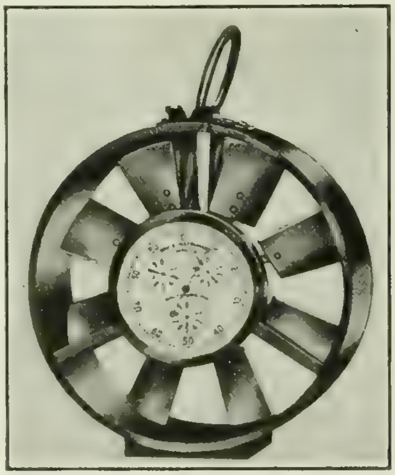
(Selected Questions.)

Ques.—Explain what is meant by the capacity of an air compressor.

Ans.—The capacity of an air compressor is expressed by the quantity of free air it can deliver each minute, and is equal to the piston displacement, in cubic feet per minute. This is the theoretical capacity of the compressor and is approximated but never actually attained by any compressor in operation.

Ques.—Describe the anemometer and state its use in relation to mine ventilation.

Ans.—The usual form of the Biram anemometer is shown in the accompanying figure. It consists of the revolving vane having its blades inclined to the plane of revolution. The inclination of the blades is such that an air current, moving with a velocity of one foot a minute, will produce one revolution of the vane in that time. In other words, a single revolution of the vane corresponds to one foot of air travel. The vane is connected, through a series of gears, to a recording dial that indicates the number of revolutions of the vane. The instrument is used to ascertain the velocity of the air current in an airway in a mine. The number of revolutions shown by the reading of the dial divided by the number of minutes the instrument is exposed to the current gives the velocity of the air in feet per minute. The measurement of velocity by the anemometer is merely approximate, but it is much used in mining practice.



THE BIRAM ANEMOMETER

Ques.—Describe a rescue apparatus with which you are familiar.

Ans.—Without referring to any particular type of breathing apparatus, all of which involve the same principles of construction, it may be said in reply to this question that the principal features of breathing apparatus are an oxygen cylinder equipped with a reducing valve by which the high pressure to which the oxygen is compressed (120 atmospheres) is reduced to a normal pressure for breathing. A breathing bag with inhaling and exhaling divisions is connected by tubes with a mouthpiece or helmet worn by the operator. A mouthpiece and nose clip are generally preferred to the helmet, as the latter is too bulky for use in the mine. The apparatus contains a regenerator holding caustic soda, which absorbs the carbon dioxide from the exhaled air, making the air again respirable. In use the breathing bag is first filled with pure air. As this air is inhaled by the effort of breathing and again exhaled, it passes into the exhalation side of the breathing bag, where it comes in contact with the caustic soda, which removes the carbon dioxide from the air. The air, slightly depleted of its oxygen, then passes into the inhaling division, where it is mixed with fresh oxygen from the oxygen cylinder. The oxygen is delivered at the rate of two liters per minute, which is the estimated supply needful to restore the air, which has lost some of its oxygen through absorbtion by the blood in the act of breathing.

Other parts of the apparatus are a pressure gage for indicating the quantity of oxygen remaining in the cylinder, an emergency bypass and valve that provides for the filling of the breathing bag with oxygen, in case the reducing valve fails; a saliva trap to prevent the saliva from the mouth entering the breathing bag; an inspiratory and expiratory valve for regulating the flow of the air to and from the breathing bag to suit the requirements of the wearer.

Ques.—A volume of 200,000 cu.ft. of air enters a mine at a temperature of 40 deg. F.; what is the volume at the outlet, the temperature being 70 deg. F.?

Ans.—Assuming there is no increase of volume due to the presence of mine gases in the return, and ignoring the effect of the decrease of ventilating pressure in the return airway, the volume of air passing varies directly as the absolute temperature. In other words, the volume ratio is equal to the absolute-temperature ratio. Therefore, calling the required volume of air in the return airway x we have

$$\frac{x}{200{,}000} = \frac{460 + 70}{460 + 40} = \frac{530}{500}$$

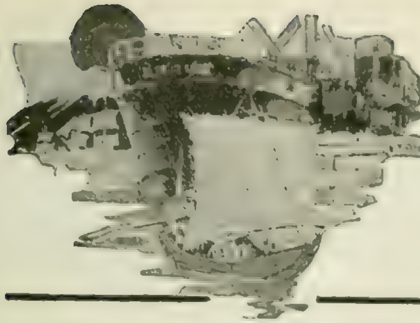
$$x = \frac{200{,}000 \times 530}{500} = 212{,}000 \text{ cu. ft.}$$

Ques.—If 10,000 cu.ft. of air passes per minute through an airway 12 ft. in diameter, how many cubic feet per minute will pass through an airway 6 ft. in diameter, the length and pressure being the same in both cases?

Ans.—For circular airways of equal length, the quantity of air circulated by the same pressure is directly proportional to the square root of the fifth power of the diameter. In other words, the quantity ratio is equal to the square root of the fifth power of the diameter ratio. Therefore, in this case, calling the required quantity of air x, we have

$$\frac{x}{10{,}000} = \sqrt{\left(\frac{6}{12}\right)^5} = \sqrt{\left(\frac{1}{2}\right)^5} = \frac{1}{\sqrt{2^5}} = \frac{1}{\sqrt{32}}$$

$$x = \frac{10{,}000}{\sqrt{32}} = \frac{10{,}000}{5.657} = 1{,}757 \text{ cu.ft. per minute.}$$



Foreign Markets and Export News

Bulgaria's Coal Resources Are in Need of Development

Only One of the Country's Mining Regions Has Been Extensively Developed, Twenty-three Miles From Sofia—Greater Part of the Coal Produced Is a Fair Quality of Soft Brown Lignite

As the production of coal in Bulgaria is insufficient for the needs of the country, Consul Graham H. Kemper, Sofia, reports, under normal conditions coal must be imported. Coal mining has not reached an advanced stage, nor is the coal produced of a very high grade. The conditions under which it is mined are such that the average output per man is very low, now approximately one-third of a ton per day.

Only one of the numerous coal-mining regions in Bulgaria has been extensively developed, the Pernik region, lying about twenty-three miles southwest of Sofia. The mines there are owned by the State and supply the greater part of the coal mined in Bulgaria. The productive area of these mines is said to be about twenty-three square miles. The State mine Bobov-Dol, situated about fifteen miles south of the Pernik mines, is the second in importance. The region covers a greater area than the Pernik region, but its productive area is smaller.

Other deposits, not yet extensively developed, are found in the Balkan Mountains between the towns of Gabrovo on the north and Sliven on the south; in the region north of the Maritza River, not far from Stara-Zagora; and in the territory around the Black Sea port of Burgas. Some of the mines in these regions are owned by the State; other mines and concessions are privately owned.

The greater part of the coal produced in Bulgaria is a fair quality of soft, brown lignite. Black coal, however, is found in the Stara Plaina or Balkan Mountain region.

The following table shows the annual production of coal in Bulgaria during the years 1911-1919 (metric ton = 2,204.6 pounds):

	Lignite, Metric Tons	Black Coal, Metric Tons
1911	260,540	8,064
1912	306,488	7,055
1913	347,525	10,220
1914	408,620	12,551
1915	515,263	18,502
1916	623,681	16,132
1917	742,221	19,052
1918	646,602	26,272
1919[a]	550,000	20,000

[a] Estimated.

No coal was imported into Bulgaria during 1918 and 1919, and very little since 1914. The quantity and value of coal and coke imported each year from 1911 to 1917, inclusive, was as follows:

	Coal		Coke	
Year	Metric Tons	Value	Metric Tons	Value
1911	184,070	$953,704	4,930	$37,320
1912	153,284	878,331	4,448	36,003
1913	106,951	835,970	1,003	10,625
1914	213,109	1,403,954	5,460	42,943
1915	375	3,474		
191[illegible]	360			
1917	54,207	966,480	1,902	47,821

The greater part of the coal imported before the war came from England and Turkey. The English coal entered at Varna, Bourgas, and Dedeagatch, and the Turkish coal at Varna and Bourgas. The imported coal was consumed almost entirely in the eastern part of the country. The western part, including the capital, Sofia, used only Bulgarian coal mined in that region. The English coal, being far superior to Bulgarian or Turkey coal, was reserved almost exclusively for the railroads. A very small quantity of Serbian coal (from the Vrushka Tohouka mines) was imported at certain ports on the Danube for local use.

No coke is produced in Bulgaria, but it was formerly imported from England, Germany, Austria and Belgium. Before the war is was purchased for 60 leva ($11.58) per ton. The present price is said to be prohibitive. There is coal in Bulgaria from which coke could be produced, but the manufacture of coke has not been undertaken.

No coal is exported from Bulgaria. The demand has always exceeded the domestic supply, and at the present time there is a serious shortage.

While at present the high cost of coal, together with the fall in the exchange value of Bulgarian currency, prevents the importation of foreign coal, it is believed that in a short time the demands for more coal must be filled if the country is to continue the industrial development of the years prior to the war. It is not believed that such a demand can be satisfied by the coal mines of Bulgaria.

A congressional committee which recently visited the Virgin Islands declared that facilities for bunkering American vessels at St. Thomas are superior to those at Barbados and recommends that American vessels be bunkered and fueled at St. Thomas.

Oil Engines Favored by Swedish Shipbuilders

About 75 per cent of the steamers now under construction in England, it is stated, will be equipped for both oil and coal fuel. In this connection it is of interest to note that 70 per cent of all ships now building in Sweden will be equipped with Diesel motor engines. The opinion in Sweden is that the oil engine is decidedly superior to the combined oil and coal burners, and this opinion is supported by the testimony of the large Swedish shipping companies that have used the Diesel-motor ships for many years.

As the Diesel-engine steamer seems to be the prevailing type in the Swedish mercantile marine, several of the largest shipyards have changed their equipment in order to be prepared to build the new type exclusively. The largest shipyard in the country, Gotaverken A/B, at Goteborg, has enlarged and altered its docks and workshops with a view to using the new type, and other large yards are expected to follow this example.

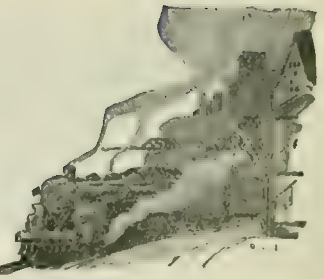
At present there are being constructed at Gotaverken four Diesel-engine steamers of a combined tonnage of 37,000 and one steamer of 7,500 tons. At Lindholmen A/B, Goteborg, there are now being built three ships of the combined oil and coal-burning type with a total tonnage of 24,000; at Kockums A/B, Malmo, a Diesel-engine ship of 8,000 tons is under way; and at the shipyard of the Oscarshamn Shipbuilding Co. there are in an advanced state of construction four ships for oil burning.

Japanese Coal Production Increases 10 Per Cent

According to Commerce Reports of the Department of Commerce, in spite of pessimistic reports made from time to time of the gradual exhaustion of the mines, *Shipping and Engineering* note with interest that the output of coal in Japan during the first eleven months of 1919 was put at 25,825,000 tons, showing an increase of 2,740,000 tons, or about 10 per cent, as compared with the corresponding period of the previous year.

The larger output is attributed to the revival of old mines and the increase in the number of new mines, owing to the profitable prices obtaining, although the output in Kyushu, which constitutes approximately 60 per cent of the total production, did not materially change.

Production and the Market



Weekly Review

Production Gains with Better Car Supply and Some Relief Is Experienced in the West and Middle West—Conditions Still Acute in the East—Export Movement Gains —Lake Situation Worries Shippers—Anthracite Advances Reported.

BETTER movement of loads and empties is the general reason for the upward trend in production reported by the Geological Survey for last week. Consumers everywhere complain, however, that cars are not being received, and reports of plants forced to close or curtail operations for lack of fuel continue to come in.

As the railroads slowly work off the accumulations in yards with such limited labor supply as they can muster some coal is getting through. At the mines the lack of empties is almost as serious now as it was two weeks ago, but every day shows a little improvement and a production in excess of 9,000,000 tons is estimated for the last week of April.

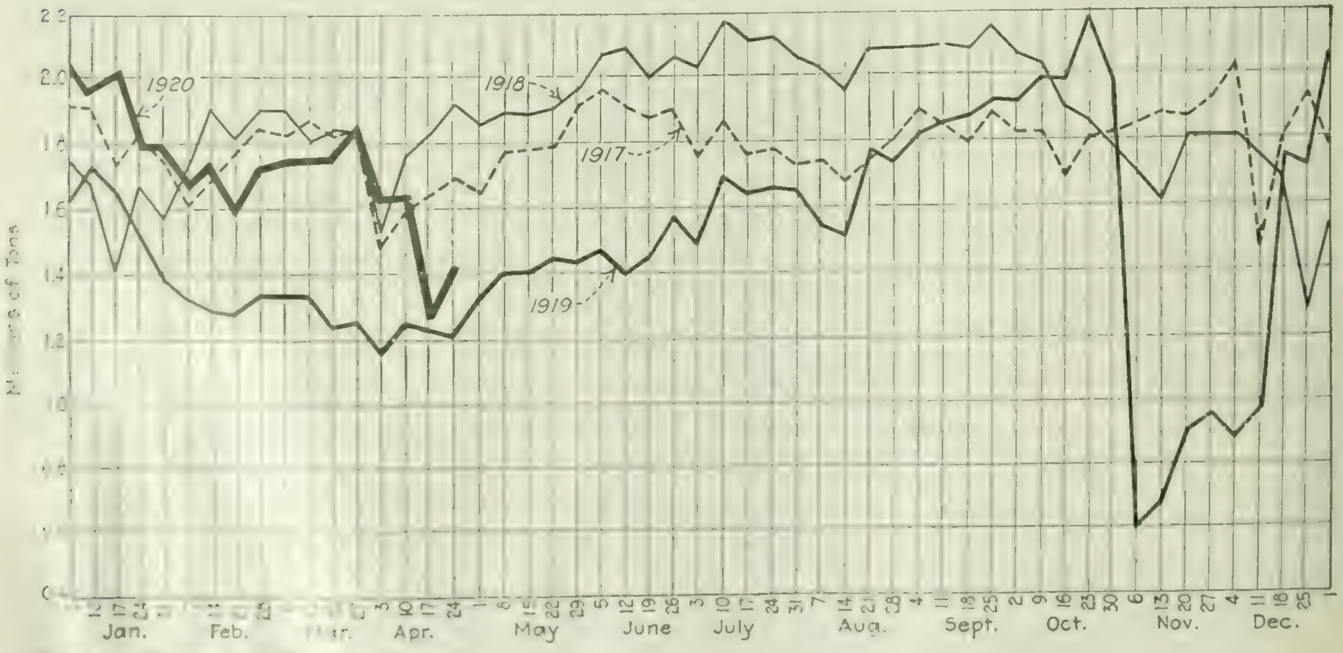
Export movement continues heavy with demand in excess of the supply. The passing of the Federal Tidewater Coal Exchange is expected to expedite movement by removing all restrictions. Western embargoes on the Chesapeake & Ohio and the Norfolk & Western last week forced a heavy movement to Hampton Roads, so much as to seriously congest the port. New high levels in smokeless prices are reported from the roads, $11 at terminal being reported in one instance. Boston reports heavy clearances for New England from this port with prices gaining over previous levels.

Improvement in railroad conditions is reported from such Western centers as St. Louis, Columbus and Cleveland, but with the supply still limited as it is, prices are high and going up. From Pittsburgh comes the word that both buyers and shippers are discounting the return to less troubled times and that buying is light with a break in prices expected in a short time.

Assigned cars are in use and the roads have found it necessary to confiscate less coal for their own uses as a result. Complaint is made that mines with assigned cars are getting the labor away from the commercial shippers and that cars in excess of ability to load are being left at railroad fuel mines to the serious detriment of the other operations.

Anthracite is in an uncertain period. While waiting for the wage decision some companies have advanced prices as much as a dollar a ton. Deliveries have been delayed by strikes and cold weather has kept demand strong.

Average Daily Production of Bituminous Coal*



*From weekly reports of Geological Survey.

Reports From the Market Centers

New England

BOSTON

Traffic Conditions Improve Slightly — Railroads Continue Seizures—Assigned Cars Expected to Cause Complications — Prices Strong — Heavy Clearances at Hampton Roads—New High Levels on Smokeless—Anthracite Advance Foreshadowed.

Bituminous—Traffic conditions show a slight improvement from week to week. The Boston & Maine has somewhat increased the number of cars taken daily from connecting lines, and the flow of west-bound empties is greater. The Boston & Albany and the Maine Central have about resumed normal service, although the latter is largely dependent upon the Boston & Maine. The New Haven road is still unable to function in any adequate degree, having maintained an embargo against anthracite for about four months.

Commercial coal is being taken freely for railroad requirements. Commercial and other consumers' coal, which was shipped at Government fixed price, has been confiscated by the railroads and must now be replaced to the consumers at an extra cost of something over $2 per ton. The railroads may either have to replace the coal taken, or pay the going price in the current market for coal yet to be shipped. It is understood that one New England road, alone, has confiscated 200,000 tons within a short period.

Assigned cars will not solve the problem of railroad fuel. Certain mines will have cars; others will not, and labor will be certain to take umbrage. Consumers who bought their supplies early, at lower prices, may find that assigned cars are carrying off the entire output of individual mines.

Car-supply, generally, is reported to be better, especially in central Pennsylvania, and contract shipments may soon begin to increase. For several days the all-rail requirements may suffer somewhat, because of the great dearth of bunker and other steam coal in New York Harbor.

All quotations on steam and gas grades are quite firm. Despatch at Hampton Roads is practically normal. The volume of coal is sufficient now to keep the terminals up to capacity, and there is no lack of bottoms to load. New England clearances are still small compared with the tonnage that came here two years ago, but this territory is fast disappearing from all calculations of shippers from the smokeless fields.

High rates by water have led consumers here to turn to all-rail channels, and the average buyer favors getting coal from central Pennsylvania all-rail.

Prices on Pocahontas and New River, especially for bunker purposes and to piece out cargoes, have gone soaring recently—$9 f.o.b. vessel. Large and wealthy concerns are offering the most extravagant inducements, and a few operators are yielding. Except among the most conservative the contract figure of $4 per net ton has been entirely lost sight of.

At this end the smokeless coals are easily commanding $12 and more on the cars at Providence, Boston or Portland, and a much increased tonnage might be absorbed as spot fuel at remunerative figures.

Quotations at wholesale, for spot shipment, range about as follows:

	Cambrias and Somersets	Clearfields
F.o.b. mines, net tons	$4.50@5.25	$4.15@5.00
F.o.b. Philadelphia, gross tons	7.25@8.10	6.55@7.45
F.o.b New York, gross tons	7.60@8.45	6.90@7.80

Anthracite — Definite signs of the company program have now appeared. An announcement has been made by one company of the advancement of circular prices of $1 per ton on broken, egg, and stove; 90c. on chestnut, and about 75c. on pea. This probably foreshadows similar action on the part of other companies and may mean $7.35 for broken and egg, $7.70 for stove and chestnut, and $6.00 for pea, all f.o.b. mines per gross ton.

Retail distributors continue to be most apprehensive. Shipments are extremely slow in every direction. Both by water routes and all-rail receipts are quite light.

Tidewater

NEW YORK

Anthracite Prices Advanced by Large Company—Some Piers Resume Loading—Unsettled Labor Conditions at Mines and at Tide—Demand Heavy With All Coal Supplies Short—Bituminous Quotations Show Slight Changes.

Anthracite—Without waiting for the operators and miners to end their wage conferences, at least one of the large operating companies advanced mine prices for domestic coal $1 per ton beginning May 1. It would not be surprising to the trade in general if similar increases would be made shortly by the remaining companies.

The court order dissolving the Reading Company has caused some prominent members of the trade to predict a free-for-all market, the quotations fluctuating similar to every other commodity when the subsidiary companies of the Reading are segregated.

Conditions in this market show a slight improvement. Loading at the piers has been resumed in part, due to the partial ending of the railroad strike and an improvement in transportation problems. Shipments from the lower ports are not as prompt as from the upper ones, due to a continuance of the harbor labor difficulties. None of the piers is on a normal basis.

Production has shown gradual improvement, the miners expecting shortly to know the result of the wage conference. But with the members of the subcommittee deadlocked and the Federal authorities appealed to, conditions are not so favorable for continuance of work at the mines.

There is much dissatisfaction at the delay in reaching a wage agreement and the union leaders are having some difficulty in keeping the mines open.

Local conditions are serious. Retail yards are running low of supplies and dealers are cutting down deliveries to one- or two-ton lots. Dealers report a heavy booking of orders for next winter's fuel. Buckwheat is in heavy demand. Because of weather conditions, most of the big office buildings are using almost normal quantities. Rice and barley are in good demand but, as in the case of buckwheat, the stocks are short. Current quotations for company coal per gross ton at mine and f.o.b. tidewater, at the lower ports are as follows:

Broken, mine $5.95; egg, $6.35@$7.35, tidewater $8.20@$9.20; stove, mine $6.60@$7.60, tidewater $8.45@$9.45; chestnut, mine $6.70@$7.70, tidewater $8.55@$9.55; pea, mine $5.30, tidewater $7.05; buckwheat, mine $3.40@$3.75, tidewater $5.15@$5.50; rice, mine $2.75@$3.25, tidewater $4.50@$5; barley, mine $2.25@$2.50, tidewater $4@$4.25; boiler fuel, mine $2.50, tidewater $4.25.

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—The local market shows considerable strength so far as demand goes, but there is much delay in shipments. Deliveries are as important as prices, and some dealers are said to pay an extra price if assured the coal will be shipped promptly.

Coal is coming here in better shape, but nothing like normal. The various piers are loading better but harbor difficulties make towing difficult, and there were rumors of additional trouble. Lack of fuel has caused many factories here to discontinue operation, throwing many employees out of work.

Uneasiness continues in the mining fields because of slack work, chiefly on account of the shortage of cars. A continuance of these conditions may drive many of the mine employees into other fields of activity. The railroads continue to confiscate large quantities of fuel and the consignor is put to much trouble to replace it.

Towing is a big factor in the price of coal. These charges continue to range from 50c. to $1 a ton and some individuals report higher quotations.

With the Government controlled Tidewater Coal Exchange out of existence, handlers of coal for export look for added strength to that market. It is not expected that the issuance of export licenses will be continued by another branch of the Federal Government.

Quotations showed slight changes from last week, many shippers withholding prices because it was impossible to promise prompt deliveries. Producers of Shawmut were quoting around $4.75, with Pool 11 being quoted at about $5.25. Pool 10 was held by some shippers at from $5.50 to $5.75, the latter being the top price. Quotations for loaded boats ranged from $10 to $12, with an occasional higher figure demanded.

PHILADELPHIA

Anthracite Domestic Increases $1 a Ton at Mines—Some Steam Sizes Go Up, Others Down—Retail Prices Increase and Delivery Heavy — Bituminous Scarce with Demand Strong—Spot $6 at Mines.

Anthracite—For the first time probably within the past twenty-five years, the individual shippers set the pace as to the price of coal to be shipped during the month of May. One prominent independent announced a flat price of $9.75 for egg, stove and nut, with $7 for pea, f.o.b. mine. Shortly afterward the largest independent shipper announced the following prices: Egg, $7.55; stove, $7.85; nut, $7.95, and pea, $5.80, at mines. Next one of the largest companies quoted $7.35 for broken and egg, $7.70 for stove and nut, and $6 for pea, practically an increase of $1 per gross ton in the mines prices. Finally most of the independent houses gave out figures approximately 75c. higher than the last named.

The steam coals have been quoted as follows: Buckwheat, $4; rice, $3; boiler fuel, $2.25, and barley, $1.25—an increase of 25c. for buckwheat, a decrease of 25c. for boiler and of $1 for barley. The last size has been a drug on the market.

The change-of-size proposition seems to have been entirely lost sight of in the turmoil of price fixing. The dealer has passed the increase on to the consumer, adding something to cover the increase of capital needed in business, together with gradually increasing delivery costs.

All city yards have fairly large stocks, but they are quickly cleaned up, and the dealers are beginning to ask for more coal, expecting nothing but moderate shipments for some weeks. There is the possibility of the miners stopping work.

The steam trade is extremely active, especially on buckwheat and rice, reflecting the shortage of bituminous coal in this market.

Bituminous—There is quite a strong demand for bituminous throughout this district. The iron industry is in urgent need of fuel. The great need is for gas coal, with a car supply running from 13 to 35 per cent. Contract customers receive 40 per cent of the amount called for, with utility plants doing a little better on steam coals.

In the spot market gas coals are offered around $5.75 to $5.85, f.o.b. mines, for Fairmont mine-run, with Pennsylvania gas coals at about the same quotation. Quotations on Pennsylvania steam coals from pools 10 and 11 are from $5.50 to $6. However, some consumers needing coal frankly said they could not pay anything like these prices and continue in business.

Some of the larger manufacturers are going direct to the mines and bidding for the coal, resulting in increasing the spot figures.

The railroads are willing to pay about $3.25 at mines for Pennsylvania coal and $3 for the Fairmont grades for their own use. Producers mostly insist that such prices are simply impossible and are less than cost of production, although some shippers feel that they might thus be able to get cars and make up the difference by having a greater tonnage for the spot market. The roads are not getting enough fuel in this manner and confiscation is far from unusual.

In regard to another strike of the railroad men, the various brotherhoods have been holding conferences ever since the last outbreak, and the spirit of unrest is far from quieted; many crews are idle in this territory on account of a continuance of strike conditions at New York tide piers.

BALTIMORE

Spot Market Moves Upward with Reserves Light — Embargoes and Coal Trimmers' Strike Features in Connection with Heavy Export Movement—Hard Coal Demand Dead as Trade Awaits Schedules.

Bituminous—In the face of a lessening urgent demand on the part of consumers, due to the belief that a break in the present exceptionally high market is sure to come, the operating and sales end of the coal industry continue firm in their demands. During the past week the spot market moved upward, and it is now almost impossible to get any quantity of Pools 9 and 71 coal without paying around $6 f.o.b. mines.

Good coals are readily sold all the way from $5.25 to $5.75 at the mines, and run-of-mine Fairmont gas coals, with a differential of 25c. a ton against them, have sold here the past week as high as $5.25. It is now rare to hear of $5 spot coals, f.o.b. mines, and probably nothing is being sold below that figure.

Both consumers and sellers are generally holding back from contracting. There is a disposition to take no chance of losing any rise that may come. The new tidewater pool arrangement has gone into effect here without complication.

But an embargo has been put on some of the pools that are crowded, and a coal trimmers' strike has slowed up loading, so that a general embargo may be necessary for a time at Curtis Bay. The reserve at Curtis Bay is now around 1,800 cars per day or about 40 per cent of normal. The loadings here in April have been quite heavy for export coal, and the total for the month, of coal placed aboard foreign-bound coal cargo carriers, will run around 400,000 tons.

Anthracite—The hard coal situation still awaits the action of the miners and operators and the establishment of a wholesale schedule thereafter. The dealers here do not take orders except on a basis for price at time of delivery. Many will only deliver for immediate domestic use and will not put coal in for storage. Some few dealers are selling the coal they receive at 50c. above schedule rates, but most of the coal merchants here are sticking strictly to schedule.

Lake

BUFFALO

Bituminous Coal Moving Slowly—Pittsburgh District Still Tied Up by Strikes —Canada Stocked Up But New Freight Arrangement Unpopular — Anthracite Situation Much Improved.

Bituminous—The situation here is not much improved; the Pittsburgh district still being tied up by switchmen's strikes. The slow coal movement is not all due to a car shortage; the railroads are doing what they can to increase the supply, but they can make but little headway. Notices of shipment are quite irregular, so that dealers do not know whether to push sales or not.

At the same time the demand is not large. Consumers expect prices to drop as soon as the strikes are out of the way and some shippers agree with them. For this reason consumers are not buying any more than for present needs. Canada seems to be pretty well stocked up, and now, with a new order out requiring absolute prepayment of all freight on coal to Canada, some new arrangement has to be made. Some shippers do not plan to pay freight on contract coal sold at mine prices, but others say that the shipper cannot escape these payments. It is a great burden on them.

Buffalo harbor is about as badly tied up as it well could be. Practically all the men concerned are on strike and refuse to sign up for the opening of the season. No coal is coming in and the fleet cannot sail except on fuel left over last fall.

The price of bituminous is little changed and the consumer pays it unwillingly. Allegheny Valley mine-run has been marked up to $6 to $6.35, with Youghiogheny gas $6.75; Pittsburgh and No. 8 lump and three-quarter, $6.25 to $6.50; mine-run and slack, $6 to $6.25; Pennsylvania smithing and smokeless, $6.50 to $6.75, all per net ton, f.o.b. Buffalo.

Anthracite—The situation is much improved from last week. One of the leading companies is delivering coal at such a good rate for several days that the complaint of scarcity has about disappeared. At the same time the demand keeps up, for everybody wants to get winter coal at present prices. If the shippers have the coal it goes out freely. The fear of further difficulty at the mines is not so great as it was.

The loading of water coal is as yet confined to one company, which now has about 50,000 tons afloat. With no fuel, no rate and no crews, in some cases, the future does not look very rosy.

Much more anthracite has been burned in the city this spring than usual on account of the shortage of natural gas. Many people, who restored the gas service, had to put in coal again, as the gas went out.

Coke—Coke consumers are not buying any more than they must of local shippers, it being apparent that the current prices are much higher than their contracts. The supply has been badly reduced by car shortage and other difficulties, so that it was often necessary to get coke wherever it was to be found. Shippers were not always able to get any sort of a supply, so that prices are as high as ever, with low grades about out of the market. Quotations are as follows: $12 for 72-hr. foundry, $10.50 for 48-hr. furnace, and $7 for domestic sizes, to which must be added $2.60 freight for the net-ton, f.o.b. prices here.

CLEVELAND

One-third Normal Coal Supply Moving into Cleveland—Prices Continue Firm —Lake Trade Quite Small and Outlook Poor.

Bituminous—Though more striking switchmen are reported to have returned, the improvement in the railroad situation is confined to newspaper reports. Coal is moving into Cleveland in sold trainloads, to the extent of 35 to 40 per cent of normal supply. Plant activity is slightly better, though all are operating on a coal supply of a day or two. Operators fear any perceptible relief in car supply is 45 to 60 days distant. Steam-coal users continue ready to take easily twice the tonnage that operators could supply under normal conditions. Average stocking facilities in Cleveland are not over a 30-day supply, and it is feared it will take half the summer for most steam-coal users to stock up.

No more sizable contracting is reported, as operators are unwilling to commit themselves further until conditions become more normal. The contract market seems to be $3.75, f.o.b. mine, for No. 8 slack and mine-run and $4, f.o.b. mine, for lump. Retail dealers are paying from $4.25 to $4.50 f.o.b. mine, for spot supplies of No. 8 and No. 6 steam coal.

Anthracite and Pocahontas.—The usual spring dullness grips both grades, and sales are light, though not abnormally so for the season. Prices remain unchanged.

Lake trade—The close of April finds the Lake trade a good million tons behind last year to this date. May's beginning is most inauspicious, as the movement to the Lake front is light. Unless summer and fall shipments break all records, the 1920 movement will be far under the 30,000,000 tons planned.

Lake shippers fear the Frelinghuysen bills, providing seasonal freight rates on coal, will divert cars from the Lake trade. It is announced that Lake bunker coal from lighters will cost $6 a ton, and at Sandwich and Line island docks, $7. Fifty-five cents to Lake Michigan ports other than Milwaukee, with 60c. to Milwaukee, are the freight rates named in a recent large contract.

Prices of coal per net ton delivered in Cleveland by retail dealers are:

Anthracite—Egg and grate, $12.20@12.40; chestnut, $12.50@12.70; and stove, $12.50.

Pocahontas—Shoveled lump, $10.50; and mine-run, $9.25.

Domestic Bituminous—West Virginia splint, $8.75; No. 8 Pittsburgh, $7.75; Millfield lump, $8.50; and cannel lump, $11.00.

Steam Coal—No. 6 and No. 8 slack, and No. 6 and No. 8 mine-run, $7.75; and No. 8 ¾-in. lump, $8.00.

MILWAUKEE

Soft Coal Famine Imperils Industries—Coal Dealers Call a Halt and Restrict Deliveries—No Relief Expected Until Receipts by Lake Improve.

The last week in April finds the Milwaukee coal market in a chaotic condition, due to a shortage of soft coal and inability of dealers to obtain new supplies. The Milwaukee-Western Fuel Co., which handles 50 per cent of the coal received at Milwaukee, makes public an announcement that it has exhausted every effort to secure coal, and that after April 30 it will not be able to supply soft coal to consumers until the embargoes at the eastern and western coal fields are lifted.

Deliveries will be limited to water works and other public utility food-product plants, hospitals and homes. No coal will be allowed to go to non-essential industries. The switchmen's strike and the refusal of eastern railroads to accept coal, prevents supplies from reaching Lake ports from the mines. Lake shipping is at a standstill in consequence.

Householders are able to secure hard coal, owing to the fact that a cargo of 9,500 tons was received April 16. A cargo of 7,500 tons of soft coal was also received. These two cargoes represent the April Lake business thus far. A general advance in coal prices is slated for May.

Inland West

COLUMBUS

Better Transportation Aids Production—Good Demand for All Grades—Manufacturing Handicapped by Fuel Scarcity — Mine Output One-third Normal

The best feature of the coal trade in Ohio is the return to work of a large number of strikers; this aids the train movement and the car supply at the mines is growing better. As a consequence the output is better in all of the mining sections of the state. While embargoes are still in force, a fair tonnage is being shipped and some sections are being relieved of a fuel shortage, but conditions are far from normal.

Demand for steam sizes is probably the strongest feature of the trade. Many factories are still on half time or closed down entirely and reserves are fast disappearing. However, general manufacturing is going on in a way. Public service concerns are now being supplied and the same is true of most public institutions. Railroads are taking a larger tonnage as their freight movement increases.

The domestic demand is also strong and dealers are quite short of supplies, small lots only being delivered. Coal purchased often cannot be delivered; should it arrive it cannot be set on the switch for unloading, and trucks are used to relieve the situation.

Retail prices are firm. Hocking lump sells at $7.50 and mine-run at $7.25, delivered. Pomeroy lump and mine-run are about 25c. higher. Pocahontas is scarce and new stocks are arriving. West Virginia splints (prepared sizes) retail for about $8.50.

Production is now about 30 per cent of normal in most of the Ohio districts. In eastern Ohio the output is quite low because of strike conditions at junction points. The Hocking Valley and Pomeroy Bend districts are producing about 35 per cent of normal. A small amount of coal is being loaded for Lake shipment with producers loath to enter into agreements under present conditions.

Prices at the mines, of coal used in Columbus territory, are as follows:

Hocking lump	$3.75	@	$[illegible]
Hocking mine-run	3.50	@	[illegible]
Hocking screenings	3.25	@	[illegible]
Pomeroy lump	4.00	@	4.25
Pomeroy mine-run	3.75	@	4.00
Pomeroy screenings	3.50	@	3.75
West Virginia splints, lump	[illegible]	@	4.75
West Virginia splints, mine-run	[illegible]	@	[illegible]
West Virginia splints, screenings	[illegible]	@	[illegible]
Pocahontas lump	6.00		
Pocahontas mine-run	[illegible]		
Pocahontas screenings	[illegible]		

CINCINNATI

River Shipments Prevent Serious Shortage—Railroad Strike Clearing Up—Demand Strong and Prices Firm.

The "outlaw" switchmen's strike is being felt by the coal interests here. The production in the fields in West Virginia and Kentucky, which supply most of the coal to this market, has been comparatively large, but the car supply has been quite short, consequently in many quarters the pinch is being felt severely.

The Ohio River has again stood by in the hour of need, Cincinnati being spared a serious shortage through the medium of this waterway, great quantities of coal coming down at times when they were most needed.

The strike of yardmen on the Chesapeake & Ohio at Russel, Ky., is clearing up, and all that is required to approach normal on that line is for conditions to better themselves in other places, so that empties might be returned. Little coal has come down from West Virginia by rail in the past week because of washouts.

The demand for coal is strong here and prices are firm, but it is extremely difficult to gage prices at the present time. Local retailers are supplying their customers' immediate demands, but industrial firms have difficulty in getting a supply ahead.

ST. LOUIS

Slight Improvement in Railroad Conditions—Shortage of Steam and Domestic Coal—Country Districts Suffer—Situation in Various Mining Fields.

The local situation, although there is an acute shortage of steam coal, is showing a little improvement. A few switching crews have gone to work. At times a trainload of 15 to 20 cars will come in to one of the yards of the larger dealers, but the small ones are gettting no coal. A few steam plants get a car now and then.

More than half of the present requirements of St. Louis, outside of the storage supply, is coming in via trucks and wagons from East St. Louis. The domestic demand is easy on account of the weather.

In the country, however, both steam and domestic are short, and many plants are on the verge of shutting down. In the southwest the conditions are somewhat easier than at points that must be reached through the terminals in the larger places.

In the Carterville field cars are furnished a couple of days a week on the Missouri Pacific and Illinois Central railroads to mines that load railroad coal and a little domestic fuel. The Chicago & Eastern Illinois is tied up tight. The Burlington is doing better than the rest, with about three or four days a week.

In the Mt. Olive and Standard fields, the mines get one or two days a week, mostly railroad coal; little [illegible] it moving into East St. Louis.

In the Carterville and Mt. Olive fields the operators are maintaining their regular circular prices, but in the Standard field operators ask $3.25 for screenings, $3.50 for mine-run, and all they can get for domestic sizes.

There is nothing to indicate that conditions will be any easier. Coal in St. Louis is retailing (any kind obtainable) for from $7 to $8. No anthracite coal is moving in and no smokeless, and nothing from Arkansas. The coke supply is about exhausted.

DETROIT

Coal Traffic Manager Appointed—Federal Authorities Expedite Shipments to Gas and Electric Companies — Lake Trade Crippled.

Bituminous—Efforts to get coal into Detroit and Michigan, before the gas and electric companies of the state are compelled to close down for lack of fuel, appear to be making some headway. Following a conference in Lansing, between all parties concerned, an appeal for assistance was made to the U. S. Interstate Commerce Commission

As a result, Frank H. Alfred, president of the Pere Marquette R.R., has been appointed coal traffic manager for Michigan, and he has delegated the work to E. C. Campbell, president of the Michigan Gas Association, to collect information on the coal requirements of the gas and electric companies.

A list will be forwarded to the coal committee in Washington, of the gas and electric companies, with a report of the number of days' supply of coal each has.

The Federal authorities expect to expedite coal shipments to the companies in most urgent need, and Mr. Alfred gives assurance that shipments will be dispatched after their arrival in Michigan.

Many of the gas and electric companies have not more than a three or four days' supply of fuel. Detroit has been almost wholly dependent on coal in local railroad yards and shipments coming in in small allotments. Most of this supply has now been exhausted.

Lake Trade—Owing to the railroad strike and the urgent demand for coal in lower Lake markets, little stock is available for shipment up the Lakes. The supply arriving at lower Lake ports is so scanty that few of the Lake freighters have been able to begin operations. In some instances motor trucks have been used to get coal to vessels requiring fuel. In other cases freighters have been shifted to other ports where coal might be had.

CHICAGO

Railroad Situation Better and Strike May Soon Be Over—Dealers Placing Smokeless Contracts at Fair Prices.

The situation in Chicago is a trifle better than it was last week. Considerable coal is coming in and the railways are making a strong effort to rush steam sizes through to various factories in order to keep them from closing down. The retail yards, too, are in better shape, especially on the north and northwest sides, where last week there was quite a serious coal shortage. It is freely predicted that if the railroads continue their aggressive plans and keep on replacing the striking switchmen, the strike will soon be broken and the situation will once more be normal.

It was heard this week that several of the retail dealers here had succeeded in placing contracts for a substantial tonnage of Pocahontas and other smokeless coal. The contracts, of course, were made with firms who took care of these retailers during past years. We are advised that the prices named on the various contracts closed were quite fair, considering the general situation. West Virginia and Kentucky coals are still very scarce, and the retail trade is not counting on a very heavy tonnage moving west this year.

MIDWEST REVIEW

Output of Illinois Districts Purchased—Product Not Oversold—Coal Sold at April Prices—Car Supply Improving but Still Bad—Strike to be Broken Soon.

There is no coal market in Chicago this week because no one has any coal for sale. The output of the southern Illinois mines was removed from the market first, and the production of other districts was purchased soon afterward, in the order of excellence. Operators are showing decided tendencies not to oversell their product, and everybody out here in the coal business is going exceedingly slow.

The whole trade has been badly disorganized on account of the switchmen's strike. Coal has been taken out of its accustomed channels, forced through others, and many temporary changes are the result. Manufacturers and retailers in the country are benefiting largely, as, on account of the embargoes at the big industrial centers, all coal is moving to outlying districts and towns, thus giving some manufacturers and retailers a little coal for storage purposes.

Car supply continues bad, although it has been considerably better than last week. The strike breakers on duty at the various terminals have returned a large number of empty coal cars, which were held in the Chicago switching district, and at Peoria and St. Louis. The market continues to be flooded with anxious purchasing agents, but the distributors and operators in the Middle West are refusing to sell their coal at premiums over the market prices published early in April.

The switchmen's strike is still interfering with industries here and a large number of plants have been forced to close down both on account of lack of fuel and the fact that they are unable to get cars in which to ship their finished products. The railroads in and about Chicago are bending every effort to clean up their yards without the aid of the strikers and they are making excellent progress. It is believed the strike will be completely broken within the course of another week.

South

LOUISVILLE

Little Coal Contracting on High and Uncertain Market — Better Tonnage Expected to East, North and Northwest—South in Fair Shape.

Coal production too short for summer stocking at present time. Car shortage in April worst ever known. Prices high and contracting light.

A few coal contracts are coming in for Lake movement and from sections of the North and Northwest, but as a whole little coal contracting is being done on the present high and uncertain market; buyers hope for a lower market, and producers are not anxious to tie up production.

If car supply shows reasonable increase, and promise of becoming at all steady, contracts should be taken freely. Northwest coal men are beginning to order early regardless of high prices.

The embargo situation has opened up somewhat, and far better tonnage movements to the East, North and Northwest should result. The movement for the past few weeks has been largely south. Railroads are asking for coal and seizing a considerable amount while the gas and byproduct plants are also clamoring.

A big contract has been made between the Hazard field operators and M. A. Hanna & Co., and other Lake operators, for a shipment of about one-half of last year's tonnage at a price of $4.25 a ton for 1½-in. lump, to move through Toledo to the Northwest by Lake.

Gas coal and domestic are in good demand, with a fair demand for steam coal. It is estimated that car supply of the Louisville & Nashville in Kentucky is only 30 per cent of requirements for April, this being by far the worst month in the history of the field.

Hazard fields are quoting a price of $4.50 for mine-run at mine, prices not being available on screenings or domestic, none being sold.

The Harlan field is quoting prices at mine as follows: Domestic, $4.50@$6; mine-run, $5.50@$6; screenings, $4@$4.50. High-grade gas coal is in big demand and operators can get top prices for output.

Western Kentucky is quoting lump at $3.25@$3.40; mine-run, $2.85@$3; nut and slack, $2.50@$2.60; pea and slack, $2.25@$2.35, at mine.

Smokeless, anthracite and eastern Kentucky coal are quite scarce in the Louisville market. There is little demand of any kind, as the coal is not available.

BIRMINGHAM

Demand Strong, Spot Buying Brisk and Contracting Progressing—Operators to Protest Preferential Car Supply.

With a strong and continuing demand for all coal that can be produced in this field, conditions are in more satisfactory shape than for many months. Spot buying is brisk and contracting by steam users has made good headway. The Atlantic Coast Line and the Louisville & Nashville closed contracts during the week for fuel coal for the next twelve months, and agreements with the Frisco and other lines will be signed during the week.

There is a heavy demand for bunkerage coal at the ports of Mobile, New Orleans and Pensacola, and the amount of this business booked is only limited by coal supply and equipment for this movement.

No improvement is reported in equipment supply for the mines in the district, the average furnished in the field ranging from 65 to 70 per cent. A delegation of coal men will protest the order of the Interstate Commerce Commission, authorizing preferential car supply to mines furnishing fuel coal for the railroads.

Domestic coal has been contracted for extensively, and retailers are slowly stocking, the supply of this grade of fuel being much short of needs.

Quotations on steam coal have fluctuated little the past week and are as follows per net ton mines:

	Lump	Prepared
Big Seam	[illegible]	[illegible]
Black Creek	[illegible]	[illegible]
Cahaba	[illegible]	[illegible]
Carbon Hill	[illegible]	[illegible]
Nickel Plate	[illegible]	

Domestic grades are quoted as follows per net ton mines:

	Lump
Big Seam	[illegible]
Black Creek	[illegible]
Cahaba	4.60 @ 6.00
Carbon Hill	[illegible] @ 3.85
Montevallo	7.15
Corona	4.65
Straven (Montevallo)	6.75

West

TORONTO

Anthracite Situation Shows Improvement—Bituminous Remains Unchanged.

Conditions as regards supplies of anthracite show improvement, and a fair amount is now coming forward. On account of continued cold weather and the general desire of large consumers to lay in stocks early in the season, dealers have large orders on their books and new orders are generally being refused. The bituminous situation remains practically unchanged. Very little is being received and industrial plants are only kept running from day to day. Dealers are not quoting wholesale prices.

Quotations for short (retail) tons are as follows:

Anthracite egg, stove, nut and grate, $14; pea, $12.50; bituminous steam, $11; domestic lump, $12.50; cannel, $14.

COAL-TAX LEGISLATION

Legislative Action on Coal-Tax Matter—Governor Morrow Favors Plan—Conference Suggested of Governors of All Competing States — Replies Received.

During the recent session of the Kentucky Legislature, coal bill after coal bill placing tonnage tax on production was killed. The *Louisville Times* suggested editorially that as operators claimed such action was impossible, due to lack of similar laws in other states, thus working a discrimination against Kentucky operators, the various states appoint committees and get together on the matter.

This suggestion has borne fruit. As early as Jan. 20, 1920, Lieutenant-Governor Ballard corresponded with the governors of other states as to the possibility of placing coal-tonnage taxes on an equitable and uniform basis in all the bituminous coal-producing states.

During the legislative session, bills introduced were hurriedly thrown together without regard for low and high-grade coals, necessary differentials and conditions in non-taxing states, which would have an advantage over Kentucky.

Governor Morrow is said to favor the drafting of a uniform bill that can be used in Kentucky and other states, to become effective in all the states of the central competitive field at the same time.

It has been suggested that a conference of the governors of the states of the central competitive field be held in midsummer, probably at Louisville, in order to discuss the plan. Noncommittal replies are said to have been received from Governor Lowden, of Illinois; Governor Cornwell, of West Virginia, and Governor Davis, of Virginia, all of whom favored the conference.

Governor Sproul, of Pennsylvania, stated that a tax on anthracite was held unconstitutional if bituminous coals were not included. Governor Cox, of Ohio, in his reply referred to action of the Legislature of his state in turning down such a bill. Governor Goodrich, of Indiana, said that Indiana could not act without other states coming in.

Governor Gardner, of Missouri, is reported as approving the plan, and referring to such a tax in Oklahoma. Governor Roberts, of Tennessee, feared that such a tax would be unconstitutional Charles H. Brough, Governor of Arkansas, enthusiastically supported the plan.

If the conference is arranged, it is believed that all the governors will attend, and that the matter will be thrashed out. The movement is attracting much public attention.

News From the Coal Fields

Northern Appalachian

PITTSBURGH

Heavy River Shipments — Rail Shipments Little Improved — Market Quiet.

Railroad conditions, as affected by the strikes of switchmen, have not improved much. Most of the yards in the Pittsburgh district and for some distance west of here are tied up almost as badly as at any time, and it is still difficult to make coal shipments in normal manner.

Considerable coal is being moved, partly by increased use of the Monongahela River and also through the sending of through trains. The river shipments are chiefly to points in the immediate Pittsburgh district, and even the trainloads do not go far. There is some loading of cars that either remain on coal company sidings or move to railroad sidings not far from the mines.

Many mines are equipped for both rail and river shipment. Week before last coal shipments by mines that have river facilities only amounted to 24,000 tons, while mines having both rail and river facilities shipped about 80,000 tons by river. Including trainload coal and other loadings that may not have gone far, the total of loadings and actual shipments was about 30 per cent of the Pittsburgh district's normal.

The coal market in general is very quiet. The market is quotable, generally, at $3.50@$4 for contracts and $4@$4.50 for prompt lots, per net ton at mine, Pittsburgh district.

CONNELLSVILLE

Coke Yards Congested—Transportation Little Improved — Varied Byproduct Situation.

Movement of Connellsville coke is somewhat improved, but is still only between 60 and 70 per cent of the rate obtaining prior to the rail strike. Little coke is moved through the regular channels. There is a heavy coke movement by water and also by solid trainload requiring little or no switching or yard service.

Railroad yards in and near the region are reported congested with loaded coke, and there are also piles at the hand-drawn ovens, but it being hardly feasible to pile coke at machine-drawing operations.

The byproduct ovens are having various experiences. The Cleveland plants are doing relatively little and those at Youngstown practically nothing. Lorain and Benwood are operating practically normal. In the immediate Pittsburgh district both the byproduct and the beehive ovens are operating normal, their regular source of coal supply being by river.

The market is quiet, with sales possible only to a small fraction of the total number of consumers. Such sales are made at prices obtaining before the rail strike began—$11@$12 for furnace and $12@$13 for foundry, per net ton at ovens, Connellsville region.

Coke movement slightly improved, at 60 to 70 per cent of rate before rail strike. Byproduct ovens have various experiences.

EASTERN OHIO

Mines Returning to Normal—Lake Coal Begins to Move—Outlaw Strikers Reporting for Work.

After the first few days of the weekly period ended April 24, mines in the northern Pan Handle of West Virginia and in eastern Ohio began to show signs of returning to normal. Striking yardmen on the Pennsylvania at Wheeling voted to return to work on April 20 and had reported for duty to some extent on the twenty-first.

Suspension of the coal movement through Holloway, caused by a strike of Baltimore & Ohio yardmen at that point, was ended when the strikers there returned to work by the middle of the week and Lake coal began to move. The Baltimore & Ohio reported a freight business 55 per cent of normal on the nineteenth and it was estimated that the freight runs of April 20 amounted to 75 per cent of normal.

Yardmen and brakemen on the Cleveland & Pittsburgh R.R. were obstinate about returning to work, and hence coal production was retarded in Ohio. Striking yardmen of the Wheeling & Lake Erie at Wheeling were the last to report for work, but trains of coal were beginning to be moved.

FAIRMONT

Little Commercial Coal Shipped—Assigned Cars Deprive Many Mines of Tonnage—Tidewater Embargo Lifted

With the railroads in northern West Virginia working overtime in furnishing assigned cars and with cars extremely limited at best, comparatively little commercial coal was produced and shipped from various fields here during the week ended April 24. When the car shortage became most pronounced at the end of the week, operators were informed that there were only enough cars for railroad fuel, and mines not loading such fuel were compelled to go without cars.

While transportation conditions were somewhat improved in northern West Virginia fields, there had not been a full recovery from the effects of the rail strike. However, producers were able to consign coal to certain points closed during the previous week, as for instance to the Lakes via Holloway, but in general the movement of coal from the mines and yards was retarded.

The tidewater embargo as far as Curtis Bay was concerned was lifted. Owing to a congestion at the Brownsville, Pa., yards of the Monongahela R.R., it was several days before Monongahela and Morgantown & Wheeling mines were able to operate.

The car shortage was still making itself felt in the northern regions of the state throughout the week, the daily supply not averaging more than

Estimates of Production

FROM THE WEEKLY REPORT OF THE GEOLOGICAL SURVEY

BITUMINOUS COAL

	1920 Week	1920 Calendar Year to Date	1919[a] Week	1919[a] Calendar Year to Date
April 10[b]	9,644,000	150,120,000	7,544,000	118,730,000
Daily average	1,607,000	1,740,000	1,257,000	1,376,000
April 17[b]	7,559,000	157,679,000	7,411,000	125,141,000
Daily average	1,260,000	1,708,000	1,235,000	1,367,000
April 24[c]	8,473,000	166,152,000	7,378,000	133,519,000
Daily average	1,412,000	1,690,000	1,223,000	1,358,000

[a] Less one day's production during New Year's week to equalize number of days covered for the two years. [b] Revised from last report. [c] Subject to revision

ANTHRACITE

	1920 Week	1920 Calendar Year to Date	1919 Week	1919 Calendar Year to Date
April 10	1,488,000	23,106,000	1,792,000	20,363,000
April 17[a]	1,190,000	24,296,000	1,603,000	21,966,000
April 24[b]	1,516,000	25,812,000	1,435,000	23,401,000

[a] Revised from last report. [b] Subject to revision.

BEEHIVE COKE

Week Ended Apr. 24, 1920[c]	Week Ended Apr. 17, 1920[b]	Week Ended Apr. 26, 1919	1920 to Date	1919 to Date[a]
341,000	246,000	259,000	7,012,000	7,108,000

(All figures in net tons.)

[a] Less one day's production during New Year's week to equalize number of days covered for the two years. [b] Revised from last report. [c] Subject to revision

600 cars for the Fairmont region, for instance. Owing to the fact that so little commercial coal was being produced, prices were advancing quite materially in the Fairmont and other northern West Virginia regions as the month drew to a close.

Middle Appalachian

POCAHONTAS AND TUG RIVER

Little Coal Goes West—Heavy Eastern Tonnage—But Mines Work Only Day or So During Week—Car Supply 40 Per Cent for the Field.

With yardmen and switchmen of the Norfolk & Western still on strike during the greater part of the week ended April 24 at Kenova, Ashland, Portsmouth and Columbus, western service on this road was still so greatly impaired that little coal from the Pocahontas, Tug River and Kenova-Thacker fields was being shipped westward. For the same reason no cars were being obtained from western points.

The only coal handled by the road to western points was that in solid trainloads not requiring any switching. Production was at a lower ebb than during the previous week. In many instances mines were unable to work more than a day or so during the entire week.

There was a heavy eastern movement of coal from Norfolk & Western mines, more especially to tidewater. Dumping was on such a large scale that most of the coal arriving was speedily unloaded.

Conditions in the Pocahontas field were similar to those during the previous week, production losses being sustained through seriously impaired transportation facilities. Few cars being supplied from the West and no shipments in that direction.

There continued to be quite a heavy demand for export coal and much of the product of the Pocahontas field was being so consigned. With a 40 per cent car supply many mines found it difficult to operate after the first day or so of the week. Had there not been a good many bottoms at tidewater, it is believed congestion would have been inevitable.

Production in the Tug River field was 68,000 tons for the week ended April 24, exceeding even the output for the week ended April 3. But idleness at many mines was the rule rather than the exception. Coal held at Portsmouth, during the yardmen's strike, had begun to be weighed and moved, but the movement westward was rather light in volume, and the bulk of the cars for the field was still coming from the East. Speculators were receiving no encouragement in endeavoring to secure a large tonnage in the field, with a view to increasing prices. Pools Nos. 41, 42 and 43, at the tidewater terminal of the Norfolk & Western, were embargoed on April 26. That affected the shipment of the lower grades of coal from this field.

NEW RIVER

Shortage of Cars—Heavy Demand at Tide and Many Vessels to Load—Big Prices Offered.

The principal obstacle to large production in the New River field during the week ended April 24 was a shortage of cars. There was not more than a 40 per cent supply in that field, averaging the week as a whole, total production reaching only about 117,000 tons. While shipments of New River smokeless were not affected by an embargo, as was the case with high-volatile coal, nevertheless it was regarded as certain that such embargoes would indirectly affect the field inasmuch as equipment could not be released promptly.

There was an unusually heavy demand at tidewater for the New River product, with an ample number of vessels available for loading. Big prices offered by speculators, running as high as $11 a ton at tidewater, were frowned upon by producers. No New River coal, or coke either for that matter, was shipped to western points owing to a continuance of the strike at Russell, Ky., and sub-normal transportation conditions existing elsewhere.

During the week ended April 24, in the Winding Gulf field, there was a 60 per cent car supply on the Virginian and a 40 per cent car supply on the Chesapeake & Ohio. There was quite a stiff demand for smokeless coal at tidewater. Operators believe that there will be no betterment in the car supply in the Winding Gulf field for several weeks.

The Virginian Ry. is furnishing the mines on its line with blueprints showing the dimensions of the road's new 120-ton car so that operators could make any necessary adjustments to their tipples in order to take care of the new type of gondola. One thousand have been purchased, delivery to be made starting July 1 at the rate of from 15 to 20 cars a day.

KANAWHA

Mines Close Due to Rail Strikes in the East and Congestion at Tide—Slides and Washouts Keep Down Production.

Mines in the Kanawha district fared worse from a transportation standpoint than mines in the New River field, for several reasons. Not only was the car supply running shorter, but Kanawha mines were embargoed both east and west. The western outlets were closed, due to the failure of striking yardmen to return to work at Russell, Ky., while tidewater terminals were closed owing to a congestion growing out of the greatly increased shipments made during the previous week. In fact shipments were permitted only to inland points throughout the week.

With Kanawha & Michigan bridges washed out in Ohio, and with no cars obtainable from the East, all the mines on the north side of the Kanawha River in the Kanawha field were closed down, only 65 cars being loaded during the entire week, a total of 3,250 tons.

On April 23 not a single ton of coal was loaded either on the Kanawha & Michigan or the Kanawha & West Virginia, a subsidiary. Production would have been light even had there been no washout, owing to the fact that rail conditions were not normal either at Columbus, Toledo or other points. Owing to numerous embargoes, of course, it was still impossible to begin Lake shipments.

According to many operators, the assigned-car evil was fast becoming intolerable. Instances were numerous where mines furnishing railroad fuel had as many as 40 and 45 assigned cars over and above their regular allotment—even had empties left over—while other mines were forced to go without cars. This was affecting commercial coal mines because it was leading miners to desert commercial mines and seek work at railroad-fuel mines.

LOGAN

Bad Conditions in Logan Field—Car Shortage and Slides—Coal Goes to Inland East—Big Demand for Logan Coal.

Conditions were worse in the Logan field from every standpoint than at any time in recent months, during the period ended April 24, with car-shortage losses approximating 275,000 tons. The total production was not over 120,000 tons for the week, a decrease of 35,000 tons as compared with the previous week.

There was an actual shortage of cars and at least twice during the weekly period; slides made it impossible to reach the mines with empties, the result being general idleness at most mines during the greater part of the period ended April 24.

With a strike still in force at Russell, Ky., and with other western markets closed, the only outlet for Logan fuel (aside from that supplied the railroads) was to inland East points, since all high-volatile shipments to tidewater via the Chesapeake & Ohio were prohibited under an embargo. With a large number of cars at tide still unloaded and with Eastern points only furnishing empties, it was not strange that cars were so scarce.

NORTHEASTERN KENTUCKY

Slight Gain in Output—But Mines Work Only One to Two Days a Week—Poor Showing for April—Spot Prices Unsatisfactory.

Only 90,575 tons, or 33 per cent of full time capacity (276,670 tons), were produced in the northeast Kentucky field during the week ended April 24, that leaving a loss of 186,095 tons or 67 per cent; the car shortage being responsible for a loss of 64 per cent. There was a gain over the previous week of approximately 10,000 tons, all being at Chesapeake & Ohio mines.

due to the district's tidewater outlet at Charleston, S. C., and the running of solid trains from the district to points in the Middle West, eliminating switching, weighing and classifying at the Russell scales, where the switchmen still are on strike.

The situation at Louisville & Nashville mines was worse than it had been during the previous week, mines here working one full day during the week, with mines on the Chesapeake & Ohio working two days.

Production for the month, including April 24, had amounted to only about 400,000 tons, or 25 per cent less than for the same period in March, and with little prospect of the strike's conclusion. It was estimated that the month of April would show a falling off as compared with March of easily 200,000 tons. The total losses in production in April (barring the last week) had aggregated 575,000 tons, out of a total potential capacity of about 900,000 tons. This made the average working time until the twenty-fourth for the month 39 per cent. Production for the same period of 1919 had been 101,570 tons.

Prices quoted on spot shipments in the northeast Kentucky field did not reach anything like the level which might have been expected, although the previous disparity between export and domestic prices had been wiped out.

Middle Western

INDIANA

The mines in Indiana, the last week of April, were averaging between two and three days a week, the car shortage being responsible for losses of about 43 per cent of full time, labor trouble for 6 per cent and mine disability 6.3 per cent. The Terre Haute & Southeastern and the Southern railways made the poorest showing on car supply, the Big Four and the Chicago & Eastern Illinois, among the larger railroads, furnishing the best supply. This was an improvement over the week ending April 17, when the mines averaged barely two days a week. Production increased from 276,000 to 369,600 tons for the week ending April 24.

The market continued strong, with spot prices averaging about 50c. above the old Government prices. The adjustment of [illegible] old contracts to cover the wage advance of April 1 have been as low as 30c. per ton, but in general $2.85 mine-run f.o.b. mines represents the starting point for price quotations.

DUQUOIN

Production of coal in Southern Illinois has been reduced practically to a minimum mainly on account of the continued strike of the switchmen in Chicago. Most mines in the southern Illinois have now fallen below 20 per cent of the average production, and no immediate prospect is in sight for a change even when the striking railroaders return to work. In the Franklin and Williamson county districts the percentage has been better, probably because these two counties are served with more roads than others. Coal officials have predicted that the mines will have trouble getting enough cars for capacity loading, far into the summer, owing to the congested conditions of the terminals.

A deal of importance was recently consummated in the purchase of two mines in Williamson County by the Big Ben Coal Co. The mines were owned by the Johnston City Coal Co., of Chicago. The Big Ben will add, by this purchase, 1,250,000 tons of coal annually to its already large production in southern Illinois. The new owners state that the main reason for purchasing these two large mines was due to the fact that the coal land purchased lay in such a position that the company could mine the coal from some of the original Old Ben mines, which otherwise could not have been easily reached.

The operators of the Hallidayboro mine, nine miles south of here, are rushing the work on the erection of the new steel tipple, which is to replace the large wooden one recently destroyed by fire. The mine is controlled by the Jackson Coal Co., of Chicago, and was said to be the largest producer in Jackson County. It is planned to have the mine in operation again within 60 days.

Drilling is being done in Jackson County, southwest of here, by the Big Muddy Coal & Iron Co., and it is expected that work will be started at once on the sinking of one or more mines in this district. The drillers found a seam about 4½ ft. thick and are drilling further to reach a lower seam said to be about 400 ft. deep. The company now owns three producing mines in the neighborhood and this new plant will make a large addition to the annual output of the concern. The mines will be served by the Illinois Central R.R., the Carbondale & Murphysboro Traction Co., and probably the Iron Mountain and the Mobile & Ohio railroad.

The large rescreening plant, which was built by the Rutledge & Taylor Coal Co. at its mine three miles south of this city, is about in running order. The plant was designed by the Link Belt Co., Chicago, and was started in January.

Canada

The Lignite Utilization Board of Canada is expected to make important advances this year in the development of the Saskatchewan lignite coal fields and the furnishing of the people of the prairie provinces of the Dominion with cheaper and better fuel. One of its definite objects is to place the briquetting business on a commercial basis. For the use of the board there has been appropriated the sum of $400,000 by the Dominion, Manitoba and Saskatchewan governments. The former is to contribute one-half of the amount and the two latter one-quarter each.

Nanaimo, B. C.—Coal lands situated close to this town are being developed. A shaft is being sunk and it is expected that coal will be taken out in a short time. The new company has purchased the machinery of an old adjacent mine to use in its development operations.

There is a dispute as to the title to some 1,222 acres of Vancouver Island coal lands. This property at present is held by the Canadian Collieries, Ltd. It originally belonged to the old Baynes Sound Coal Mining Co. and attained a considerable development. In 1904, when the Provincial Government reached an understanding with the Esquimalt & Nanaimo Ry. Co., by which coal rights within the island railway belt were secured for a number of old-time settlers, in return for which the railway company was granted further lands in the northeastern section of the island, operations had ceased at the Baynes Sound collieries.

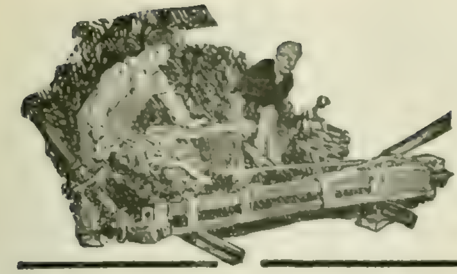
The property of the Baynes Sound company came within the limits of the supplementary railway land grant. It was found, however, that the railway company did not obtain possession of the Baynes Sound holdings. However, certain other property, in the northeastern section, was staked out by the railway company, later transferred to the Wellington Colliery Co. and thence to the Canadian Collieries, Ltd.

Messrs. E. T., C. H. F and E. A. Carew-Gibson and E. Priest contend that the railway company did not stake the land accurately, and that they are the only ones who complied fully with the law, following the lapse of the Baynes Sound Coal Co.'s leases. On this ground they are asking for possession. This demand being refused by the committee of the Legislative Assembly, the claimants assert that they will carry their case to the courts.

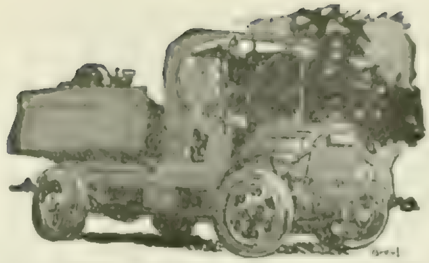
Huntington, W. Va.—Members of the Logan Operators' Association, at a meeting held in this city, went on record as being opposed to the assigned-car system on the present basis of distribution. The subject was raised by the decision of the Interstate Commerce Commission, announced on April 15. The matter was referred to the executive committee for further action.

Illinois and Wisconsin Retail Coal Dealers' Association will hold its annual convention Aug. 4 and 5 at Milwaukee, Wis. Secretary, I. L. Runyan, Chicago, Ill.

The Industrial Relations Association of America will hold its second annual convention at the Auditorium Theatre, Chicago, Ill., May 19, 20 and 21. Assistant Secretary, E. A. Shay, Orange, N. J.



Mine and Company News



ALABAMA

Birmingham—One battery of 60 ovens of the Sloss-Sheffield Steel & Iron Co.'s new $6,000,000 byproduct plant at North Birmingham began operation recently. Construction of the new plant is nearing completion, and Vice President Hugh Morrow states that fires under the second battery will be started at an early date.

The plant has two batteries of 60 Semet-Solvay ovens each, with a coking capacity of 2,500 tons of raw coal every 24 hours. The coke will be used by the furnaces of the company and the breeze and screenings for boiler fuel. The tar produced will be marketed as a crude product at present. No tar-refining equipment has been installed and such refining is not contemplated during the initial operation of the plant.

Equipment for the ammonia distillates is being installed. The light oil will be refined and the products marketed.

Tests made of the coal which will be supplied to the plant indicate a 24-hr. production of the following byproducts: About 20,000 gal. crude tar; 60,000 pounds ammonium sulphate, or equivalent in liquor, 17,000 gal. light oil, or equivalent in fractionated products and 1,800 tons of coke. The products noted will result from the operation of the two blocks of ovens.

The fuel-gas surplus has not been accurately determined, as the boiler plant of 4,800 rated hp. will consume a large amount. The boilers will furnish, in addition to the plant needs, steam for an electric-power station, distributing to the company's various mines, quarries and furnaces. It is estimated, however, that 7,000,000,000 cu.ft. of gas will be available every 24 hours for market purposes.

ILLINOIS

Carlinville— Macoupin County coal records were broken when mine No. 2 of the Superior Coal Co. hoisted 5,382 tons of coal in eight hours. A total of 1,537 mine cars were required to get the fuel to the top and 107 railroad cars to haul it away

Chicago—The Ayrshire Coal Co., of Oakland City, Ind., has placed a contract with The Krehbiel Co., of Chicago, for a new steel tipple to be equipped with Jacobsen horizontal screens and picking tables, for its new mine at Oakland City.

Collinsville — The office and engine rooms of mine No. 17 of the Consolidated Coal Co., about two miles northeast of here, were destroyed by fire, which made a total loss said to be between $25,000 and $30,000. No one was injured. Because of the switchmen's strike, the mine has cut down its force and only 15 men were at work when the fire was discovered. They reached the surface safely. At least two weeks will elapse before the machinery can be replaced and the plant put in working order again. Kingdon Gould, of New York, a son of George J. Gould, is president of the Consolidated company.

Herrin — A temporary wooden tipple is being erected at the Sunnyside mine, near here, in Williamson County, Ill., the tipple and washer having been destroyed by fire on April 11. President Warden, of Chicago, visited the mine recently and announced definite plans relative to rebuilding. The temporary structure will be replaced by a steel tipple as soon as materials and labor can be secured. It is likely that the washer will not be rebuilt, but a modern rescreening plant will be constructed instead. It is said the mine began hoisting coal May 1, thus giving employment to about 450 miners.

The Sunnyside mine of the Sunnyside Coal Co., at this place, lost the tipple and washery by fire on April 11. The hoist and boiler house were saved. The origin of the fire is supposed to be defective wiring, and the loss is estimated at $100,000. Plans are being made to erect a modern steel tipple and the mine is expected to be working full time again within three months. A number of mines were closed down for a few days, in this section, on account of the drivers refusing to accept the raise in wages but all mines are now working again.

Harrisburg—According to reports, the Harco mine, near this place, in Williamson County, Ill., has recently closed a contract with the New York Central R.R., which calls for a shipment of 35 cars daily. The railroad company has agreed to furnish the cars. This means that the Harco shaft will be running steadily during the summer, when ordinarily two days a week is about the average running time.

Springfield—The Illinois Supreme Court has placed its stamp of approval on the use of connecting mines as escapements, in the case of R. R. Fowler, state's attorney of Williamson County, Ill., against the Johnson City & Big Muddy Coal Co. The decision reverses the Williamson County Circuit Court, which enjoined the company from using one of its mines as an escapement for a connecting mine. The objection to the escapement was made because it is more than two thousand feet from the hoisting shaft.

INDIANA

Clinton—Vermilion Coal Co., operating a mine in the Clinton field, has leased 1,700 acres of fifth-seam coal land from the United States Steel Corporation, and will sink a mine southwest of Clinton, on the Chicago & Eastern Illinois R.R. switch. Bricks for the boiler house are here and steel and boilers are being shipped to the mine site. The steel corporation operates the Bunsen mines at Universal, and is retaining a large acreage of its own adjoining the leased tract.

KENTUCKY

Madisonville — Equipment of the Sunlight Mining Co. of Hopkins County is being shipped from Birmingham, Ala., to this city which should enable the company to operate its mine within 90 days. Grading will commence at once and the construction of a tipple will also begin in a short time. The company will use its steam shovel for grading purposes and will also strip coal which lies near the surface. In places the coal is covered with only ten feet of earth, while at other points it is 60 ft. beneath the ground. The company will operate a drift mine after stripping the available coal. Both No. 11 and No. 12 seams of coal will be mined. J. S. Morrow, general manager, says that the company has 600 acres of mining rights situated on the Louisville & Nashville cut-off and the mine will be three miles southwest of this city.

Smalley—The Bucks Branch Coal Co. has recently increased its capitalization to $100,000, to provide for general business expansion.

Type—The Mitchell-Willis Coal Co. is arranging plans for extensive improvements at its plant to provide for increased operations. It is proposed to open additional mines to provide increased output, and the company's plans call for the construction of about 25 houses for miners' service.

Sergent, — The Acme By-Products Coal Co., Fleming, Ky., is understood to be arranging plans for the immediate construction of a new tipple at its local mining operations. Plans will also be made for the construction of about 50 new dwellings to be used by miners.

MARYLAND

Cumberland — To arrange for increased coal transportation over its system, the Morgantown & Kingwood R R., a subsidiary organization of the Baltimore & Ohio R.R., has purchased a total of 1,000 additional coal cars from the Lehigh Valley R.R. Approximately 35 mining operations are conducted along the lines of the company, with production averaging about 100 to 125 loads of coal daily.

For the proposed development of extensive coal properties in the Meadow Creek district, contract has been awarded to Boxley Brothers, Huntington, W. Va., by the Greenbrier & Eastern Ry. Co., recently incorporated, for the construction of a new steam-operated railway, estimated to cost in excess of $1,500,000 for initial work.

Spruce Bridge — The Consolidation Coal Co., Fairmont, W. Va., is understood to be arranging plans for the installation of machinery and equipment for the immediate development of a total of about 12,000 acres of coal lands in the vicinity of Spruce Bridge.

NEW YORK

New York — On May 1 many of the occupants of the Washington Building, No. 1 Broadway, left this old building, which has been the headquarters of the coal industry for many years. The building is now the property of the International Mercantile Marine Co. and will be altered to meet its purposes. Some coal firms now located in the building have been provided with offices on other floors. Those firms that recently removed to other quarters, in New York City, are the following:

Alden Coal Mining Co., Inc.	Grand Central Palace
American Coal Co.	111 Broadway
American Coal Exporting Co.	154 Nassau St.
Coaldale Mining Co.	350 Broadway
Emmons Coal Mining Co.	149 Broadway
Eyre Fuel Co.	80 Broadway
Frame, Friend & Stineman, Inc.	Grand Central Terminal
H. B. W. Haff	1 Broadway
G. D. Harris & Co.	522 Fifth Ave.
Hartwell & Lester, Inc.	154 Nassau St.
Industrial Coal & Coke Corporation	Marbridge Bldg., 1328 Broadway
F. R. Long & Co.	Marbridge Bldg., 1328 Broadway
Archibald McNeil & Sons Co.	Grand Central Palace
W. A. Marshall & Co., Inc.	25 Beaver St.
W. C. Mason & Co.	143 Liberty St.
Morrisdale Coal Co.	15 Whitehall St.
Robinson, Haydon & Co.	143 Liberty St.
Rochester & Pittsburgh Coal & Iron Co.	90 West St.
Seller Coal Co.	90 West St.
Shawnee Fuel Co.	90 West St.
Smokeless Fuel Co.	154 Nassau St.
Spring Coal Co.	501 Fifth Ave.
Steamship Fuel Corporation	52 Broadway
Wholesale Coal Trade Association	90 West St.

New York,—W. A. Marshall & Co., of 22 Beaver St., this city, will hereafter have a Canadian organization to be known as W. A. Marshall & Co. of Canada, Ltd. The officers will be W. A. Marshall, president; Raymond Havemeyer, vice president; David L. Morrison, secretary-treasurer; and R. R. Boon, managing director. The headquarters will be at 58 St. Francis Xavier St., Montreal. Mr. Boon is well known in Canadian coal circles and until recently was identified with the Canadian Import Co.

Brooklyn—Six long established coal companies in Brooklyn announced recently that they had completed a merger and henceforth will do business under the name of the Commonwealth Coal Co., Inc., with a capital of $3,500,000. The combination, it was said, will save $400,000 a year in overhead charges. Officers of the new concern are Richard J. Wulff, president; Rudolph Reimer, Jr., first vice president; Justin J. Rathjen, second vice president, and Walter H. Nelson, treasurer. Frank D. Tuttle is chairman of the board of directors. The firms participating in the merger are: John F. Schmadeke, Inc.; S. Tuttle Sons & Co.; Z. O. Nelson & Son; Rudolph Reimer; Jurgen Rathjen Co., and Harry Blinn Coal Co.

OHIO

Columbus — The Queen Shoals Collieries Co., incorporated under Ohio laws recently for the purpose of developing a tract of 2,000 acres of coal lands at Queens Shoals, W. Va., will probably change to a West Virginia corporation before organizing. Clyde H. Hoyt, of the Clyde H. Hoyt Coal Co., of Toledo, is the moving factor in the enterprise. D. H. Armstrong, of Columbus, is also interested. The tract has an operating mine which will be enlarged to produce 1,000 tons daily. The product will be sold through the Clyde H. Hoyt Coal Co., of Toledo.

Steubenville—J. W. Blower, president; E. W. Blower, secretary; D. C. Thomas, vice-president, and E. M. Blower, all connected with the Panhandle Collieries Co., which is operating a large mine on the Pennsylvania R.R., near here, were on the property recently inspecting progress. The announcement is made that the mine, which will have a capacity of approximately 1,000 tons daily, will be opened by the middle of the summer. The mine is a shaft operation and will be modern in every respect.

PENNSYLVANIA

Pittsburgh — C. B. Turner, and associates, are understood to have completed negotiations for the acquirement of a total of about 1,000 acres of coal properties located in the vicinity of Fairmont, W. Va., and plans are being arranged for immediate development of the field and the installation of machinery.

The Kresage Coal & Mining Co., a Delaware corporation, has recently increased its capital from $1,000,000 to $2,000,000 for general business expansion.

Scranton—It is stated that heavy damage has been caused by a fire raging in the upper seam workings of the Continental mine of the Delaware, Lackawanna & Western Coal Co. on the West Scranton mountains. The company is maintaining a day and night fire-fighting force in its effort to conquer the fire. The first is said to have started several weeks ago, but is confined to a small area. At first the company officials tried to fight the flames with ordinary means, but, failing to make headway, they concluded to seal up this section of the workings and then flush with culm.

Uniontown—The sale is announced of 1,450 acres of virgin Pittsburgh coal land in Clay Township, Monongalia County, West Virginia. The price ranges from $250 to $300 an acre, the total consideration being approximately $500,000. The coal lies up Dunkard Creek, and is pierced by the Morgantown & Wheeling R.R. The sale was made by E. D. Patterson, of Waynesburg, for the owners, to the Monongahela Development Co., a holding concern composed of Morgantown, W. Va., men. Identity of interests back of the purchase has not been disclosed, but this sale is understood to be a forerunner of other deals by large industrial concerns to insure adequate fuel supply for the future.

Waynesburg—Seven hundred dollars an acre was the price paid for 1,700 acres of coal lands in Cumberland Township, Greene County, according to a deed filed here. The land was sold by the Prospect Coal & Coke Co., of Uniontown, and others, to the Buckeye Coal Co.

Another, but smaller, tract of coal land has been purchased by the Greene Improvement Co., which recently completed a series of transactions involving large acreage in eastern and southern Greene County. In the latest deal 53 acres in Cumberland Township was purchased by the company from Mrs. Lucretia E. Garrettson, of Knoxville, for $26,760, or approximately $500 an acre.

VIRGINIA

Lynchburg—The Banner Fork Coal Co. has increased its capitalization from $1,000,000 to $1,200,000, to provide for general business expansion. S. D. Ferguson is president.

Richmond—The Richmond Collieries Co. has been incorporated with a capital of $500,000 to engage in general coal mining operations in the Richmond district. William Job is president, and L. M. Johns, secretary.

WEST VIRGINIA

Cecil—The Sterling Coal Company is understood to be arranging plans for the immediate rebuilding of the electric power plant and tipple at its local operation recently destroyed by fire with a loss estimated at about $50,000.

Charleston—A material increase in the capital stock of the Carbon Fuel Co., of Cabin Creek, in the Kanawha field, has been decided upon and authorized by the Secretary of

State. From $1,000,000, the capital stock has been increased to $1,250,000. J. R. Thomas, of this city, is the president of the company.

Charleston, W. Va.—The Stover Coal Co. has acquired the Brown Coal Co., with extensive holdings and operations at Nuttall in the New River field. The acquisition of the Brown company holdings, the purchase of new equipment and the construction of many new houses will involve an expenditure of about $700,000 or $800,000. The Stover Coal Co. has been organized with Holly Stover, of Chicago, president. He is also president of the Holly Stover Co., with headquarters in Chicago, the company operating in the Illinois field. Mr. Stover is also largely interested in the Stover Elkhorn Coal Co., operating in Kentucky, and in the Eclipse Pocahontas Coal Co., operating in the smokeless fields of West Virginia.

Fairmont, W. Va.—The Chesapeake Coal Co., with headquarters at Wheeling, W. Va., having recently materially increased its total capitalization, has entered the Marion County, W. Va., field. The Chesapeake company secured from the Fairmont & Monongahela Coal Co. 750 acres of Sewickley coal, on the waters of Buffalo Creek, near Barrackville in Marion County. The purchase price was reported to be about $250,000. The company plans immediate development, contracts covering the sinking of two shafts having already been closed. T. H. Johnson, of Bellaire, is the president of the Chesapeake company, being also an eastern Ohio operator. The vice-president is J. A. Paisley and the secretary-treasurer, C. H. Eberts, of Wheeling, W. Va.

Gilbert, W. Va.—The Guyan Collieries Corporation recently organized with a capital of $2,000,000, is arranging for the immediate development of about 11,000 acres of coal lands in the vicinity of Gilbert. It is understood that this property contains six workable coal seams.

Logan, W. Va.—Protest against the proposed rate increase in electric power applied for by the Kentucky & West Virginia Power Co. was made on April 21 by a delegation of 15 coal operators of the Logan field, headed by J. J. Ross, president of the Logan Operators' Association. The power company is asking for a 42 per cent increase, as well as a new form of contract, both of which are opposed by the operators.

Norwood, W. Va.—The Peacock Coal Co., of Clarksburg, W. Va., which recently incorporated with a capital of $150,000, has perfected its organization, with Olandus West, president; J. Horner Davis, vice-president; E. B. Templeman, secretary; and P. M. Robinson, treasurer. The company has completed negotiations for coal properties in the vicinity of Norwood, and is planning for the installation of machinery and for the development of the operation. Carl Hornor is general manager.

Wheeling, W. Va.—The Chesapeake Coal Co. has completed negotiations for the purchase of about 750 acres of the coal property holdings of the Monongah Coal Co. T. H. Johnson, Bellaire, Ohio, is president of the company, and C. H. Ebberts, Wheeling, is secretary-treasurer. The company has already awarded a contract for the sinking of two shafts on the property in connection with proposed development plans.

WESTERN STATES

Clarksville, Ark.—The Nichols-King Coal Co. is understood to be having plans prepared for the sinking of an additional mine at its local operation, to provide for increased output. J. E. Nichols heads the company.

Jefferson City, Mo.—The Millbrook Coal Co., Exchange Bank Building, recently organized, is planning for the development of extensive coal properties in Moniteau County, Mo., recently acquired under lease. Machinery and equipment will be installed, while electrically operated apparatus will be utilized wherever possible. A. L. McCawley, of Jefferson City; W. P. Grishorn and Raymond A. Becker, both of Kansas City, head the new organization.

St. Joseph, Mo.—The Black Diamond Coal Co. has been incorporated with a capital of $150,000 to engage in general coal-mining operations. The company has completed negotiations for the acquirement under lease of about 1,200 acres of coal properties in the vicinity of Mendota, Mo., and plans are now being arranged for immediate development. T. L. Greenleaf, P. A. Hilderbran, both of the St. Joseph, and W. S. Fleming, Kansas City, are the incorporators.

Eagle Pass, Tex.—The International Coal Mines Co. is having plans prepared for the installation of coal mining machinery and equipment for all features of operation in connection with the proposed development of about 2,880 acres in the Eagle Pass district. It is planned to have an initial capacity of about 250 tons daily. D. H. Echols is manager.

Spokane, Wash.—Four months after incorporation, the Harvard Coal Co., operating at Princeton, B. C., is ready to start shipments according to F. M. Goodwin, secretary-treasurer of the company, who has his headquarters in the Old National Bank Bldg. in this city. The company is planning extensive development work according to Mr. Goodwin.

Roanoke Rapids, N. C.—The Rosemary Mfg. Co. is planning for the installation of new coal-handling apparatus at its plant, in connection with other extensions and improvements. Arrangements for the entire work have been completed.

Flint, Mich.—Coal operations will be started here within a few weeks by the West Side Coal Co., composed of Cleveland and Chicago operators, who have taken over leases near the west end of the town, formerly held by the What Cheer Mining Co. This property includes a square mile of territory which is estimated to contain 4,000,000 tons of coal. The site of the plant is in Genesee County.

Omaha, Neb.—It was announced recently that orders have been placed for 2,000 steel coal cars for summer delivery to the Union Pacific R.R. They will cost more than $2,000,000.

Auburn, N. Y.—The Columbian Rope Co., of this place, manufactures hemp rope of various sizes, and to make it more difficult for others to counterfeit, a paper ribbon is inserted in one of the strands during manufacture. On this ribbon is stamped the name of the manufacturer, the address and the date of the patent. The advantages of this method of protection are obvious. A trade mark placed on the outside of the rope readily could be counterfeited by others. But a strand woven into the rope, at the time of its manufacture, or as in this case a ribbon of distinctive type, adds security.

Coming Meetings

The Rocky Mountain Coal Mining Institute will hold its annual meeting in Denver, Col., in conjunction with the National First Aid Meet, an Aug. 20 and 21. Secretary, F. W. Whiteside, Denver, Col.

M. O. I. Coal Association will hold its annual convention June 16, 17 and 18 at Cedar Point, Ohio. Secretary, B. F. Nigh, Columbus, Ohio.

National Retail Coal Merchants' Association will hold its annual meeting June 10, White Sulphur Springs, W. Va. Secretary-manager, Ellery Gordon, Philadelphia, Pa.

Kentucky Mining Institute will hold its annual meeting June 4 and 5 at Lexington, Ky. Secretary, C. W. Strickland, Huntington, W. Va.

American Society of Mechanical Engineers will hold its spring meeting May 24, 25, 26 and 27 at St. Louis, Mo. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

West Virginia Coal Mining Institute will hold its annual meeting June 7 and 8, at White Sulphur Springs, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

American Wholesale Coal Association will hold its annual meeting June 1 and 2 at Pittsburgh, Pa. Secretary, G. H. Merryweather, Washington, D. C.

The Colorado Retail Coal Dealers' Association will hold its annual meeting June 8, at Colorado Springs, Col. Secretary, E. Hopper, Denver, Col.

West Virginia Freeport Coal Operators' Association will hold its annual meeting June 3 at Kingwood, W. Va. Secretary, A. T. Carnahan, Akron, Ohio.

International Railway Fuel Association will hold its annual meeting May 24, 25, 26 and 27 at the Hotel Sherman, Chicago, Ill. Secretary, J. G. Crawford, Chicago, Ill.

American Institute of Electrical Engineers will hold its annual convention at Sulphur Springs, W. Va., June 29 to July 2. Secretary, F. L. Hutchinson, New York, N. Y.

National Coal Association will hold its annual meeting May 25, 26 and 27 at the Traymore Hotel, Atlantic City, N. J. Secretary, W. B. Reed, Commercial Bank Building, Washington, D. C.

The American Association of Engineers will hold its annual convention at the Planters Hotel, St. Louis, Mo., May 10 and 11. C. E. Drayer, secretary, Chicago, Ill.

Obituary

George Strebel for many years superintendent of mining properties in Belleville, Ill., and Edwardsville, Ill., died recently at Springfield, Ill., following a stroke of paralysis. He was 67 years old and a native of Switzerland. He is survived by his wife and five daughters.

William A. Hunt, assistant superintendent of the Pursglove mine, of the Pursglove Maher Coal Co., at Stewartsville, Ohio, was accidently electrocuted by coming in contact with a 66,000-volt current. He was handling a switch at the entrance of the mine at the time of the accident. Mr. Hunt was 29 years of age and had been with the Pursglove Maher Co. for the last ten years.

I. W. Seamans, a prominent Fayette County, Pa., coal and coke operator, died recently at his home in Uniontown, Pa., following an illness which has its origin two years ago. Mr. Seamans never regained his health following an operation in Philadelphia, in August, 1917. At one time he was a power in the coal and coke development in the Connellsville region, being identified with a number of operations. Mr. Seamans was associated with J. V. Thompson at one time in some of his big deals. His widow and five children survive him.

William A. Hunt, superintendent of the Purseglove mines at Stewartsville, Ohio, was instantly killed on April 7 while attempting to adjust a high-tension switch at the entrance to a mine, 66,000 volts electrocuting him. Mr. Hunt was quite well known in mining circles throughout eastern Ohio. He was in his twenty-ninth year and had been closely identified with the Stewartsville operation for several years, being a relative of the owners of the plant. He leaves a wife and two brothers and two sisters.

Harry Haskell Small, sales manager of the Goodman Manufacturing Co., Chicago, died April 4, of heart failure, after quite a brief illness. He was born Oct. 7, 1862, at Portland, Me., and received his theoretical training at Worcester Polytechnic Institute. After connection with other industries he came to the Goodman Manufacturing Co. in 1901, as manager of the contract department, and the following year he was made sales manager. It is said that the efficiency of the Goodman Co.'s sales department is due in great measure to Mr. Small's forcefulness, his methodical attention to business, his judgment in commercial matters and his intimate knowledge of mining machinery manufacture and use. He had a wide acquaintance throughout the mining industry.

James H. McClelland, aged 60, died of blood poisoning at his home in Brazil, Ind., following a recent operation. He was one of the pioneer operators in the Brazil block coal field and for many years was head of the Brazil Block Coal Co., which at one time was the largest producer of coal in Indiana. After the exhaustion of the Brazil mine he operated bituminous mines at West Terre Haute and recently purchased a large holding south of that city. Mr. McClelland was on many committees for the settlement of differences between miners and operators and represented the block coal fields in many national conventions. He was interested in the Citizens National Bank of Brazil, the Central Iron & Steel Co., and several industries. Mr. McClelland was chairman of the United War Work campaign which raised more than $35,000 in Clay County, Ind.

Personals

John Lloyd, efficiency engineer of the [illegible] has resigned to [illegible] manager of the [illegible] Co. [illegible]

S. W. [illegible], of [illegible]hia, Pa., has [illegible] for Devoy [illegible] Coal [illegible] succeed **E. G. Ridgeway**, [illegible]

David Fleming [illegible] general manager of [illegible] Coal Co., at Colver, Cambria County, Pa., has re[illegible] take up his [illegible]

L. C. Thomas [illegible] position in [illegible] of the [illegible] Coal Co. [illegible] fuel [illegible] R.R. He is succeeded by **M. D.** [illegible].

F. W. Holderman, formerly assistant division engineer of the Hazleton division (Luzerne County, Pa.) of the Lehigh Valley Coal Co., has been appointed division engineer of the Lehigh division of the same company, in place of **G. R. Wood**, promoted.

James S. Burgess, who was formerly division engineer of the Snowshoe division (Center County, Pa.) of the Lehigh Valley Coal Co., has resigned to accept the position of superintendent of the Evans Colliery Co., at Beaver Meadow, Carbon County, Pa.

L. A. S. Wood, prominent in illumination engineering circles both in this country and in Europe, has been made manager of the illuminating section of the supply department of the Westinghouse Electric & Manufacturing Co., with headquarters

Paul Jocquel, for many years sales manager of the Berry-Bergs Coal Co., of St. Louis, has resigned to go with the Union Fuel & Ice Co.

N. F. Lefavor has been appointed Southwestern Sales Agent for the Illinois & Indiana Coal Corporation, succeeding **F. M. Johnson**, who goes with the St. Louis Coke & Chemical Co.

L. G. McCarty, of Solvay Collieries Co., Hemphill, W. Va., has accepted a position as superintendent with the J. C. Sullivan interests, at their Bartletts Creek Plant, Wyoming County, near Mullins, W. Va., effective April 16.

W. L. Luce, formerly general manager of the mines of the Ellsworth Collieries Co., at Ellsworth, Washington County, Pa., has resigned his position. Mr. Luce was recently tendered a farewell banquet by officials of the company at Ellsworth.

H. I. Smith, formerly assistant general superintendent of the Vandalia Coal Co., of Sullivan, Ind., is now with the American Mining Commission at Belgrade, Servia, where an investigation is being conducted to determine the possibilities of coal mining in the Balkan States.

W. A. Luce, of Sewickley, Pa., recently resigned as general superintendent of the Ellsworth Collieries Co., a subsidiary of the Lackawanna Steel Co., a position which he has filled for several years. His resignation becomes effective May 1. The operations consist of several large well-equipped mines on the Ellsworth branch of the Monongahela division of the Pennsylvania R.R.

M. A. Buehler, formerly sales manager of the Western Electric Co. at its Omaha house, has been made sales manager at the Minneapolis office. Mr. Buehler joined the Western Electric Co.'s organization in the early part of 1915 and became sales manager at Omaha during the fall of 1917.

Eliot Lum has been promoted to the position of sales manager at the Omaha office of the Western Electric Co., to succeed Mr. Buehler. Mr. Lum entered the employ of the Western Electric Co. as a student in the educational courses in 1905, directly after his graduation from college. In 1907 he became a member of the telephone engineering department at Chicago, and in 1909 was transferred to the sales department of the Minneapolis house, joining the Omaha organization in the same capacity in the winter of 1912.

Edward L. Haas, who has been employed by the Union Collieries Coal Co., at Penton, Pa., as coal inspector, has been promoted to the position of safety inspector with the same company, over its five mines and will hold both positions for the present. Mr. Haas is president of the Renton Athletic Association and takes an active interest in community welfare work. He was formerly employed by the Equitable Coke Co., at its Harwick mine as assistant mine foreman.

P. A. Coen, formerly vice president of the Sunday Creek Coal Co., has been made vice president of the Philadelphia & Cleveland Coal Co., of Cleveland, which has opened an office at Columbus, Ohio. The Cleveland Company is now one of the important factors in the coal business in Ohio. In addition to the Columbus office the company maintains a branch in Wheeling, W. Va. Mr. Coen will spend his time between the Columbus and Cleveland office and in the field, and will specialize on Hocking coals.

James Dalrymple, state coal mine inspector of Colorado, recently won a decision in the Supreme Court sustaining his right to an increase of $400 a year in salary, allowed by the last legislature. State Auditor Strong had refused to issue a warrant covering the raise on the ground that the inspector's salary, under the constitution could neither be raised nor lowered during his term of office. Mr. Dalrymple contended that the constitutional bar was removed when his office was brought under civil service.

Arthur F. Martin, auditor for more than 12 years for the Davis Colliery Co. and the West Virginia Coal & Coke Co., Elkins, W. Va., and associated with the W. H. Green Coal Co. as sales manager since Jan. 1, 1920, has resigned the latter position to become associated with the Boone County Coal Corporation, at Sharples, W. Va., as auditor. **Harry B. Martin**, his brother, will be his successor.

C. H. Nesbitt, chief mine inspector for Alabama, has been re-appointed for another term by Governor Kilby. Mr. Nesbitt has had supervision over the coal mines, in the capacity of chief inspector, for a number of years, having served under three state administrations. Prior to his initial appointment he was connected with some of the larger coal-mining companies in an engineering capacity, and is well posted on mining conditions and problems in this field. **J. B. Corlin** has been appointed an assistant inspector to succeed Hugh Lynch, who resigned some weeks ago.

Joseph G. Bradley, president of the Elk River Coal & Lumber Co., has been elected president of the Gauley Coal Land Co., to succeed the late Colonel Higginson, of Boston. The Gauley company owns what is said to be one of the largest, if not the largest, acreages of coal and timber in West Virginia, much of the company's holdings in Greenbrier County having been leased within the last year or so. Mr. Bradley, new president of this company, is a director of the National Coal Association and president of the West Virginia Coal Association. He is also a trustee of the Cameron estate and of the Bradley estate.

Eugene McAuliffe, president and general manager of the Union Colliery Co., in an address before the St. Louis Railway Club, advocated coal storage during the low-consumption season. His subject was "The Bituminous Coal Industry and the Public." "During the period of low consumption," he said, "the excess coal should go into storage, and from this storage should be taken the monthly deficit occasioned by the season of high consumption. With a duty due to the thousands, who from force of circumstances cannot store coal during the summer season, the working class in particular, the operators and dealers should unite in their efforts to provide the proper storage for the coal, which becomes so essential during the long and especially hard winter."

Carl Scholz, a well known Chicago mining engineer, made his first trip by airplane from Charleston to Wyoming, both in W. Va., where he is superintending the opening of large coal mines. The trip did not result disastrously, nevertheless he did not make it unscathed, since when near his destination Mr. Scholz and his pilot were forced to land and the machine in which they were riding struck the branch of a tree in a ravine. Mr. Scholz had chosen the aircraft as solving the problem of getting to the Wyoming mines without the loss of a day's time on the railroad and succeeded in interesting other operators in the project. Where it formerly took him a day to reach the property the aircraft made the trip in 40 minutes. While Mr. Scholz sustained a number of cuts and bruises when the airship was forced to land, he has not abandoned his plan of using the air route as a quick way of getting to and from the operation in which he is interested.

O. C. Straight and **Fred B. McClure**, civil and mining engineers, successors to the Fairmont Engineering Co., have opened offices in the American Building, Fairmont, W. Va. This firm is equipped to do all kinds of engineering, both members of the firm having had considerable experience in the examination and making of reports on coal properties, in constructing mining plants and in building highways. Messrs. Straight and McClure bought out the Fairmont Engineering Co. March 20, and are now doing the engineering work for about 20 coal mining companies. O. C. Straight has had ten years' experience in mining engineering. He was with the Hope Gas Co. for three years. He has located many wells in West Virginia and in Pennsylvania. For two years he was assistant chief engineer of the Bethlehem Coal Co. His experience in highway construction consists of eighteen months' work in France with the A. E. F. For a time he was connected with the Fairmont Engineering Co.

Fred B. McClure has had four years' experience in mining engineering, during which time he was in charge of the mining operations (as engineer) of the Fairmont & Lowesville Coal Co. He engineered the construction and installation of the new plant of the company. He was also connected with the Fairmont Engineering Co. at South Bend, Ind.

COAL AGE

The Weekly Journal of the Coal and Coke Industries

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The Vanishing Point

PROFIT can be taken from a business in such a degree that it affords to the operator a maximum benefit without upsetting price levels generally. A few of the larger coal companies have deliberately set their prices at a point that will render them a maximum net profit for the year with a minimum payment of Federal taxes. If all coal companies would follow the same practice the income of the Government would be seriously decreased and Congress forced to adopt other and better avenues of taxation than the present excess profit system.

Taking all the market will bear under present conditions nets the producer little but ill-will on the part of the consumer and piles up the storm of wrath to come, for beyond a certain point taxes take the bulk of the receipts. Figure it out for yourself and put a stop order on the price.

Educate the Public with Facts

THE National Coal Association has recently entered upon a program of publicity that contemplates the organization of speakers' bureaus in the local associations and widespread publicity by word of mouth and through the press. The new work of the national association along these lines is described as an effort to lay a ground work for the character of public declaration that will tell exactly what the problems of the industry are and in doing so form the basis for a better understanding on the part of the public. We are told that to do this "the public must be taken into the operator's confidence and be frankly and unhesitatingly told the operator's vieypoint." A very laudable program and one in the furtherance of which the coal trade press will gladly assist. But it is not sufficient to tell the public the viewpoint of the operator—tell the operator the viewpoint of the public if you would win public approval.

Accept first the fact that the public is now interested first in price—price of mine labor and of coal—and after that in profit, both of labor and operator. Get the facts and lay them before the public. The industry today, as an industry, is without the assembled information to properly convince the skeptical, and such data as are available are closely held.

If the producers of half the bituminous coal in the United States, the members of the national association, really desire to let the public in on the condition of their business, and we believe they have nothing to lose by so doing and nothing to hide, let them assemble the facts and give them to the public. We can do no better than quote a paragraph from the address of Dr. Garfield a year ago to the operators assembled in Chicago at the second annual meeting of the National Coal Association:

"Now, the public has much to learn. The public is waiting to be informed concerning many of these vital questions which are pressing upon you and upon the officers of the government. The public is ready to pay for what it ought to pay for. But the public demands the right to know whether what is being charged is just or not. You and I haven't any right to ask that they close their eyes and pay. Just as it is important for you to know the cost of production so it is important, if not imperative, that the public know what the cost of *consumption* is. In other words, gentlemen, they have a right to know in a general way, at any rate, what profits you are making, whether excessive or not."

Apply the Golden Rule

LABOR gets an increase, costs of production go up, profits figured on the percentage basis are added on, the cost of commodities and of living mount and labor demands another increase, in the ordinary everyday routine of today. Each, labor and producer, blames the other. Everyone is the innocent bystander now and the loudest protests and most radical statements are coming from the supposedly staunch element of our people—bankers, who have to pay thirty cents for a collar; lawyers and doctors, who are asked fifteen dollars for a pair of shoes.

If the buying public were but organized we would today witness a strike of far greater moment than any heretofore—a strike of buyers of the ordinary conveniences of life. Far-sighted leaders in business today point the way to start the line of prices downward without a wreck. Let every seller reduce his profit to the vanishing point or lower, taking a loss if necessary for a time. Thus the first step in the "Do unto others" policy would lead to the next, for our faith in the common honesty and fair mindedness of American labor is such that we believe that the coal operator once having proven good faith by lowering prices and profits, could ask and would receive concessions in wages from his employees.

Cottrell Director of Mines

MINING men will be pleased at the selection by the Secretary of the Interior of Dr. F. G. Cottrell as the new director of the Bureau of Mines. Although not a mining man by training or experience, Dr. Cottrell is a thoroughgoing scientist, a man of broad thought and very human sympathies.

Under his direction the bureau will find new inspiration for scientific research and the mining industries a new technical leader. The Bureau of Mines may be considered to have passed through the promotional stage and now, firmly established with the mining public and under the impetus of new leadership, to be entering upon a period of greater opportunity and usefulness.

Action Begins on the Indictments

NO SURPRISE was occasioned by the action of the defendants in the Indianapolis indictments when they last week filed bills in the various States in which they reside, asking that the Attorney General and various and sundry other legal lights of the Government be enjoined from putting them on trial before Judge Anderson.

The defendants are first of all interested in keeping out of Federal jails, and the indictment of last March was a trap for the unwary. It is understood to be the opinion of some counsel that should those indicted appear before Judge Anderson, and should a single overt act by any one of the accused be proven, all would be liable, so broad and hazy is the indictment.

Of course, what both operators and miners desire is to separate the charges and have each accused told what he is accused of having done, in order that he may proceed to defend himself. Perhaps the present proceeding will force the Government to come out in the open and most certainly will give us a new set of interpretations of the validity of the Lever Act.

Boiler Room as the Manager's After-Thought

IN the boiler rooms of too many of our coal mines the fact is clearly attested that the real business of the coal industry is not running a power plant but operating a coal mine. There is no need to ask if the man at the head of the whole operation is a mechanical engineer. It is evident he is not or he would not have stood so long by the locomotive boiler and hand firing and resisted so determinedly the pleading of his mechanical engineers for equipment better calculated to give results and save fuel. He would have known that the only kind of coal to use under an old-style boiler with the old-style grate is the expensive lump and nut fuel that was used when old-style boilers and grates had their day.

He should remember—none more readily—that in the early years of coal mining slack was not sold but shoveled to one side. Coal was picked up with forks and the slack was left in the mines, or if brought to the surfaces was piled outside in the tipple yard. No one could afford to use slack with the old type of grate, for it wouldn't raise steam and went through the grate openings to be wheeled to a dump, where to the despair and chagrin of the whole neighborhood it usually completed its combusiton and filled the air with the aroma of sulphur fumes.

It was only when automatic stokers were introduced that slack became salable. At first it barely paid freight, then it began to pay a part of the mining cost and finally in a few isolated cases in times of shortage it sold a little higher than lump because the large coal had to be crushed and appliances for that purpose were not available.

It may be said and thought that slack having become of value, Why not go on using lump or nut in the field? It has been done before when these sizes were expensive or exclusively salable; why not go on doing it now that the smaller sizes are marketable at a more reasonable figure? Why make a change now when the argument for change is a little weaker rather than a little stronger than before?

The answer is this: The difference in price between slack and larger sizes still warrants the greater use of slack; dirty coal can be used on the newer-style grates and cannot be burned on older types; good grates save coal while others only waste it. The argument is strong enough to eliminate the need for any hesitation. The only reason why such a change does not come quicker is because the mining man sees all his problems from the working face of his mines. He rarely looks in the boiler room unless a flue is leaking or a grate, a firedoor or an arch has fallen. Any boiler is good enough for him, for he doesn't understand the steam-making business.

More and more is coal sold on specifications. Quality is taking the place of quantity as the great desideratum. The only way to provide all the quality of which a coal is capable to cast out all the inferior material and to do this in the most liberal manner. Where the choice is between the market or the rock dump, care in selection must be exercised, but where the choice is between one's own boiler plant and the boiler plant of the customer the coal operator can afford to eliminate much coal that is merely dubious. At times he may even have to add some clean slack to the waste. Only a picking table and a mechanical stoker at the mine can give the essential letters of introduction for any coal that seeks admission to the best type of boiler installation in a distant city.

The time is coming when the boiler room will cease to be the manager's after-thought or his bad guess. The mining engineer, regular or consultant, will not have anything to do with its design or construction. The mechanical engineer will be left untramelled in its planning and his mining *confrère* will then cease to be troubled with the high cost of steam raising or with the difficulties arising from frequent boiler breakdowns.

Look Far Afield

NOTHING does more to develop industry than the disadvantages under which some portions of it labor. Out of the perplexities of certain regions come developments that more favored localities might never discover and initiate.

Thus we look to the Pacific Coast for progress in the pulverization of coal, its distribution and use and to Brazil to gain information as to the use of that product by railroads. To California we may direct our attention, for its low-grade fuel and the needs of the war have made experiments in pulverization profitable.

Briquetting may possibly make its largest progress away from the coal regions, notably in Ontario. The advances made will, however, soon react on the coal field, which, it is true, has long had quite a few briquetting plants. The Dakotas are going to show us something about carbonizing and briquetting low-grade coals, and Saskatchewan will soon indicate ways in which the work may be done. In those sections only lignites are now being, or are to be, beneficiated, but the work will undoubtedly add to the methods already tried and available in the treatment of low- and high-volatile bituminous coals.

Many are the problems bearing on operation in normal coal fields, but they find their first and most phenomenally successful solution where difficulties are greatest. Proved there, they gradually spread to mines that are more normal. The far-afield becomes close up as the year pass by.

Representative Garland Is House Authority On Mining Affairs*

As Chairman of the Committee on Mines and Mining Pennsylvania Representative at Large Has Made a Close Study of Mineral Production—Was at One Time Vice-President of Federation of Labor

BY PAUL WOOTON

WHEN Mahlon M. Garland, now Representative at large from Pennsylvania and chairman of the Committee on Mines and Mining of the House of Representatives, was a younger man an incident occurred at the collar of the shaft of a Pennsylvania coal mine which has since stood him in good stead in analyzing political and legislative propaganda. At that particular mine it was customary to keep the mules underground all the time unless it became necessary to shut down the mine for a considerable period. Such a shutdown having become necessary, the mules were brought to the surface after they had been underground many months. He saw them brought to the surface with their eyes carefully bandaged, and noted the safeguards taken to prevent their too sudden exposure to the light of day.

For weeks thereafter these mules revelled in a pasture. Then it came time to start working the mine again, and the mules were led up to the cage preparatory to being lowered for another long sojourn underground. They were keenly conscious of the fact that they were about to be returned to surroundings less to their liking, showing all the obstinate determination for which they are noted, and declined to be led or driven onto the cage. Every expedient tried was unsuccessful until the foreman conceived the idea of leading a blind mule onto the cage first. Despite the disposition they had previously shown, the mules, like sheep, followed their superannuated companion onto the cage, and soon were at their old task of providing traction in the darkness of the workings.

MAHLON M. GARLAND

This incident was regarded by Mr. Garland as typical of human conduct in many instances. Despite the good sense of individuals, they frequently defeat their own desires for betterment through following improper leadership. In his long experience in adjusting differences between employers and employees, and during his career as a politician and statesman, Mr. Garland has found frequent use for the story of the mules as an illustration of the consequences of blind leadership.

Through his life-long association with the coal industry Mr. Garland has followed closely developments in other lines of mineral production. He has given much attention to mining legislation and has just conducted a thorough investigation of the war-minerals situation. He is particularly interested in the relationships between capital and labor in the mining industry. Mr. Garland formerly worked as a laborer in iron and steel mills and has been prominently connected with the union labor movement. He at one time was the president of the Amalgamated Association of Iron, Steel and Tin Workers, and served two terms as vice-president of the American Federation of Labor.

As a labor leader who also enjoyed the confidence of employers he has frequently been called upon to advise labor and capital in industrial troubles. During the anthracite strike Mr. Garland took an important part, and was selected by John Mitchell as labor's member of the arbitration commission, which, however, did not function, as an agreement was reached without referring the matter to an arbitration board.

Mr. Garland was born in Pittsburgh in 1856. After twenty years' work as a laborer in the steel mills he embarked in politics, and served for many years as Collector of Customs at Pittsburgh. He has served as a member of the City Council of Pittsburgh and as a member of the School Board. He has been prominent also in the affairs of the Loyal Order of Moose.

As chairman of the House Committee on Mines and Mining, Mr. Garland is confronted with a variety of legislation which has an important bearing on mining affairs.

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*Reprinted from an article in *Engineering and Mining Journal*, entitled "Government Officials Who Influence Mining."

Mine Layout Arranged for Large Tonnage and Minimum Handling Cost

While Not a Deep Seam, Care Has Been Taken to Leave Adequate Side Pillars on All Headings and a Large Area of Coal Round the Shafts, Both of Which Are To Be Used for Hoisting—A Natural Grade of 1.5 Per Cent Facilitates Caging

By James R. Elliott
Pittsburgh, Pa.

ONE OF the most important points in the transportation system of any mine is the shaft bottom. No matter what the facilities for handling coal on the surface or how elaborate the arrangements for dispatching the trips within the mine may be, ease and efficiency of operation at these points go for naught if the coal moves slowly at the foot of the shaft. The loaded and empty cars as they enter and leave the cages must be handled quickly and effectually.

The method by which the coal is to be developed exerts a strong influence upon the bottom layout. Furthermore the lay of the bed must be considered, as well as the general dimensions of the tract to be mined. Sometimes much advantage may be taken of the natural dip of the coal. At the Mather Collieries,[1] located at Mather, near Jefferson, in Greene County, Pennsylvania, can be found a bottom layout that is highly effective and yet notable for the absence of machinery. This plant is served by a branch of the Chartiers Southern R.R. which runs along the south branch of Ten Mile Creek, and connects with the Monongahela division of the Pennsylvania R.R. at Millsboro, Pa.

The company owns about four thousand five hundred acres of the Pittsburgh bed of coal, which averages from 6 ft. to 6 ft. 9 in. in thickness throughout the tract. Overlying the coal is a drawslate about 1 ft. in thickness. The plant is situated in the southeast central part of the field and near the lowest elevation of the bed. Two concrete-lined shafts have been sunk to the coal, which lies at this point about 350 ft. below the surface. These shafts are 850 ft. apart. Both shafts eventually will be utilized for hoisting the coal, although at present the whole output is removed through the No. 1 shaft. Shaft No. 2 is employed for hoisting men and materials. The fan which normally exhausts air from the mine is situated at the No. 2 shaft. The direction of the air currents is shown in Fig. 2.

The map, which covers only a small portion of the property, was prepared as a projection for the current year's operation and shows in detail the method of mining. The landings for loads above each shaft are double tracked for a distance of 1,000 ft. and will ultimately be extended the same distance below for the empties. The grade is in favor of the loads, averaging 1.5 per cent and over, so that the handling of cars is entirely by gravity. This has been made possible by sinking the shaft square with the general dip of the bed, thus utilizing to a large degree a natural grade.

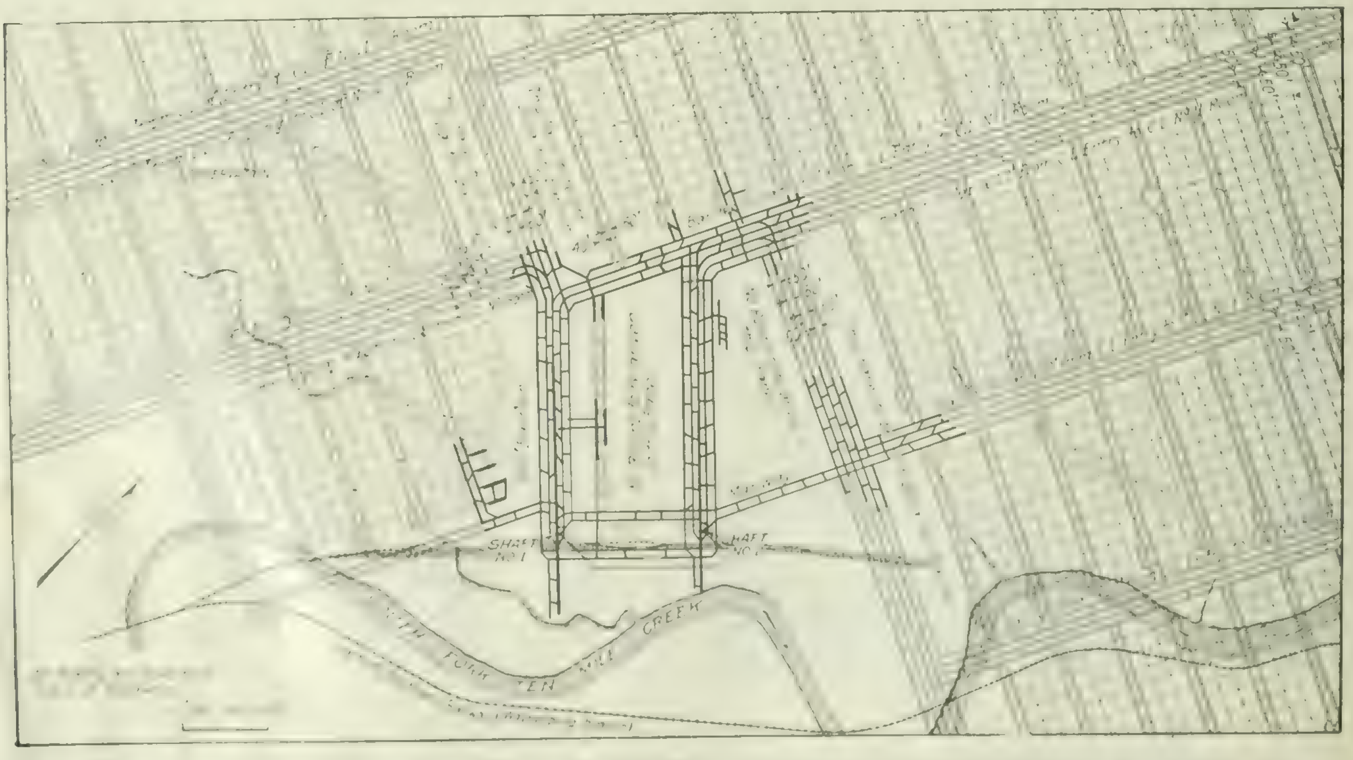

FIG. 1. PLAN OF PART OF THE MATHER MINE SHOWING METHOD OF PROVIDING FOR LARGE TONNAGE WITHOUT CONFLICT OF TRANSPORTATION UNITS

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[1] The surface plant of this operation was fully described in Vol. 16, pp. 783-786.

Self-dumping cages are employed. After leaving the cage the empty cars drop by gravity to a double-tracked landing below the shafts. Thence they may be made up into trips and hauled away by locomotives over empty tracks located on either side of the loaded-car landing and 40 ft. distant from it.

All main entries in the mine have been laid out on 50-ft. centers, one heading for the loads and one for the empties paralleling it. Manways have been provided and outside entries are used for the return air. It is the intention to bring the tonnage through shaft No. 1 up to 4,000 tons in eight hours, and in order to facilitate underground transportation it was deemed advisable to provide ample empty and load trackage.

The concentrated panel system of development has been adopted, the lengths between face entries being about 1,200 ft., with 300-ft. rooms. These chambers are driven on 100-ft. centers with breakthroughs every ninety feet. The shaded portion of the map indicates where it is intended to commence drawing the rib section.

The coal is cut with Jeffrey shortwall machines and the loaded cars are gathered at the main entries by storage-battery locomotives. From this point the trips are hauled to the shaft bottom by trolley locomotives. At the present time six 6-ton storage-battery machines and one 13-ton trolley locomotive are in use.

Sixty-pound rail is used on the landings; 40-lb. on all haulage entries and 20-lb. sections in the rooms.

Fig. 3 shows the shaft bottom and landings at the No. 1 shaft; the arrangement at the No. 2 shaft is an exact duplicate. The track gage is 44 in. while cars of 2½-ton capacity are used. This illustration is practically self-explanatory, showing in detail the type of construction around the bottom as well as the arrangement of the tracks better than any descriptive matter that could be written. The plant at Mather was designed by Baton & Elliott, of Pittsburgh, Pa., who also supervised its construction.

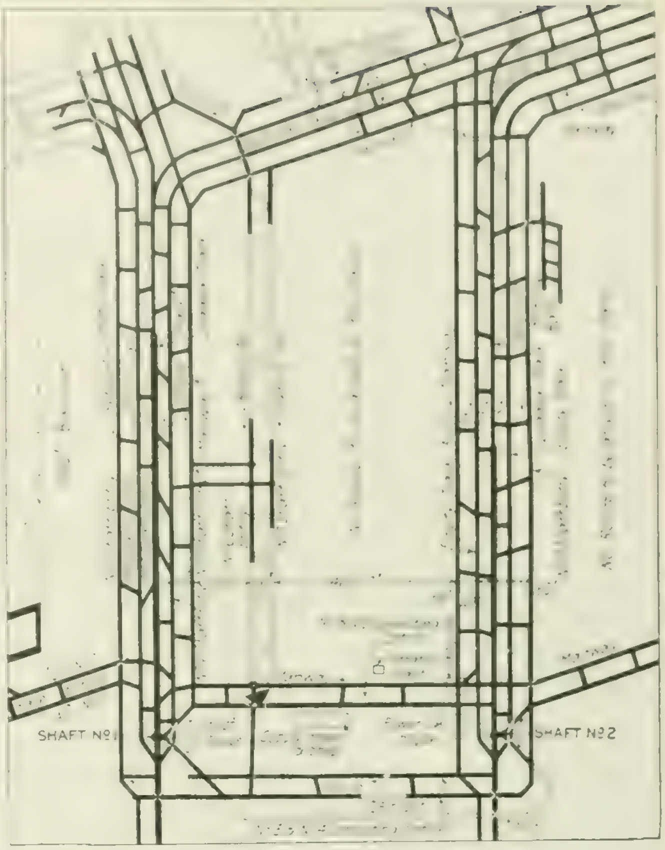


FIG. 2. LAYOUT OF SHAFT BOTTOM
With such large pillars and a seam only 350 ft. deep no movement of any kind should trouble the shafts

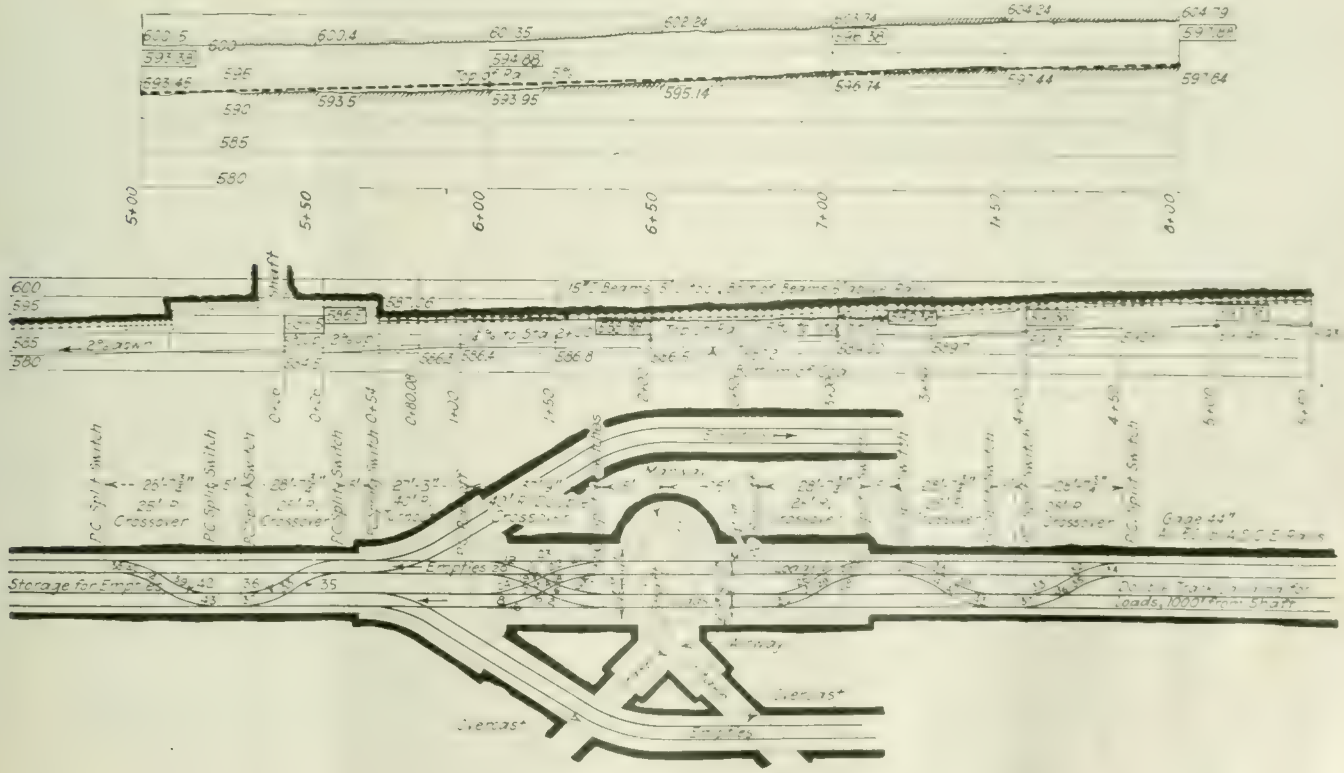


FIG. 3. DETAILS OF THE SHAFT BOTTOM AND TRACKAGE LAYOUT
Convenience and capacity characterizes this gravity-operated bottom layout. Steel timbering and concrete provide for the permanency of the installation. Few, if any, mine problems exceed in importance that of the layout of the landing of a shaft.

What Belt Should Be Selected and What Treatment It Should Receive

Belting Should Be Fitted to the Conditions Existing, Though a Lengthening of Pulley Centers, an Increase in Pulley Width and Other Changes May Lessen Wear—Improper Lacing May Cause an Otherwise Good and Suitable Belt to Fail

By E. K. Black
Akron, Ohio

TRANSMISSION belts, like delicate machinery, must be given proper care if the user expects them to render adequate service. This is such a self-evident truism that it seems hardly worth repeating and yet it is frequently overlooked. Belts that should be good for years of continued service are in many cases subjected to abuses which soon render them useless. The manufacturer often is blamed for having put out a defective product when in reality the belt itself was faultless.

Unjustified claims for adjustments on injured belts are made frequently by disgruntled users. Every manufacturer can cite dozens of such cases. The Diamond Rubber Co., for instance, recently was asked to make an adjustment on a belt that had been torn along its length for several yards at either end. The user was vehement in asserting that the belt was defective, but when an examination was made it was clearly shown that the only cause for injury was improper lacing. The lace holes had been punched haphazardly and with no regard to the necessity for providing that the stress would be across the width of the belt. The result was that when put in use the belt ripped and was practically ruined.

Improper lacing probably is the most common mistake made by users, and yet it is the one that causes the most serious trouble, often completely nullifying all the knowledge and skill that the manufacturer used in making the belt. There is no excuse for ruining a good belt in this way. By observing the following simple rules the belt will give the best service of which it is capable:

(1) Cut the ends of the belt absolutely square. Do not depend upon your eye or use an ordinary ruler. If the end is slanted in the least degree the pull will come all upon one side of the belt, and the consequences are likely to be disastrous.

(2) Make the holes as small as practicable. Whenever possible use an awl rather than a punch.

(3) Leave a sufficient margin at the edge of the belt beyond the holes, so as not to impair its strength. In belts 2 to 6 in. wide, the holes should not be nearer to the edge than ½ in.; in belts 6 to 12 in. wide not closer than ⅝ in., and in belts 12 to 18 in. wide not closer than ¾ in.

(4) Make two rows of holes on parallel lines straight across the width of the belt. These should be staggered so that the stress will be equal upon different portions of the belt.

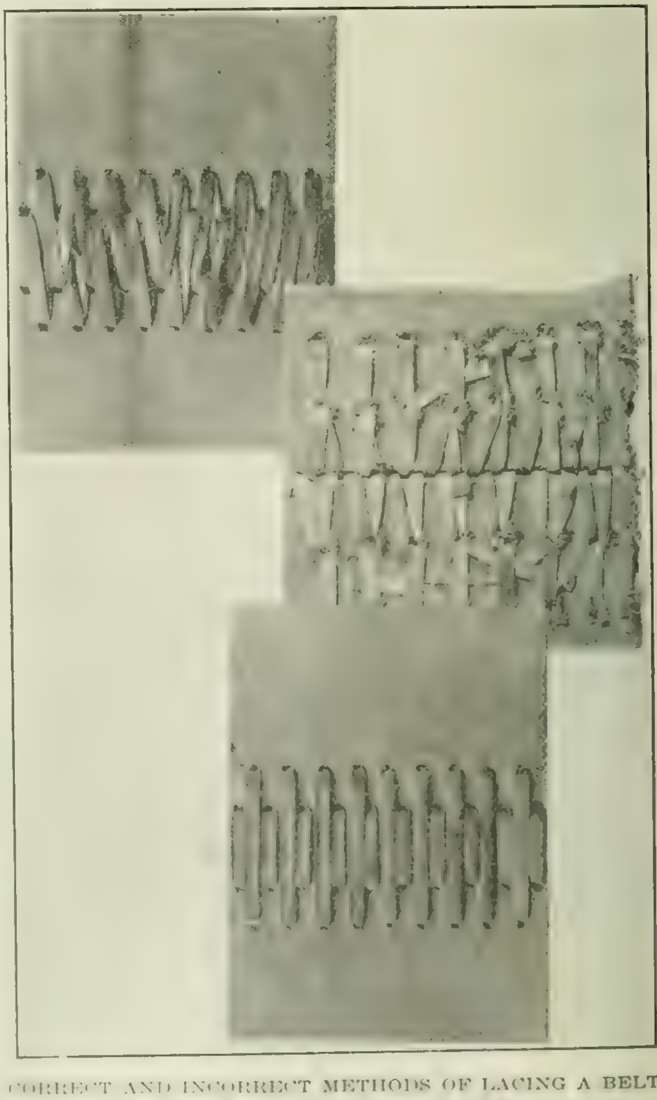
(5) Be sure that the holes in the two ends to be joined match exactly. Otherwise there will be a "jog" in the belt, and this is likely to result in tearing it lengthwise.

(6) Use flexible lacing, being careful to have it of a size proportionate to the size of the belt. A heavy lacing is likely to cause trouble.

(7) In lacing the belt make the pulley side as smooth as possible. Rough places should be avoided and ends should be pulled through away from the pulley.

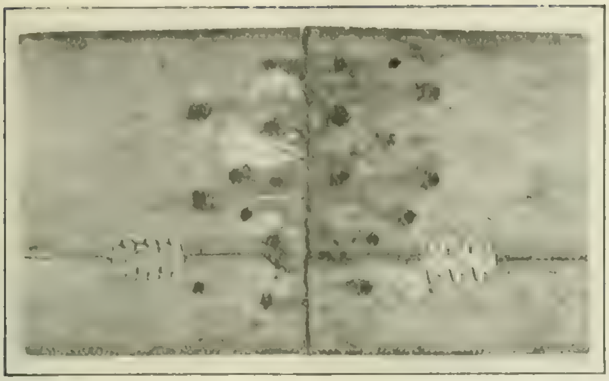
(8) In using metal fasteners select those that put the tension stress on the lengthwise strands of the belt. The crosswise strands are not as strong as those which run lengthwise.

Besides improper lacing, there are many other abuses that cut down the life of belts. Shafting that is out of



CORRECT AND INCORRECT METHODS OF LACING A BELT

The upper and lower figures show respectively the outside and pulley side of a properly laced belt. The middle figure shows a poorly laced belt—one that will sooner or later give trouble.



IMPROPER LACING CAUSED THIS BELT TO RIP

If any system or plan was followed in locating the lace holes, this is not apparent. This belt was ruined not worn out.

line may cause an undue strain upon the belt and make it run off the pulley. Oil may be allowed to drip upon it and ruin it. The belt may be applied with an initial tension so great as to produce an unnecessary strain.

Many complaints regarding unsatisfactory performance can be traced to the fact that the wrong belt was selected. No matter how good a belt is or how careful the treatment it may receive, it will fail to give satisfactory service if not adapted to the use to which it is put.

In deciding upon the proper belt for any particular installation eight factors must be considered: (1) distance between pulley centers; (2) diameter of the pulleys; (3) width of the pulleys; (4) use of idlers, cone pulleys, quarter turns, half turns, etc.; (5) speed; (6) horsepower to be transmitted; (7) nature of load, whether jerky or constant, and (8) conditions such as contact with moisture, oil or other bodies likely to cause deterioration in the material of the belt.

Over these factors the belt man usually has little or no control. His problem is to take conditions as he finds them, and apply a belt that will give the best service possible under the circumstances. Yet he may sometimes perform a real service by calling attention to a faulty arrangement when conditions are such that the fault may be corrected. Real economies may sometimes be effected by lengthening the distance between pulley centers, increasing the width of the pulley face, or by changing the arrangement of a vertical belt so as to give a certain degree of slant.

The factors which are under the belt man's control are these:

(1) The kind of belting to be used—whether rubber, leather, canvas, etc.; (2) the grade—whether cheap, medium or high grade, and (3) the weight of the belt—whether it shall be 4- or 6-ply, single or double.

In determining the kind, the merits of rubber belting should receive full consideration. This type is economical in first cost, extremely efficient in service and frequently outlasts other constructions. On the other hand, in places where constant contact with oil is unavoidable a rubber belt will not give good service. The constant use of shifters also injures a belt of this type.

In deciding upon the right grade of belt for a particular installation the points to be considered most carefully are the size of the pulleys, the presence of idlers or other unusual conditions, if any, and the speed. Small pulleys operated at high speed require a high quality of belt because internal wear takes place between the various plies of fabric, and even between the

TABLE FOR FINDING THE HORSEPOWER THAT A BELT WILL SAFELY TRANSMIT

Width, In.	Ply	Speed in Lineal Feet per Minute 200	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000
4	4	1.45	3.64	7.27	10.9	14.5	18.2	21.8	25.4	29.0	32.7	36.4	40.0	43.6
	5	1.82	4.55	9.1	13.6	18.2	22.7	27.3	31.8	36.4	40.9	45.4	50.0	54.6
	6	2.18	5.45	10.9	16.4	21.8	27.3	32.8	38.2	43.6	49.0	54.5	60.0	65.5
5	4	1.82	4.55	9.1	13.6	18.2	22.7	27.3	31.8	36.4	40.9	45.4	50.0	54.6
	5	2.27	5.68	11.4	17.1	22.8	28.4	34.1	39.8	45.5	51.1	56.8	62.5	68.2
	6	2.73	6.83	13.6	20.5	27.2	34.1	41.0	47.8	54.5	61.4	68.2	75.0	81.8
6	4	2.18	5.45	10.9	16.4	21.8	27.3	32.8	38.2	43.6	49.0	54.5	60.0	65.5
	5	2.73	6.83	13.6	20.5	27.2	34.1	41.0	47.8	54.5	61.4	68.2	75.0	81.8
	6	3.28	8.18	16.4	24.6	32.8	40.9	49.1	57.3	65.5	73.7	81.8	90.0	98.2
8	4	2.91	7.27	14.5	21.8	29.1	36.4	43.7	51.0	58.2	65.5	72.7	80.[illegible]	87.3
	5	3.64	9.1	18.2	27.3	36.4	45.5	54.6	63.6	72.7	81.9	91.0	100.0	109.2
	6	4.37	10.9	21.8	32.7	43.6	54.5	65.5	76.4	87.3	98.3	109.0	120.0	131.0
10	4	3.64	9.1	18.2	27.3	36.4	45.5	54.6	63.6	72.7	81.9	91.0	100.0	109.2
	5	4.55	11.4	22.7	34.2	45.5	56.9	68.3	79.5	91.0	102.2	114.0	125.0	136.4
	6	5.46	13.65	27.3	40.9	54.5	68.2	81.8	95.5	109.0	122.6	136.4	150.0	163.6
12	5	5.46	3.65	27.3	40.9	54.5	68.2	81.8	95.5	109.0	122.6	136.4	150.0	163.6
	6	6.55	16.3	32.7	49.1	65.5	81.7	98.2	114.4	130.9	147.0	163.5	180.0	196.0
14	5	6.36	15.9	31.8	47.7	63.6	79.5	95.5	111.4	127.2	143.0	159.0	175.0	191.0
	6	7.64	19.1	38.2	57.3	76.4	95.5	114.6	133.8	152.8	172.0	191.0	210.0	229.2
16	6	8.73	21.8	43.6	65.5	87.3	109.0	131.0	152.7	174.6	196.5	218.0	240.0	262.0
	8	11.63	29.1	58.2	87.3	116.3	145.3	174.6	203.5	232.6	262.0	290.6	320.0	349.2
18	6	9.82	24.5	49.1	73.7	98.2	122.8	147.4	171.8	196.4	221.0	245.6	270.0	294.8
	8	13.09	32.7	65.4	98.3	130.9	163.4	196.6	229.0	261.8	294.0	326.8	370.0	393.2
20	6	10.9	27.3	54.5	81.8	109.0	136.5	163.6	191.0	218.0	245.6	273.0	300.0	327.2
	8	14.5	36.4	72.7	109.0	145.5	181.9	218.0	254.5	291.0	327.7	363.[illegible]	400.0	436.0
24	6	13.09	32.7	65.4	98.3	130.9	163.4	196.6	229.0	261.8	294.0	326.8	370.0	393.2
	8	17.4	43.6	87.2	130.8	174.4	218.0	261.6	305.0	348.8	392.0	436.0	480.0	523.2
30	6	16.3	40.8	81.6	122.4	163.2	204.3	245.0	286.0	326.4	368.0	408.6	450.0	490.0
	8	21.8	54.6	109.0	163.8	218.0	272.8	327.6	382.0	436.0	492.0	545.6	600.0	655.0
30	10	27.3	68.2	138.4	204.6	273.0	341.0	409.2	477.4	546.0	614.0	682.0	750.0	818.4
36	8	26.2	65.5	131.0	196.5	262.0	327.5	393.0	458.0	524.0	589.0	.655.[illegible]	720.0	786.0
	10	32.7	81.8	163.6	245.4	327.2	409.0	490.8	573.0	654.4	737.0	818.0	900.0	981.6
42	8	30.5	76.4	152.7	229.2	305.4	382.0	458.4	535.0	610.8	687.0	764.0	840.0	916.8
	10	38.2	95.5	190.9	286.5	382.0	478.0	573.0	668.0	764.0	860.0	956.0	1050.0	1146.0
48	8	34.9	87.3	174.5	261.9	349.0	437.0	523.8	612.0	698.0	786.0	874.0	960.0	1,047.[illegible]
	10	43.6	109.0	218.0	327.0	436.0	546.0	654.0	764.0	872.0	982.0	1,092.0	1,200.0	1,308.0

fibers in each ply, each time the belt rounds the pulleys. A high-grade "rubber friction" (an elastic rubber film between fibers) is the best possibble protection against this internal wear, because it protects each fiber with an elastic coating that remains uninjured and which indeed retains its life and elasticity longer when in use than when lying idle.

In this connection it should never be forgotten that the value of a particular rubber friction cannot be determined merely by the test showing "pounds pull." If the plies were fastened together with glue, this test would still show a high-grade belt. Everyone knows, however, that such a belt could not give service. The most valuable property of rubber friction is that intangible quality called "life." There is no known test for this but length of service.

In specifying the proper ply of rubber belt for a given installation the determining factors are the size of the pulleys, width of the belt, speed and horsepower to be delivered. The belt itself should be at least 1 in. less in width than the face of the pulley. With this in mind, the proper ply can be determined by consulting the accompanying table of horsepower and plies. To illustrate, assume a pulley whose face is 13 in. wide, operated at a speed of 4,000 ft. per minute, with a maximum load of 100 hp. It will be found by referring to the table that a 12 in. 5-ply belt operating at 4,000 ft. per minute will transmit 109 hp. Specification will be made accordingly. In specifying the ply it must also be remembered that the greatest number of plies to be used on a 12-in. pulley is four, on a 18-in pulley five, on a 30-in. pulley six, on a 40-in. pulley seven and on a 48-in. pulley eight.

Carbonization of Lignite To Be Tried in North Dakota

NEW SALEM, North Dakota, has been selected by the Bureau of Mines as the place at which it will conduct its experiments in the carbonization of lignite. Congress has appropriated $100,000 for this work and an additional $200,000 is to be furnished by private interests who are co-operating in the work.

Immediately following the appropriation of the funds O. P. Hood, the chief mechanical engineer of the bureau, was assigned to the task of finding a suitable location for the conduct of the experiments. Extensive lignite deposits of a promising character exist in North Dakota and in Texas. Early investigations led to the conclusion that it would be advisable to locate the plant in Texas, because at that time there were a number of places in close proximity to the lignite deposits where there would be a ready sale for the gas.

After a site for the plant practically had been agreed upon extensive oil fields were developed in the same general region, which did much to solve, temporarily at least, the Texas fuel problem, and there was no hope of competing with the low-priced natural gas which suddenly became available. With this change in the situation North Dakota became the more promising location for the work, but it has been necessary to devote considerable time to making arrangements for the co-operative work. A contract has now been signed by the Bureau of Mines with John B. Adams and Fred Bremier, who will form a subsidiary to the Consolidated Lignite Collieries Co. The site on which the plant will be established is owned by this corporation.

It is the idea of the Bureau of Mines that as a result of the work which will be done the plant will be made commercially successful, and that it will continue in operation after the investigational fund has been expended. It is expected that publication of the results of the experiments will stimulate duplication of such plant throughout lignite areas.

The Bureau of Mines has assumed the responsibility of planning, erecting and operating the plant which is to carbonize lignite and will also undertake the same obligation with regard to the briquetting plant. The bureau also is to maintain active general supervision over the construction and operation of the entire activity during the period of the investigation. The co-operating company has agreed to furnish the site; to provide $200,000 for construction and installation of equipment; to install certain specified portions of the equipment; to furnish all lignite coal and other raw materials; to conduct the business operations of the enterprise, including the selling of the products; to furnish all labor and keep all necessary books and operating records. The equipment of the plant is to include special machinery which has been developed by the work of S. M. Darling, who will be in immediate charge of the experimental plant.

Immense quantities of lignite are available in Texas, North Dakota and other Western states. This fuel is fully equal to much of the fuel on which European countries depend for industrial development, but this country has such quantities of higher-grade fuel that the shortcomings of lignite have confined its use to relatively small quantities in narrow fields.

The fact that the fuel disintegrates on drying or when placed on a hot fire makes it less desirable than good bituminous coal. There are ways, however, of benefiting this fuel which looks very promising. By heating the lignite sufficiently to drive off the moisture and a part of the volatile matter, a char is obtained which, in heating value and analysis, closely approximates anthracite coal. Its physical condition is, however, comparable to the finer sizes of buckwheat anthracite, which are not used as domestic fuel but can, however, be briquetted and made into a satisfactory household fuel.

In driving off the volatile matter, numerous byproducts are made available which may be made into salable products. There have been no commercial installations combining carbonizing, briquetting, and recovery of byproducts in one plant, although considerable experimental work has been done in each of these fields and some attempts have been made to combine them.

It is believed that under present conditions a successful plant can be assembled. The government fund will be used in providing those parts of the plant that are unusual and special, and in making a thorough investigation of the process and of the quantities produced so that a report for public use will be available for those desiring to enter this field.

In our issue of April 22, p. 790, in an article entitled "Self-Closing Gates" credit was given to the blacksmith at the Silver Creek Colliery for inventing the device described. He is indeed to be credited with the construction of the Silver Creek turnstile, but Cornelius Walters, outside foreman at Eagle Hill Colliery, actually devised the mechanism and with co-operation of the blacksmith at that mine worked out his ideas, erecting at that operation the first gate of that type.

Cutting Power Costs at an Anthracite Mine By Utilizing Exhaust Steam

For Years Power Has Been Purchased and Steam from Several Engines Exhausted Into the Atmosphere — Utilization of This Exhaust in Low-Pressure Turbines Will Result in Large Savings — Other Important Incidental Economies

By Dever C. Ashmead
Tarrytown, N. Y.

FOR a number of years the Price-Pancoast Coal Co., of Scranton, Pa., has been purchasing its electric power, although it has been necessary to generate steam to the amount of 2,200 b.hp. to operate the hoisting, breaker and various other engines at the mines. For many years these engines have been exhausting into the air and consequently wasting an enormous amount of power that might have been utilized.

Moreover, the money spent in the past for electric current probably would have paid many times over for the construction of the contemplated new power plant. Realizing this tremendous waste, the coal company thoroughly investigated the subject of using its waste heat for the production of useful energy. As a result of this investigation it was decided to install exhaust-steam turbines for the generation of electric current and to remodel the boiler plant simultaneously.

The old boiler installation consisted of six 300-hp. Stirling and two locomotive boilers. The short stacks seen in Fig. 2 are those from the boilers of this last-named type. The plant will not be enlarged; in fact when the improvements are completed it will be smaller than before, for the two locomotive boilers will be discarded and the space now occupied by them will be used for the blower fans and the boiler-feed pumps.

Dutch ovens have been added to the boilers and Coxe stokers have been installed. An overhead coal bunker having a capacity of 900 tons has been constructed. As it was necessary to carry on construction work while the plant was being operated, it was possible to install

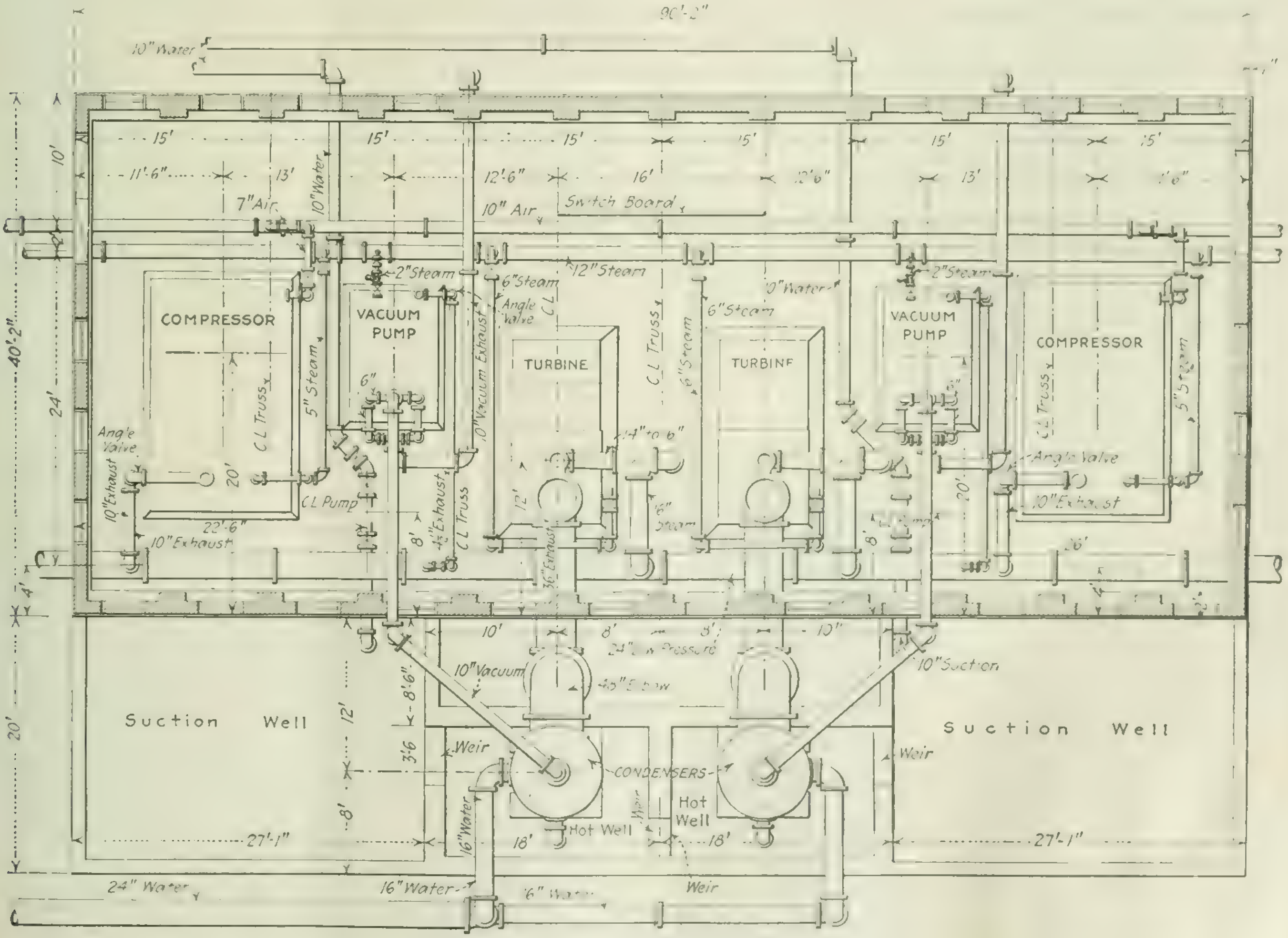


FIG. 1. PLAN OF THE PRICE-PANCOAST POWER HOUSE, SHOWING ARRANGEMENT OF MACHINERY

Balance in the arrangement of this plant is immediately apparent. The main header runs completely through the building and brings steam from both directions.

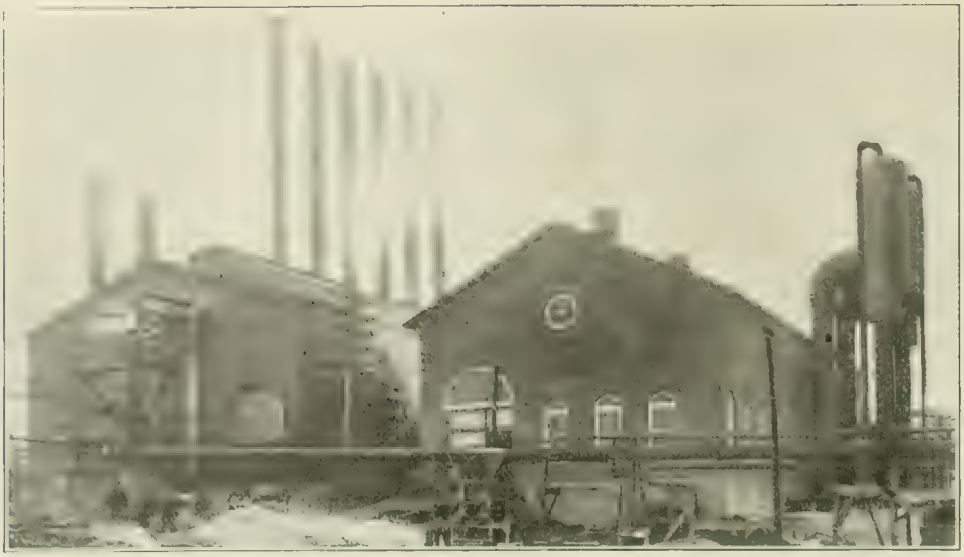


FIG. 2

General View of the Plant

Long steam transmission lines, characteristic of the anthracite region, and which this plant is designed to render unnecessary, appear prominently in the foreground.

only one stoker at a time. Temporarily separate blowers are being used for each boiler. When all the stokers are in place so that the old locomotive boilers can be disposed of blower fans will take care of all the air requirements simultaneously. The stokers are driven by a temporary engine, but this will be replaced by electric drive as soon as the power plant is in operation. There is no separate control for the stokers as they are driven by a line shaft. At present their rate of speed is from 1½ to 2 in. per minute. A large Cochrane feedwater heater is located in the boiler room.

By reference to Fig. 6 it will be seen that the coal is brought from the breaker to the boiler plant by means of a dragline scraper which discharges into a conveyor which, in turn, delivers the coal to the distributing conveyor in the boiler house. These conveyors have a speed of 98 ft. per minute. As for some reason the coal bunkers may be full provision has been made for a storage pile outside the boiler plant and breaker. This pile furnishes a place for coal whenever the coal bunkers are completely filled. It saves the breaker from having to take care of any boiler-fuel surplus.

At the present time the boiler plant is using a mixture of equal proportions of buckwheat, rice and barley coals, but the company hopes that it will be able to use only rice and barley coals when the new boiler plant is completely finished. The ashes from the boilers are discharged into a dragline scraper that conveys them to the ash dump.

From the preceding description it can be seen that the new boiler plant when entirely completed will be, as far as possible, mechanically operated, whereas in the old plant everything was done by manual labor.

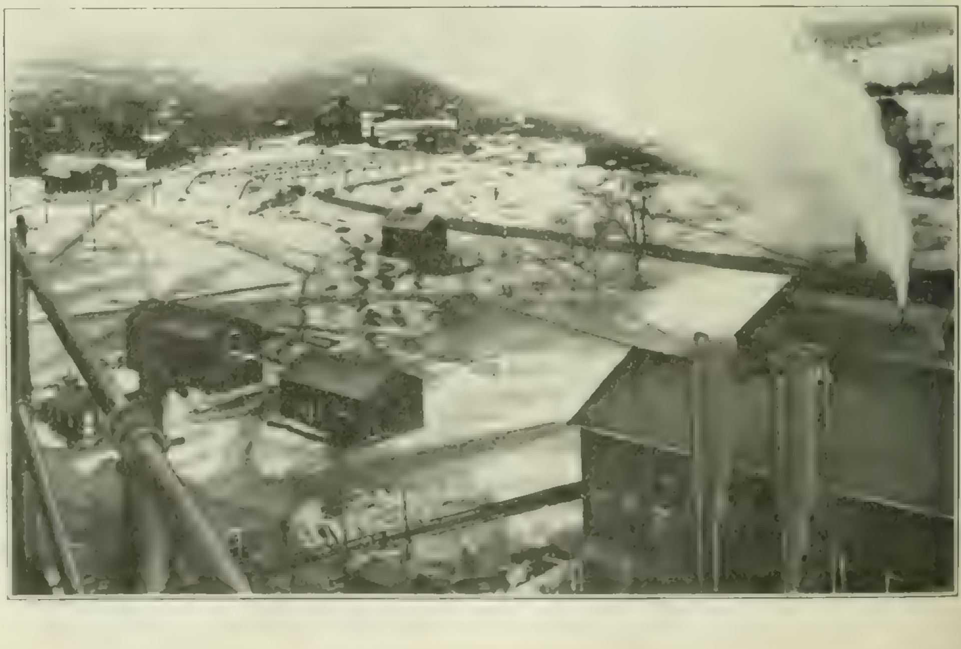
At present the boiler plant furnishes steam to the main hoisting engine, the hoist for the main shaft, the breaker engine, the shop engine, three fan engines, a number of pumps in the mine, two air compressors and five underground steam hoists.

Close to the boiler house is the new power plant. This building is of brick with steel roof trusses and concrete floors. It houses two General Electric Curtis steam turbines operating at 3,600 r.p.m. The generator is a 1,250-kva. machine working at 2,300 volts. Both steam- and motor-driven exciters are furnished with these outfits while a 12-panel General Electric switchboard is provided for the proper distribution of the current. The vacuum pumps for the turbo generators are 8 x 12 and 20 x 12. Besides the electric units in the power house there are two large Ingersoll-Rand two-stage air compressors, with the steam ends 18 and 29 x 20 and the

FIG. 3

Looking Toward the Spray Pond

The fuel-supply scraper line as well as some of the old steam lines may here be plainly seen. The spray pond is visible near the rear ground at left center.



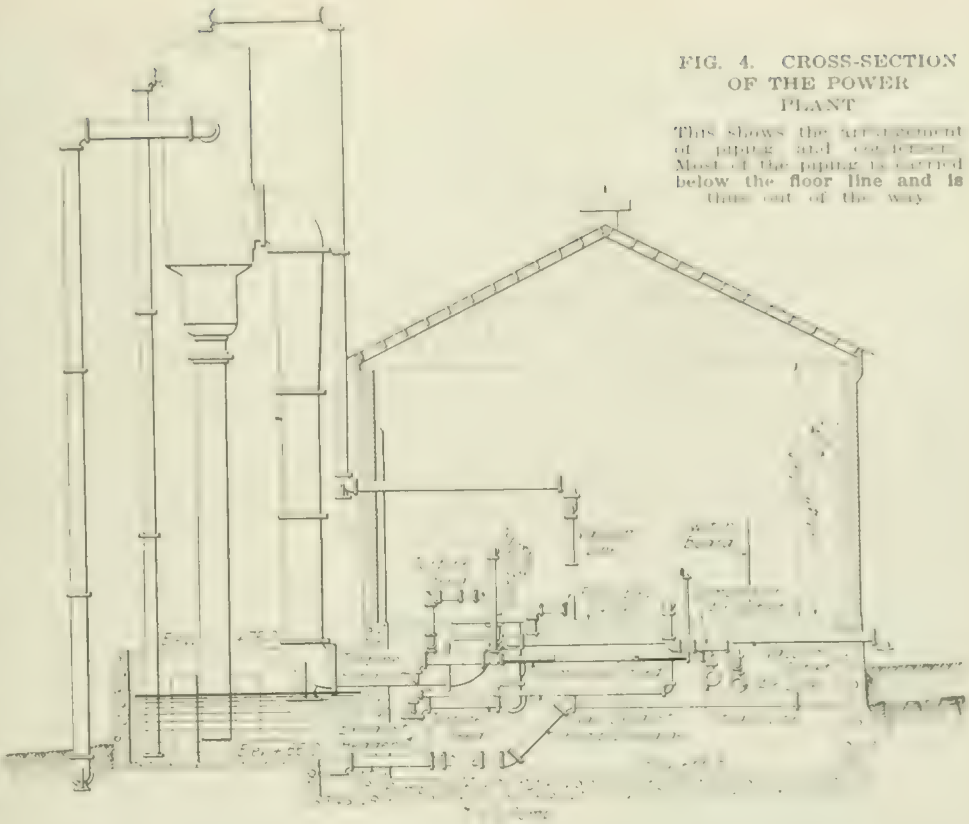


FIG. 4. CROSS-SECTION OF THE POWER PLANT

This shows the arrangement of piping and condensers. Most of the piping is carried below the floor line and is thus out of the way

air cylinders 16 and 26 x 20. These compressors furnish air at from 90 to 100-lb. pressure. A 5-ton traveling hand-operated crane is provided for handling the larger units in the power house.

The turbines are of the low-pressure type with a regulator permitting the use of high-pressure steam should the amount of exhaust be insufficient. The exhaust steam from the main-shaft hoisting engine will be delivered to the power plant by a 6-in. line. A 10-in. line will deliver the steam from the main-hoisting engine, while an 8-in. line will bring the exhaust steam from the breaker and a 6-in. line from the 21-ft. Guibal fan. This exhaust steam will be delivered to a main of 24-in. diameter and about 100 ft. long located in the power plant. Besides this steam that is furnished to the power plant, the exhaust from the vacuum pumps, from the two compressors and from the water-circulating pumps will be discharged into the 24-in. main. One end of this main will have a homemade flap valve to regulate the pressure of the exhaust steam.

The turbines will be fed with the exhaust steam from the 24-in. main through 16-in. pipes which will be reduced to 14 in. on entering the machines. The exhaust will pass from the turbines to barometric condensers through a 36-in. main. The water from the condensers is pumped to a spray pond designed by the Spray Engineering Co. which is equipped with 170 No. 11A nozzles. The water-circulating pipes are 10 in. in diameter.

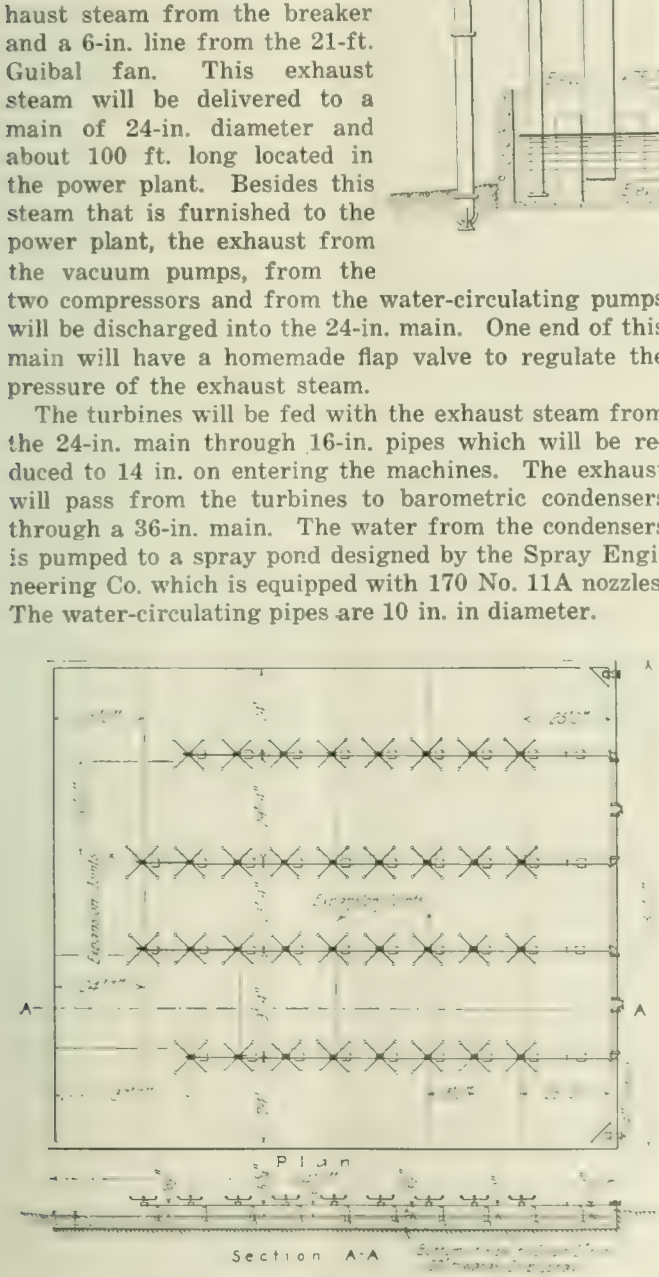


FIG. 5. PLAN AND CROSS-SECTION OF THE SPRAY POND

This spray pond performs the same function as a cooling tower. The fine sprays of warm water give up their heat to the air, cooling the water and permitting it to be used again.

Live steam is delivered from a 20-in. header in the boiler plant to a 12-in. header in the power plant and to a 10-in. main for transmission to the mines for use in hoisting, breaker and fan engines.

Great advantages and economies will accrue to the coal company upon the completion of these improvements. All use of steam underground can be dispensed with and electricity used instead. This means that all the pumps and the five hoists previously mentioned will be electrified. All loss arising from the condensation of steam which hitherto was carried long distances will now be prevented, and the more economical method of distribution of power by electricity will be employed. On the surface one fan engine which is about a quarter of a mile from the power house will be electrified, and thus a further saving of power will be made, for at present a long pipe line furnishes steam to this engine.

It is believed that the plant when completed, by utilizing the full power generated in the power house and not wasting it, will enable the company to discontinue the use of the two locomotive boilers and save the coal that they are now consuming. Furthermore, by using the exhaust steam which until now has been wasted, sufficient power will be provided to furnish the mine with all the current it may require and consequently it may be possible to discontinue the purchase of power from outside.

Ultimately savings will come from four sources: First, that due to the burning of finer-sized coals in the boiler plant; second, that due to the discontinuance of long steam lines on the surface and underground, now causing heavy losses because of the condensation of the steam; third, that due to the utilization of steam which was formerly exhausted into the atmosphere, thus wasting heat; fourth, that resulting from dispensing with the employment of unnecessary labor, required because of the failure to provide suitable mechanical equipment.

From these economies the company will make a de-

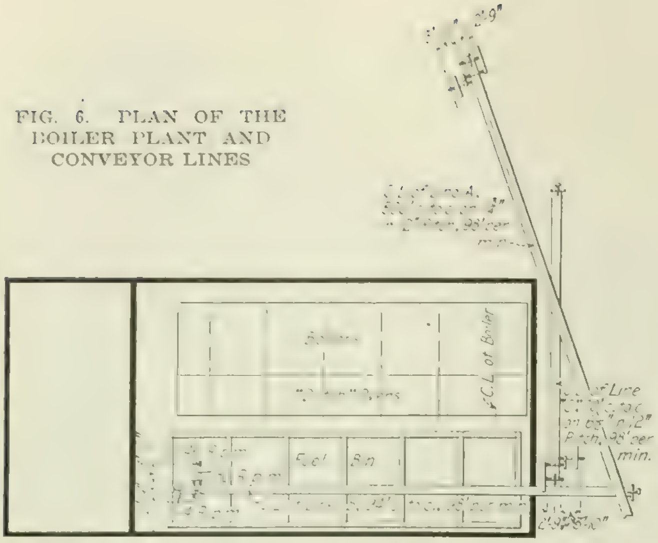


FIG. 6. PLAN OF THE BOILER PLANT AND CONVEYOR LINES

cided saving because of its ability to generate all its own power at no greater cost than it sustained in the generation of only a part. A sheer gain in operation will be obtained equal to the cost of the electricity heretofore purchased.

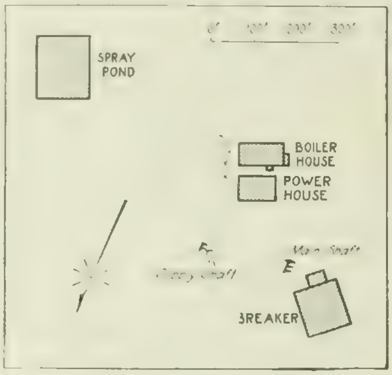


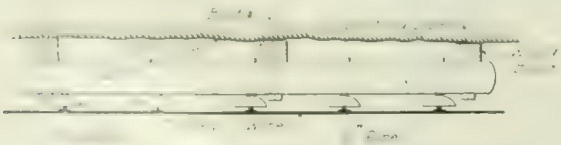
FIG. 7. GENERAL ARRANGEMENT OF SURFACE PLANT
Showing relative positions of breaker, power plant and spray pond.

Uniform Curve on Trolley Wire

By G. E. **DAUGHERTY**, Pikeville, Ky.

TO INSURE a uniform curve on trolley wire at places in the mine entry where the necessary supports cannot be conveniently placed, the following plan may be of value

The Pond Creek Coal Co., at Stone, Ky., takes a one-and-one-half inch pipe, bends it to suit the purpose, drills holes through it spaced three and one half feet apart for bolts to hold the insulators.



METHOD OF HANGING WIRE ON CURVES

The pipe is supported at each end and in the middle by wedge bolts driven into holes drilled in the roof; the bolts are sunk into convenient collar beams supporting the roof.

This arrangement prevents the trolley pole from leaving the wire, saves the pole from possible injury and prevents accidents.

French May Erect Coke Ovens in Lorraine

Desire to Free the Iron and Steel Industry of the Province from Entire Dependence on Germany for Coke

REHABILITATION of the iron and steel plants of Lorraine by France is a perplexing problem owing to fuel difficulties. When the French took over the plants, according to the report of Trade Commissioner J. F. Butler, many were found to be in a run-down state, due to intensive exploitation and lack of upkeep during the latter period of the war. In many cases damage was deliberately done to the machinery by the Germans. During the past year a very large part of this damage has been repaired, and the majority of the plants now are in very fair condition.

At the present time the Lorraine plants are turning out only about one-third of their pre-war production. This is due principally to the lack of coke for the blast furnaces. Before the war France consumed about 12,500,000 tons of coke, of which it produced only about 6,200,000 tons. The resulting deficit is augmented to the extent of 4,900,000 tons by the annexation of Lorraine, of which the production is slight, making a total deficit of 11,100,000 tons.

It is true that the French acquisition of the Saar opens to them rich sources of coal supplies. Unfortunately the coke produced from this coal is of such a friable nature that it can be used only in small or medium-sized blast furnaces, being quite unsuitable for the large blast furnaces of Lorraine. Coke could be imported from England, but the cost of transport renders supplies from this source practically prohibitive. A similar objection applies in a smaller degree to coke from Belgium, which moreover is available only in limited quantities and is of inferior quality compared with German coke. The Lorraine blast furnaces must continue, therefore, to find their coke in Germany.

By the terms of the armistice Germany was supposed to furnish France 11,000 tons of coke daily. This contract was not adhered to, the Germans alleging various reasons for the non-delivery of coke in the stipulated quantities, especially strikes in the Westphalian coal regions and lack of transports. On May 7 an agreement was reached whereby Germany was to receive 1¼ tons of iron ore for each ton of coke sent to Lorraine, Luxemburg, Saar, or Meurthe-et-Moselle.

Germany should now furnish France with coke to the extent of 13,000 tons a day. Although the amounts received during the latter part of 1919 were far greater than those of preceding months, they did not exceed one-half the quantity stipulated. This is a source of much embarrassment to the Lorraine industry, which hesitates to contemplate a future of entire dependence on Germany for coke.

In this connection it is interesting to note one of the conclusions made in a report on the iron and steel works in Lorraine by a commission appointed by the British Ministry of Munitions. According to the report, the French are said to be considering the erection of coke ovens in Lorraine and the importation of Durham coal to mix with their Saar coal. In exchange for the British coal they would ship basic pig iron to Great Britain. As matters stand, the French feel that their steel industry is too greatly at the mercy of Germany.

Management Methods That Will Secure Results in Mine Construction

Organizations for Mine Operating Are Seldom Adapted to Construction Work —To Employ Them for Such a Purpose Usually Is a Mistake—Building Procedure Should Be Planned as Carefully as the Plant Design Itself

BY CHARLES GOTTSCHALK*
Bethlehem, Pa.

TO CARRY on simultaneously the various operations involved in constructing the surface layout and in developing the underground nucleus for a modern coal mine of large capacity requires the highest type of organization. Some such provision is necessary if the many forms of leaks and delays are to be kept down to a minimum.

Construction and operation may be kindred arts but ability to succeed in both rarely resides in the same man. The two principal men in mine construction are the engineer and the chief clerk, the business of the latter being much more trying than in operation and requiring ability to prevent misuse and loss of material and keep track of costs.

Many glaring examples might be cited where large financial interests have carried work of this nature through to conclusion with organizations absolutely out of harmony and unfitted for their responsibilities. The sums thus dissipated and the valuable time thus lost cannot be accurately estimated, but it requires neither deep reasoning nor close observation to perceive that the possibilities for savings are worthy of the expenditure of considerable effort.

Not long ago a prominent mining man made the remark that a great many of the new coal mines erected with large production in view with which he was acquainted had undergone a complete turnover in the personnel of their local managements after the high officials had patiently waited and failed to realize promised results. This is often the outcome of choosing an organization adapted only to operating a mine and of expecting it to be able to build one rapidly and economically. The consequence is a failure to keep the ever-increasing details of construction under control. The workmen are first to sense the confusion, and matters go from bad to worse.

When the construction work finally is finished it is then too late to re-establish confidence in the ability of the management, although the work has now progressed to the point for which the men in charge were really selected. When, by reason of the financial strain, those who are providing the capital are forced to investigate, a turnover with its attendant disadvantages appears to be the only solution of the difficulty.

Companies exercising better judgment avoid from the beginning such a catastrophe by starting to build the plant with an organization experienced in the kind of work in hand and with full knowledge that it must "make good" from the start. Such an organization is not in a position to excuse its shortcomings in construction work with the hope of accomplishing big things later on.

Naturally the success and progress of the work depend more upon a harmonious organization working in accordance with a well-defined plan than upon any other consideration. Everyone has observed that average methods with concerted push behind them accomplish more than much mechanical equipment and original ideas handled in a disconcerted or confused manner. In the latter case problems in methods of construction which are worthy of much preliminary study appear unannounced and must be hastily decided, snap judgment often resulting. Some of these experiments will surely prove costly and embarrassing.

Jobs begun in this manner are seldom completed along the lines that were planned when the work started, but are likely to be rushed through in a slipshod manner in order to make up for the time lost in trying out each pet notion suggested. Later the job proves a failure and the design, rather than the poor method of construction, receives the blame, while high maintenance or operating costs absorb the loss. It is therefore highly essential to provide from the very start for teamwork and systematized planning.

Most of the problems encountered fall logically within the province of an experienced and resourceful engineer. This individual should be not merely a transit man or an inexperienced graduate but a field engineer big enough to secure a thorough grasp of the many units both individually and collectively. It is just as essential to have a first-class engineer work up and execute the plan of construction as it is to employ a reputable firm of specialists to draw tipple and surface building plans and design coal-handling machinery. In many instances, however, the actual work of constructing a mine is prosecuted without co-operation or system, whereas a plan of the work and methods to be employed could be made to afford a degree of assistance equal to that derived from plans of design.

If, as previously observed, the superintendent has been selected by virtue of his former connection with a successful operation, there is a probability that the construction side of a large modern mine continued over a long period will prove highly distasteful to him long before the work is completed. He cannot under such circumstances round his organization of coal getters into shape and rest easy, as he may have been able to do formerly. In construction work the scene changes rapidly and the mechanics required to-day must be replaced by those of another trade next week, and so on to the end. The successful superintendent of construction must be a tireless worker who is ever on the alert.

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*Formerly in charge of construction of the Kathleen mine, Duquoin, Ill.; at present on special work with the Dodson Bituminous Coal Co., Bethlehem, Pa.

EXECUTIVE ABILITY AS GOOD AS KNOWLEDGE

Complicated blueprints reveal but little in detail except those experienced in the art of reading them, and even then much care and study are sometimes required if all the essentials are to be grasped. A man handicapped by a lack of this technical experience cannot fairly be charged with the responsibility of planning an effective construction campaign because he cannot grasp the details of design until the jobs are well under way and must likewise reserve any unprejudiced criticism until so late that the errors cannot be rectified without more or less additional cost or delay. By the same token the methods of doing the work cannot be planned ahead and the proper tools and equipment provided and estimates of the time required cannot be furnished to the greatest advantage. Some mine superintendents not technically inclined are nevertheless broad enough to recognize their own limitations and have the executive ability to develop the best in their subordinates by not being jealous of the superior specialized knowledge of various department heads. Men of this caliber, however, are sadly in the minority around the coal mines.

In any event there should be no division of authority between the engineer and the superintendent. The entire responsibility for construction methods and progress should be placed upon the shoulders of the man who has been selected for the work because of his individual fitness to handle it. Even though the prospective mine superintendent is not qualified for the management of the construction work, he still has this field of usefulness that he can lay the foundation for a successful operating organization which will be ready to undertake the work of operation as soon as construction approaches its end. By accomplishing this important work he will establish his company on a basis that will thereafter reflect credit on himself.

CHIEF CLERK SHOULD BE CAREFULLY CHOSEN

The executive in charge having been carefully selected, the matter of choosing a chief clerk should receive similar consideration. The scope of the clerk's duties are likely to be underestimated unless it is remembered that several hundred carloads of miscellaneous material are required for the job, with the possibility that many shipments may be delayed in transit or be lost or may arrive with shortages. These items must all be checked and followed up until shipments are complete. Materials arriving are sometimes stored and later charged out to the various jobs.

The constant movement of the labor gang from one job to another adds greatly to the clerical work, and the distribution of the charges to the proper accounts must be tabulated promptly and intelligently in the field in order that the local management may study the unit costs as the work progresses and detect any abnormal outlay in time to calk the leak.

Furthermore most of the small business transactions within the organization and many without it are handled personally by the clerks, and upon their conduct largely depends the reputation which the company acquires regarding its policies and business integrity.

In one instance a certain chief clerk possessed of the necessary intelligence and capacity for work abused his position when dealing with those to whom he felt no responsibility for his actions. As the result of an oversight on his part which could have been disposed of by a simple explanation he became insulting to a foreman many years his senior in age. The foreman left the office bent upon quitting. When the clerk was informed of his blunder, he responded, "To hell with him; let him quit if he wants to."

The foreman was one of the most valuable men in the organization and especially hard to replace at that particular time. Others were constantly receiving the same lack of consideration while endeavoring to get information necessary to the best interests of the company.

Possibly much of this indifference arises from a lack of knowledge of its possible harmful effects. If so, it is time to present the matter to the offenders in a light that will give them a keener insight into their duties to the company. Otherwise discord is likely to spread and an owner or general manager of a property desirous of giving everyone a square deal will unknowingly have his policies toward others entirely misconstrued because of their faulty execution by the officials in whom he has reposed his confidence. To avoid the development of such a condition the importance of carefully selecting the superintendent and chief clerk should be thoroughly appreciated.

OFFICIALS SHOULD RESPECT THE MANAGEMENT

Here let me digress. Some long-experienced officials never seem to be able to learn the fact that their own work is made much lighter by always referring to the management above them in respectful terms. They try to excuse their own acts of indiscretion by confidentially telling various employees that the orders to which exception is made came from the "Big Boss." Disintegration of the organization must surely follow such a policy, because the best tone in any organization is secured when the bosses and the men alike feel that the president of the company is a genuine fellow. This sort of respect generates an influence for good in every employee of the company. And yet the possibilities thereby to be secured are ignored by many superintendents.

Assuming, however, that from the start two men of large caliber have been chosen the *esprit de corps* will be whatever these two heads insist upon maintaining, even though only reasonable care is exercised in the selection and instruction of the remaining officials and workers.

Before, or at least as soon as, the actual work of construction begins a complete and accurate contour map should be available. To this should be added the final location of the railroad spur, shafts, buildings both temporary and permanent, and any other improvements contemplated.

It is highly probable that no good roads will be found already constructed up to the building site. It is important therefore that a permanent wagon road be built to the mine and put into shape before much hauling of material becomes necessary. A temporary water supply is often secured by damming a small natural drain and depending upon the rainfall. Immediately following a heavy precipitation such streams become extremely destructive and unless the dam has been well designed it will become ineffective.

All temporary structures should be plotted on the map or general layout plan upon which the permanent improvements have been located. Thought should be given as to where it will be desirable to unload building materials and place equipment. In this connection the location and design of the temporary office and storeroom may greatly facilitate the work of the entire organization. The temporary building should be of sufficient dimensions to permit of several partitions. The largest section should be large enough to contain the current supply of cement, lime and other perishable building materials.

The room adjoining this should accommodate the clerks. The partition separating the two should be provided with a sliding window with a ledge opening into the large room so that anyone getting materials can conveniently sign a receipt showing the proper distribution. By this arrangement it will be possible to keep stocks under lock and key in practice as well as in theory without too much red tape.

Material Cards Are a Convenience

On a big installation several thousand bags of cement will be required and they will be used on a large number of different jobs. At the beginning a card may be ruled up for each job, on which the estimated amount of cement needed may be shown. Thereafter whenever cement is taken from the warehouse an entry can be made directly on the proper card. This will eliminate much unsatisfactory guess work when accounting for the material used. It also will be possible at a glance to check the quantities used as against the estimated requirements.

The room occupied by the clerks should be equipped with a large number of shelves and bins similar to those in a permanent storeroom. An additional room or two may serve to accommodate the superintendent and engineers. This may appear to be a rather elaborate layout for a temporary structure, but it need not be expensively built, and at a later date the lumber can all be re-used without loss.

Failure to provide from the beginning for handling incoming materials of small sizes, checking each article received against the original order, and then storing in groups properly labeled will lead to all kinds of trouble and delay. If materials and supplies intended for a certain place are thrown into a general store for indiscriminate requisitioning many pieces will be used on odd jobs as the emergency arises, with no charge made for them. For this reason no order for the replenishment of such supplies will probably be made until occasion rises for the use of such duplicates. With such a lack of method unnecessary delay or expensive substitution is sure to follow.

As an aid to keeping track of materials ordered and received for the various jobs a graphic chart will prove most valuable. This may be arranged with a long horizontal series of items, one for each division of the work, such as tipple, hoist house, sub-station, etc., each column to be subdivided into spaces. Coloring in these smaller divisions with crayon to correspond to an adopted legend will show at a glance whether the order has been received completely or partially, in good or bad order, or otherwise. This chart may be hung on the wall of the office and it will act as a daily reminder of the orders which require special attention if a delay in delivery is to be avoided.

Storing and Checking Should Be Systematic

Before deciding on the method to be followed in unloading and storing heavy materials or those requiring considerable space, reference should again be made to the general layout plan showing all improvements, temporary and permanent. When the most advantageous point for unloading and storing of each item or shipment has been selected the corresponding order number should be placed on the material or on a stake driven near the object unless its nature and use are self-evident from the class of material. In this connection the material should always be unloaded or piled so as to be readily checked. A pile so stacked generally occupies less space than if piled haphazard and is less likely to become damaged. Material should not be checked simply according to the kind and number of items on the bill of lading, but also in accordance with the required dimensions shown on the plans and specifications. This will require close co-operation between the chief clerk and engineer.

As previously mentioned, each development should be studied individually, the best method of handling it determined and estimates of the time required based thereon. All the work may then be viewed as a whole and the different items scheduled in the most logical order. This plan should then be consulted from day to day in connection with the graphic material chart.

It is not to be presumed that any such schedule can be followed out precisely as originally planned, as it inevitably will require weekly revision. Nevertheless, such a plan will form a continuous objective to be constantly sought, while it also serves as a stimulus to results. Furthermore, the analysis required for the drawing up of a schedule will be of great value in the selection of the most practical equipment, as the methods of doing the work must be given thoughtful consideration before any estimate can be made of the time required to complete it.

Problems Easily Solved in Well-Planned Work

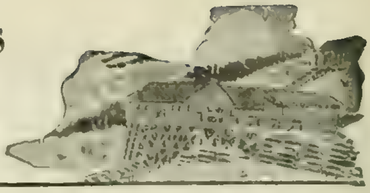
Detailed sketches and methods which have been employed on various installation projects might now prove interesting, but the object of this paper has been to emphasize the policies to be inaugurated before getting deeply into the work. The problems that follow are more or less local and are quite sure to be solved efficiently if the organization is the result of a studied effort and when the field work is systematized, and the details are not left to take care of themselves.

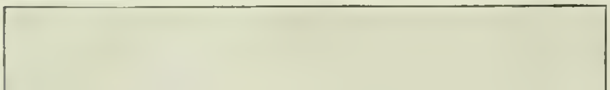
One of the most famous of artists and architects the world has ever produced has said: "Trifles make perfection, and perfection is no trifle."

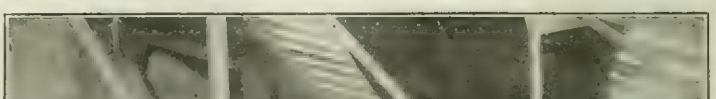
Strike to Release Winnipeg Reds

BECAUSE the leaders in the strike which deprived Winnipeg, Man., of all communication with the outside world, paralyzed industry within the city and seriously threatened the food supply, bringing sovietism almost within sight, have not been released on bail, pending a hearing in the higher courts, 15,000 Nova Scotia coal-mine workers struck on May 1, as a one-day protest against the alleged injustice.

Through the Coal Fields With a Camera







Modern Equipment Helps to Increase Production

(1) Mine 18 of the Consolidation Coal Co., Buxton, Iowa—(2) A Rotary Dump of Four-Car Capacity Rotated by Means of an Electric Motor Has Been Installed at the Little Ben Mine of the Woodward Iron Co., Woodward, Ala.—(3) Jig Floor at the Sayreton Washery of the Republic Iron & Steel Co., at Sayreton, Ala.

Many Solid Fuels Can Be Mixed With Oils To Form Liquids or Jellies

Anthracite, Bituminous Coal, Lignites and Peats, Gas Coke, Charcoal, Wood, Sawdust and Industrial Carbonaceous Wastes Can Be Combined with Oil Colloidally

LINDELL T. BATES in a book entitled "American Fuels" to be published shortly by the McGraw-Hill Co., Inc., gives the following information regarding the colloidal fuel which Lincoln W. Bates is manufacturing on a small scale. What follows is taken from the book in question, which volume is prepared for publication by Bacon and Hamor.

"The coal particles [for the colloidal fuel] should be finely divided in order that the mixture may be stored, handled and atomized in the same manner as any other liquid fuel. Tests show that Bates colloidal fuel is filled with particles which have the Brownian movement and that the majority of the particles are about 0.0001 inch in diameter. Some portions of the coal are actually soluble in mineral oils, and the others, being so finely divided, are held in suspension for weeks and even months with hardly any appreciable settlement. The significance of this in connection with the storage and distribution for the fuel will be readily appreciated.

COLLOIDAL FUEL IS CONCENTRATED HEAT

"Unless special measures be taken [to comminute the coal] the rate of settlement is as a rule too rapid to allow the composite body to be used as a fuel. The particles are normally stable if sufficiently within collodial limits of size, and precipitation by electrolytes may be prevented by the use of such 'protective colloids' as gelatine, sodium cleate, dextrin, silicic acid, etc. Bates fuel saves oil and yet makes it possible to store more potential heat in any given space than can be stored where pulverized coal alone is used. The process utilizes substances which have the property of stabilizing, in liquid form, carbonaceous particles up to 40 per cent by weight, many of which are above colloidal size. It is found that coal and similar carbonaceous substances may be simultaneously stabilized and peptized (i.e., some dissolving takes place, and also the particles take up part of the liquid). When peptized, the material becomes spongy in texture, thus reducing the apparent specific gravity and the tendency to settle; the peptizing agent has also a marked stabilizing effect.

"Colloidal fuel may be manufactured in liquid form, in which event it contains 40 per cent by weight of pulverized carbonaceous matter or less, or it may be made in the form of mobile pastes carrying about 75 per cent of particles. Mobile gels may be made from liquids or pastes. Many combinations of these forms may be used, and all comply with the requirements that the fuel be atomizable and that the components be simultaneously combustible. The composite is in three stages of dispersion, viz., solution, colloidization and suspension.

"All carbonaceous substances capable of being reduced to particles by pulverizing or otherwise may be combined with liquid hydrocarbons to form colloidal fuel. Materials which can be used for making the fuel include practically all grades of anthracite, bituminous coal, lignites and peat (even including grades relatively high in ash and sulphur content); pressure-still, smelting and gas coke, charcoals, woods and such byproducts as waste from starch, corn and flour factories, wood pulp, sawdust, etc. The carbonaceous substance should be ground so fine that 95 per cent passes through a 100-mesh screen. Finer reduction is advantageous but not essential. An ordinary coal-pulverizing ball or tube mill is the most economical means of reducing the material to size.

MANY SUBSTANCES MAY SERVE AS DISPERSION MEDIA

"Oils, tars and pitches have all been used successfully as the dispersion medium for the carbonaceous particles and there is no reason why such liquids as molasses should not be used. Various blends of liquids may be used either for the purpose of utilizing what supplies may be available or to lower the average sulphur and water content, or to obtain a suitable viscosity. The colloidal fuel is not unduly sensitive as regards composition, and precipitation is not so rapid as to jeopardize its passage through pipes, etc., even where high pre-heat temperatures are employed.

"The apparatus needed in the manufacture of colloidal fuel is simple, comparatively inexpensive, and occupies small space. Up to the pre-heater stage colloidal fuel carrying up to 40 per cent carbonaceous particles can be handled as well as heavy crude oil. The viscosity at 20 deg. C. is rarely below 65 deg. Engler, and is generally between 160 deg. and 350 deg., depending upon the composition. At higher temperatures, such as those of the pre-heater, the fuel resembles the lighter of fuel oils. No material change in oil-burning equipment is needed to burn liquid colloidal fuel, but slight modifications and increased pressure may be needed if pastes be used. Increase in pressure alone is sufficient in the case of a gel which is broken up by pumping or which liquefies in the pre-heater.

COLLOIDAL FUEL IS SUPERIOR TO OIL

"The specific gravity of liquid colloidal fuel is usually between 1.03 and 1.32, the flash point about 190 deg. F. and the fire point over 250 deg. F. The thermal value of colloidal fuel is higher than that of oil, and about 5 per cent greater efficiency of combustion has been observed compared with oil under the same conditions. At the moment of ignition the rending action of the oil in the pores of the carbonaceous particles makes extremely efficient combustion certain.

"A paste containing 60 per cent coke and 40 per cent oil yields about 198,000 B.t.u. per gallon, compared with 145,500 B.t.u. per gallon for oil. For metallurgical purposes the character of the flame may be varied over a wide range by varying the composition of the fuel.

Standard Washhouse Design of Reading Co.

Washhouses Are a Great Aid to Cleanliness—They Relieve Miners' Wives of Much Unnecessary Work at Home—A Building That Is Artistic and Efficient and Also Fireproof

ONE of the greatest of aids in securing a state of satisfaction and good feeling among the miners is the washhouse. This feeling is fostered by the fact that the man goes home to his family clean; he does not carry into the house the amount of dirt upon his clothes and his person that he otherwise would. As a result of this it is not necessary for his wife to have hot water ready upon his return and there is no dirt to clean up; no dirty, wet clothes to hang up to dry which when dry will shed their dirt and dust to the floor, necessitating another cleaning operation.

Many washhouse designs, some excellent, others poor, have been made. One of the best of these is that prepared by the Philadelphia & Reading Coal & Iron Co. at Pottsville, Pa. For a number of years this firm has been experimenting with different types and designs of washhouses, with the result that the one described below has been adopted as a standard.

This house is extremely efficient and convenient in design, is readily cleaned, easily heated and comfortable for the men. The building is architecturally attractive and when placed in well-kept grounds makes a pleasing appearance at the mine. The building is either entirely of brick or to a height of 8 ft. is of concrete, surmounted by stucco. The roof is supported by wooden trusses and is covered by asbestos shingles.

The new washhouse at the Eagle Hill Colliery is probably the best that the company has erected up to the present time. The main part of the building is 28 x 70 ft. 6 in., and has accommodations for 348 men. This portion is used as a change and clothes room. The washroom is 16 x 25 ft. and is furnished with 16 showers arranged on three sides of the room. Across the doorway a screen is built to protect the men from cold drafts that might come through the door. The entrance to the building is into the main or change room through a small vestibule which is used to prevent cold air and gusts of wind from entering the building. The inside door is so arranged that it shuts automatically.

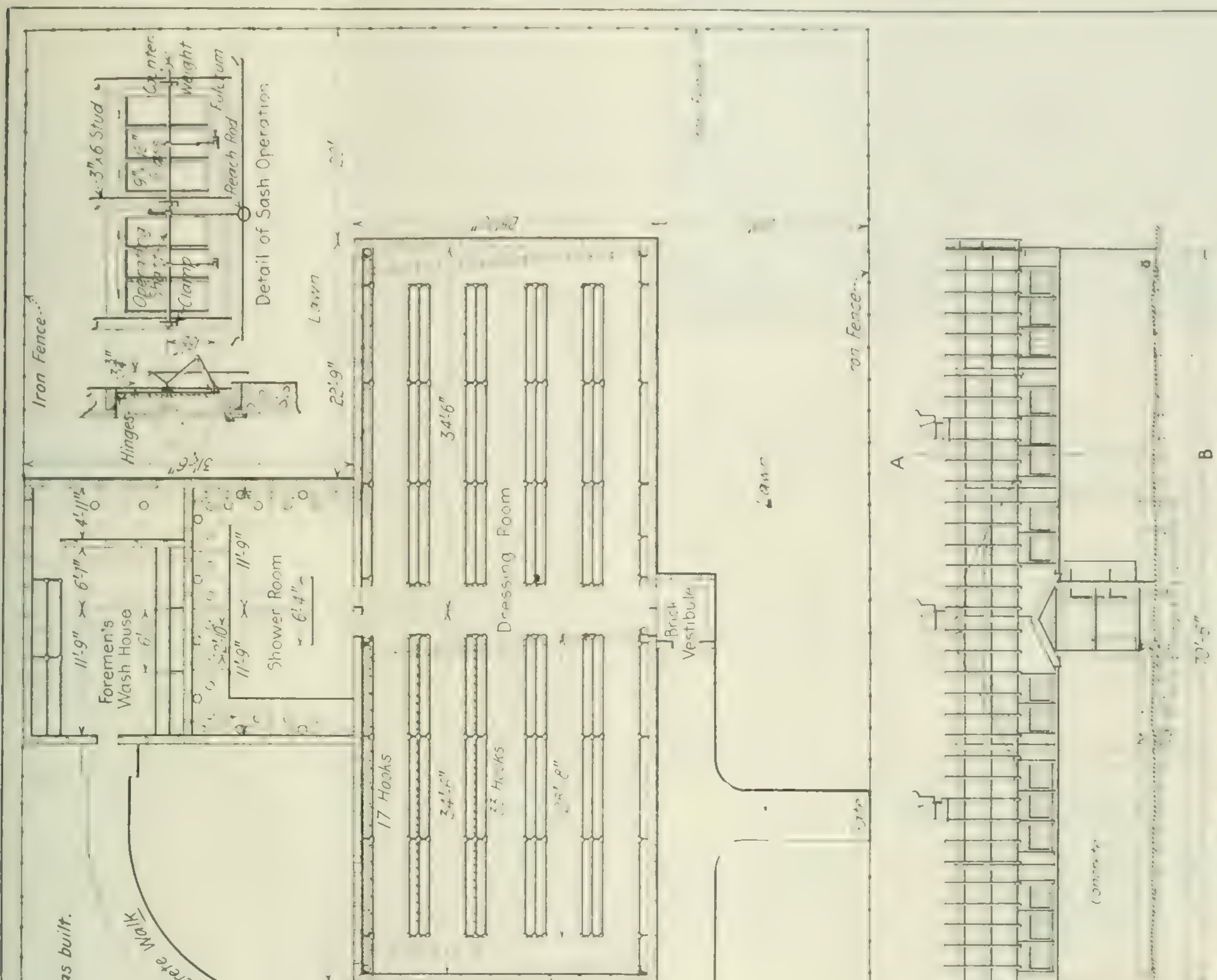
During the day light is now furnished by means of a row of windows that extend completely around the building. These windows are 20 x 21 in. and have six panes of glass. They open outward and are regulated from the inside. The arrangement of these windows is shown in the accompanying drawing. The house at night is lighted by twenty 100-watt electric lights. The building is heated by steam. There are four radiators in the dressing room and two radiators in the shower room. They are made of 2-in. pipe, extend completely along each side of the room, live steam being used as the heating agent. The temperature of the washhouse is kept at 90 deg. F.

The water for the showers is heated in the washhouse and a heater employed consists of a 12-in. pipe carrying water, inside of which is placed a 3-in. pipe carrying steam. The total length of the heating apparatus is 20 ft.

SCHEDULE OF MATERIAL USED IN THE CONSTRUCTION OF THE WASHHOUSE

1 [illegible] door lock with knobs.
2 3x3 [illegible] loose pin butt hinges.
1½ 2x2 [illegible] loose pin butt hinges.
1 Pair of [illegible]-W 20 gem trolley roller bearing barn.
Door hangers complete.
1 [illegible] of No. 31 trolley track 8 ft. long.
1 No. 68 [illegible] door stay roller.
1 No. 70 flush door pull, 1 No. 71 handle door pull.
3 18-in. dia. Swartwout galvanized-iron rotary ventilators.
(For [illegible] on ridge of shingle roof, having 6 to 12 in. pitch on each side.)
200 ft. 4-in. terra cotta sewer pipe.
8 4-in. terra cotta sewer pipe elbows.
12 4-in. terra cotta sewer pipe, single "T" branch 2 ft. long.
2 4-in. terra cotta sewer pipe, double "T" branch, 2 ft. long.
324 2-in. dia. hothouse pulleys with screws.
324 2-in. dia galvanized wrought rings made of $\frac{3}{16}$-in. round iron.
7,600 ft. ¼-in. sash cord.
1,280 ft. 1¼-in. dia. galvanized-iron pipe (for railing).
65 1¼-in. galvanized floor flanges (for pipe railing).
28 1¼-in. galvanized wall flanges (for pipe railing).
1[illegible] galvanized ells (for pipe railing).
37 [illegible] tees (for pipe railing).
27 [illegible] outlet ells (for pipe railing).
2[illegible] [illegible]le outlet tees (for pipe railing).
[illegible] outlet crosses (for pipe railing).
[illegible]
[illegible] shower heads, for ½-in. iron pipe.
[illegible] brass handles, for ½-in. iron pipe.
4 [illegible] handles, for 1-in. iron pipe.
1 [illegible] for 1¼-in. iron pipe.
1[illegible] iron pipe.
2 [illegible] for ½-in. iron pipe.
[illegible]
[illegible]
No. [illegible]
No. [illegible]
No. [illegible]
No. [illegible]
No. [illegible]
No. 7—12 [illegible]
No. [illegible]
No. [illegible]
No. 10—4 [illegible]
No. 11—4 [illegible]
No. 12—2 pair [illegible]
No. 13—2 pair [illegible]
No. 14—76 rafters, 2x6 [illegible]
No. 15—2 rafters (valley), 2x6 in. by 22 ft. long.
No. 16—6 studs, 3x6 in. by 8 ft. long.
No. 17—2 sills, 3x6 in. by 6 ft. long.
No. 18—2 caps, 3x6 in. by 7 ft. long.
No. 19—2 ties, 3x6 in. by 7 ft. long.
No. 20—84 window studs, 3x6 in. by 4 ft. long.
No. 21—20 nailers, 3x6 in. by 12 ft. long.
No. 22—50 nailers, 2x4 in. by 12 ft. long.
25 2-in. W.P. plank, 10 in. wide, 12 ft. long.
Surfaced on 1 side
1,600 ft. 1-in. W.P. barn boards, 12 in. wide, 10 and 12 ft. long.
1,600 lin. ft., 1x3 in. W.P. battens.
1 W.P. 4-panel door, 1¾ in. thick, 3 ft. 0 in. wide, 6 ft. 8 in. high.
1 W.P. 6-panel door, 1¾ in. thick, 4 ft. 0 in. wide, 7 ft. 0 in. high.
60 Single window sash 1¼ in. thick, 2 in. top rail, 2¼ in. bottom rail, 6 lights each, 9x12 in. glass, P.&G.
1 Keg of 10d. cut nails; 1 Keg of 40d. cut nails.
36 ¾-in. head bolts, 9 in. long.
26 ¾-in. head bolts, 12 in. long.
26 ¾-in. head bolts, 15 in. long.
600 bags cement; 80 tons sand; 130 tons broken stone.
9 NT-23 truss castings.
9 NT-42 truss castings.
18 NB-64 angle brackets.
9 1-in. dia. truss bolts, 7 ft long.
140 ¾-in. round cast washers.
324 clothes hooks.
5 Sash operating shafts, ¾-in. dia. by 6 ft. 1½ in. long.
14 Sash operating shafts, ¾-in. dia. 9 ft. 0 in. long.
2 Sash operating shafts, ¾-in. dia., by 11 ft. 0 in. long.
81 Clamps for the above.
21 Counterweights 3 in. dia. by 5 in. long.
21 Levers "A."
18 Reach rods, 2 ft. 9 in. long.
3 Reach rods, 7 ft. 6 in. long.
54 Levers "B;" 54 Links; 54 Fulcrums.
For Asbestos Cement Shingle Roof
3,500 ft. 1-in. Hemlock flooring.
1 keg 8d. wire nails.
3,000 sq.ft. one-ply tar felt roofing.
30 squares No. 20 gray 12x12 in. asbestos H.C. shingles.
160 ft. No. 20A gray starters.
160 ft. No. 21 gray starters.
110 ft. gray ridge roll.
Copper storm nails and galvanized
Iron needle pointed nails for the above shingles.
Fasteners for the above ridge roll.

In the change room there are eight rows of benches for the men to sit on while changing their clothes. These benches are made of galvanized-iron pipe with portable wooden seats. The floor of the whole building is concrete. Portable wooden walkways or duck walks are placed between all benches and on all aisles. In the bathroom there are other wooden duck walks for the men to stand on while taking their showers. In the washhouse these are made of the best oak. The idea is to have everything in the washhouse easily cleanable. The building is scrubbed out every day and a man is kept constantly in attendance.



FLOOR PLAN, VARIOUS CROSS-SECTIONS AND SOME DETAILS OF THE WASHHOUSE

INTERIOR OF WASHHOUSE

Note the lines leading from the back of the benches. These lead to the clothes hangers suspended from the roof.

The Philadelphia & Reading Coal & Iron Co. is now combining the washhouse for the bosses with that for the men. The bosses' washhouse is built as an extension to the washroom of the men's house, but there is no connection between them. It accommodates 20 men and has two showers. The advantage is that the same attendant can take care of both houses and the same hot-water heater can be used. The clothes, both in the foremen's and the men's washhouses, are hoisted to the ceiling for drying.

Behavior of Various Sulphur Compounds in Coking[*]

Many Coals Contain Organic Sulphur—Sulphur Reactions Mostly Occur Below 500 Deg. C., but Hydrogen Lowers Decomposition Temperature of Pyrite

By ALFRED R. POWELL[†]

AN INVESTIGATION has been made to determine whether the Powell and Parr method of analysis for the forms of sulphur in coal should be applied to a variety of coals other than those from Illinois on which the Powell and Parr tests were made. A complete study was made of the sulphur in the following coals: Upper Freeport bed of Pennsylvania; the Pittsburgh bed of the same state; the Pocahontas No. 3 bed of West Virginia; the coals from Letcher County, Kentucky; Morgan County, Tennessee, and Cherokee County, Kansas.

The method of analysis gave excellent results when applied to these coals. In the determination of pyrite the iron-sulphur ratio checked in every case with the theoretical. After the extraction of the pyrite and sulphates the remaining sulphur was proved to be of an organic nature.

This work indicted that sulphur exists in coal in three typical forms: (1) Pyrite of marcasite, (2) sulphates, and (3) organic sulphur. A study of the changes which these forms undergo during coking has been made on a variety of coals, and the following five classes of reactions established:

1. Complete decomposition of the pyrite and marcasite to ferrous sulphide pyrrhotite and hydrogen sulphide. This reaction begins at 300 deg. C., is complete at 600 deg. C., and generally reaches its maximum between 400 and 500 deg. C.
2. Reduction of sulphates to sulphides. This reaction is complete at 500 deg. C.
3. Decomposition of the organic sulphur to form hydrogen sulphide. In the primary decomposition from one-quarter to one-third of the organic sulphur is thus affected, but the byproduct gases traveling through the coking mass increase this reaction to as much as one-half of the organic sulphur present. Primary decomposition is most active below 500 deg. C.
4. Decomposition of a small part of the organic sulphur to form volatile organic sulphur compounds. The greater portion of these find their way into the tar. This decomposition occurs at the lower temperatures of the coking process.
5. Disappearance of a portion of the ferrous sulphide and pyrrhotite, the sulphur apparently entering into combination with the carbon. This reaction seems to be most active in the neighborhood of 500 deg. C. and higher.

ORGANIC SULPHUR CHANGES ITS CHARACTER

The organic sulphur not accounted for by the above reactions undergoes a decided change in character between 400 deg. and 500 deg. C.. and shows none of the properties of the original coal sulphur. From these experiments it would not seem that the relative amounts of pyrite and organic sulphur in the coal have much effect on sulphur distribution during coking.

Methods for changing the sulphur distribution were studied so that the minimum amount of sulphur would be retained in the coke. A complete study was made of the efficiency as desulphurizing agents of hydrogen and of gases containing hydrogen when passed through coal in the process of coking.

The effect of the hydrogen on the removal of sulphur from coke was very noticeable, in some cases nearly all of the sulphur being removed as hydrogen sulphide during a period of three hours. The ordinary sulphur coking reactions were affected in two ways by the passage of hydrogen through the coking mass: (1) the pyrite was caused to decompose at a much lower temperature; (2) the coke sulphur, which is presumably in combination with carbon, was eliminated at an almost constant rate at the higher temperatures of the coking process.

The size of the particles of coal did not seem to affect the rate of evolution of hydrogen sulphide. For gases containing hydrogen, the desulphurizing efficiency seemed to be proportional to the partial pressure of the hydrogen.

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[*] Article entitled "Sulphur in Coal and Coke," published as one of the Monthly Reports of Investigations of the U. S. Bureau of Mines.

[†] Physical organic chemist, U. S. Bureau of Mines.

King Would Make Sherman Law More Drastic

STATING that he believed that Supreme Court decisions had made the Sherman Law of doubtful efficacy in curbing combinations in restraint of trade, Senator King, of Utah, introduced a resolution, May 1, asking that Congress make a study to determine if supplemental legislation is needed to restrain the formation of trusts and monopolies.

Summer Season Is Best for Coal Shipment in Eastern Ohio

THE accompanying diagram shows in very striking manner why the coal operators in Ohio are not in favor of the seasonal coal rates proposed by Senator Frelinghuysen and others. This diagram, taken from one prepared by D. F. Hurd, secretary of the Pittsburgh Vein Operators Association, and presented as evidence before the Senate committee hearing on the bill to authorize summer reductions in coal freight rates, shows that in this field at least the greater movement of coal is in the summer and that any change in rates tending to 'increase summer traffic to markets other than the Lakes will only tend to make it more difficult to meet ordinary demands.

The report of the Geological Survey for 1917 shows that nearly 5,000,000 tons of coal were shipped up the Lakes that year from the coal fields in northern Ohio, that this quantity represented 18 per cent of the total production and that of the total Lake movement 94 per cent was in the six months May to October inclusive. It is evident therefore that it is the Lake business that gives the hump in the summer time to the production curve for this field. Other fields have the same conditions, and these fields are the ones to which the seasonal rates do not appeal.

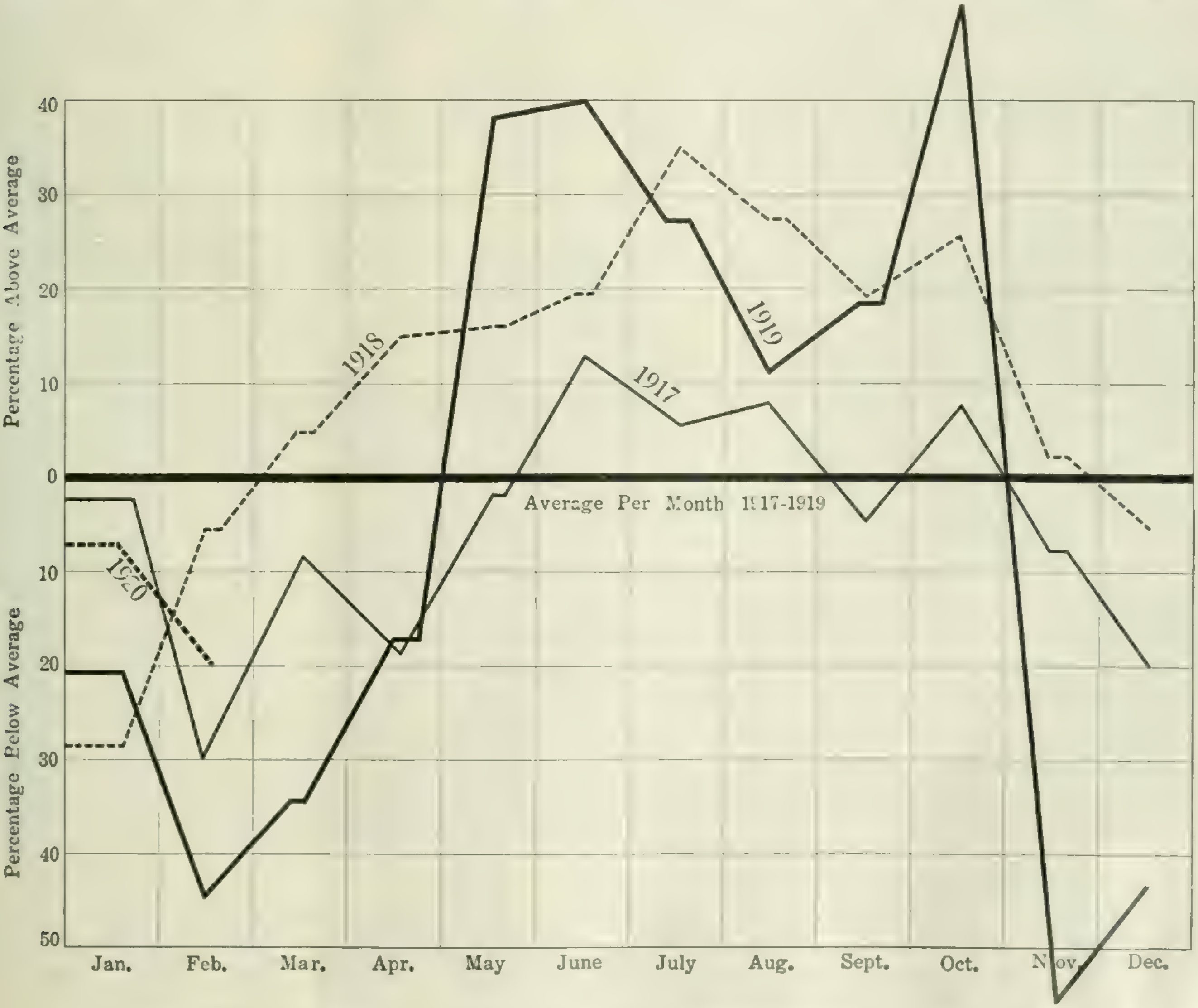
Bituminous Coal Movement to Tidewater During March

SHIPMENTS of bituminous coal to tidewater during March, according to the Geological Survey, established a new high record for that month. The total quantity of bituminous coal dumped into vessels at North Atlantic ports was 3,965,000 net tons. This was an increase over February of 1,066,000 tons, or 38 per cent, and exceeded by 199,000 tons the record of March, 1918, which had hitherto been the largest for that month. The total amount dumped during the coal year 1919-1920 was 39,657,000 net tons.

BITUMINOUS COAL SHIPPED TO TIDEWATER (Net Tons)

	Coal Year 1919-20	Coal Year 1918-19
January	3,185,000	2,954,000
February	2,899,000	2,537,000
March	3,965,000	1,962,000
Coal year total	39,657,000	41,763,000

Coastwise shipments to New England during March were the largest in any month since the armistice.



SEASONAL FLUCTUATIONS IN COAL PRODUCTION IN THE PITTSBURGH NO. 8 FIELD OF OHIO

The production by months is shown for the period January, 1917, to date in terms of percentages above or below the average monthly production for the three years 1917, 1918, 1919 (971,122 net tons).

The total quantity—954,000 net tons—was 20 per cent greater than that of February and nearly twice as great as during the corresponding month last year. The coal year, however, closed with the cumulative shipments far behind those of the preceding year. The total for the year ended March 31, 1920, was 9,172,000 net tons, as against 14,373,000 tons the year before. The decrease was 5,201,000 tons, or 36 per cent.

BITUMINOUS COAL SHIPPED TO NEW ENGLAND VIA TIDEWATER
(Net Tons)

	Coal Year 1919–20	Coal Year 1918–19
January	804,000	721,000
February	793,000	554,000
March	954,000	490,000
Coal year total	9,172,000	14,373,000

Overseas exports during March were 1,033,000 tons, or at the rate of 12,396,000 net tons per year; February exports were 718,000 tons.

EXPORTS FOR JANUARY, FEBRUARY AND MARCH COMPARED

	January, Tons	February, Tons	March, Tons
New York	....	....	....
Philadelphia	103,000	43,000	34,000
Baltimore	174,000	58,000	83,000
Hampton Roads	591,000	553,000	858,000
Charleston	29,000	64,000	58,000
Total	897,000	718,000	1,033,000

Compared with February, this was an increase of 315,000 tons. Exports fell off at Philadelphia and Charleston but increased sharply at Hampton Roads.

Railroad Shipments for January

SHIPMENTS of coal and coke carried over fourteen leading railroads during January, 1919 and 1920, compiled by the U. S. Department of Commerce from reports furnished by the roads, are as follows:

Coal and Coke Shipments for January, 1919, and January, 1920, Compared

Classes and Railroads	Originating on Line 1919	Originating on Line 1920	Received from Connections 1919	Received from Connections 1920	Total 1919	Total 1920
For Revenue Only						
Anthracite:	*Short Tons*	*Short Tons*	*Short Tons*	*Short Tons*	*Short Tons*	*Short Tons*
Buffalo, Rochester & Pittsburgh	......	....	13,730	14,343	13,730	14,343
Buffalo & Susquehanna	......	..	179	2,446	179	2,446
Chesapeake & Ohio	530	1,304	2,756	4,200	3,286	5,504
Erie	711,408	646,637	232,180	263,283	943,588	909,920
Huntingdon & Broad Top	...	.		56	.	56
Pennsylvania	491,776	445,676	422,914	439,476	914,690	885,152
Pittsburgh & Lake Erie	..	....	48	....	48	....
Pittsburgh, Shawmut & Northern	.	....	1,436	2,125	1,436	2,125
Virginian	270	200	99	100	369	300
Western Maryland	......	....	32,980	26,186	32,980	26,186
Totals	1,203,984	1,093,817	706,322	752,215	1,910,306	1,846,032
Bituminous:						
Buffalo, Rochester & Pittsburgh	732,644	663,518	28,301	13,167	760,945	676,685
Buffalo & Susquehanna	117,326	155,949	188	....	117,514	155,949
Chesapeake & Ohio	1,801,680	2,319,046	179,507	200,920	1,981,187	2,519,966
Erie	31,239	40,760	860,986	884,957	892,225	925,717
Huntingdon & Broad Top	79,258	86,533	114	2,145	79,372	88,678
New York Central (Buffalo and East)	608,677	669,887	......	......	608,677	669,887
Norfolk & Western	1,310,803	1,767,969	212,909	262,827	1,523,712	2,030,796
Pennsylvania	3,369,342	3,372,361	815,301	737,801	4,184,643	4,110,162
Pittsburgh & Lake Erie	493,693	558,025	601,437	752,075	1,095,130	1,310,100
Pittsburgh & Shawmut	200,340	221,190	....	.....	200,340	221,190
Pittsburg, Shawmut & Northern	42,474	69,230	28,768	40,436	71,242	109,666
Virginian	380,915	492,073	57,721	61,458	438,636	553,531
Western Maryland	287,139	433,168	673,415	884,102	960,554	1,317,270
Totals	9,455,530	10,849,709	3,458,647	3,839,888	12,914,177	14,689,597
For Company Fuel						
Anthracite:						
Buffalo, Rochester & Pittsburgh	..	.	....	625	.	625
Erie	12,474	21,442	...	817	12,474	22,259
Pennsylvania	8,844	18,339	5,153	6,698	13,997	25,037
Totals	21,318	39,781	5,153	8,140	26,471	47,921
Bituminous:						
Buffalo, Rochester & Pittsburgh	78,398	74,933	543	48	78,941	74,981
Buffalo & Susquehanna	8,199	11,878		....	8,199	11,878
Chesapeake & Ohio	168,026	210,116		...	168,026	210,116
Erie	122,716	118,255	256,351	251,507	379,067	369,762
Huntingdon & Broad Top	2,036	....	....	1,435	2 036	1,435
New York Central (Buffalo and East)	179,313	154,285	....	....	179,313	154,285
Norfolk & Western	204,441	242,792	36,159	57,352	240,600	300,144
Pennsylvania	1,135,163	735,244	40,077	101,899	1,175,240	837,143
Pittsburgh & Lake Erie	23,224	41,064	32,843	27,705	56,067	68,769
Pittsburgh & Shawmut	5,083	4,343		......	5,083	4,343
Pittsburg, Shawmut & Northern	3,566	4,693		...	3,566	4,693
Virginian	30,969	40,375	611	1,202	31,580	41,577
Western Maryland	25,537	60,951	48,274	3,982	73,811	64,933
Totals	1,986,671	1,698,929	414,858	445,130	2,401,529	2,144,051
Coke for Revenue and Fuel						
Buffalo, Rochester & Pittsburgh	22,831	16,653	47,155	27,738	69,986	44,391
Buffalo & Susquehanna	25,145	32,186	..	39	25,145	32,225
Chesapeake & Ohio	53,478	38,572	8,284	8,161	61,762	46,733
Erie	13,631	39,798	28,635	35,227	42,266	75,025
Huntingdon & Broad Top	6,769	3,654	1,534	11,210	8,303	14,864
Norfolk & Western	165,238	89,916	20,258	20,853	185,496	110,769
Pennsylvania	695,653	651,667	182,235	151,099	877,888	802,766
Pittsburgh & Lake Erie	61,549	43,472	563,325	424,425	624,874	467,897
Western Maryland	5,401	3,282	47,531	14,711	52,932	17,993
Totals	1,049,695	919,200	898,957	693,463	1,948,652	1,612,663

[illegible] No report has been received from the Baltimore & Ohio Railroad

Though Silent, Holland Has Acute Need of Coal

By M. Meredith
Liverpool, England

MOST people who are not intimately acquainted with the coal trade in Holland are apt to consider the position of that country as fairly satisfactory. This belief has apparently been confirmed by the silence of Holland on this point while most other countries have been crying out their needs as loudly as possible.

Before the war the quantity of coal consumed in Holland amounted to about 10,000,000 tons annually, and of this quantity only 636,924 tons were supplied by the domestic collieries. Apart from the supply of Dutch consumers a large transit trade was carried on, the figures for 1913 being as follows:

HOLLAND'S COAL SUPPLY IN TONS DURING 1913

Imports from Germany	17,920,274
Imports from England	1,958,698
Imports from other countries	511,692
Total production of Dutch Coal	1,774,140
	22,164,804

EXPORTS OF COAL IN TONS FROM HOLLAND IN 1913

Exports to Belgium	7,355,109
Exports to other countries	4,662,251
	12,017,360

HOLLAND'S COAL CONSUMPTION IN TONS IN 1913

Consumption of coal in Holland	10,147,444
Foreign coal	9,510,520
Dutch coal	636,924

After the close of war it was hoped larger supplies of foreign coal could be secured, but such supplies were not so large as might have been expected. No definite figures are yet available, but the total quantity imported in 1919 is estimated to be under 2,500,000 tons, and this figure was favorably influenced by the importation from Belgium of about 900,000 tons during the first half of the year. The Belgian authorities thereupon prohibited the export of coal to Holland, and no further supplies were received from that country. The imports from Germany remained stationary, and a limited quantity was again imported from England, while during the last few months of the year American coals also were imported.

Pre-war coal consumption by Holland was approximately 10,000,000 tons annually, of which only 636,924 tons were produced by domestic collieries. Exports were about 12,000,000 tons. With the approval of the Entente governments Germany will supply 2,250,000 tons this year. Prospects for the immediate future are anything but hopeful.

The output of the Dutch collieries could not be further increased in 1919, 3,600,000 tons being produced by them, bringing the total supply to just over 60 per per cent of pre-war consumption. The Government Coal Office, on the other hand, had estimated the following quantities to be the minima required to cover only the barest needs:

ESTIMATED COAL REQUIREMENTS IN TONS

Domestic purposes	2,100,000
Industry	4,100,000
Railways	900,000
Shipping	600,000
	7,700,000

It will be observed that Germany occupied first place, outdistancing all other countries in supplying Holland with fuel. The imports from that country, furthermore, were rapidly rising; while, on the other hand, imports from England were steadily decreasing.

After the outbreak of war foreign supplies quickly dropped, and though the production of Dutch collieries was increased and the export of coal prohibited during 1915, it became evident more stringent measures were required, since the normal demand could no longer be met. In the early part of 1916 a Government Coal Office was instituted to distribute the available supply and to take measures to increase it. No expense was spared to increase the output of Dutch collieries, the largest and most important of these being state-owned and managed. The output during that year reached 2,600,000 tons, or an increase of over 50 per cent compared with the highest pre-war production. Only 5,500,000 tons were imported, bringing the total supplies during the year to about 80 per cent of pre-war consumption.

In 1917 the position became decidedly worse. The output of the Dutch collieries increased to over 3,000,000 tons, but the imports fell to 3,000,000 tons, leaving a shortage compared with pre-war consumption of 4,000,000 tons.

It should not be overlooked that prior to the war the consumption of low-grade fuel such as peat was already fairly important, and that the average quality of the coal was superior to that used at present. A large percentage of the output of the Dutch collieries is meagre coals or those of low heat content, and the average calorific value is considerably lower than that of the foreign coal used formerly.

Prospects for the near future are anything but hopeful. The output of the Dutch collieries cannot be increased further to any considerable extent during the next few months, and it is feared that the quantity of foreign coal that can be imported will not be much larger than it was in 1919.

Subject to approval by the Entente, an arrangement probably will be entered into with the German government, insuring for Holland a supply of about 1,000,000 tons from the Ruhr Valley and 1,250,000 tons from the coal fields in Germany adjoining the Dutch frontier, which are owned and worked by a Dutch concern. Including these quantities about 6,000,000 tons will be available, leaving a shortage of 4,000,000 tons compared with pre-war consumption, or, taking the estimate of the Government Coal Office as a basis, at least 2,000,000 tons will be required for the barest needs of Holland, and the only countries she can look to for any further supplies are England and the United States.

It is important for the reader to bear in mind that the statistics quoted by Mr. Meredith are from official reports and that the Netherlands records any coal passing through the country, such as coal from Germany or Belgium, as imports and as it leaves the borders of the country, the same coal is reported as exports. The result is a showing of exports far in excess of domestic production or even of domestic consumption. This duplication should be clearly kept in mind.—EDITOR.

Coal Operators Question Good Faith of Trade Commission

Action Requiring Monthly Cost Reports After Adverse Decision by Justice Bailey Surprise to National Coal Association

WHILE no announcement has been made as to whether the Federal Trade Commission will issue default notices in case coal producing companies, other than the Maynard Coal Co., fail to make monthly reports to the commission, it is the inference from the letter of April 26 and the attitude of the commission, that default notices will be issued. A very general opinion among operators is that the issuance of default notices would violate the understanding as to a friendly test suit and many regard the letter of April 26 as being distinctly at variance with the idea that the entire question be left to a test case. The letter of April 26 was printed on p. 838 of the last issue of *Coal Age*. Its purport simply is that the commission will continue to require monthly reports from all producers, other than the Maynard Company. In that connection Rush Butler, the general counsellor of the National Coal Association, analyzes the situation as follows:

It should be understood that this circular letter is not a formal notice of default which subjects operators to penalties for failure to send in the reports referred to. If such default notice is subsequently served on operators who do not wish to comply with the commission's request and do not send in their reports, then those operators will still have 30 days in which to file reports if they see fit to do so.

In this connection, coal operators will be interested to know that the order of injunction entered by Mr. Justice Bailey provides:

"It is hereby ordered, adjudged and decreed that a temporary injunction be and is hereby issued pursuant to the prayer of said bill of complaint, suspending the said order of said defendant."

The order referred to is the order of Jan. 31, 1920, which was the amended order requiring the filing of monthly reports. The order of injunction then goes on to provide that the injunction be entered "restraining said defendant, the Federal Trade Commission, its members, agents, assistants, deputies and employees, from taking any steps or instituting or causing to be instituted any proceedings to enforce said order or to require the plaintiff to fill out and file the prescribed form of report."

While it may be contended that technically the last part of the above order of injunction refers only to the Maynard Coal Co., the plaintiff in the case, nevertheless the first portion of the injunction clearly suspends the commission's order requiring the filing of monthly reports, and it seems improbable that the Federal Trade Commission would undertake to prosecute any proceedings based upon an order which is suspended by an injunction of the Supreme Court of the District of Columbia.

The written opinion of Justice Bailey, filed in the case, is clearly based upon broad fundamental principles that apply to all coal operating companies equally with the plaintiff in the test case. While the institution of proceedings against a coal operating company other than the plaintiff perhaps might not be a technical violation of the injunction, it would clearly be a disregard of the court's announced decision on the fundamental questions of law involved.

There can, of course, be no objection to companies filing the reports with the commission if they desire to do so. On the other hand, no company need file such reports until a notice of default has been served upon it, and even then, in view of the decision of Justice Bailey, there would seem no doubt that the commission's actions to require the filing of such reports could be promptly enjoined. Until the injunction order has been set aside by further order of the court or on appeal, the decision of the Supreme Court of the District of Columbia stands as the law of the land. It is our belief that the Federal Trade Commission will so recognize it and will not take any steps to cause penalties to accure unless the injunction order is reversed on appeal.

The penalty section of the Federal Trade Commission Act, which covers these reports, reads as follows:

If any corporation required by this Act to file any annual or special report shall fail so to do within the time fixed by the commission for filing the same, and such failure shall continue for thirty days after notice of such default, the corporation shall forfeit to the United States the sum of $100 for each and every day of the continuance of such failure, which forfeiture shall be payable into the Treasury of the United States, and shall be recoverable in a civil suit in the name of the United States brought in the district where the corporation has its principal office or in any district in which it shall do business. It shall be the duty of the various district attorneys, under the direction of the Attorney General of the United States, to prosecute for the recovery of forfeitures. The costs and expenses of such prosecution shall be paid out of the appropriation for the expenses of the courts of the United States.

Denies That Coal Property Assets Will Be Distributed

CONTRADICTING reports current in financial circles, W. H. Coverdale, chairman of the Board of Directors of the Pittsburgh & West Virginia Railway, says the company is not contemplating a distribution of its coal property assets vested in the Pittsburgh Terminal Railroad & Coal Co.

The decision of the U. S. Supreme Court in the Reading Company case created the impression that the Pittsburgh & West Virginia would voluntarily segregate its coal company from the railroad so that stockholders of the latter would reap the benefit.

In some quarters, however, it is believed that the three companies comprising the Pittsburgh & West Virginia system will be consolidated as a result of a special meeting of the stockholders to be held following the regular annual meeting in Pittsburgh this week.

Counsel for the company is reported to have informed officials of the system that the company has not been in conflict with the provisions of the Sherman Anti-Trust Act nor will it offer grounds for a Government suit after the new plan becomes operative.

In addition to the railroad and the coal company there is the West Side Belt Railroad, which is controlled by the coal company. The Pittsburgh & West Virginia is the successor of the old Wabash-Pittsburgh Terminal Railway, which was reorganized in 1916.

NEWS FROM THE CAPITOL

BY PAUL WOOTON

Deadlock Continues in Washington Anthracite Wage Negotiations

BELIEVING that with the steady work they have had year after year (broken only, yet not greatly, in the last year) the anthracite mine workers were not entitled to all that was conceded to the soft-coal employees by the Bituminous Coal Commission, the anthracite operators offered only a 15-per cent increase, or thereabout, as has already been stated. The mine workers rejected the offer. The situation seemed ominous, John Lewis having been reported to have said to Secretary of Labor Wilson over the telephone that "the break in negotiations is near."

The anthracite operators offered, it is stated, to arbitrate the matter, but the mine workers were opposed to any such action. The parties were invited to Washington and spent three days with Secretary Wilson presenting their respective claims. After that, May 4, a recess was taken till May 11, Secretary Wilson desiring time to consider the contentions submitted and President Lewis of the United Mine Workers being obliged to go to Indianapolis in connection with his prosecution in the Federal courts for a breach of the Lever Act, for which he and 124 mine workers' leaders and operators have been indicted.

West Virginia Operators Appeal for Cars, Alleging Discrimination

ASKING that relief and reparation be granted as a result of their failure to furnish one hundred per cent of the orders for cars placed by the Monongahela Ry., the Northern West Virginia Coal Operators' Association has brought action before the Interstate Commerce Commission against various carriers. It is pointed out that during the period from July 1, 1919, to March 1, 1920, the Monongahela Ry. was compelled to look to the Pennsylvania R.R. and the Pittsburgh & Lake Erie R.R. for its supply of empty coal cars. Similarly the Morgantown & Wheeling Ry. was compelled to look to the Monongahela Ry. for its supply of cars for coal loading.

Neither line owns any coal-carrying equipment. The capital stock of the Monongahela Ry. is owned jointly by the Pennsylvania and the Pittsburgh & Lake Erie. As a result operators of mines on the Monongahela and Morgantown lines were dependent upon the same sources of coal-car supply as were operators with mines on the Pennsylvania and Pittsburgh & Lake Erie lines.

Attention was called to the fact that the dependent carriers were parties to the "Uniform Mine Rating and Car Distribution Rules." Under these rules the operators on the Monongahela and Morgantown lines were entitled to their pro rata share of cars. Figures are given showing that they received only 72.2 per cent of the cars ordered, whereas shippers on the Pennsylvania and Pittsburgh & Lake Erie received 83.7 per cent car supply.

This complaint is regarded as unusually important because the opinion which will be handed down will establish a precedent. In that connection it may be stated that complaints of car shortage have increased very greatly since the period covered in the plea of the West Virginia operators. It is declared that for the last twenty-two days not an empty car has been placed by the Pennsylvania in No. 8 Ohio district. Many mines on other roads are working only a few hours a week because of car shortage. That this is one of the contributing causes to the abnormally high prices being asked for coal may be seen from the result of a study made in 1917 by Messrs. Garnsey, Norris and Allport, the engineer committee of the Fuel Administration. The study was made in the New River district and was for a twelve-months' period. It shows:

When Car Supply Is Below Normal by This Percentage	Coal Cost Is Above Normal by This Percentage
5	3.0
10	6.0
15	9.0
20	12.0
25	13.5
30	19.5
35	24.0
40	29.0
43	34.5
50	40.5
55	47.0
60	54.5
65	64.0
70	74.0
73	85.0
80	98.0
85	113.0
90	136.0
92	156.0

Filibuster on Water-Power Bill

Just when it was being taken for granted that the Water-Power bill soon would become a law, a formidable filibuster against it was organized in the Senate. At this writing it appears that the bill is in serious danger unless the conferees will consent to modify it materially.

After the passage of the bill by both houses considerable delay resulted in conference due to the inability of the conferees to agree on several points, one of which was the definition of "navigable waters." After a definition was agreed upon the conference report was accepted by the House with only 30 votes against it.

The filibuster in the Senate will be led by New England Senators who object to what they term Federal control of business. Under the definition "navigable waters" as provided in the conference report, it was declared that no one will be able without getting a license from the Federal agency to build a dam for any purpose in any creek or small stream which empties into a river held to be navigable.

Middle-West Consumers Support Seasonal Freight Rates

Declaring That the Cppcsition to the Idea Comes from Those with Only Selfish Motives, Representative of Iowa Consumers Declares That Seasonal Rates Will Work Great Relief to Coal Situation in the Middle West

THAT the consumers of coal in Iowa are displaying the greatest interest in the seasonal freight rate in the hope that it will become an actuality was brought out with particular clearness at the May 5 meeting of the Frelinghuysen sub-committee. J. P. Haynes, commissioner of the Traffic Bureau of Sioux City, Iowa, and H. F. Sundberg, traffic manager to the Chamber of Commerce of Cedar Rapids, testified at that hearing. Each came well prepared and in the opinion of Senator Frelinghuysen added very materially to the value of the record which is being built up.

Mr. Haynes pointed out that 90 per cent of the coal consumed in western Iowa moves all-rail from southern Illinois mines, an average distance of 800 miles through Mississippi River crossings, where the traffic density is great. As a result each winter sees a great amount of public inconvenience as well as suffering.

Mr. Haynes was a member of a conference committee which made a study of the situation in the Middle West in February. At the conference were five shippers' representatives, five coal operators and five railroad representatives. The railroad men represented twenty of the leading railroads of the Middle Western and Northwestern States. At that conference it was decided that means of increasing the seasonal spread between rates must be resorted to if the general public in those sections of the country were to be properly safeguarded. Mr. Haynes presented other resolutions and communications showing that sentiment in the West and the Northwest is overwhelmingly for the seasonal rates.

By permission of the chairman, George H. Cushing asked Mr. Haynes the following question: "Is it not true that in the past in the territory which you describe there has been a very much larger annual fluctuation in the price of coal than is now contemplated in the rate of freight? Is it not true that this wide fluctuation of 75c. to $1 per ton failed to induce any general buying of coal for storage?"

To this Mr. Haynes replied: "No, the spread in the summer-delivered price and the winter-delivered price, due to the fluctuation, if any, at the mines, has not been of such importance as to encourage the summer movement."

This led Senator Frelinghuysen to ask: "Is it not also true that the consumer has no assurance that the price in the winter will not be just as low as in the summer? Is he not always looking and hoping that the price will be less in the future? Do you not believe that if the consumer were assured that he would have a 50c. differential in his rate, that would induce the buying and storing of coal, particularly after the experience of the past winter?"

To this Mr. Haynes answered in the affirmative, and added: "It is an absolute necessity to show consumers that it is a matter of money to them. When they know they will profit, large amounts will be expended for storage facilities."

Mr. Cushing then declared that after an intimate experience of fifteen years in the very territory under discussion every inducement had been held out to stimulate the summer buying of coal. A profit of from 12 to 25 per cent on money so invested was assured but no summer movement of coal resulted.

Mr. Haynes introduced evidence showing that Indiana and Illinois coal has and is being successfully stored. Some Iowa coal also is being stored under water, he pointed out.

At another point in his testimony Mr. Haynes said: "I have sat with the railroads of the Central West, the operators of Central West, and the consumers in that territory, which includes Chicago, the Twin Cities, and other large centers. All are in accord in advocating seasonal coal freight rates. At a meeting yesterday in New York, which I attended as a member of the Executive Committee of the National Industrial Traffic League, at the suggestion of Chairman Clark of the Interstate Commerce Commission, the question came up as to how the shippers and the railroads can get together at this time to bring about some relief in the pressure on transportation.

"The chairman of that meeting, Mr. Pearson, president of the New Haven road, and Mr. Wright, freight traffic manager of the Pennsylvania R.R., said, 'Let us pass that question because it is very well taken up in the existing bill before the Senate. We will not try to do anything until that is passed.' I feel that that was an expressed approval of this measure, with the added reason that the railroads played a prominent part in drawing up a recent resolution at a meeting in New York City in February of the coal and coke section of the American Institute of Mining and Metallurgical Engineers, of which Herbert Hoover was chairman, and the committee from the American Railroad Association.

"The committee which indorsed this as one of the fundamentals in stabilizing the coal industry consisted of Samuel Rea, president of the Pennsylvania system; F. D. Underwood, president of the Erie R.R.; A. F. Tice, president of the Philadelphia & Reading R.R.; E. J. Pearson, president of the New York, New Haven & Hartford R.R., and J. F. Porterfield, representing C. H. Markham, president of the Illinois Central R.R."

With reference to this Senator Frelinghuysen said that the statement just quoted is a very valuable contribution to the record since it shows that these railroad leaders are committed to the principle involved in the Senate bill.

Mr. Sundberg stated that concrete storage bins, in which the coal is submerged in water, have been in successful operation in Cedar Rapids for several years. Both Iowa and Illinois coal is stored in that manner. He said no difficulty was experienced due to freezing, as the coal was extracted from the bins with clam-shell buckets. He declared that Eastern opposition to the seasonal freight rate is "prompted by selfish reasons and a desire to ignore the rest of the country,"

"The interest of the public," said Mr. Sundberg, "is so great that the selfish interests of the few should be lightly considered. Opposition from the sources from which it has come proves the wisdom of the plan.

"My idea of exempting certain minimum rates from the provisions of the bill is that very few rates would be affected. Any rate of 75c. and under is in effect for a very short haul, probably five to ten miles to the consuming point. There would not be much advantage in storing coal for that short haul since the coal equipment used in that traffic works like a shuttle. It is usually a switch movement. The cars are unloaded promptly and they are back at the mine in a day."

Move to Quash Indictments

ILLINOIS coal operators who were indicted at Indianapolis a few weeks ago for violating the Lever Act, brought individual suits on May 5 in Chicago, asking that the United States Government, through its officials, be restrained from prosecuting them further. Among those who took this action were G. B. Harrington, F. C. Honnold, J. K. Dering, C. M. Moderwell, R. C. Whitsett, R. E. Lee, R. W. Couffer, John T. Connery, E. C. Searles, T. C. Keller, Walter Bogle and H. A. Huskey.

These petitions for injunction are construed as another attack on the constitutionality of the Lever Act, and in this attack a number of Federal officials are named as defendants, among them being Attorney General Palmer, Washington; Assistant Attorneys General L. E. Slack and D. W. Sims, District Attorney F. Van Nuys, all of Indianapolis, as well as District Attorney C. F. Clyne and others of Chicago.

In the petition for injunction a full history since 1916 of wage scale negotiations with the United Mine Workers of America is given, and special emphasis is laid upon the situation which confronted the coal operators at the time of the strike last November. It is charged that the prosecutions resulting from the Indianapolis indictment were an attempt to interfere with the relations between the operators and the United Mine Workers, which relations were entered into at the request of the U. S. Fuel Administration, and with the full knowledge and consent of the Department of Justice. The petition further declares that the charges of the Government, accusing the operators of collecting excessive prices for coal, were made in an indefinite manner, and that the coal industry has suffered great damage became of the resulting inability of the operators to decide what prices would be considered exorbitant and what prices would be considered fair.

The Lever Act comes in for special attention, as the petition states relative to certain provisions of the act that "These provisions are so vague, indefinite and uncertain that they cannot have the force or effect of law within the meaning of the Constitution of the United States, particularly the fifth amendment, and that any penalties exacted under that statute would constitute the taking of property or the deprivation of liberty without due process of law." The petition goes on to protest very strongly against the Government charge that the operators conspired to limit the production and transportation of coal.

These injunction suits will be argued before Federal Judge Carpenter this week and it is believed that if the petitions for injunction are granted, the cases against the coal operators will be dropped.

In the meantime at Indianapolis the operators of Indiana and the officials of the United Mine Workers appeared before Judge Anderson to answer to the indictments of the grand jury. The answer was a series of motions to quash the indictments on the ground that the Lever Law, under which they were made, is unconstitutional, that the President exceeded his authority under the act, and the insufficiency of the indictment. Charles Evans Hughes appeared for the miners and S. D. Miller and James A. Bingham as counsel for the operators. The defense argued that, aside from the fact that the Lever Act was "hopelessly vague and indefinite," it could not be applied, if valid, to sustain the indictment against the coal men in view of the authority given the President to control the industry.

"We shall insist," said Mr. Hughes, "that Congress, no more in time of war than in time of peace, can take away constitutional rights. There is no authority of Congress to maintain a law of this kind."

He particularly directed attention to the portions of the indictment drawn under provisions of the act providing for the prosecution of conspiracies to charge excessive prices, declaring this act is outside every known category of the law.

Simultaneously injunctions were asked by Ohio operators in the Cleveland courts and certain other Illinois operators in St. Louis, to restrain the court from requiring their appearance at Indianapolis.

Non-User Does Not Lose His Rights

THE rule of law under which a mining privilege is sometimes regarded as being a mere license, which may be lost by non-user, is confined to cases where the privilege is limited and no exclusive right in the minerals themselves is granted.

The rule does not apply to a conveyance of "all of the mineral right and coal privileges and rights of way to and from said minerals and coal privileges; also the right to search for all undiscovered minerals and coals upon the land hereinafter described"; and warranting "the above-described privileges unto the grantee forever, free from me, my heirs, and assigns," etc.

This conveyance shows a clear intention to convey to the grantee the perpetual and exclusive right to all the minerals, thereby investing him with title to the minerals themselves. Since there is a severance of the mineral estate from the surface estate, the owner of the minerals does not lose his right or his possession by any length of non-user, nor does the owner of the surface acquire title by adverse possession to the minerals by his exclusive and continued occupancy and enjoyment of the surface merely.

The above-mentioned conveyance includes oil and gas that may be found underlying the land. (*Kentucky Court of Appeals, Scott vs. Laws, 215 Southwestern Reporter, 81.*)

Crowsnest Miners Back to Work

SINCE early in March the Crowsnest mine workers have been idle, but on April 27 the Director of Coal Operations was able to announce that the strike was at an end. It is stated that the United Mine Workers gained a complete victory and that it is now preparing to get a new settlement in accord with the wage agreement in the United Staetes, which will mean an increase of about 11 per cent on the present wage.

U. S. Steel Earnings Greater Than in 1919

IN ITS report for the first quarter of this year the U. S. Steel Corporation shows net earnings of $42,089,019, a total greater than for any quarter of 1919. Not since the third quarter for 1918 has the corporation been able to present such an excellent record. After charges, depreciation and provision for preferred dividends, there was a balance of $19,726,866 for the common stock, which was equivalent to $3.88 a share. Against this amount there was nothing other than the regular dividend declaration of $1.25 a share, so that $2.63 a share was carried to surplus. On the basis of $3.88 a share for the first quarter of the year, the full year's earnings on the common stock would amount to $15.52 a share, as compared with a normal dividend rate of $5 a share.

The chief figures in the statement and a comparison with other quarters are shown in the following table:

INCOME ACCOUNT

	Quarter Ending Mar. 31, 1920	Quarter Ending Dec. 31, 1919	Quarter Ending Mar. 31, 1919
Net earnings	$42,089,019	$35,791,302	$33,513,384
Dep. s. f. etc.	10,765,318	12,751,027	10,638,955
Net income	31,323,701	23,040,275	22,374,429
Interest on bonds	5,291,916	5,344,979	5,393,413
Balance	26,031,785	17,695,296	17,481,016
Addition to balance	...	185,694	...
Dividends, preferred	6,304,919	6,304,920	6,304,919
Dividends, common	6,353,781	6,353,782	6,353,781
Surplus for quarter	14,373,085	5,222,288	4,822,316

NET EARNINGS BY MONTHS

	1920	1919	1918
January	$13,503,209	$12,240,167	$13,176,237
February	12,880,910	11,883,027	17,313,883
March	15,704,900	9,390,190	26,471,304
First quarter	$42,089,019	$33,513,384	$56,961,424

The present statement conforms in style to that issued last year. No mention is made of the amount set aside to cover Federal taxes. The statement merely says that net income had been computed after making allowance for such requirements.

American Woolen Co. Report Shows 1919 Best Year in Its History

THE annual report of the American Woolen Co. for 1919 was the best in the company's history, the net profits amounting to $15,513,415 after making provision for Federal taxes. In 1918 the net profits were $12,324,084. The net profits of 1918 were slightly higher than those reported in the present statement, but in that year no allowance was made for Federal taxes.

After all charges there was a surplus available for dividends last year of $10,779,804, or the equivalent of $39.89 a share on the common stock, after making allowance for the preferred distribution. In the preceding year the amount available for dividends was $5,572,527, or $13.86 a share on the common. The surplus for the year after dividends was $4,770,804. The report shows that $14,500,000 was restored to surplus from reserve, and that $7,250,000 was set aside as a reserve against a possible diminution in inventory value.

The balance sheet shows no holdings of Liberty bonds, whereas the 1918 report indicated $3,306,400 in such assets. The inventory is the highest ever recorded, totalling $52,990,116, an increase of nearly $15,500,000 over the preceding year. The surplus of the company now stands at $31,754,427.

William M. Wood, president of the company, in his remarks to stockholders, says in part:

"We have been able to increase our foreign deliveries for the year 1919 approximately 100 per cent. Total deliveries amounted to about $4,500,000, unfilled orders $4,800,000, orders which we refused to accept $13,000,000. The volume of foreign orders was so great that we were obliged to cancel many of them, as your mills were unable to fill these orders on account of their sold-up condition or inability to manufacture for deliveries within the time required by customers."

Remedies for Labor Shortage Proposed At Immigration Conferences

PRACTICAL measures to relieve the present labor shortage were proposed by the National Immigration Conference held April 7 in New York City. This gathering included leaders in finance, industry and agriculture, together with labor men and representatives of foreign-born groups in America. The conference was called by the Inter-racial Council, 120 Broadway.

The common interest which drew these varied elements together is the need of greater production, more stable labor conditions and a better understanding between the different races living in America. In other words, better team work is essential. Americans and immigrants should pull together for the benefit of all.

Among the measures proposed were greater protection for the immigrant against fraud, extortion and violence. A Federal assimilation bureau should be established to look after the welfare of the immigrant, help him learn our language and place him where he can work to the best advantage to himself and to the nation. Standards for citizenship should be high, but useless hindrances and red tape should be done away with. An advanced immigration policy was advocated as a remedy for the present labor shortage, including the selection of industrious and thrifty men and women of good character, and their distribution to points where they can do the work for which they are fitted.

As an immigrant may be of great value to the country as an unskilled laborer, regardless of his inability to read, it was urged that the present literacy test be eliminated, which would open the gates to unskilled workers in agriculture and industry, construction, railroads and domestic service, where there is a great need for help at this time. Our present labor shortage is estimated at between four million and five million, and this would be relieved by a policy of admitting immigrants without book learning but of good character, sound body and mind and Old World habits of frugality and industry.

Among the industrial concerns represented at the conference was one coal mining company—the Berwind-White Co., of Philadelphia.

It is stated at the Federal Trade Commission that a very large number of requests is being received from operators asking that the cost reports of the Commission be continued.

Judging from letters and telegrams being received in Washington a rumor has gained wide currency that Senator Lodge intended to press legislation looking to the restoration of price control on coal. Senator Lodge states positively that he has no such plan and it is believed highly improbable that Congress would give, at this time, any serious consideration to a return to price control on coal.

Conferees Reach Agreement on Water-Power Bill

Measure Is Reported Out Which Provides for a Commission to Have Authority Over Development of Water Powers

SENATE and House conferees on the Water-Power Bill, after protracted sessions, reached an agreement on April 30. The bill reported out on that date by the Conference Committee of the Senate and House creates a Federal Power Commission to be composed of the Secretaries of War, Interior and Agriculture, to which is delegated authority over all matters pertaining to the development of water powers in which the Federal Government has jurisdiction or in which it is interested as owner of lands or other property necessary to such projects.

The commission may issue preliminary permits allowing applicants three years in which to make examinations of water power projects, to prepare plans and to make financial arrangements. It also may issue licenses for a period of fifty years from the expiration of preliminary permits. The commission may reserve such projects the development of which in its opinion should be undertaken by the United States itself, and must give preference to states and municipalities, provided the commission deems the plans for same are equally adapted to utilize the water resources of the region.

The bill encourages the building of headwater storage reservoirs with a view to equalizing power production, preventing floods, and in arid states the use of the water for irrigation purposes on the lowlands after the water has been utilized for the generation of power. Provision also is made for the construction of locks in power dams in navigable streams with a view to extending navigation into the upper reaches of rivers. At the expiration of the fifty-year license the government is given the option of purchasing the hydro-electric plants by paying the licensee his net investment in same, or it may issue a new license to the original licensee upon reasonable terms, or to a new licensee who shall in that event pay the original owner his net investment in the plant.

Under the terms of the bill the United States may take over and operate any water-power plant under license in time of war for manufacture of explosives or for any purpose involving the safety of the country. The commission is authorized to make reasonable charges to cover the administration of the act and for the use of government lands and property, and to absorb excessive profits that cannot be prevented by regulation. Licenses are placed under supervision of state public service commissions as to rates to be charged to consumers for power, and also as to regulation of service. Severe penalties are provided for noncompliance with the terms of the act.

This bill is the result of years of work by committees of Congress, and if made a law will be one of the greatest pieces of constructive legislation ever enacted by the Federal Government. Some think its terms are too restrictive to be inviting to capital, especially in view of the fact that great efforts are being made and great inducements offered by foreign countries to secure American capital for development of their water powers. However, practical water-power men consider the terms of the bill reasonably fair. Senator Jones, of Washington, chairman of the Commerce Committee of the Senate and chairman of the Water-Power Conference Committee, in commenting on the necessity for utilization of the energy contained in our falling waters said:

"Through failure of Congress to pass water-power laws under which money could be safely invested with prospect of a fair return, water powers now wasting have been held back for years from development in at least twenty-two states of the Union. I am informed that actual water-power developments are projected to be undertaken upon enactment of this bill having a total capacity of over 4,000,000 horsepower.

"The completion of these projects would open over 4,000 miles of the upper reaches of our streams and rivers to navigation. It means the extension of navigation for an aggregate of 4,000 miles in thirty-five rivers, traversing twenty states. In this way cheap water transportation will be afforded to districts now sparsely settled and congestion of traffic will be relieved in thickly populated centers through the investment of private capital instead of through river and harbor appropriations by Congress.

"Coal shortage brings up again the folly of leaving unused the nation's vast resources of water power. The more these are developed the less desperate will be the fuel stringency. The waste is not alone one of money. It extends in its final direct results to public health and life itself, as these are affected by inability to get coal for heating and for the production of the necessaries of life. It is estimated that $5,000,000,000 of potential water power is lost in the United States every year. This may or may not be accurate, but the simplest reasoning shows that the amount lost is enormous.

"Sweden is paying $46 per ton for coal, which she has to obtain from England, and therefore is proceeding with the work of developing as far as possible the entire 5,000,000 water horsepower contained within its boundaries. The United States must not fall behind European countries in conserving its coal deposits and in developing the vast amount of cheap electric energy contained in its wasting water powers.

"All the available water power should be developed, and in the quickest time possible, in the interest of the economic uplift of the country, of its social regeneration, of its wealth, and in order to permit it to secure its share of the markets of the world. Hydro-electric energy gives us the means of saving our coal, enables us to obtain electricity at a low price, to lower in many cases our industrial costs of production, and to improve our agriculture. It will become the surest weapon in the economic struggle which faces us."

While some objection arose on the floor of the House to the $125,000 item in the Sundry Civil Appropriation Bill for the survey of power distribution in the Boston-Washington industrial area, the item was approved by the House. The objection was made on the ground that this expense should be borne by industry and that it is not a proper activity for the Federal Government. The claim also was made that so long as the House had just objected to allowing the Federal Government to have a hand in the distribution of water power, holding that it was a proper activity only for the States, it would be improper for the Federal Government to meddle in the matter of distributing any other kind of power. In advancing an argument for the item the chairman of the Appropriations Committee, Representative Good, said in part:

"We are appropriating $125,000 and permitting contributions of a sufficient amount to finish the work, of making a survey of all the power plants, not simply water power but all the power plants within the territory, which is an enormous undertaking. Mr. Murray, the man whose genius put into operation the plan of electrifying the New York, New Haven & Hartford R.R., believes that as a result of this survey not only will the commercial and industrial institutions in this territory be benefited but every farmer along the line who now has a little gasoline engine to churn his butter and grind his grist and things of that kind will be benefited by being furnished power. When the supply of oil disappears he must turn to some other source.

"We may smile at this proposition. We may laugh it out of Congress just as we did by ridicule the proposition of Mr. Langley in regard to the aeroplane. I say to you that it has within it the very things we must adopt to utilize these forces and to make a greater use of coal at the mouth of the mine and at tidewater. It was the testimony of Mr. Murray; it was the testimony of Dr. Smith, director of the Geological Survey; it was the testimony of the director of the Bureau of Mines, that by utilization of the coal in this way, the utilization of the surplus power of the great industrial plant and the public-utility plants, by utilizing their surplus, more than $30,000,000 would be saved every year. At the same time it would open up a plan whereby private capital, not Government appropriation, would be used.

"I would not be in favor of appropriating a single dollar for the Government to go into that kind of a scheme. Private capital should do that. When there is so much of wildcat and watered stocks being circulated and sold, how far would you get in promoting a company of this kind that had back of it only the estimate of some private individual or company? It is intended to have a Government survey and a report, something that would have the stamp of the Government officials on it that the plan was feasible and practicable, and if the supply of oil is to give out within the time specified, we may well stop and consider if we should not study the question where we can get a substitute."

Railroads Ask the Government to Advance Half Billion More for Equipment

IN addition to the $300,000,000 revolving fund that has been provided by railroad legislation, leading railroad executives have informed the Senate Committee on Interstate Commerce that the immediate financial necessities of the railroads demand an advance of $500,000,000 from the Government this year.

The roads need the money to provide new freight and passenger cars and locomotives. These are absolutely necessary for the movement of the year's crops, the executives declared, and if they are not forthcoming there will be during the year the most serious congestion ever known.

The railway executives' representatives who appeared before the Senate committee included President Edward E. Brown of the Pere Marquette road, chairman; L. F. Loree, of the Delaware & Hudson; Henry Walters, of the Atlantic Coast Line; A. H. Smith, of the New York Central; C. H. Markham, of the Illinois Central; E. J. Pearson, of the New Haven, and Samuel Rea, of the Pennsylvania.

When the Cummins-Esch railroad bill passed it provided a revolving fund of $300,000,000 to finance various railroad betterments and expansions. A committee of railway executives undertook the distribution of the fund, and found that from $125,000,000 to $175,000,000 would be available for new locomotives and cars. The railroad heads told the Senate committee, however, that a survey of the needs of the roads shows they should have 226,000 new freight cars, 9,500 passenger cars and 3,000 locomotives, costing $1,600,000,000.

This is far more than could be produced in the next year they said, but since January 1 orders have been placed for 27,776 freight cars and 518 locomotives. Even this will absorb more than the amount available in the revolving fund, they declared, making it necessary to issue equipment trust certificates for the balance.

Freight Movement, 1917 to 1919, Inclusive

CAR service statistics of class 1 railroads of the United States, 1917 to 1919, inclusive, as prepared by Charles E. Lee, of New York, are as follows:

	Year Ended		
	Dec. 31, 1917	Dec. 31, 1918	Dec. 31, 1919
Total revenue freight tonnage	$2,177,247,081	$2,270,035,053	$2,305,868 245
Originating freight tonnage...	1,202,000.067	1,264,015,725	1,263.265,890
Avg. daily originating tonnage	3,293,151	3,463,056	3,461,002
Revenue freight cars owned..	2,253,111	2,301,947	2,323,262
Total revenue freight ton miles....................	362,444,397,129	394,465,400.493	400,379,284,206
Loaded freight car miles.....	15,879,370,777	15,932,049,759	15,028,393,450
Total freight car miles.......	22,639,356,927	22,695,744,503	22,191,586,263
Number of cars used daily to move originating freight...	144,437	140,204	130,112
Tons originating freight handled for each car owned......	533.5	549.1	548.0
Number of cars owned to each car required to move originating freight............	15.6	16.4	17.8
Ton-miles per car per day .. .	440 7	469 5	472 1
Tons per loaded car.........	22.8	24.7	26.6
Times necessary to load each car.....................	23.4	22.2	20 6
Avg. number of days between loading.................	15.6	16.4	17.8

Railroads Seek Raise in Freight Rates to Increase Revenues a Billion Dollars

TO MEET increased cost of operation and to adjust their income to the 6 per cent basis provided in the new Transportation Act, the railroads of the country have submitted to the Interstate Commerce Commission statements showing the need of an increase in revenue amounting to more than a billion dollars a year.

The roads show that while operating expenses have advanced about 100 per cent because of higher wages and increased prices of material and fuel, their revenue has increased less than 40 per cent and they assert that it will now require an increase of 20 per cent to restore the proper relation between revenues and expenses.

The companies suggest to the commission that the additional revenue be gained from freight traffic, leaving passenger rates at the present level. To provide these increases to total revenues without disturbing passenger rates the carriers estimate they will require an average increase in freight rates of about 28 per cent.

According to a report of the State Inspector of Coal Mines, Colorado's output of coal during 1919 was 10406,543 tons, a decrease of 2,251,512 tons as compared with the previous year. Of 12,799 men employed in and about the mines in 1919, 11,874 men worked an average of 221.4 days. Only 925 men worked a smaller average number of days. These were mostly employed in wagon mines which operated only during the winter months.

Big Program Announced for Denver's Four-in-One Convention

AS announced last week, the Rocky Mountain Coal Mining Institute has clubbed its interests with three other mining societies and will hold a grand four-in-one convention that will draw visitors from all over the West. All who intend to be present would do well to pick their hotel and write immediately for accommodation as Denver grows so fast that the present stopping places fail to meet its many needs. The tentative program is as follows:

Sept. 9 (Thursday)—Forenoon: Sessions of the Rocky Mountain Coal Mining Institute, probably at the Albany Hotel, and sessions of the Colorado Metal Mining Association and of the Colorado Chapter of the American Mining Congress at the Brown Hotel.

Afternoon: Mine-rescue contests and coal-mine explosion demonstration at Overland Park.

Evening: Informal banquet at Brown or Albany Hotel to be attended by all mining organizations and be addressed by the Governor of Colorado, Mayor of Denver and prominent mining men.

Sept. 10 (Friday)—Forenoon: Sessions of Rocky Mountain Coal Mining Institute. Sessions of Colorado Metal Mining Association and of Colorado Chapter of American Mining Congress.

Afternoon: First day of the First-Aid Contest at the Denver Auditorium, all teams present competing.

Evening: Opening meeting of all mining organizations at the Auditorium, to be addressed by speakers of national reputation. Program to be arranged by American Mining Congress.

Sept. 11 (Saturday)—Forenoon: Sessions of Rocky Mountain Coal Mining Institute.

Afternoon: Second and final day of the First-Aid Contest at the Denver Auditorium, all teams present competing.

Evening: Award of contest prizes, probably at Lakeside (Denver's main pleasure resort), and after the award some good speakers may address the crowd, or dancing, boating, etc., may be indulged in.

Will Contract For No More Coal Than Can Be Supplied

OWING to the shortage of open-top car equipment and a lack of locomotives to haul the cars, operators who take contracts promising to deliver all the coal that they would mine if they had the car supply which their rating entitles them to, never can by any possibility fill their contracts. Knowing that this is a fact the purchaser who would secure himself makes contracts with several concerns expecting a minimum fulfillment. This gives a false impression among producers that a large demand exists, whereas the amount of coal really needed is far below what is being contracted for.

In order to make contracts that have value the Bertha Coal Co. is basing its agreements to supply coal not on 100 per cent of railroad performance but on 50 per cent. If the railroad gives 40 per cent of the rating then the coal company fills only 80 per cent of its orders whereas under the old contracts it agreed to deliver only 40 per cent.

A clause has been inserted, however, that puts the buyer under a similar obligation. It reads: "It is mutually understood and agreed that the shipments of coal to the buyer for and during each month shall constitute the fulfillment of a corresponding proportion of this contract and that tonnage shall not be cumulative. The buyer agrees at all times to receive coal under this contract before accepting coal from other shippers, and the seller agrees to ship 100 per cent on contract prior to accepting orders for coal not covered by this and other similar contracts."

Federal Trade Commission Issues Modified Cost Form

IN RESPONSE to representations made by some of the anthracite operators regarding the tentative form recently issued for reporting anthracite costs, income and tonnage to the Federal Trade Commission an "optional" form is being prepared, which operators may use, if they so prefer, in place of the form already sent them, in reporting their monthly costs for January, February and March. A conference will be held at the office of the Commission, on May 18, 1920, to decide what form of report should be required for April and subsequent months. To this conference, the "Independent" operators will be invited to send three representatives, and the "Railroad Coal Companies," three representatives.

The Commission states that in making returns on the form already sent out (form C-52), operators may, if they prefer, combine lines 2 and 3 in one return, and show it as "Mining and loading." Operators, in certifying to the balance sheet, may if necessary insert the words "subject to adjustments made in accordance with the rulings of the Internal Revenue Department," following the statement "Certified correct and in accordance with the books."

Foreign Trade Convention To Be Held at San Francisco May 12-15

UNDER the auspices of the National Foreign Trade Council the Seventh National Foreign Trade Convention will be held in San Francisco from May 12 to 15 inclusive. The general theme of the convention will be "The Effect of Being a Creditor Nation."

The council will hold a reception for the visiting delegations of foreign business men and convention delegates in the Palace Hotel on May 11 at 8 p. m. This will be followed by an exhibition of industrial films.

The regular sessions of the conference will be held in the Civic Auditorium each day at 10 a.m., 2 p.m. and 8 p.m. A large number of speakers are listed for addresses and in addition distinguished foreign business representatives will discuss trade opportunities in their respective countries.

Proposes Committee to Investigate Mining Conditions Near Scranton

A COMMITTEE to be composed of five members of the House to investigate the safety of mining and operating conditions in Lackawanna County. Pennsylvania, is proposed in a House resolution introduced by Representative McLane of Pennsylvania. The resolution directs the Bureau of Mines to co-operate with the authorities of Lackawanna County and of the City of Scranton in recommending plans for the solution of the mine-cave problem.

Scale in Pittsburgh Field Waits on House-Rent Decision

Pick-Mining Wage Is $1.11 Per Ton in Thick-Vein and $1.03 in Thin-Vein Coal—Room Turning Is Now $5.40 for a Seven-Yard Neck—Only Machine Differentials Allowed Are Those Between Punchers and Electric Machines None Is Made Between Breast and Shortwall Cutters

BECAUSE the Pittsburgh Coal Operators' Association wanted to incorporate in the wage scale of that district a rent increase of $27.50 per year, or about $2.30 a month, no decision was reached as to that matter, but all other questions were settled. The contract was signed, however, in the Freeport Field.

It is claimed by the mine workers that one company has five thousand houses and that the increase would mean $137,000 a year. This probably is quite true, but the increase in the repair and replacement costs of that company have been many times that figure. The mine worker is always figuring that the increase means only so much to each man—a mere trifle not to be denied. When the increase is granted it is summed by the mine workers' leaders and the union boasts of the aggregate. When the operator tries to get a small and fair increase on rents the aggregate is emphasized and the small amount per man is overlooked.

This is the new wage scale:

PICK MINING

Thin vein, mine-run, per ton	$1.1164
Thick vein, mine-run, per ton	1.0311
All clay veins, 6 in. and less than 12 in.	3.98
Anything over 12 in. in all places, all the rate per foot	3.98
When clay veins run at an angle there shall be paid in all places while it continues, per yard	0.98
Anything 6 in. or less shall be considered a spar, for which shall be paid in all places	1.99
When the spar runs at an angle there shall be paid additional, per yard, in all places	0.52
Room turning, neck not to exceed 7 yards	5.40
Entry, single shift, per yard	2.95
Entry, double shift, per yard	3.50
Entry, treble shift, per yard	4.06
For 12-ft. places per yard	2.21
Breakthroughs between rooms, per yard	2.09
Breakthroughs between entries where slate is taken down, or comes down, and has to be removed, per yard	2.95
Breakthroughs between entries where slate is not taken down, per yard	2.09
Cutting drains, per yard, in entries	0.24
Ripping roof, per yard, in entries	0.31
Pick sharpening per dollar earned	0.0075

Ripping roof and cutting drain in any place to be paid at above price.

MACHINE MINING

(Harrison, Ingersoll, Sullivan, or any other punching machine)

	Mine Run	
	Thin Vein	Thick Vein
For undercutting in wide work, per ton	$0.2525	$0.2205
For drilling by hand and loading in wide work, per ton	0.7175	0.6857
For undercutting in all narrow work, per ton	0.2525	0.2205
And per yard additional	0.4532	0.4709
For drilling by hand and loading in all narrow work, per ton	0.7175	0.6857
And per yard additional	0.8934	0.9542

For loading and cutting in room turning entry price shall be paid.

Pick sharpening, loading after machines, 0.0075 on dollar; both thick and thin vein.

Loaders to receive 17.39c. per yard in addition to above prices when driving entries double shift.

MACHINE MINING

(Jeffrey, Link-Belt, Morgan-Gardner, or any other chain machine)

	Mine Run	
	Thin Vein	Thick Vein
For undercutting in wide work, per ton	$0.1692	$0.1494
For drilling by hand and loading in wide work, per ton	0.7708	0.7337
For undercutting in all narrow work, per ton	0.1692	0.1494
And per yard additional	0.2100	0.2468
For drilling by hand and loading in all narrow work, per ton	0.7708	0.7337
And per yard additional	0.9714	1.0346

For loading and cutting in room turning entry price shall be paid.

Pick sharpening, loading after machines, 0.0075 on dollar, thick and thin vein.

Loaders to receive [illegible] in addition to above price when driving entries double shift.

MACHINE DEAD WORK

Thick and Thin Vein

(With Harrison, Ingersoll, Sullivan or any other punching machine)

Clay vein 6 in. and less than 12 in.	$2.93
Anything 12 in. or over, per foot (Of which the cutter receives 73c. and the loader $2.20)	2.93
When clay veins run at an angle across the room, per yard (Of which the cutter receives 15c. and the loader 56c.)	0.71
Anything 6 in. or less shall be considered a spar, for which shall be paid (Of which the cutter receives 35c. and the loader $1.10)	1.45
When the spar runs at an angle there shall be paid additional, per yard (Of which the cutter receives 9c. and the loader 28c.)	0.37

(Jeffrey, Link-Belt, Morgan-Gardner or any other chain machine)

Clay veins 6 in. and less than 12 in. (Of which the cutter receives 47c. and the loader $2.21)	$2.68
Anything 12 in. or over, per foot (Of which the cutter receives 47c. and the loader $2.21)	2.68
When clay veins run at an angle across the room, per yard (Of which the cutter receives 9c. and the loader 55c.)	0.64
Anything 6 in. or less shall be considered spar, for which shall be paid (Of which the cutter receives 24c. and the loader $1.07)	1.31
When the spar runs at an angle there shall be paid additional, per yard (Of which the cutter receives 7c. and the loader 24c.)	0.31

All prices for narrow work and dead work in the thin vein shall apply to similar work in the thick vein.

INSIDE DAY-WAGE SCALE

Motormen	$6.10
Motormen helpers (by whatever name known), skilled wiremen in charge of work, track layers, bottom cagers, drivers, trip riders, water and machine haulers and timbermen, where such are employed	6.00
Pipemen for compressed-air plants	5.92
Tracklayer's helpers, wiremen's helpers and unclassified inside day labor	5.75
Trappers	8.18

OUTSIDE DAY-WAGE SCALE

Ram operators	$5.60	Pushers	$5.18
Dumpers	5.42	Car cleaners	5.10
Trimmers	5.36		

Union Tries to Work Its Way Into Thacker Field of West Virginia

TROUBLE seems to be brewing in the Thacker field of West Virginia, where an apparently determined effort is being made by the miners to organize. So far the miners do not seem to have made much headway, as the operators are opposed to the organization of the mines in Mingo county and will not, it is believed, submit to the organization of the mines without a struggle.

Would Not Load Railroad Cars Placed by Non-Union Brakemen

ALLEGING that non-union brakemen helped to switch empty coal cars into a railroad siding, 350 coal mine workers employed by the Kirk Dunn Coal Co., at West Point, near East Liverpool, Ohio, went on strike May 3, the strike to last till union brakemen provided other cars for the work.

To Make Survey of Tennessee Coal Beds

DAVID WHITE, Chief Geologist of the U. S. Geological Survey, is making a tour of Tennessee in company with State Geologist W. A. Nelson and Dr. L. C. Glenn, of Vanderbilt University, for the purpose of correlating the coal beds of the state.

Dr. F. G. Cottrell Will Head Mines Bureau

Well-Known Chemist and Metallurgist Selected to Succeed Dr. Van H. Manning—Inventor of the Cottrell Process of Electrical Precipitation of Fumes Has Been with the Bureau Since 1911

DR. FREDERICK G. COTTRELL unquestionably will succeed Dr. Van H. Manning as director of the Bureau of Mines. He was recommended for the place by the Secretary of the Interior. The President acted favorably on the recommendation almost immediately, and sent the nomination to the Senate. Confirmation has been delayed because no executive sessions of the Senate have been held. It is known definitely that there will be no objections to his confirmation.

The selection of an assistant director is now being considered. Since it is understood that Dr. Cottrell is not disposed to retain the office for more than a limited period, great care is being exercised in the selection of an assistant director, who would be the logical successor to the directorship.

Despite the fact that Dr. Cottrell is not a mining engineer, his appointment has general approval in the mining industry, although some continue to insist that the place should go to a mining engineer. Dr. Cottrell has been closely associated with mining problems for many years, however.

Dr. Cottrell was born in Oakland, Cal., Jan. 10, 1877. He attended school in Oakland and was matriculated at the University of California in 1893. As a university student he gave especial attention to science, particularly chemistry. After graduation in 1896, with the degree of Bachelor of Science, he was a Le Conte fellow at the university in 1896-7 and taught chemistry at the Oakland High School in 1897-1900. Then he went to Europe, where in 1901 and 1902 he studied at the University of Berlin and the University of Leipzig, receiving from the latter the degrees of Master of Arts and Doctor of Philosophy, 1902.

On his return to this country in 1902 he was appointed instructor in physical chemistry at the University of California, and in 1906 was appointed assistant professor, holding this position until 1911. While at the university Dr. Cottrell's chief contributions to science were researches relating to the electrical precipitation of fume and fine particles suspended in the gases of smelter, blast furnace or cement works flues, and he finally evolved what is known as the Cottrell process for this purpose. This invention was first utilized at the Selby smelter in California for removing fumes from the waste gases of a sulphuric-acid plant at the smelter, thereby abating a nuisance that threatened to necessitate shutting down the works.

Subsequently this electrical precipitation process was installed at other smelters to remove fume and solid particles containd in the escaping gases, and it was successfully used also at cement plants, notably near Riverside, Cal., to prevent the dust from calcining kilns from damaging nearby orange groves and vegetation. Today the Cottrell process of fume and dust removal is in worldwide use, and is recovering materials valued at many thousands of dollars heretofore wasted.

One of the latest installations is at a large smelting plant in Japan, while the largest installation is at the Anaconda smelter, Anaconda, Mont. Dr. Cottrell in a desire to encourage scientific research turned over his extensive patent rights to a non-dividend paying corporation, known at the Research Corporation, a body formed for that purpose. A fundamental provision in the incorporation is that all net profits shall be devoted to the interests of scientific research.

In 1911, when Dr. J. A. Holmes, the first director of the Bureau of Mines, was serving as a member of commissions appointed by the Government to study alleged damages from smoke and fumes from the Selby and the Anaconda smelters, and the Bureau of Mines was investigating at length the smelter-smoke problem, Dr. Cottrell, because of his scientific attainments and his special knowledge of metallurgical problems, was appointed chief physical chemist in the bureau. In 1914 he was appointed chief chemist; in 1916, chief metallurgist, and in 1919, assistant director.

Aside from his work on smelter smoke Dr. Cottrell has been deeply interested in and intimately connected with work on the separation and purification of gases by liquefaction and fractional distillation. During the world war and subsequently thereto the development of the Norton or Bureau of Mines process for the recovery of helium from natural gas has been his special care, and it was chiefly through his efforts that a plant for recovering helium—a rare non-inflammable gas—on a large scale for military aeronautics was erected near Petrolia, Texas.

Dr. Cottrell is a member of the American Chemical Society, Mining and Metallurgical Society of America, the American Electro-chemical Society and the American Institute of Mining and Metallurgical Engineers. He was awarded the Perkin medal by the New York Section of the Society of Chemical Industry in 1919 in recognition of his work on electrical precipitation.

Dr. Cottrell is the holder of the following United States patents:

Patent	Patent No.	Date
Manufacture of Sulphuric Acid	866,843	Sept. 24, 1907
Apparatus for Separating Sulphuric Acid	866,844	Sept. 24, 1907
Art of Separating Suspended Particles from Gaseous Bodies	895,729	Aug. 11, 1908
Effecting Interchange of Electric Charges Between Solid Conductors and Gases	945,917	Jan. 11, 1910
*Process for Separating and Collecting Particles of One Liquid Suspended in Another Liquid	987,114	March 21, 1911
*Separating and Collecting Particles of One Liquid Suspended in Another Liquid (Co-patentee with James Buckner Speed)	987,115	March 21, 1911
*Apparatus for Separating and Collecting Particles of one Liquid Suspended in Another Liquid (Co-patentee with James Buckner Speed)	987,116	March 21, 1911
*Separating and Collecting Particles of One Liquid Suspended in Another Liquid (Co-patentee with Allen Cheever Wright)	987,117	March 21, 1911
Purification of Gases	1,016,476	Feb. 6, 1912
Apparatus for Separation of Suspended Particles, etc. (Co-patentee with Burns)	1,035,422	Aug. 13, 1912
Filtering Media, Etc.	1,060,065	Apr. 29, 1913
Improvement in Method of Discharging Electricity into Gases	1,067,974	July 22, 1913
Synchronous Electrical Contact-Maker	1,143,175	June 15, 1915

*Owned and controlled by Petroleum Rectifying Co., 350 California St., San Francisco, Cal. (patents deal primarily with oil de-emulsifications.)

British Columbia Coal Production

Coal production of British Columbia collieries for the month of March follows:

	Tons
CROW'S NEST PASS	
Crow's Nest Pass Coal Co., Coal Creek	27,090
Crow's Nest Pass Coal Co., Michel	21,529
Corbin Coal & Coke Co., Corbin	10,116
Total	58,735
NICOLA-PRINCETON	
Fleming Coal Co., Merritt	3,344
Coalmont Collieries, Coalmont	81
Princeton Coal Co., Princeton	993
Total	4,418
VANCOUVER ISLAND	
Canadian Western Fuel Co., Nanaimo	55,769
Canadian Collieries (D) Ltd., Comox	32,587
Canadian Collieries (D) Ltd., Extension	19,277
Canadian Collieries (D) Ltd., South Wellington	7,219
Pacific Coast Coal Mines, Ltd., South Wellington	10,338
Nanoose Collieries, Nanoose Bay	1,849
Granby Consolidated Mng. & Smltg. Co., Cassidy	17,566
Total	144,595
NORTHERN BRITISH COLUMBIA	
Telkwa Collieries, near Prince Rupert	200

Mark W. Potter Nominated to Interstate Commerce Commission

PRESIDENT WILSON has nominted Mark W. Potter, New York lawyer and railroad man, to the Interstate Commerce Commission. Mr. Potter fills the last of three vacancies that existed for several weeks, two other nominations having been made a few days ago.

Mark Winslow Potter is a member of the New York law firm of Hornblower, Miller, Garrison & Potter. He was born in Kaneville, Ill., 54 years ago, and was graduated from New York University in 1888, entering law practice here.

He is president of the Carolina, Clinchfield & Ohio Railway, and of the Cumberland Corporation. He is a member of the city, county and State bar associations.

Ruhr Coal Field Has Housing for 560,077

AN investigation has recently been carried out, *The Colliery Guardian* states, covering 95 per cent of the mines in the basin and 393,067 workmen, into the state of housing in the Ruhr district. According to the report, there were 36,592 dwellings available for the accommodation of these workmen, excluding houses for officials.

Of the total, 35,184, containing 106,889 tenements, were owned by the mines, and 1,408, containing 5,937 tenements, were rented. These 112,826 tenements sheltered on June 1, 1919, 560,077 persons, of whom 151,850 were workers in the mines, comprising 138,042 heads of family or boys and 13,808 lodgers. The following table of housing statistics for the Ruhr district is not without interest:

	Average monthly rent (marks).				
	Miners	Other house-holders	No. of tenements	No. of residents	No. of persons per room
Containing —					
One room	5.54	9.49	65	76	1.16
Two rooms	10.47	19.15	5,673	18,613	1.64
Three rooms	14.51	26.59	40,523	176,611	1.45
Four rooms	17.61	35.42	57,671	306,345	1.33
Five rooms	21.09	45.24	6,850	43,975	1.28
Six rooms	24.87	56.83	2,044	14,459	1.18

In addition, the mines owned at the same date 134 hotels, accommodating 7,401 workmen, in which room was available for 12,000 persons beyond this figure.

Gompers and Allen to Debate Kansas Industrial Court on May 28

GOVERNOR HENRY J. ALLEN of Kansas and Samuel Gompers, president of the American Federation of Labor, will meet May 28 to debate the Kansas Industrial Relations Court. The debate will be held in Carnegie Hall, New York.

Under the rules prescribed, each debater is privileged to appoint a committee of fifty to act as judges.

Previous to accepting the challenge of Mr. Gompers, Governor Allen is reported to have declined to meet Clarence Darrow, the well-known lawyer, in a discussion of the new industrial tribunal.

Railroad Managers Plan Better Use of Cars To Avert Coal Shortage

OHIO railroad managers are taking initial steps to avert another coal shortage next winter. They have asked concerted action on the part of railroads in the territory east of the Rocky Mountains for the conservation of open-top cars for the carrying of coal. It is asserted that unless there is some definite action taken, there will be a worse coal shortage next winter than was ever known, due to the switchmen's strike and other causes which have held up production to a large degree.

In a general way the plan is to limit the use of open-top cars until coal mines are supplied 100 per cent. Eastern railroad officials are quoted as being favorable to this plan and it is planned to have a special committee of railroad officials to confer with the Interstate Commerce Commission, in order to get certain rules promulgated to bring about the conservation of open-top cars for coal movement exclusively.

Discussion by Readers

Edited by
James T. Beard

Let Us Deal Fairly and Squarely With The Miner

Not long since I read the letter of Sim C. Reynolds, urging the fair and square treatment of miners, and was deeply interested in his presentation of a few of the difficulties that obstruct the path of the coal miner, *Coal Age*, Mar 18, p. 553. Let me say that this question can be discussed from many angles and I will refer briefly to one of them.

It is quite true, as Mr. Reynolds remarks, that miners are often radical and irrational in their demands, but, as he frankly admits, employers often show the same unreasonableness in their attitude toward the miner.

Not long since, the miners through their officials in the Union asked for an increase of 60 per cent in their pay and shorter hours. People in general expressed their disapproval of these demands. We were told that the miner always demands more than he expects to get. It was argued that the cost of living has not increased in proportion to the increase asked by the miner. These statements, however, come very largely from people living outside of mining districts. Their remarks might be true if the conditions in mining communities were the same as in large towns. It is safe to say that if such was the case the majority of the miners would be satisfied with a smaller increase in their earnings.

To my knowledge, the company where I am employed are trying to deal fairly with their employees and, at the present time, are working on a plan that will greatly relieve the hardships of their workers. Realizing from his own experience, the difficulties that beset the miner's path, Mr. Reynolds shows by his remarks that his heart is with the miner in everything that is right, which is true of every fair-minded person.

PROFITEERING IS COMMON IN ISOLATED MINING CAMPS

Just here, let me refer to a conversation that I overheard and which took place between a triprider and the owner of a small grocery store, in a mining town. They were speaking of the profiteering of merchants and other dealers in supplies. The triprider asked why it was that he could save $20 by making his purchases in adjoining towns. He stated that he could buy the same goods for $30, in another town, which would cost him $50 at home.

The reply of the storekeeper was to the effect that if a person came into his store from out of town and offered him 17c. for an article costing between 15c. and 16c., he would not refuse the offer, knowing that he would lose the money if he did not accept the price named by the purchaser. At the same time, he did not hesitate to say that he would charge a regular customer 25c. for the same article, claiming that the people living in the town had to have the stuff regardless of the price asked.

Fish that cost this storekeeper 15c. per pound delivered, he would sell for 35c. and 38c. a lb.; and oysters that cost $2 a gallon sold for $1 a quart. Conditions such as these are not known or realized by people living in other communities; and the miner, isolated as he is from the great world outside, is expected to accept these hardships and burdens as a part of his lot. There is plenty of opportunity for our government to investigate profiteering in small mining districts and isolated communities where there is little or no competition in trade.

———, Pa. SUFFERER.

Short-Circuiting or Obstructing the Air Current in Fan Ventilation

Some time ago, I recall that, in making an air-inspection report on a mine in Pennsylvania, at a time when air measurements and water-gage readings were being taken, the following test was made in short-circuiting the air: The fan at this mine was of steel construction and exhausting 240,000 cu.ft. of air per minute from the mine under a 42-in. water gage.

In order to short-circuit the air a 5 x 7 ft. trapdoor was opened, at approximately 300 ft. from the upcast shaft, which had an area of only about 80 sq.ft. When this door was opened the air current made a circuit of not more than 1,000 ft., taking into consideration both the intake and the fan shafts, which were each 180 ft. in depth.

EFFECT OF CONTRACTED AREA OF THE UPCAST SHAFT

After making this short-circuit, we found that the water gage did not show any appreciable change. The water gage was, I believe, of the Bristol recording type. It might be of interest to say, here, that practically one-half of the mine water gage was created by the air going up the small fan shaft.

At a distance of 250 ft. from the fan-shaft bottom, when the air was going around through the mine, the water gage was 1.5 in., while it showed only 0.5 in. when we short-circuited the air. The fan was belt-driven, by an alternating-current induction motor.

As to an obstruction in the air-course, I will relate an actual incident that occurred in West Virginia, at a mine over which I had charge. The fan was a Lepley reversible, 23 x 8 ft. and used as a blower. It was producing 125,000 cu.ft. of air per minute, with a 1.4 in. water gage. This fan was direct connected to a steam engine known as the Lepley type of engine.

One morning at 2:30 a.m. the night mine foreman woke me, saying that something unusual had happened to the air current. In fact, instead of the air going up the "B" shaft, it was, if anything, coming down that shaft. In other words, the air current was almost at a standstill. I said, "Did you look at the fan?" He replied, "Yes, and its making the usual number of revolutions, and both the Bristol and the ordinary water gage register 1.4 in." When asked if the fan wheel was turning, as well as the fan shaft, he replied, "Yes."

Rising, I went down to the fan-house and found all of his statements were true. From there, we got on the cage and went to the foot of the downcast shaft and found the opening at the foot of that shaft frozen shut with soft ice, so that the area of the opening was not more than one-half a square foot, if it was that. After we broke down the ice, the air circulated as usual with the regular quantity passing and with the usual 1.4 in. of water gage.

The following day the night mine foreman, whom I wish to say was not only a good technical man, but an A No. 1 practical man, said to me, "Why didn't either one of those water gages show us that the shaft was frozen shut and the air could not get down?" This man is at present a state mine inspector, which shows further he was and is a man of exceptional mining knowledge and ability. MINE BOSS.

Greensburg, Pa.

Tamping a Charge of Dynamite Is the Safest Method

This subject has been running in my head since the discussion began. It has taken me back some 35 or 40 years, when I used to stick the jumper or tamping bar into the hole, to act as stemming; then, light the squib in the blasting barrel and rush for safety, crouching behind a mine car that I kept standing at what seemed to be a safe distance away.

I practiced this daredevil scheme until one time the shot blew the blasting barrel my way, with the result that it was imbedded in the end of the car and crumpled up under the force of its impact. Then and there I quit that game and followed a safer method in my blasting operations.

BETTER RESULTS OBTAINED BY GOOD TAMPING

Without getting into any controversy with others of a different faith, I claim that far better results are obtained when a dynamite charge is tamped fully to the mouth of the hole. Having used, I might say, thousands of pounds of dynamite ranging from a 40 to an 85 per cent grade, my belief in well tamped shots is based on actual experience, which is always the best teacher.

A few years ago, when sinking a shaft and drilling what are termed "wallside" holes, which are holes driven straight down so close to the side of the shaft that the fingers would just clear when handling the drill, I got good results, with 85 per cent dynamite (gelatin), in holes where the water would shoot from the gullets or cracks in the strata to a height of 8 or 10 ft. when the blast went off. The charge was carefully forced down to the bottom of the hole below the gullet and the water made an air-tight stemming.

However, today, in shooting coal, particularly with permissible explosives, which are considerably slower than dynamite, and when the market demands lump coal, all holes should be stemmed as hard as reasonable, in the judgment of the shotfirer.

Today, in company with a mine inspector, I went into a place that was already shot down. A shot had been placed on each side of the breast, which under ordinary conditions would do good work. We noticed that the right-side hole was still plainly visible, the shot having only cracked the coal downward. There was no coloring of clay on the sides of the hole; but, on the contrary, it was blue black, which indicated that the shot had spent most of its force in the direction of the mouth of the hole. We use AA Aetna powder.

INSUFFICIENT STEMMING CAUSES A BLOWNOUT SHOT

After examining the place, our conclusion was that the hole had not been properly stemmed. However, the place being very wet, it is possible that the clay used in stemming was in too moist a condition to offer much resistance, with the result that the shot blew its tamping. This incident again leads us to think that all holes charged with any grade of permissible explosive must be securely tamped from the charge to the mouth of the hole. Reflecting, for a moment, on what a blownout shot has done and what it is liable to do again and the serious consequences that are sure to follow, cannot fail to impress us with the necessity of good solid tamping.

In the interest of safe mining, let us insist on the employment of honest shotfirers who will listen to admonition and regard their own safety. If we err let it be on the right side; but let us not invite trouble by doing what is liable at any time to produce another Naomi explosion as the result of such unsafe practices in blasting.

Our local and general safety committees will, I am sure, bear me out in insisting that all shotholes must be fully tamped. The manufacturers of explosives ask the same; and why should not we, who are in direct contact with and in control of the work, use every precaution to insure safety, instead of giving way to the whims of a few shotfirers who think they have too much work to do to permit of more than half-tamping the holes. R. W. LIGHTBURN.

Perryopolis, Pa.

Mystery In Mine Explosions Results from Our Lack of Knowledge

Reading the several letters discussing the mysterious explosion that occurred in the Buffalo mine, in Ohio, the account of which was given in *Coal Age*, Jan. 22, p. 197, impresses even the miner with the thought that he is continually surrounded by hidden dangers of which he has little knowledge. In recent years there have been many occurrences in mines that have been placed in the catalog of "unaccountable accidents."

While we frequently fail to account satisfactorily for these occurrences and are forced to the conclusion that the science of mining has not made the progress that we could wish, we have escaped from that atmosphere of mystery that surrounded our forefathers, who were wont to explain such accidents as the work of spooks, fairies or evil demons. Today we do not accept such theories, even though we fail to grasp the meaning of the many expert opinions that are given in explanation of the occurrence.

WE NEED TO STUDY CAREFULLY ALL THE CONDITIONS

The fact that the Buffalo mine had been examined and reported "safe" by the fireboss, only a short time before the explosion occurred, leads one to believe that either there was a great mystery in the affair or the fireboss failed to report the true condition of the place. In our practical experience in coal mining, we often meet with peculiar conditions that require a close study of the geology of coal and its formation with the occlusion of gas in the strata, which makes possible the sudden outbursts of gas that occur, from time to time, in our mines. Without the knowledge derived from this study, occurrences such as these are a mystery.

I recall a mysterious explosion that occurred some years ago in a mine in England, at a time when no one was in the mine. Different theories were advanced as to the cause, one being that gas had been ignited by sparks struck by a hard flinty rock falling from the roof upon a similarly hard substance. There were those who scoffed at this idea, as men are generally slow to accept a new principle or theory.

In recent years, the extensive use of natural gas for industrial purposes, made possible through deep boring, shows the existence of immense quantities of gas stored beneath the earth's surface. Our mining experience tells us that this gas finds its way through numerous faults and slips in the strata and makes its appearance in the mine workings, often quite suddenly and when we least expect. This proves the possibility of accumulations of gas forming at any time in a mine supposed to be free from gas and safe. Reports of explosions frequently add that "the mine was never known to generate gas."

In reference to gas being generated in the floor of a mine, many are adverse to such an opinion. That was my condition a few years ago; but, on one occasion when making my rounds of the mine where I was employed and where gas was rarely seen, I had just passed through a room where the coal was being cut by machines, when the men called me back to show me that thy had lit some gas given off in the mining at the bottom of the seam. It was a new experience to them and to myself as well.

There being no old works near the place led me to study the situation, and my conclusion has been that gas often issues from crevices in the floor and from faults in the formation, which may reasonably be expected, instead of supposing the gas must always come from the roof.

DANGER LURKS IN THE DUST-LADEN AIR IN MACHINE MINING AND IN OUTBURSTS OF GAS

We all know that fine coal dust is a great source of danger in mines, and that the danger is increased when gas is present. Anyone who has gone into a room where a machine was at work mining the coal will testify as to the density of the clouds of dust floating in the air. I have even known it to sparkle on the lamps. This condition would make a place dangerous where the amount of gas present was not sufficient to cause alarm.

Speaking of sudden outbursts of gas, there is an account, in Pameley's book on mining, of a mine where gas accumulated during the night to such an extent as to fill the shaft. The gas was ignited in the engine room at the shafthead and a volume of flame shot up 150 ft. into the air. Fortunately, no one was in the mine at the time.

To sum up, my conclusion is that mine workings are subject to such outflows of gas from great reservoirs beneath the strata. This fact, together with the possibility of the gas being ignited by the light of an unsuspecting miner, or the breaking of an incandescent lamp bulb, or other cause, makes it necessary to be always on the watch and observe every possible precaution to avoid danger.
W. M. CHAMBERS.
Staunton, Ill.

Superintendent's Plans Disrupted by a Worker's Request for a Change

The question of shifting a worker is a problem with which mine officials are frequently confronted and one that often proves very annoying. About the time a superintendent has completed his organization and is beginning to think that everything will move along smoothly, he is suddenly brought face to face with a request from a man, holding a subordinate but important position, who asks to be transferred to another place. The change is not often easily adjusted.

How often has a mine official gone from his office to his home and perhaps to bed; and, before closing his eyes for the night, has gone over the whole situation and completed his plans by which he hoped to strengthen the whole organization. Every man on the force is known to him; he has studied each man's capability and fitness for the position contemplated. The arrangement is made in the best interests of all concerned. Then, before this could be put into effect, in comes some one with a special request for a position other than what the superintendent has planned for him.

The change will disrupt his plans and necessitate making other changes not in the program. Some one asks, "Should the superintendent curse and swear?" There are times, no doubt, when something should be said; and this may be true in the case cited in the inquiry that started this discussion, *Coal Age*, Feb. 12, p. 327. No doubt, the superintendent in that instance, thought he had this particular man placed in a position best suited to him and where he could use his knowledge and experience, as an electrician, to the best advantage. But, here, the mine electrician has offered the man a job of bonding rails in the mine, with more pay than what he was getting at the substation.

THERE ARE FREQUENTLY GOOD REASONS FOR A WORKER SEEKING A CHANGE

The instance cited, reminds me of a restless fellow whom I happen to know. He is a good fellow; will do almost anything; but, like the Irishman's flea, when you think you have him located, he is gone. The case in hand may be a similar one. In asking for the change desired, the man may have been wholly within his rights. It is quite clear that he has not stated all his reasons, which if we knew might alter our judgment. The work at the substation, while tiresome to an active man, would suit an older man better.

However, the superintendent showed a weakness in that he did not control his feelings and restrain his temper. If one must swear it is better to wait until he is alone by himself. Then, if he is still of the same mind he can let it out and it will do no one harm but himself. How can a man control a body of men if he fails to control himself?

"Millions for defense; not one cent for tribute" was the terse reply of our representative to the threats of the agents of France (1798). There are times when an emphatic answer must be given; but, under no consideration, should a man lose control of himself, whatever his provocation.

In my earlier experience, I have worked for mine officials who seemed to lack the least sense of courtesy. Such was their manner that I would shudder to see them coming, fearing a storm of abuse and fault-finding. As mine officials we need to extend the same courtesy and respect to our employees that we expect to receive from them, thus setting them the example.

Osceola Mills, Pa. S. D. Hainley.

Build an Up-To-Date Plant and Electrify the Mine

The inquiry of Arthur L. Sheldon of Charleston, W. Va., which appeared in *Coal Age*, Feb. 26, p. 419, relative to the best and cheapest method of working three seams of coal, has naturally aroused an interesting and profitable discussion. Different plans have already been submitted and others will be forthcoming from which Mr. Sheldon will be able to extract many excellent points that will be helpful.

The first consideration is the statement that a daily output of 1,000 tons is desired, and we may infer from this that the company have a sufficient acreage to maintain this tonnage for many years. In that case it would be desirable to build an efficient plant second to none in the state. In the plans I am about to submit, the cost of installation must not be considered as excessive, inasmuch as the cost of production and upkeep, per ton of coal mined, will be materially lessened as advancement is made in the mine, from year to year. It should be understood that I am writing from a general standpoint of economy and safety, and do not forget the increase that will be effected in time.

MAKE AMPLE PROVISION FOR THE FUTURE IN THE LAYING OUT OF THE MINE

The three seams lie at depths, approximating 50, 100 and 160 feet, respectively, below the river bottom. They will be known, in what follows, as Seams Nos. 1, 2 and 3, respectively. Mr. Sheldon is right in proposing to sink two shafts, 300 feet apart, as required by law; but I would suggest that, as soon as the location for the plant has been determined, he proceed to open a slope to No. 1 seam. This should be done as rapidly as possible while erecting a temporary tipple that will later form a part of the permanent equipment. This being accomplished, work No. 1 seam as rapidly as possible and market the coal, thereby gaining the advantage of an income to help offset the first-cost of an up-to-date plant.

It is now time to sink the two shafts to No. 2 seam; and when Seam No. 1 is reached in sinking connect the shafts at once with that seam, for safety and air conditions. By the time Seam No. 2 is reached by the shafts, Seam No. 1 will be well advanced, and underground conditions, as to water, haulage, roof and bottom, can be studied to advantage for the purpose of improving the plans for laying out the mine in No. 2 seam. Any slight errors that are apt to occur can be thus eliminated.

PLAN FOR SAFETY AND ECONOMY IN THE EQUIPMENT

Electrify the plant in every phase of economy, safety and convenience. Build a steel headframe and a concrete storage bin, having a capacity of from 700 to 1,000 tons and divide it into at least two connecting compartments with a fly-pan just below the receiving chute, so arranged that the coal from either seam can be separated if necessary because of market conditions. This arrangement will naturally mean self-dumping cages. My advice is to equip the plant with electric hoists.

By the time the shafts to No. 2 seam are completed and coal is being brought to the surface, the development in Seam No. 1 will determine whether or not it is advisable to bring No. 1 coal up the shaft or to continue to haul it up the slope. In any event, however, the temporary tipple at Seam No. 1 should be so constructed that any slate and rock from the three seams that must be brought to the surface can be dumped over a pan, dropped for that purpose, and allowed to slide down a chute into a lorry or car waiting to convey it to the rockdump. The temporary tipple should be erected alongside of the storage bin so that the one crew can attend to all.

The mine cars should be so constructed, as to size and durability, that with slight changes they can be adapted for use in No. 3 seam, later. Equip each seam with storage-battery locomotives and charging stations. Weigh the coal on the inside. It is understood that the equipment used in the first two seams can be used, later, in the lower seam, at least in a general way.

COMPLETE EXTRACTION OF COAL DEPENDS ON ORDER OF WORKING THE SEAMS

Working from the standpoint of a complete recovery of coal, it will be advisable to work No. 1 seam in advance of No. 2, and No. 2 in advance of No. 3. But, to maintain the desired tonnage (1,000 tons per day), it would seem that the coal from No. 1 or at the most some from No. 2 would be sufficient. This would concentrate the working forces and not demand such an elaborate system of upkeep on each seam.

About the time No. 1 seam is exhausted, the shafts should be sunk to No. 3 and that seam made ready for production to offset the loss of No. 1. The material taken from No. 1 can generally be used in No. 3 seam. Also, as the biggest operation, in later years, will be from Seam No. 3, the material from No. 2 can be transferred when that seam is worked out.

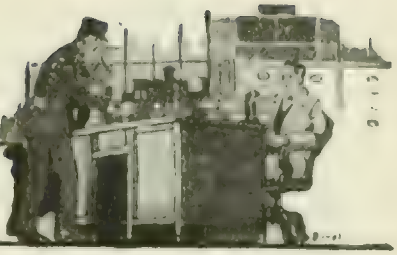
It should be born in mind that similar working plans should be used in all these seams. The pillars left in the first two seams should be directly over those in the lower seam, and when pillars are to be drawn, particular attention should be given to draw the upper ones first. More especially is this true if any working places have been driven under the river. Such workings should never be attempted if possible to avoid them.

It is difficult to determine the best plan to adopt in working these seams. Mr. Sheldon states that the mountain rises 1,000 ft. above the railroad; and, considering the general geological conditions, we might assume that the top over the coal would be fairly good. But, the working of Seam No. 1 in advance of the lower ones will afford an advantage in determining the right procedure for the other two. I should think, moreover, that the core taken from the two test holes and the knowledge at hand as to acreage and possibilities would be of considerable help in determining the number and width of the entries, and the width of the pillars and rooms, in order to secure the most economical and safe system of working these three overlying seams.

Thomas, W. Va. Ben.

Inquiries of General Interest

Answered by
James T. Beard



Removing Gas From Rise Workings

A question asked at a recent mine foremen's examination was brought up a little later at a night school where I attend, with the result that no satisfactory conclusion was reached. The question is as follows:

Suppose you had charge of a mine where there was a gob area extending 200 ft. to the rise of the ventilating shaft and, during periods of falling barometer, gas issued from the gob in such quantities as to foul the air in all the adjacent upgrade workings. Suppose, also, that the mine's resistance is so low that a water gage of one-half inch produces sufficient ventilation for the rest of the mine; but this pressure is not sufficient to drive the gas from the rise workings. The question is, what can be done to remove the gas on the rise side of the mine, without increasing the quantity of air circulating in the other workings? A NEWBURY.

Nanaimo, B. C., Canada.

This is an instance of the lack of the proper regulation of the air passing into the mine. The air current should be split at the foot of the downcast shaft. A regulator should be placed, at that point, on the aircourse leading to the dip workings. The opening in this regulator should be so adjusted as to increase the pressure leading to the rise side of the mine sufficiently to produce the desired results.

The quantity of air passing into the dip workings is controlled by the adjustment of the regulator to suit the conditions. It is simply a matter of the proper distribution of the air entering the mine and involves supplying a sufficient ventilating power to produce the required pressure in the rise workings. The ventilating pressure in the main drift will, of course, be raised by the presence of the regulator at the foot of the shaft.

Shortening a Hoisting Rope

A question that has caused considerable argument hereabout, is one relating to the shortening of a hoisting rope on one side of a double-compartment shaft. For the purpose of securing a better grade and expediting the movement of the cars on the shaft bottom, it was proposed to raise the sump logs on one side of the shaft 8 in., and to shorten the hoisting rope on that side the same amount. Formerly, the sump logs on both sides of the shaft were at the same level and the two ropes, which were attached to the same drum, were of equal length.

It was argued that when the cage attached to the long rope is at the upper landing, the other cage will rest on the sump logs, after the rope has been shortened and the logs raised 8 inches.

In discussing this question, I contended that when the two ropes are made of unequal length the ascending cage attached to the shorter rope will reach the upper landing when the descending cage on the long rope is within 8 in. of the sump logs on that side of the shaft.

Or, again, even assuming that one of the ropes is changed on the drum, so as to permit the cage attached to the long rope to rest on the bottom when the other cage is at the upper landing, I claim that the descending cage attached to the short rope, would then reach the sump logs, raised 8 in., before the other cage has risen to the upper landing.

Some of the men think that it will make no difference, and that we can hoist just the same when one rope is shorter than the other, provided the sump logs are raised so as to correspond to the shortening of the rope. Please answer this question in the columns of *Coal Age* and settle our dispute. LARRY MCGONNIGAL,

Toluca, Illinois. Mine Mgr.

Assuming that the two ropes, in a double-compartment shaft, are attached to the same drum and the diameter of the drum is the same throughout, it follows that any given number of turns or revolutions of the drum will raise one cage the same distance that the other is lowered. By raising the sump logs 8 in. on one side of the shaft, the depth of hoist, on that side, is shortened the same amount. As a result, the hoist from those sump logs to the upper landing, will be completed when the drop on the other side of the shaft lacks 8 in. of completion. This is true which ever cage is being hoisted or lowered, the shorter side will complete the trip between the upper and lower landings when the longer side lacks 8 in. of reaching its level.

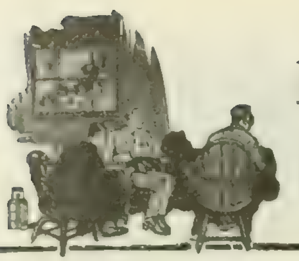
Economy in the Firing and Care of Steam Boilers

How is it possible to fire steam boilers to get the best results, and what care is needed in their use?

La Salle, Ill. ASST. FIREMAN.

Steam boilers should always be fired at regular short intervals, by placing the fresh coal at the front of the fire and allowing it to remain there until it has become partly ignited when it is spread quickly and evenly over the fire. This process is called the "coking method" of firing. It has the advantage of maintaining a constant and uniform heat beneath the boiler which is very important in the production of steam.

In order to secure the best results, steam boilers require thorough cleaning at regular intervals, when any scale accumulated on the inner surface of the boiler and tubes must be removed. In order to prevent, as far as possible, the formation of scale in the boiler, the purest possible feedwater should be used. When feedwater contains lime, magnesia, or other impurities, in the form of carbonates or sulphates, some reliable method of treatment must be adopted to remove these impurities before the water is introduced into the boiler. The boiler should also be partly blown off at frequent regular intervals to remove any accumulation of sediment and to keep the boiler clear.



Examination Questions

Answered by

James T. Beard

Miscellaneous Questions

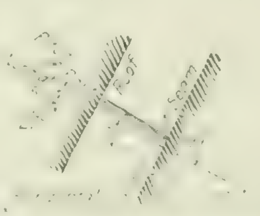
(Answered by Request.)

Ques.—What causes a dust explosion; and what method would you adopt to prevent the occurrence of such an explosion?

Ans.—A dust explosion results from the ignition of a cloud of dust, which has been thrown into the air by the concussion produced by a windy or a blownout shot, or by the disturbance incident to the various operations going on in the mine. This is liable to occur wherever any undue accumulations of fine coal or dust is permitted in the working places and on the roads and travelingways in the mine.

The best means of preventing dust explosions is to adopt plans that will avoid undue accumulations of dust at the working faces and on the roads. Strict rules and regulations should be enforced regarding the blasting of coal, so as to reduce to a minimum the production of fine coal and dust. The working face must be kept clean and all "fines" loaded out with the coal. Dust-proof cars should be used and these should not be loaded so as to cause lumps of coal to fall from the cars in transit. All roads and travelingways should be thoroughly cleaned at regular intervals. It may be necessary to install an effective sprinkling system in the mine. At the working face, a soft friable coal should never be blasted off the solid; and every shot should be well mined so that the charge can properly perform its work.

Ques.—The center props, in a slope of 63 deg. pitch, are set 5 deg. up the pitch. What is the pitch of the prop?



Ans.—A slope pitching 63 deg. makes that angle with the horizontal and, as shown in the accompanying figure, a normal line in this seam will make an angle of 27 deg. with the horizontal. Then, since the post is "underset" 5 deg., the pitch of the post, or the angle it makes with the horizontal, is 27 + 5 = 32 deg., as indicated in the figure.

Ques.—Give the principal causes of personal accidents in mines.

Ans.—The chief causes of personal accidents are the following: Failure to examine one's working place and properly secure the roof and coal and reset any discharged timbers, before proceeding to work; lack of judgment and skill in the placing of shots, charging, tamping and firing of holes; carelessness and recknessness in the handling of powder when making up a cartridge; violation of mining laws or mine regulations and disobedience of orders; and, finally, undue haste and neglect to take necessary precautions and act on safety-first principles when at work at the face, or in going to and from work in the mine.

Ques.—In a certain mine, what should be the diameter of a 14-ft. collar beam if 6-in. timber is used where the collars are 8 ft. long?

Ans.—Assuming the unit load, or load per foot of length, of the collar is the same in each case, the diameter of the collar will vary as the cube root of the square of its length or the distance between notches. In other words, the cube of the diameter ratio is equal to the square of the length ratio. Therefore, calling the required diameter of the 14-ft. collar x, we have:

$$\left(\frac{x}{6}\right)^3 = \left(\frac{14}{8}\right)^2 = 1.75^2 = 3.0625$$

$$x = 6\sqrt[3]{3.0625} = 8.71, \text{ say } 9 \textit{ in.}$$

Ques.—Three airways are passing 100,000 cu.ft. of air per minute. Airway A is 5 x 6 ft., 14,000 ft. long; airway B is 6 x 6 ft., 17,000 ft. long; airway C is 5 x 7 ft., 3,000 ft. long. What volume of air will pass in each airway?

Ans.—The sectional areas, perimeters, and lengths of these airways are as follows:

$$A,\ a = 5 \times 6 = 30 \text{ sq.ft.};\ o = 2(5 + 6) = 22 \text{ ft.};\ l = 14{,}000\ \textit{ft.}$$

$$B,\ a = 6 \times 6 = 36 \text{ sq.ft.};\ o = 2(6 + 6) = 24 \text{ ft.};\ l = 17{,}000\ \textit{ft.}$$

$$C,\ a = 5 \times 7 = 35 \text{ sq.ft.};\ o = 2(5 + 7) = 24 \text{ ft.};\ l = 3{,}000\ \textit{ft.}$$

The quantity of air passing in each airway, in natural division, is proportional to the pressure potential for that airway. Therefore, it is necessary to calculate the value of the potential for each split. The work is much simplified by taking the lowest relative values of the areas, perimeters and lengths. The areas are, as given, 30, 36, 35. The lowest relative perimeters are 11, 12, 12; and the lowest relative lengths, 14, 17, 3. The potential values for these three splits are as follows:

$$A,\ X_a = a\sqrt{\frac{a}{lo}} = 30\sqrt{\frac{30}{14 \times 11}} = 30\sqrt{0.1948} = 13.24$$

$$B,\ X_b = 36\sqrt{\frac{36}{17 \times 12}} = 36\sqrt{0.1765} = 15.12$$

$$C,\ X_c = 35\sqrt{\frac{35}{3 \times 12}} = 35\sqrt{0.9723} = 34.51$$

Sum of potentials 62.87

The quantity of air passing in each split is then found as follows:

$$A,\ Q_a = \frac{13.24}{62.87} \times 100{,}000 = 21{,}060\ \textit{cu.ft. per min.}$$

$$B,\ Q_b = \frac{15.12}{62.87} \times 100{,}000 = 24{,}050\ \textit{cu.ft. per min.}$$

$$C,\ Q_c = \frac{34.51}{62.87} \times 100{,}000 = 54{,}890\ \textit{cu.ft. per min.}$$

The Labor Situation

Edited by

R. Dawson Hall

Eastern Kentucky and Tennessee Agreement Made

A WAGE and working-condition agreement has been successfully negotiated in District 19, which includes parts of eastern Kentucky and Tennessee. The Harlan field of Kentucky is not included in the contract. This agreement gives the union recognition but does not provide a check-off, which has never yet been in effect in that district.

The 8-hour day is adopted; house rent is not to be raised more than 50c. per month and house coal is to be supplied at $2.50 per month per house. The tonnage rates are increased 24c. a ton for both pick and machine mining, while the rate for daymen is increased $1 per day, giving the following day-wage scale:

Machine runners	$5.40
Motormen, blacksmiths and drum men	5.00
Spike-team drivers and boss drivers, head trackmen, head timbermen, bratticemen, engineers and carpenters	4.84
Blacksmiths' helpers	4.64
Carpenters' helpers	4.60
Machine runners' helpers, couplers, single-mule drivers track helpers, wiremen and pipemen, pumpmen and timbermens' helpers	4.44
Unclassified inside labor, tippers and trimmers	4.20
Firemen	4.04
Teamsters and inexperienced coal loaders	3.80
Unclassified outside labor	3.72
Sand men, greasers and yard couplers	3.64
Trappers and boys	2.53

Nova Scotia Mine Troubles Still In an Unsettled State

GREAT dissatisfaction has been felt in Nova Scotia with the Patterson and MacKinnon awards, the latter having been accepted by the employees of the Dominion Coal Co., Ltd. At a mass meeting held in St. Mary's Hall, Sydney Mines, N. S., on Tuesday April 27, President Baxter and Board Member MacPhee were busy for three hours answering questions propounded by the many malcontents who had denounced the awards as being inadequate and unsatisfactory. The meeting filled the hall and flooded the sidewalk.

In the end the leaders won the day but they declared their intention to demand in the near future the increase of 27 per cent in contract rates and $1 per day to day men ("datal hands") that has been granted in the United States by the Bituminous Coal Commission. A motion was put to refer the matter back to the locals, but it was voted down and an amendment to accept the Patterson award carried by a large majority.

About May 1 the operators of the mines which are located at Joggins, Inverness and Little Bras d'Or agreed to meet the wage-scale committee of district 26, thus taking the initiative from the Dominion Coal Co., Ltd., the Nova Scotia Steel & Coal Co., Ltd. and the Acadia Coal Co., which, being the big companies of the province, usually lead the rest. Of course, nothing can be done till these larger companies also consent to meet the representatives of the district.

Nova Scotia mine workers have in recent months accepted membership in the United Mine Workers of America. Formerly they had their own provincial union. Since their amalgamation with the international body they have reacted immediately to all wage changes taking place in the United States.

Montana Completes Its Wage Scale

JOINT conferees of the Montana Coal Operators' Association and the United Mine Workers reached an agreement as to wages on April 21. It will be effective from March 31. The instrument gives the miners a 27-per cent increase and advances the day men a dollar a day. Boy workers will receive 53c. more for each day's work. Monthly men get $30 more per month based on a 30-day month. The increase for both pick and machine miners is 24c. per ton. Yardage and dead work are increased 20 per cent. House coal is raised from $3.20 per ton to $4.40, and powder is advanced 60c. per keg.

Would Fix Their Own Rate of Pay

SELF-DETERMINATION seems to be the slogan in the old mining village of Stoneboro, near Sharon, Pa., where 350 coal-mine workers want nine hours' pay for eight hours' work. These men apparently like the increases that were awarded by the Bituminous Coal Commission and accepted by the International Union, to which 60 per cent of the men belong, and by the operators in general and their own operators in particular. They like the increases but believe they could improve on them and in fact do 12.5 per cent better. So 350 mine workers were on April 2 engaged in a strike to enforce the nine-hour pay for the eight-hour day with the Bituminous Coal Commission's award in addition. The dissatisfaction appears likely to be enduring, for ten days earlier the men walked out to enforce the same demand, but they were ultimately induced to return.

Motormen Quit in Support of Discharged Fellow Workman

BECAUSE a motorman was discharged by the officials of the Delaware, Lackawanna & Western R.R. coal department at the Archbald colliery all the electric-locomotive drivers at the mine went on strike on April 28. The sanction of the union was not obtained for the strike.

Men in the anthracite region are now not indisposed to make trouble because they hope by such means to aid in a more rapid agreement of the scale sub-committee and one that will give the mine workers a larger increase in pay than negotiations will provide. Around Mahanoy City several are said to have laid down their tools already.

Wage-Scale Agreement for Central Pennsylvania

House Rent Unchanged Except Where Improvements Are Made—Allowance for Pushing Where Miner Pushes Both Ways—Coal To Be Charged at Last Government Price Plus 27 Per Cent Plus Cost of Delivery—Powder To Be Sold at Cost Including Handling, Transportation and Insurance

MANY details were omitted in the scale agreement of the central Pennsylvania district, No. 2, in last week's account and some errors were made in reporting the scale. It is here given in full:

This agreement, made April 26, 1920, by and between the Association of Bituminous Coal Operators of Central Pennsylvania, hereinafter called the operators, for and on behalf of each of its members, party of the first part, and the United Mine Workers of America of district No. 2, hereinafter called the mine workers, party of the second part.

Witnesseth, it is hereby agreed that this agreement shall take effect as of the date of April 1, 1920, and continue in force until April 1, 1922. Each of the parties agrees that, during the term of this agreement, the following scale of wages, rules and conditions shall be observed and govern at all collieries owned or controlled by the operators and wherein a majority of the employees are members of the mine workers.

TONNAGE WAGE SCALE

Pick mining, per gross ton	$1.2803
Pick mining, per net ton	1.1431
Machine loading, per gross ton	0.6656
Machine loading, per net ton	0.7729

Machine mining per ton (machine mining to cover cutting, scraping and loading on a tonnage basis) shall be advanced 26.88c. per gross ton or 24c. per net ton.

ADVANCE NOT TO BE COMPUTED ON BONUS

Cutting and scraping by any other method than day or ton shall be advanced 27 per cent but this advance shall not be computed or applied on any part of the 5 per cent concession or bonus in the scale agreement of April 30, 1917.

Cutting and scraping per ton shall be advanced 5.11c. per gross ton or its equivalent 4.56c. per net ton.

All deadwork and yardage shall be advanced 20 per cent over prices in effect Oct. 31, 1919, provided that this advance shall not be computed or applied on any part of the 5 per cent concession or bonus in the scale agreement of April 30, 1917.

It is hereby distinctly understood and agreed that all of the hereinbefore-mentioned rates have included therein a 5 per cent bonus or concession granted on the 1916 scale prices as specifically set forth in the supplemental agreement of April 30, 1917. It is now positively agreed between the parties hereto that the said 5 per cent bonus or concession shall be deducted from or taken off the hereinbefore stated rates on April 1, 1922.

In the Miller Vein on the main line of the Pennsylvania R.R. where any bottom is taken up or where rolls are being cut in the bottom, 69c. per yard shall be paid for farm work. The main line includes only operations at Dunlo, Portage Branch, Lanfair, South Fork, Beaverdale, Ehrenfeld, Portage, Sonman, Bens Creek, Lilly, Cassandra, Cresson, Gallitzin and Bennington, and shall not include any other points than those above named.

INSIDE DAY-WAGE SCALE

Occupation	Rate per Day	Occupation	Rate per Day
Motormen	$6.10	Trip riders	$6.00
Spraggers	6.00	Water and machine haulers	6.00
Skilled wiremen in charge of work being done	6.00	Timbermen	6.00
Wiremen's helpers	5.77	Pipe men	5.92
Track layers	6.00	Trappers	3.18
Track layers' helpers	5.77	Cutters	6.10
Bottom Cagers	6.00	Scrapers	5.85
Drivers	6.00	All other inside day labor not herein specified	5.77

OUTSIDE DAY-WAGE SCALE

Occupation	Rate per Day	Occupation	Rate per Day
Dumpers	$5.42	Trimmers	$5.36
Ram operators	5.60	Car cleaners	5.10
Pushers	5.18	Firemen now working on change shifts of eight hours each	5.60

All other firemen to receive $1 per day advance over the contract prices in effect Oct. 31, 1919, based on the present standard number of hours now constituting a day's work under such employment at each operation.

All main hoisting steam-plant engineers working on changing shifts of eight hours each shall be paid not less than $5.65 per day nor more than $6 per day; provided, however, that where any engineer is paid more than the maximum rate, he shall have the option of continuing his present hours, conditions and rates or accept a rate not greater than the maximum rate hereinbefore provided for eight hours' work.

All sub-station engineers and attendants shall continue work on and under the present customs and conditions at $1 per day increase over prices in effect Oct. 31, 1919, based on the present standard number of hours now constituting a day's work under such employment at each operation.

OTHER ENGINEERS' HOURS REMAIN UNCHANGED

All other engineers, excepting those herein above mentioned, shall work the same hours and at the same rates as at present plus an advance of $1 per day over the prices in effect Oct. 31, 1919, based on the present standard number of hours now constituting a day's work under such employments at each operation.

All boys under eighteen years of age receiving on Oct. 31, 1919, not more than $2.65 per day shall be advanced 53c. per day; and all boys on Oct. 31, 1919, getting more than $2.65 per day and less than man's wages shall be advanced 53c per day based in both of the above-mentioned cases on the present standard number of hours now constituting a day's work under such employment at each operation. The provisions as to eight hours for firemen and engineers are subject to the usual exceptions in cases of emergency.

All other outside able-bodied day labor, except coke men, to be advanced $1 per day over the prices in effect Oct. 31, 1919, based on the present standard number of hours now constituting a day's work under such employments at each operation; but the total wage shall not be less than $5 per day.

All monthly men shall be advanced $1 per day over the prices in effect Oct. 31, 1919, based on the present standard number of hours and days now constituting a month's and a day's work under such emploments at each operation; provided, however, that this clause shall not apply to mine foremen, assistant mine foremen, fire bosses or bosses in charge of any class of labor inside or outside the mine, or coal inspectors or weigh bosses.

All labor engaged in the manufacture of coke shall be advanced at the rate of $1 per day over and above the prices in effect Oct. 31, 1919, with the exception of boys under the age of eighteen years, who shall be advanced to a minimum wage of $3.50 per day. The application of said advance in both cases mentioned in this paragraph shall be based on the present standard number of hours, average ovens drawn and average cars loaded per man, now constituting a day's work in such employment at each operation.

The charge for blacksmithing shall be 0.75c. per ton for pick mining, and 0.5c. per ton for machine mining. The operators agree to use every reasonable effort to have the miners' tools repaired and sharpened with as little delay as practicable.

All differentials in tonnage and yardage rates existing under the 1914 scale agreement shall be continued and remain in force during the life of this agreement, or until April 1, 1922.

The practice of voluntarily paying more than the contract price, either by bonuses or otherwise, which is done ordinarily for the purpose of enticing employees from other mines, and thereby creating discord and disorder in the coal industry, is condemned. It will therefore be assumed in any future joint conferences convened for scale-making purposes that all voluntary bonuses or advances in excess of wages provided in contract were paid because of physical conditions in or around the mines where such methods are practiced, and the wages so paid shall be considered the base price for such mines.

All the customs, conditions and provisions existing under the 1914 scale agreement shall remain unchanged during the period covered by this agreement, except as modified or changed by the following rules and regulations:

Rule 23—House rent shall be the same as during the period expiring March 31, 1920, plus an adjustment for substantial improvements if and when made or added, after March 31, 1920. In case of dispute as to increased rent, the same shall be settled under Rules 12 and 13.

Rule 34—That the pushing of cars, loaded or empty, by the mine workers is natural to the industry and is an integral part of the day's work, and that through the negotiations of thirty years this work, where practiced, has been paid for in the general tonnage rates; but in this district at all mines where cars are pushed both ways by the miner the operator shall pay for this work the sum of 6c. per gross ton, or its equivalent net. Whenever the operator reduces the car-pushing work to a one-way push in the direction at the choice of the miner, the compensation shall cease. This clause shall not be taken to authorize an adverse change in conditions at mines as to the handling of cars where they are now handled one or both ways.

Rule 35—That the price at which house coal shall be furnished the mine workers at the tipple shall be determined by adding to the price in effect on Oct. 31, 1919, the average percentage allowed as an increase on the wage scale, to wit, 27 per cent, and that when coal is delivered to the miners' houses by the operator the actual cost of delivery shall be added.

Rule 36—That explosives shall be furnished the miners at cost, which is to include handling, transportation and insurance.

Eastern Ohio Miners Concede a Fair Scale

After Naming a Lot of Concessions That Would Have Put Eastern Ohio as a Mining District off the Map for Some Years, Leaders of Mine Workers Assent to a More Reasonable Settlement

A WAGE-SCALE agreement was reached Tuesday, May 4, at Cleveland between the scale committees representing the miners and operators of the eastern Ohio field. The agreement follows a deadlock of two weeks. Consideration of the scale was taken up first at a joint convention of miners and operators held at Odd Fellows' Hall, in Wheeling, W. Va., beginning April 19. After a disagreement the scale was referred to joint scale committees, who remained in session there until April 22, and adjourned to Cleveland. The joint committees remained in session until May 4, when the agreement was reached which will mean continuous operation of mines until April 21, 1922, when a new scale must be framed.

The miners' committee was headed by W. T. Roberts, as chairman; Edward Reibold, Joseph O'Grady, Ettor Del Guzzi, William R. Truax, Alex. Felczan, Ira Kimes, James Kunik, Jack Bell and Leibold Zearott, elected at the Bellaire convention.

The operators' committee consisted of S. H. Robbins, as chairman; W. L. Robinson, Michael Gallagher, C. E. Maurer, H. E. Willard, E. L. Thoner and T. K. Maher, all of Cleveland; T. H. Johnson, of Bellaire; Joseph Meister, of Bridgeport, and R. L. Wildermuth, of Columbus.

Under the new agreement the tonnage scale was increased 34c. and day labor and dead work 20 per cent. The miners will receive 3c. an inch for the removal of the first 12 in. of "draw slate." The old contract called for payment only for slate in excess of 12 in. in thickness, the rate being 9c. an inch.

The original demands numbered forty-one, and it is interesting to record them at length, though probably no one seriously thought that everything asked for would be granted. They included: (1) Payment on mine-run basis; (2) No discrimination in hiring of men, the men being employed in the order in which they present themselves, men with good union cards being given preference; (3) Payment of all day men for actual time worked with time and a half for overtime and double time for Sundays and half holidays; (4) Entire elimination of Rule 4; (5) Free tools and free house coal to all workers in and around the mines; (6) Pay for all stone; (7) Delivery of all cars to face of working place; (8) Company to do all track laying, using iron rails exclusively.

NOT MUCH OVERLOOKED IN DEMANDS

Other demands are: (9) Placing of all weigh houses so that the check weighman can see the scales; (10) Better sanitary conditions in mining communities; (11) Washhouses large enough to accommodate all the mine workers employed; (12) Daymen to receive the same percentage increase as the tonnage men; (13) Payment of $2.50 for each crossbar set or erection of crossbars by company men; (14) Elimination of Rule 17; (15) Payment for the amount of coal lifted and for restoring a place to normal conditions wherever a miner has to take up an excessive thickness of bottom in coming to, or going over, a roll, this being in addition to the regular payment in accord with the roll rule; (16) Payment to machine men for actual time consumed in moving a machine from entry to entry; (17) The leaving of all "bottoms" in place.

The mine workers also ask for: (18) Payment to all machine men for setting and resetting posts; (19) The right of all daymen who are not satisfied with the wages under this scale to receive an average place in the mine; (20) Payment to machine men for cutting-over tracks; (21) Payment of 15c per ton extra for all butt work and for all places driven on an angle off the face; (22) Elimination of double shift and night shift; (23) Introduction of the section check system: (24) Payment to be made to loaders in rooms for all wet yardage, the rate being the same as in entries.

In addition the mine workers are seeking: (25) Payment of the maximum inside day wage where men have to go home because of some fault in the company management; (26) Payment to machine men for "crush coal"; (27) Itemized report to be made to local secretaries of the union of the money checked off the rolls for union purposes; (28) Delivery of all supplies to the face of each room and the unloading of these supplies by daymen; (30) Elimination of Rule 7; (31) Uniform day wage for all inside and outside day labor, the maximum inside day wage being made the basis for the rectification; (32) Hauling of all men in and out of the mine at company expense.

Other demands are: (33) Elimination of the figures $25 from Rule 26, second paragraph, sixth line; (34) Delivery of powder to the working place; (35) Extra compensation to loader for any double shoveling made necessary by excessive width of working place; (36) Posts to be delivered in half-foot lengths and to the working place; (37) Insertion of all interpretations of the contract in the contract; (38) May 1 as an additional holiday; (39) Elimination of Rule 28; (40) Fixing of pay day on every Saturday beginnig at 12 noon; (41) Setting payment of loader at 79c per ton and of machine man at 15c per ton.

KEEN COMPETITION AFFECTS SCALE

The sub-district covered by the contract includes that district of eastern Ohio which mines the No. 8, or Pittsburgh, bed and the West Virginia Pan Handle mines. Severe competition requires a scale in line with those provided for adjacent districts.

Renton Coal Mines, of Washington, To Be Flooded and Abandoned

With an Output of 116,000 Tons in 1919 the Company Operating the Mines Lost $126,000

THE Renton coal mines, the oldest and best known in the State of Washington, are to be flooded and abandoned. Orders have been issued to remove the equipment, take out the pumps and let the mines fill with water, with the announced purpose of making no further attempts to mine any of the remaining four million tons of coal still in the lower levels of the property. According to the company's surveys, there is enough coal in the veins to give a further life of thirty years to the mines, based on the productive capacity of the properties in the past. In addition to abandoning these mines the company is also surrendering to the Renton Coal Co. leases from the Northwest Improvement Co. which still have eighteen years to run.

The reasons given tell a tale of losses and discouragement that left no other alternative. Briefly, they state that with an output of 116,000 tons in 1919 there was a total loss of $126,000, or that every ton mined cost $1.09 per ton more than the company received for it. Coal at the surface exceeded in cost $6.50 per ton.

Labor at the mine received a fraction more than 92 per cent of all the gross revenues, leaving less than 8 per cent of the total receipts for all other costs, such as timbering, supplies, power, maintenance, taxes and interest.

"If the mine could not operate under the wage schedules in force Nov. 1, last," said Manager W. J. Grambs, "the new schedules, carrying an increase of 14 per cent, granted under the order of President Wilson, are out of the question. We can't meet them. When there was a shortage of coal last summer the Renton Coal Co. undertook to increase its output.

"At the same time the Northwest was facing a shortage in water power. This meant more coal would be required for power purposes, as steam must supplant hydro-electric power whenever there is a water shortage. The Puget Sound Power & Light Co., from whom the Renton Coal Co. leased the mines, was asking for 140,000 tons of coal for its steam plants. Orders were issued, therefore, to speed up, and in place of working two shifts at the mine we increased the working force to three shifts.

"The output dropped alarmingly instead of increasing in proportion to the increase in the working force, and the three shifts mined only a little more than half as much coal as had been mined previously by the two shifts. Our output should have increased 50 per cent. Instead, it decreased nearly 50 per cent. So on Sept. 25 we ceased mining and closed the mines."

There is a record of coal shipped into Seattle in 1869, but it was not until the early '70's that these mines entered upon the career that made them historic.

The Seattle Electric Co. acquired the mines in 1900. They are now owned by the Puget Sound Power & Light Co. and are under lease to the Renton Coal Co., a subsidiary corporation, of which W. J. Grambs is manager. These mines yielded 3.8 per cent of the coal mined in the State last year and about 2,400,000 tons since 1900.

Foreign Markets and Export News

New Zealand's Coal Production Declines

The coal situation in New Zealand at this time, Consul General Alfred A. Winslow, Auckland, reports, is far from normal, and the outlook is not very promising, notwithstanding the fact that there is an abundance of a fairly good quality of bituminous, steam, and house coal in sight of the Dominion. Coal production in New Zealand has been declining since 1917, despite the fact that the demand for fuel has been increasing. This shortage has interfered quite seriously with certain developments that were under consideration, as well as limited the output of certain industries in the Dominion.

The output of the coal mines of the Dominion in 1913 was 1,888,005 long tons; in 1914, 2,275,614 tons; in 1915, 2,208,624 tons; in 1916, 2,257,135 tons; in 1917, 2,068,419 tons; and in 1918, 2,034,250 long tons; with 145,069 long tons as the output for the first seven months of 1919. Some 200,000 tons of this yearly output are lignite. The two State-operated mines produce from 200,000 to 280,000 long tons annually.

The coal resources of the Dominion have been estimated at 2,358,000,000 long tons, with an estimated 896,000,000 tons in proved deposits, made up of the following items:

Kind of Coal	Proved Tons	Probable Tons
Anthracite	Very little	Very little
Bituminous	269,000,000	450,000,000
Semi-bituminous....	114,000,000	341,000,000
Brown..................	234,500,000	728,000,000
Lignite..................	278,500,000	839,000,000
Total	896,000,000	2,358,000,000

The annual consumption of coal in New Zealand in normal times is about 2,500,000 long tons, of which approximately 15 per cent is imported; but during the last three or four years the consumption has fallen, for the reason that the domestic output has fallen off and it has been difficult to secure the necessary imports. The large consumers of New Zealand coal are the State railways, the several gas works and electric light plants of the Dominion, shipping interests, and the different industrial interests.

Coal Mines of China Report Increased Production

Consul Douglas Jenkins reports that coal continues to be produced in the Kailan mines in increasing quantities. The average daily output in 1918 was about 10,000 tons. Over one-half of this coal was sent to Shanghai and other Chinese ports. Of the amount shipped to foreign countries about one-half went to Japan and the remainder chiefly to Hongkong, the Philippine Islands and Chosen.

The daily production in 1918 of the two other principal coal mines of this district, the Ching-Hsing and the Fu Chung Corporation, was 1,000 tons and 4,000 tons, respectively. The cost of coal on the local market showed no material change as compared with previous years, and its advance elsewhere was entirely due to high freights and attendant charges.

There was also an advance in the production of coke, which is needed for foundries and dockyard work in Japan, Shanghai, and Hongkong. The supply was not equal to the demand.

The quantity and value of the coal exports from Tientsin during 1917 and 1918 were as follows:

	1917		1918	
Articles	Tons	Value	Tons	Value
Kailan	26,150	$106,692	28,121	$142,580
Ching-Hsing.		....	4,816	31,500
Shansi	1,015	4,659	2,905	16,011
Bunker.....	54,417	222,021	50'923	258,193

Great Britain Expends £32,200,000 in Coal Subsidy

Lincoln Hutchinson, commercial attaché, London, reports that the British Chancellor of the Exchequer, in giving particulars in the House of Commons on Feb. 17 as to the expenditure to date and the estimate total expenditure for the current fiscal year (ending March 31, 1920) on account of the coal subsidy, said the figures were £22,631,000 to date; £32,200,000 for the year.

Chinese and Japanese Are Mining Coal in Manchuria

The mining possibilities in Manchuria, Consul General E. Carleton Baker, Mukden, reports, are generally assumed to be enormous, but the present developments are of a limited character. Coal is already being extensively mined both by Japanese and Chinese. The former are working large deposits with modern machinery, while the latter are still using crude native methods. The Chinese are planning, however, to obtain modern mining equipment, and it is expected that there will soon be a considerable demand for American machinery.

Australian Coal Mined During March

Coal mined in Australia during March, according to a cablegram from the American consulate at Newcastle, Australia, totaled 400,000 tons. Of that amount 93,113 tons were exported, 43,000 tons were used to supply bunker coal for foreign vessels, while the remainder was consumed locally. The rate of freight to the western coast is $18 United States currency, while the rate to Honolulu is $10. Coal is being carried to Manila by Japanese vessels.

Canada Imports 21,411,813 Tons of Coal from United States

According to figures recently issued by the Canadian Bureau of Statistics, Ottawa, Canada purchased from United States last year 21,411,813 tons of coal, valued at $70,603,005. Total exports of coal from Canada were valued at $10,380,186 and her total production in 1919 was 13,676,300 tons, of which 73,893 tons were anthracite.

Coal Imports at Harbin

Imports of coal into the Harbin consular district through the custom houses at Harbin, Manchouli, Suifenho, Aigun, and Sansing in 1918 were valued at $301,586, compared with $172,437 in 1917 and $115,303 in 1916.

Quarterly Imports of Coal and Coke During 1919*

	Jan. 1 to Mar. 31, 1919		Apr. 1 to June 30, 1919		July 1 to Sept 30, 1919		Oct. 1 to Dec. 31, 1919	
Coal—	Tons	Value	Tons	Value	Tons	Value	Tons	Value
Anthracite...	23,995	$175,837	5,737	$40,765	9,026	$63,272	35,187	$242,545
Bituminous and shale	205,065	1,127,994	173,227	979,826	159,346	909,017	354,178	1,875,859
Slack or culm.	81	422	128	409	4,797	27,733	6,348	29,426
Coke	4,934	49,118	1,759	16,691	1,195	10,711	6,832	63,133
Charcoal	379,112	8,719	73,491	5,788	203,168	15,246	1,258,857	15,506
Compositions used for fuel	10,200	82	...	.	35,400	177	225,600	791
Total value	......	$1,362,172	.....	$1,043,479	...	$1,027,156	.....	$2,227,260

* Compiled by Bureau of Foreign and Domestic Commerce.

Demand for Tonnage to Europe Is Less Urgent

W. W. Battie & Co.'s coal trade freight report announces numerous charters of steamers for single voyages, consecutive voyages and transportation contracts to Europe, and although the demand for tonnage still continues it is not quite as urgent as it was. The demand for tonnage to South America and the West Indies still continues and rates are a little firmer than a week ago.

Rates for May loading are as follows:

	Rate	Tons Displaced
Copenhagen	23 50/24 00 —	1,000
Stockholm	24 00 25 00 —	800
Gothenburg	23 00 24 00 —	1,000
Antwerp Rotterdam	About 19 50 —	1,000
Hamburg	21 50 22 00 —	1,000
French Atlantic, excluding Rouen	About 20 00 —	700
Barcelona	About 23 00 —	1,000
Algiers	23 00 23 50 —	800
Genoa/Leghorn	About 23.00 —	1,000
Spezia/Savona	About 23.00 —	1,000
Piraeus	26 00 26 50 —	1,000
Trieste Venice	26 00 26 50 —	1,000
Port Said	About 26 00 —	1,000
Constantinople	26.00/27.00 —	500
Pernambuco	14.50/15 00 —	500
Bahia	14.50/15.00 —	500
Rio	About 14.50 —	1,000
Santos	15 00/15 50 —	600
Buenos Aires or La Plata or Montevideo	About 13 50 —	1,000
Para	About 14.50 —	500
Rosario	About 15 00 —	750
Bahia Blanca	About 15 50 —	1,000
To Nitrate Range	9 00 10 00 —	750
Havana	6 50 6 75 —	600
Sagua or Cardenas	About 8 50 —	300
Cienfugos	8 00 8 25 —	500
Caibarien	About 8.50 —	300
Guantanamo	8 00/ 8.25 —	500
Manzanillo	About 9 00 —	300
Bermuda	7 00 7 50 —	300
Bermuda p.c. and dis. free		
Kingston	About 9 00 —	400
St Lucia	About 10 00 —	500
Barbados	About 10 00 —	500
Santiago	8 00 8 25 —	500
Port of Spain, Trin	About 10 00 —	500
Curacao	9 00 9 50 —	500
Free p.c. Curacao		
Demerara	13 00 —	400
St Thomas	About 9 00 —	500

All above rates, gross form charter

Coal Imports by the Straits Settlements

Consul General Edwin N. Gunsaulus, Singapore, reports that a table compiled by the local chamber of commerce shows the following imports of coal into the Straits Settlements for the month of January, 1920, with the countries of origin:

	Tons
Japan	17,872
Borneo	510
India	16,609
Elsewhere	336

Belgian Miners Demand 15 Per Cent Increase

At a meeting of the Belgian National Federation of Coal Miners held in Brussels March 14, Trade Commissioner C. E. Herring, Brussels, reports a general increase in wages of 15 per cent, effective March 1, was demanded. The federation also adopted resolutions calling upon the Belgian government to equalize and establish a maximum of profits for coal mines, to establish national selling agencies under government direction, and to use the excess profits resulting from new price regulation for the creation of a fund to provide for the assistance of needy workmen. The latter measures should become operative by July 11, according to the federation.

The membership of the federation showed a remarkable increase of strength during the past year. On March 31 there were 52,000 members in Belgium; on June 30, 73,000; at the end of September, 92,000, and at the end of 1919, 123,000 or about 85 per cent of the miners of the country. The funds at the disposal of the central and regional federations totaled 3,140,000 fr.

Report of Lake Coal Traffic

West bound traffic through canals at Sault Ste. Marie, Michigan and Ontario for the month of April, 1920, as reported by L. C. Sabin, general superintendent, St. Marys Falls Canal, Michigan, was as follows:

	U. S. Canal	Can. Canal	Total
Coal, soft, short tons	42,831	8,000	50,831
Coal, hard, short tons	10,000		10,000
Stone, short tons	6,247	....	6,247
General merchandise, short tons	12,500	2,905	15,405

Mesopotamia Increases Imports of Coal

According to a report by Consul Oscar S. Heizer, Bagdad, imports by Mesopotamia through the port of Bassorah of coal, coke and patent fuel during the period May-December, 1918, from India were valued at $108,425 and from Persia $3,660. The total 1918 imports of coal, coke and patent fuel amounted to $231,290; for 1917. $76,867.

Exports from Seattle Over $2,000,000

The domestic and foreign imports and exports of coal through Seattle last year, according to figures just made public by U. S. Collector of Customs R. H. Drumheller, totalled 373,596 tons, valued at $2,536,921, of which 344,086 tons, valued at $2,334,171, were imported.

By far the largest share of this trade came from Canada, divided as follows—65,605 tons of anthracite, valued at $494,367, and 257 tons of bituminous coal, valued at $1,716,877.

Seattle's exports of coal to Canada were but 62 tons, worth $1,337. Other exports were 30,437 tons to Alaska, valued at $201,131, and 11 tons (worth $282) to the Hawaiian Islands. During the year 18,076 tons were brought to Seattle from the Atlantic Coast and 1,879 from California, valued at $111,476 and $11,274, respectively.

New Zealand Coal Imports Increase; Exports Decrease

Coal imports by New Zealand during 1919, according to commerce reports issued by the U. S. Bureau of Foreign and Domestic Commerce, were valued at £382,016, compared with £202,102 in 1918, £214,152 in 1917 and £189,526 in 1916.

Exports of coal during the same period were: £201,383 in 1919; £227,228 in 1918; £236,063 in 1917, and £326,563 in 1916.

Owing to unsettled rates of exchange values are not given in dollars.

Belgian Coal Production Increases, but Output Per Man Is Less

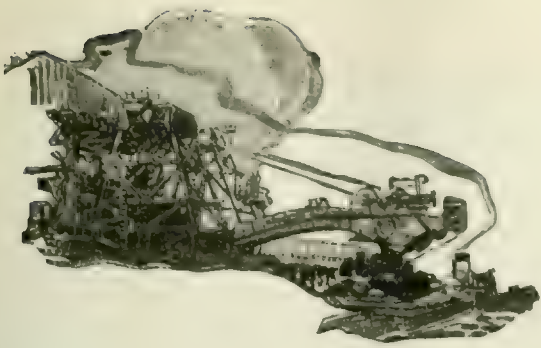
Trade Commissioner C. E. Herring, Brussels, reports that the need of increasing coal production in Belgium is urgent, as exports of non-industrial coal are a very important item in decreasing Belgium's large adverse trade balance. The necessity for increasing the output of coking coal is perhaps even greater, because of difficulty in obtaining adequate deliveries from Alsace-Lorraine and Germany.

The output for the entire year 1919 was 18,487,230 tons, compared with 13,887,600 tons for 1918.

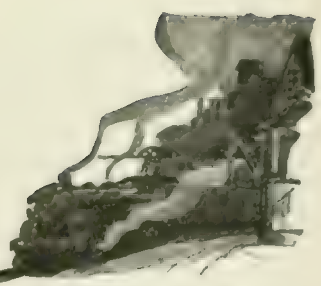
The following table gives the Belgian production of coal in 1918 and 1919. The comparative decrease in output in relation to the number of operatives is largely due to the general introduction of the eight-hour day in Belgian mines. According to statistics prepared by the Mine Workers' Syndicate, the average output of miners steadily increased during the past year, having been 54 kilos (120 pounds) per day more in November than in January.

The output for the first and second half of 1919, by districts, follows:

District.	Net production.	Stocks on hand.	Workmen.
Jan.-June, 1919:	*Tons.*	*Tons.*	*Number*
Couchant de Mons	1,802,660	219,840	32,463
Center	1,402,680	167,510	23,465
Charleroi	2,958,860	818,860	42,377
Namur	232,610	72,890	3,630
Liege Seraing	1,611,320	176,370	27,485
Plateau de Herve	382,790	27,970	4,904
Limbourg	52,160	2,350	1,077
Total, Jan.-June, 1919	8,443,080	1,485,790	135,401
Total, Jan.-June, 1918	7,562,960	625,040	117,450
Gain in 1919	880,120	860,750	17,951
July-Dec., 1919			
Couchant de Mons	2,244,820	93,380	34,724
Center	1,711,100	42,070	25,329
Charleroi	3,310,280	324,250	47,576
Namur	278,080	27,820	3,955
Liege Seraing	1,933,010	54,370	30,803
Plateau de Herve	479,090	1,810	5,713
Limbourg	87,770	3,000	1,562
Total, July-Dec., 1919	10,044,150	546,700	149,662
Total, July-Dec., 1918	6,324,640	1,295,130	110,922
Gain in 1919	3,719,510		38,740
Loss in 1919		748,430	



Production and the Market



Weekly Review

More Hopeful Outlook for Car Supply at the Mines—Consumers Are Waiting for Coal that Has Been Shipped and Is Tied Up in Railroad Yards—Anthracite Production Keeps Up, but the Market is Upset in the Absence of May Circulars.

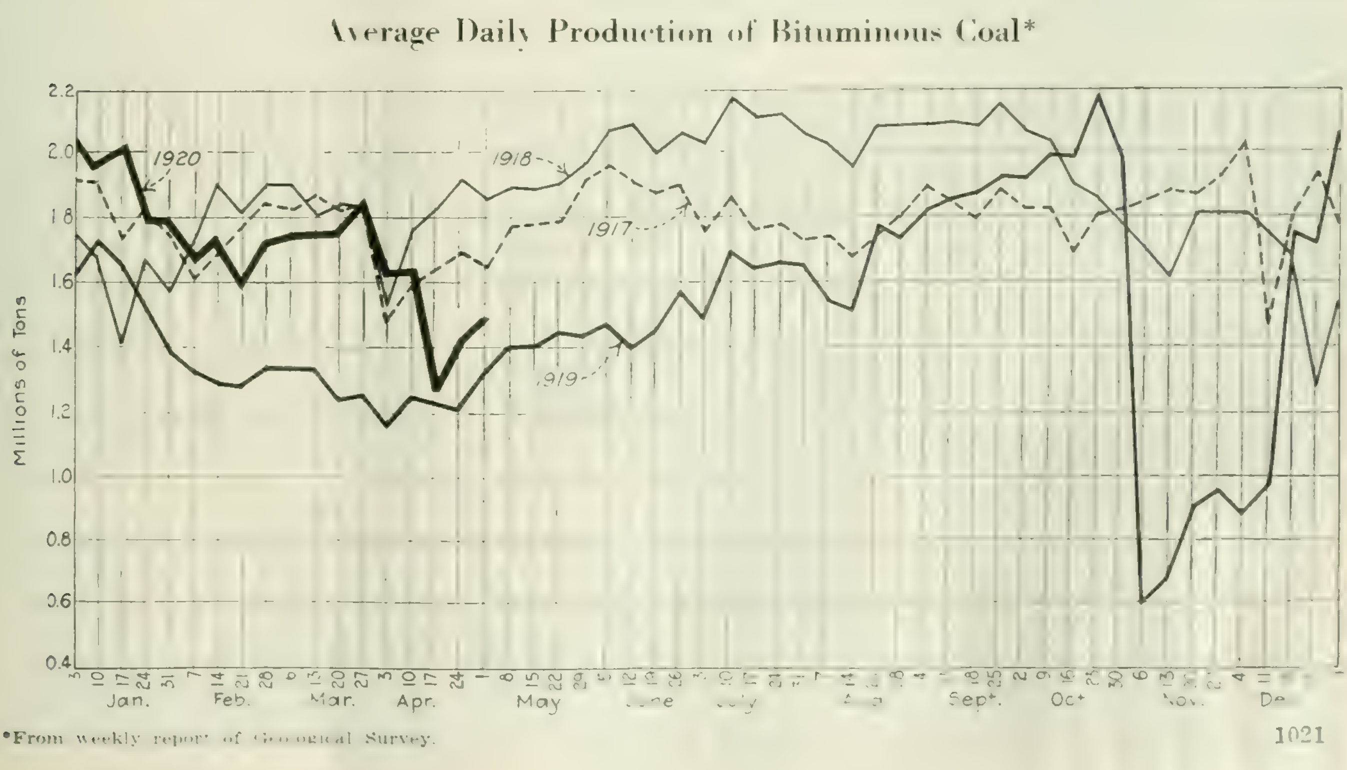
MORE coal and easier conditions are reported generally in all centers during the past week. The Geological Survey reports a gradual improvement in production the past three weeks with an output of 8,898,000 tons of bituminous and 1,792,000 net tons of anthracite in the week ended May 1. The week of May 8 will show still further gains, but not until the railroad labor is all back at work and the innumerable tangles in traffic have been straightened out will production again reach the 11,000,000 tons a week toward which efforts were being set when the switchmen's strike upset calculations.

There is no let-up in the demand for steam coal, and the cold weather that has extended into May has called for more than normal quantities of domestic sizes. The market is reported exceptionally strong in the South, with car shortage of more than usual extent in the Birmingham district. The condition of stocks is such that in nearly every industrial center some consumers are really suffering for lack of fuel, and in Milwaukee rationing of what little coal was getting through was seriously considered last week.

Prices are holding firm, with the bulk of the coal, however, going forward on contract at prices below the present spot price level. Sentiment among coal shippers is strongly in favor of moderate charges, but there are enough who cannot resist temptation to furnish material for those who see only bad in the industry.

Anthracite production has been maintained at a higher rate this spring than last, despite the difficulties interposed by the railroad strike. Deliveries have not fared so well and numerous communities are registering complaints of anthracite shortage when the coal they want is perhaps tied up in a railroad yard but a short distance away. Anthracite prices are as yet uncertain. In New York the April circular is reported in effect, whereas in Philadelphia no mine prices are quoted and retailers have increased prices to the consumer. This state of uncertainty is bound to persist until the wage question is finally settled and operators can figure costs on the new scale.

Average Daily Production of Bituminous Coal*



*From weekly report of Geological Survey.

Reports From the Market Centers

New England

BOSTON

Buyers Active in the Region—Car-Supply Shows Only Moderate Improvement—Output Further Curtailed by Floods—Rail Movement Somewhat Better—Strong Demand in Every Direction—Dumping at New York Piers Increases—Norfolk and Newport News Despatch About Normal—Prices Rule High—Anthracite Unchanged—Domestic Sizes Come Forward Very Slowly.

Bituminous—Active and insistent buying is the main feature of the current market. Representatives of large corporations are in practically all the districts of Central Pennsylvania, as well as in West Virginia, and they are on the spot with cash for prompt coal. There is much less quick coal offering than was the case a fortnight ago and there are rumors of more than $6 per net ton being offered for coal of only indifferent grade. It is to be hoped, however, that operators will hold quotations down within reasonable limits.

There are signs of better car-supply. The New England roads are making better returns of empties, and from other lines there are also hopeful developments. On the New Haven road consumers are in constant distress for coal, due to the heavy volume seized for locomotive supply. The Harlem River gateway has been prostrated for several weeks on account of strikes in New York harbor.

Receipts at the all-rail gateways reflect the gradual improvement in car-supply, other than on the New Haven. The Boston & Maine is steadily increasing the number of cars taken daily from the Delaware & Hudson and from the New York Central. The Boston & Albany is back to almost normal movement of coal, and confiscations have practically ceased, except where company coal taken by intervening lines has made replacement necessary.

There is no gainsaying the strength of demand from every quarter. All kinds of buyers are actively in the market, although here it is noticed that purchasers are generally confining their operations to their accustomed sources of supply. Distinctly there is less "wild" buying than might have been anticipated.

Despatch at the Virginia terminals continues about normal. The increasing use of much larger cars has a favorable effect upon movement, and for several weeks now the piers have been supplied with all the coal that could be dumped. Receipts in New England are still light and less and less is heard in the open market with regard to Pocahontas and New River. At least one large contract, made in 1915 for 5 years, is to expire this season, and it will be of much interest to see what new contract offerings will be around July 1.

Quotations at wholesale range about as follows:

	Cambrias and Somersets	Clearfields
F.o.b. mines, net tons	$4.75@$5.50	$4.50@$5.25
F.o.b. Philadelphia, gross tons	7.15@ 7.95	6.95@ 7.50
F.o.b. New York, gross tons	7.50@ 8.50	7.50@ 8.00

Pocahontas and New River contract prices from April 1 have ranged from $6.54@$7.50 f.o.b. Hampton Roads. Spot prices at the same piers are from $8.50 @ $9.50. On cars Boston or Providence prices are $10.75@$12 per gross ton.

Anthracite—No further developments in anthracite have come to light at this writing. Embargoes are still in effect against large parts of New England, and by water it will take several weeks to begin to make up for the suspension of dumping at the piers. Tows are moving with fair regularity, and if strikes and other obstructions can be avoided, there should be a reasonably good tonnage moved forward during May, June and July. If maximum movement is not attained during those months the future will indeed look dark for this territory.

Tidewater

NEW YORK

April Anthracite Prices Mainly in Force—Dumping of Coal Gaining—Trade Uncertainty Due to No Mine Wage Agreement—Bituminous Situation Serious—Receipts Low.

Anthracite—The lead set by the Lehigh Coal & Navigation Co. last week in advancing the price of domestic anthracite $1 per ton has not yet been generally followed by the large producers but some of the independent operators have accepted the prices and have added the 75c. differential to the new prices. The large producers state that no change from the April prices had been ordered.

More coal is coming forward but it is soon absorbed by the local trade. Shipments both from the mines and from the local tidewater docks continue to be interfered with because of the railroad and local marine troubles. With the men gradually drifting back to work the dumping of coal is slowly gaining and a larger tonnage is being moved.

The trade is in a state of uncertainty because of the failure of the operators and miners to decide on a new wage agreement. However the Washington conferences may at any time have a happy termination.

It is difficult to get fuel to tidewater and to the Great Lakes and one big producer has begun to dump coal at one of its storage plants, while other railroads are reported to have placed embargoes on shipments to Buffalo.

The local retail yards are short of coal and deliveries being made subject to the prices to be set by the producers when the wage conferences are ended. Coal is being delivered in one or two-ton lots to those who need it most.

The demand for the smaller sizes is strong but the supply inadequate to meet the demand. Buckwheat for spot delivery is being quoted at from $4.25 to $4.75; rice around $3.25 and barley around $2.

Current quotations for company coal per gross ton at mine and f.o.b. tidewater at the lower ports are as follows:

	Mine	Tidewater
Broken	$5.95	$7.80
Egg	6.35@7.35	8.20@9.20
Stove	6.60@7.70	8.45@9.55
Chestnut	6.70@7.70	8.55@9.55
Pea	5.30	7.05
Buckwheat	3.40@3.75	5.15@5.50
Rice	2.75@3.25	4.50@5.00
Barley	2.25@2.50	4.00@4.25
Boiler fuel	2.50	4.25

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—There is little coal at the docks. The railroad trouble is not completely ended and, while most of the men have returned to their work, some difficulty is met in moving the boats when they are loaded. The railroads continue to take coal intended for commercial use, which must be replaced by the shippers.

The situation here has become serious. One of the trolley lines operating on Long Island was compelled to suspend operations one day last week because of its inability to obtain coal. Several city departments were able to operate only because of the work of policemen in bringing coal to the city from the lower ports.

Car supply is ragged, many mines not getting more than one-third of their quota of cars. With the railroads taking coal, commercial users will have difficulty in getting prompt shipments. Very little quoting is being done for local delivery. There is much difficulty in keeping bunkers supplied and on this account steamers are frequently delayed in leaving this port.

Quotations for some of the pools are not always available. Early this week Pools 1 and 9 were being quoted at $6.25 to $6.50 per net ton, mines; Pool 10, $6 to $6.25; Pool 11, $5.50 to $5.75, and Pool 18, $5 to $5.50. Gas coal was quoted around $6.50. Quotations for loaded boats in the harbor ranged from $10 to $12. Towing charges ranged from $1 to $1.25 per ton.

PHILADELPHIA

Anthracite Prices Unsettled — Final Circulars Due When Wage Dispute Is Cleared — Retailers Increase Prices — Heavy Premiums on Popular Sizes — Steam Trade Active, Especially in Buckwheat — Bituminous Continues Scarce with Light Receipts.

Anthracite—The price situation is quite complicated; most of the big producing companies having announced a schedule for current shipments—subject to change without notice. The chief cause of disturbance is that shipments will be made subject to prices to be fixed for the coal at a later date. That is at such time as an agreement is reached with the miners on a new-wage scale. Thus the dealers are compelled to take a chance in fixing their retail prices.

An increase of $1 a ton on the prepared sizes has been announced, but it is believed that the increase to be allowed the miners will mean an even higher advance in the wholesale rates. Retail prices on the various family sizes are as follows: Egg from $12 to $12.75, stove and nut from $12.75 to $13.25, and pea $9.75 to $10.50. This is for a gross ton of 2,240 lb. Dealers are mostly quoting only on such coal as they have in their yards for delivery.

It is almost certain that the range of retail prices as given above cannot continue long, as the dealers have allowed themselves little increased margin over the wholesale price. It is believed when the price policy is settled for the year by the big companies the retail increases occasioned thereby will be such as to cause much comment.

The shipments into the city have been extremely light during the past ten days and the trade expects light shipments all summer long. The consuming public still insists on its preference for stove and nut and as a result of this some of the independent houses are asking prices well above $9 for these sizes.

In New England there is ample opportunity to move the coal at heavy premiums, and if it were not for frequent embargoes both rail and tide, there would be even a greater tonnage moving in that direction at top prices.

Using the circular of one of the big producing companies as a basis the anthracite prices per gross ton at mines for line delivery and f.o.b. Port Richmond for tide are about as follows:

	Line	Tide
Broken	$7 35	$9 20
Egg	7 35	9 20
Stove	7 70	9 55
Nut	7 70	9 55
Pea	6 00	7.60
Buckwheat	4 00	5.05
Rice	3 00	3 90
Boiler	2 50	3.50
Barley	2 25	3 15

Bituminous—The situation is still impeded by the light car supply. Only a light tonnage of coal is reaching this market. The heaviest tonnages are being received by the public utilities. The manufacturing plants, however, are going along on the narrowest kind of a margin, some of them even being on reduced production. The steel mills have never been able to catch up since the rail strike.

Contract customers are receiving only meager deliveries, while spot coal has in some instances touched the $6.25 mark for the highest-grade fuels. Were it not for the fact that tide shipments are frequently embargoed, thus throwing more or less tonnage on the line trade, still higher prices would prevail. The railroads are in constant need of fuel and they confiscate commercial shipments.

Recent quotations have been: Pools 9, 10 and 11, $6, with occasionally $6.25 asked for strictly Pool 9. Pool 18, $5.50 to $5.75; these are for coals originating on the Pennsylvania R.R. For Baltimore & Ohio, Pool 9, 10 and 11 coal has been quoted at $5.50 to $6, with Pool 18 around $5. These prices are for the net ton f.o.b. mines. For coke there is a steady demand for foundry from $10.25 to $12, with furnace around $9.75. Domestic byproduct stove and nut is selling for $7. These prices are per net ton at ovens.

BALTIMORE

Prices keep climbing despite some breaks northward and $6 to $6.50 coal at the mines is more the rule than the exception. Foreign buyers eager to get coal at any price and export movement holds well despite embargo on all but shipments under railroad permits. Hard coal men raise prices.

Bituminous—The top notch for bituminous prices does not seem to have been reached. Despite predictions that the six-dollar mark per net ton as reached at the mines was the limit of the present rise, and the fact that there have been some signs of a break at northern points, because consumers are unwilling to take any coal except for immediate needs at that price, the rise has continued here.

At present the run is equal that of last month, about 70,000 tons of cargo coal having been handled the current week as export cargo fuel, and the expectation being that better than 300,000 tons will be loaded on this account during May.

The prices at tide here for best grades such as Pools 71 and 9 are all the way from $6.25 to $6.50 per net ton f.o.b. mines, while medium-value coals are selling at from $5.75 to $6. The lowest sales, those of Pool 18, are at from $5 to $5.25. Gas coals hold up well also, screened fuels commanding readily from $5.50 to $6, f.o.b. mines.

Anthracite—The definite hard-coal situation naturally waits upon the results to come from adjustments following the end of the Washington conference. Meanwhile the premiums paid by dealers here on any coal they can get through at this time are growing, and usually running between $1.25 to $1.50 above the old winter schedule. The result is that dealers are forced to sell at an advance over the old rates, and for the most part are charging a dollar a ton more than they did during the winter. This schedule is as follows: White ash—No. 1 (broken) $13.50; No. 2 (egg) $13.50; No. 3 (stove) $13.75; No. 4 (chestnut) $13.85, and pea, $11.25. Lykens Valley—No. 2, $14.20; No. 3, $14.60.

Lake

BUFFALO

Strike Cuts Out Coal Again—Conditions About as Bad as Formerly—Some Allegheny Valley Coal Gets In—No Steamboat Fuel—Anthracite Arriving Slowly—No Coke Market.

Bituminous—The old situation that prevailed during the first switchmen's strike is back again. Some effort has been made to get outside men to throw switches but it is a chance if any coal comes through. Somehow the supply seems to be sufficient, though nobody knows how it comes about.

One of the worst conditions is the lack of fuel for the Lake steamers. Some of them are able to manage temporarily by various expedients. But the business offering by Lake is small; so the owners have in many instances discharged their crews.

The car supply is anything but good. The Allegheny Valley mines had been furnishing most of the coal used here. from the time of the first switchmen's strike, and they would have continued if the cars had not run short. It is, of course, just as difficult to get an empty car out of a yard as it is to get a loaded one in.

It is next to impossible to get any price quotations, some shippers saying they are selling at any price they can get and others refusing to discuss the situation at all. The list, as given by one shipper, is $6.10 to $6.35 for Allegheny Valley, all sizes; $6.25 to $6.50 for Pittsburgh, No. 8 lump and three-quarter, and $6 to $6.50 for all slack, per net ton, f. o. b. Buffalo.

Anthracite—The anthracite trade is about as badly hampered as bituminous, though some of the roads have been able to marshal some forces to assist in getting the trains through the yards and to keep up a supply of coal. The demand is not very urgent; some distributors having a supply of buckwheat coal, for example, which does not move out.

Only one of the shipping agents has any water coal yet. The others do not now look for any right away, for it will take weeks to get into shape again after the strike is over. Something like 100,000 tons is now afloat, and a few cargoes have made their way through the ice that is still heavy in front of the harbor. Fuel is now becoming scarcer rather than more plentiful.

Coke—The coke situation is the same as that of bituminous coal. Cars do not move and there is no other way of getting a supply. There is really no coke market, prices being nominal on the basis of $12 for 72-hr. Connellsville foundry and $10.50 for 49-hr. furnace. With a little chestnut for domestic use at $7, adding to this the $2.60 freight gives the f.o.b. Buffalo price per net ton. The future of the trade for the season is uncertain. Some of the vessels are discharging their crews and tying up until the businesss shows a disposition to move.

CLEVELAND

Pooling of all coal receipts under direction of the Cleveland Chamber of Commerce is the latest plan to keep as many plants as possible operating. Receipts, while slowly increasing, are not over 25 per cent of normal for the season. Spot No. 8 mine-run and slack hold at $4.75 to $5, mines.

Bituminous—The crux of the entire fuel situation, so far as Cleveland steam-coal users are concerned, continues in the inability of railroads to place empties at the mines. At some No. 8 district mines not a pound of coal has been taken out for three weeks. The average operation does not work over 35 per cent, and a good share of this output is going to the railroads.

There is scarcely a plant in Cleveland that does not suffer from lack of fuel. A Chamber of Commerce bureau is pooling all receipts. Operators continue to avoid making contracts, with operating and shipping conditions so uncertain. Spot No. 8 mine-run and slack are commanding $4.75 to $5, f.o.b. mines, and operators foresee no change that will lower this level in the near future.

Demand, of course, continues several times the supply of all grades except domestic bituminous. Retail dealers' prices on No. 6 and No. 8 mine-run and slack are around $8.50, delivered, an increase of 75 cents. West Virginia splint, for domestic use, has been advanced to $9.50.

Anthracite and Pocahontas—Most dealers have continued their old prices on anthracite, but demand is seasonably light. Deliveries on Pocahontas are more deferred, and some dealers are entirely out.

Lake Trade—Lake Erie docks in April dumped 307,000 tons of bituminous coal, compared with 1,082,183 tons in April, 1919. Loading so far in May also has been light, and June 1 will probably see the Lake trade 2,000,000 tons behind last year.

Retail prices of coal per net ton delivered by dealers in Cleveland are:

Anthracite, and grate, $12.20@12.40; chestnut, $12.50@12.70; and stove, $12.50.

Pocahontas, shoveled lump, $10.50; and mine-run, $9.25.

Domestic bituminous, West Virginia splint, $9.50; No. 8 Pittsburgh, $7.75; Millfield lump, $8.50; and cannel lump, $11.

Steam coal, No. 6 and No. 8 slack, $8.50; No. 6 and No. 8 mine-run, $8.50; and No. 8 ¾-in. lump, $8.75.

MILWAUKEE

United Action Taken on Near Exhaustion of Coal—Emergency Committee Secures Temporary Relief—Rationing Postponed.

Milwaukee had a week of hysterics following the announcement by the leading dock company that it could not promise any more deliveries of coal. The panic increased when it became known that ships were lying at the docks because they were unable to obtain fuel and that one steamer had to pay $9 per ton to fill her bunkers.

The Governor of the state, the Mayor of the city and representatives of various civic organizations got together, appointed an emergency committee and appealed to Senator Lenroot to petition the Interstate Commerce Commission to speed the movement of coal cars in order to avert a financial and industrial crisis in the Northwest. As a result, 419 carloads of coal reached the city inside of three days. No rationing will now be undertaken for the next two weeks.

Eugene McAuliffe, of St. Louis, states that the entire nation will be confronted with a serious fuel situation next winter. He urged Milwaukee dealers to lay plans at once if they wanted to avert a shortage. The May advance in prices did not materialize here as yet, notwithstanding the scarcity of coal.

Thus far this season 25,221 tons of hard coal and 18,500 tons of soft coal have come by Lake, against 105,303 tons of hard and 181,032 tons of soft coal during the same period last year. At this time last year the docks held about 400,000 tons of coal, which had been carried over on account of the mild winter of 1918-19.

Inland West

COLUMBUS

Strike Slowly Breaking Up—Increased Output of Ohio Mines — Embargoes Still in Force — Demand for Steam Grades Especially Strong and Prices Higher.

Reserve stocks have been reduced to a low point in every line of manufacturing. Public service concerns and public institutions have been supplied for the time being. Extreme high prices are expected to prevail for some time.

Domestic demand is still strong. Retail stocks are light and in many cases exhausted. Retail prices are firm and show a tendency to advance in sympathy with higher quotations at the mines.

Pocahontas is quite scarce and little is available in this territory. West Virginia splints are also reaching this market in limited quantities. Hocking lump retails at $7.50 and higher, while West Virginia lump is selling at $8.50. Pocahontas when obtainable retails around $10.50 to $11.

Steam trade is active as railroads are now good purchasers and most other industries are in the market. In the Michigan industrial centers fuel is scarce and many of the plants were compelled to close down. Prices soared as a result. Quotations of $5.75 for Kanawha slack were heard of in the local market.

The Lake trade is assuming more importance. Some cargoes have been moved to the upper Lake region, but embargoes have largely prevented shipments to the lower Lake ports. The tonnage moving to the docks is under the control of the producing companies.

Prices at the mines for the principal coals used in Ohio are:

Hocking, lump	$3.75@$4.25
Hocking, mine-run	3.50@4.00
Hocking, screenings	3.25@3.75
Pomeroy, lump	4.00@4.50
Pomeroy, mine-run	3.75@4.00
Pomeroy, screenings	3.50@4.00
W. Va. splints, lump	5.00@5.50
W. Va., mine-run	4.50@5.00
W. Va., screenings	4.50@5.00
Pocahontas, lump	8.00
Pocahontas, mine-run	7.50@7.75

CINCINNATI

Movement of Cars Increasing — Demand Is Strong for Both Industrial and Domestic Fuel — Much Coal Moving by River—General Outlook Encouraging and Prices Are Firm.

With strike conditions on the railroads being rectified somewhat, operators here see no reason why the coal situation in this district should not clear up in a similar manner. It is quite evident, they say, that more empties are going to the mines and consequently the production will be larger in the near future, and with embargoes in general removed, conditions should brighten up to a considerable extent.

Shipments into the Cincinnati district from West Virginia have increased in the past week and many industries that were low on their supplies were able to stock up a bit.

Prices for all kinds of fuel remain firm in the Cincinnati market. Everybody is buying coal. There are no coal users who are going to be found without their usual winter supply next November.

Dealers in Cincinnati state that never before has there been such a demand for coal from the householder. With no places to move to, even if they desired, there is nothing to do but order the winter coal and have it stowed away. That is exactly what the Cincinnati householders are doing.

Considerable coal is moving down the Ohio River. Except for this great waterway Cincinnati would have been in a pretty fix during the rail strike. There were many industries that were supplied with coal that came down the river which otherwise would have seriously felt the pinch.

Coal men in general are of the opinion that there should be only messages of optimisim going the rounds of the trade at this time and that whatever gloom may appear above the horizon should quickly be dispelled.

ST. LOUIS

Railroad Conditions Improving — Some Coal Coming in Train Loads — Mines Slowly Resuming Operations — Local Situation Fairly Good — Country Demand Strong.

The local situation is easing up gradually. The trunk roads have for the most part their full crews at work, but the terminal is tied up and coal is coming over in train loads pricipally to the main unloading points. The mines are working two to three days per week on most of the roads.

The local situation in steam coal is in fairly good shape. Conditions in the country west of the river are still bad, but a little coal is gradually getting through. In the Standard field prices are as high as $4 for lump, $3.75 for mine-run, and $3.25 for screenings. In the Mt. Olive field the conditions are about the same, with the exception that prices are about $3.25 for domestic sizes of $3.50, with practically no steam coal quoted. On the Missouri Pacific nearly all coal loaded is promptly taken by the railroad for company use, and this road is buying several hundred cars in the Standard field.

The fact that there is a contemplated merger of about 70 mines in the Standard field became public for the first time this week It involved between $9,000,000 and $10,000.000 and takes up about 50,000 to 70,000 tons per day of coal.

DETROIT

Though Little Coal Remains in the State, the Outlook for Moving Shipments Is Reported Brightening.

Bituminous—With the announcement that freight congestion is diminishing in Toledo and at other junction points, the outlook for moving coal into Detroit and Michigan is said to be improving. Under direction of the Michigan Public Utilities Commission, two traffic men have been dispatched to work on the problem, one in Columbus, the other in Cincinnati. They will try to get coal consigned to public utilities of the state, moving to its delivery point.

In many of the cities of the state, gas and electric companies have only three or four days' supply of coal and for some time to come, probably, will be dependent on receipts from day to day to continue in operation. The Ionia State hospital, which was without coal, has succeeded in getting a small supply. Shipments are reported on the way to Pontiac and Bay City, where public utilities are in urgent need of coal. The gas plant serving Plainwell, Otsego and Allegan, it was recently announced, would be obliged to close.

While the state is struggling with the problem of getting fuel, the coal mines in Michigan have closed. The miners are demanding that the new wage scale, which has been discussed for a month past, provide for the 10 cents a ton advance in wages, which they say should have been given them during the war.

MIDWEST REVIEW

There is little market news to report as there has been practically no change in the situation here during the past three or four weeks. Coal can be purchased, but in such small quantities that it cannot begin to take care of the demand, which continues quite strong. The big terminals are all embargoed and as a result operators and producers are routing coal to other points which can be reached without going through Chicago, Peoria, or East St. Louis.

Railroad authorities report that they are getting the situation well in hand, and that they are replacing the striking switchmen fast. The traffic congestion may be straightened out within the course of the next two weeks and from now on conditions may take a turn for the better.

The better grade of coals, as per May 1 announcement, is selling at ten cents over and above the April prices. In other words, southern Illinois coal which in April was selling at $3.40 per ton, is now $3.50. This ten cent per ton increase will continue monthly until October. As it is understood, no price has been decided upon beyond October.

This sliding scale of prices is quite popular with the retail trade, as it furnishes them an incentive to purchase their coal early, and at the same time gives them an idea as to operating costs for the spring and summer months. There is some coal sold at prices in excess of $3.50 for the prepared sizes, but paradoxically about all the coal that is moving at fancy prices is said to be off-grade stuff not readily sold on contract. The methods of those selling at exorbitant prices are frowned upon by the more responsible operators and by the public in general. Luckily these operators are decidedly in the minority.

South

LOUISVILLE

Demand Strong with Run-of-Mine Selling Better Than Block—Embargo Situation Bad — Heavy Movement South with Northern Demand Starting.

The demand for all grades of coal is strong, and increasing as steam stocks run low, and as byproduct and gas plants begin getting worried about supplies. Railroads are buying coal, and paying good prices. Retailers are meeting with a larger spring stocking demand than had been anticipated on the present high market, and are glad to accept lumpy run-of-mine, where block is not available.

Comparatively little block coal is being produced, as the operators will not take chances of screening coal, having cars held over night and losing them from the net day's allotment, which is not much better than two days a week at the most. Again mine-run is selling at as good or better prices than block coal.

The embargo situation is still bad, and the Cincinnati gateway is slower in opening than had been anticipated. This is resulting in larger movement South. Northern demand is starting, although shipments are quite light.

There is an especially heavy demand for gas and byproduct coals, such as Harlan No. 4, Hazard, Elkhorn and Straight Creek. There is hardly any such thing as a market on such coals, as they are all going at prices ranging from $4.50 to $6.25 a ton.

Byproduct coals are quoted from eastern and southeastern Kentucky with run-of-mine firm at $6@$6.25. Operators in many instances refusing to charge more than $4.50 for block, but much of this grade is selling at around $6. Nut and slack are scarce, the price ranges from $5.25 a ton upward at mine.

In the Hazard field block sells at around $5.50@$6 per ton; mine-run, $4.50@$5 and up to $6 a ton; nut and slack, $4.75@$5.25.

Western Kentucky prices are firm, with block selling at $3.25@$3.40; mine-run, $2.85@$3.10; nut and slack, $2.50@$2.60; and pea and slack, $2.25 @2.40.

BIRMINGHAM

Car Shortage More Acute the Past Week Curtails Production — Industrial Demand Heavy and Bunkerage Trade Active.

The car supply for this field the past week was somewhat below that for the previous period, the production of coal was hampered and deliveries to consumers were quite unsatisfactory. As there are practically no stocks in the hands of steam users any interference with daily receipts seriously menaces the business of the consumer.

There is a demand here for every grade of coal, much in excess of the tonnage to be had. Spot and contract inquiry is strong, and a great deal of the offering has to be turned down or accepted with limitations both as to tonnage and delivery. Much steam coal has been contracted through June 30, 1921, but there are a number of mines which have not yet made any contract agreements; most all operators making a reasonable tonnage reservation for the spot trade and to care for contingencies which may affect production.

There is a better demand for bunkerage coal than has existed heretofore, and the amount of this business taken on now is only limited by the supply which can reasonably be promised under present transportation conditions.

Inquiries for export coal to France and Italy have also been received in this district, a shipment having gone forward to the latter country recently.

Excessive rains which have continued through several weeks past have interrupted production at some mines by flooding the workings. Labor is delinquent, and there is also a shortage in the field as a whole, but shortage of equipment is the principal factor in holding production below the trade needs of the territory.

News From the Coal Fields

Northern Appalachian

FAIRMONT

Erratic Transportation in Northern Fields—Midwest, Lake and Other Markets Opening Up—Railroad Fuel Shipments Large.

The final week of April was a week of contrasts in northern West Virginia fields from a transportation standpoint, the supply of cars reaching the maximum and then dropping to the minimum production following. In the Fairmont region on the first day of the week there were 1,983 cars and all previous loading records were broken.

On Wednesday only 307 cars were furnished for all the mines on the Monongah division of the Baltimore & Ohio. Since a large number of the cars furnished were used for railroad fuel it will be seen that a comparatively small amount of commercial coal was loaded. After Wednesday between 500 and 600 cars a day were supplied.

Cars were somewhat more plentiful on the Monongahela R.R. than during the previous week but only for a day or so, as the Pittsburgh & Lake Erie was unable to move any freight from Brownsville, Pa., during the week, the Pennsylvania following suit. On the last day of the month there were about 2,000 cars of coal at Brownsville, Pa.

During the first few days of the week there was only a limited movement of coal to the Lakes owing to an embargo. Cincinnati for several days was the westernmost point to which much northern West Virginia coal could be shipped. It was possible to ship, during the last few days of April, to points on the Philadelphia & Reading. Staten Islands points were also opened.

By the middle of the week the Pennsylvania was forced to impose an embargo on coal shipments from northern West Virginia except under permit, railroad fuel and fuel for public utilities excepted. By Wednesday Pools 44, 11, 34 and 38 at Curtis Bay were under embargo again. By the end of the week no coal could be shipped to Curtis Bay, Locust Point and Baltimore coal piers, owing to an embargo, except under special permit.

Railroad shipments were rather large during the week, the railroads in fact securing the bulk of the coal. In some quarters it was said that the railroads had declared embargoes with a view to securing fuel.

There was produced at mines on the Monongah division of the Baltimore & Ohio during April 944,600 tons of coal, or 252,550 tons more than had been produced during April, 1919. Total production at mines supplied by the Monongahela R.R. during April reached 178,600 tons.

Use of assigned cars by railroads in northern West Virginia during the last fews days of April continued to provoke much discussion. Reports were also received of coal from northern West Virginia being confiscated.

PITTSBURGH

Car Supplies Continue to Improve—Operations Are Only About 40 Per Cent of Capacity — Lake Shipments Light.

Car supplies in the Pittsburgh district increased more in the past week than in the preceding one, but left quite an unsatisfactory situation nevertheless. Except for the solid-trainload and the river shipment, the movement of coal actually to consumers is extremely light. The condition as to line supplies is mitigated materially by there being scarcely any movement for the Lake trade, and it will require quite heavy shipping later on to make up the deficit, as Lake shipments are already a million tons behind schedule.

Taking the district as a whole, mining operations are now at about 40 per cent of rated capacity. Some consumers are getting practically a full supply while others get no coal at all. On account of decreased consumptive demand and the small Lake shipments, the supplies in general are probably equal to about 60 per cent of normal requirements.

The market continues rather quiet, with prices irregular on account of there being so much more difficulty in shipping to some points than to others. Generally speaking prices may be quoted the same as a week ago: Prompt, $4@4.50; contract, $3.50@4, per net ton at mine, Pittsburgh district.

CONNELLSVILLE

Car Supplies Irregular, with No General Improvement — Byproduct Ovens Doing Better — Connellsville Market Stiffens.

Last week opened with poorer car supplies in the Connellsville region than the previous period, but conditions improved later in the week, though hardly enough to permit any further gain in production. The solid-trainload movement is working quite well as to certain points, and the trainloads of empties generally get back in good time. The river movement has increased somewhat and is now of relatively large proportions.

The byproduct coke ovens are doing better; in the near-by Youngstown district, which was hardest hit by the rail strike, the operations are hardly much more than 50 per cent of normal. The operations have no stocks to draw upon, and their supplies are coming only by trainload movements, naturally somewhat irregular.

The Connellsville market for spot coke, both furnace and foundry, has stiffened about a dollar a ton, this being due to the larger number of consumers to whom shipments can be made, rather than to any decrease in the offerings. The spot market is now quotable at $12 for furnace coke and $13 for foundry coke, per net ton at ovens.

Estimates of Production

From the Weekly Report of the Geological Survey

BITUMINOUS COAL

	1920		1919a	
	Week	Calendar Year to Date	Week	Calendar Year to Date
April 17	7,563,000	157,730,000	7,411,000	126,141,000
Daily average	1,261,000	1,709,000	1,235,000	1,367,000
April 24	8,485,000	166,215,000	7,378,000	133,519,000
Daily average	1,414,000	1,691,000	1,223,000	1,358,000
May 1c	8,898,000	175,114,000	8,022,000	141,541,000
Daily average	1,483,000	1,679,000	1,337,000	1,357,000

a Less one day's production during New Year's week to equalize number of days covered for the two years. *b* Revised from last report. *c* Subject to revision.

ANTHRACITE

	1920		1919a	
	Week	Calendar Year to Date	Week	Calendar Year to Date
Apr. 17	1,215,000	24,321,000	1,603,000	21,966,000
April 24	1,618,000	25,939,000	1,435,000	23,401,000
May 1c	1,792,000	27,731,000	1,717,000	25,118,000

a Less one day's production during New Year's week to equalize number of days covered for the two years. *b* Revised from last report. *c* Subject to revision.

BEEHIVE COKE

Week Ended				
May 1 1920	Apr. 24b 1920	May 3 1919	1920 to date	1919a to date
373,000	342,000	295,000	7,388,000	7,403,000

a Less than one day's production during New Year's week to equalize number of days covered for the two years. *b* Revised from last report. *c* Subject to revision.

(All figures in net tons.)

Middle Appalachian

POCAHONTAS AND TUG RIVER

Output Curtailed in Last Week of April—Most Coal Goes East—Mines Work One to Two Days a Week.

The final week of April witnessed a more serious curtailment of production in fields supplied by the Norfolk & Western than at any time during the month, the full effects of the strike not being evident until a semblance of order had been restored on western lines. While men had returned to work at Kenova and Ironton on April 29, and while the weighing of coal at Portsmouth had become possible, it was still difficult to handle coal to western points on the Norfolk & Western.

Coal produced was moved to eastern points during the strike. Coal forwarded to points west of Williamson was shipped in solid trains so as to avoid switching in moving such coal through western terminals. Such solid train loads of coal moved were consigned to large consumers in Indiana and elsewhere.

The supply of cars from western sources was negligible. Virtually all the product of the Thacker, Pocahontas and Tug River mines was being sent eastward. Cars were not being returned promptly owing to the large amount of coal on hand at tidewater.

No coal was being shipped to the Lakes from Norfolk & Western originating points. Even tidewater was embargoed in certain instances, pools 41, 42 and 43 being affected in that respect. Thus Inland East markets afforded the only outlet.

Cars were so scarce that few mines were able to operate more than one or two days during the week. The bulk of Pocahontas production was flowing to tidewater. However the lower grades of coal from the Pocahontas field were embargoed to some extent. Lake ports were still closed to Pocahontas mines, so that virtually no coal has been shipped to Lake points from the Pocahontas field during the present season.

Transportation conditions were worse in the Tug River field during the final week of April than ever before. Cars were so scarce that mines were able to work only from one to two days during the entire week.

Only solid train loads were shipped to western markets, the great bulk of Tug River coal moving to tidewater terminals. It was impossible to ship any coal to the Lakes owing to conditions at Columbus, Portsmouth and other weighing points. During the latter part of the week conditions were more nearly normal.

NEW RIVER

Cars Scarce in New River—Shipments at Low Ebb East and West—Gulf Mines on Virginian Ry. Able to Work.

A shortage of cars continued to interfere with production in the New River field during the last weekly working period in April. While the backbone of the yardmen's and switchmen's strike may have been broken, that brought no relief to mines in the New River section of West Virginia. Instead conditions had undergone a change for the worse, cars being much more scarce than during the strike. The maximum car supply for the week was little more than 50 per cent.

One reason for the pronounced shortage lay in the fact that extremely few cars were being received from Western connections, and that so much coal was still under load at tidewater; there was only a comparatively small number of empties in the shuttle movement between tidewater and the mines. Western shipments of coal and coke from the New River field were at low ebb, although embargoes had been removed on a number of western points.

Winding Gulf mines able to ship over the Virginian Ry. during the week ended May 1 enjoyed somewhat of an advantage over mines in other fields, owing to the more liberal car supply on the road mentioned; mines on that road being able to work about four days out of the six.

While Virginian mines fared better than mines in other regions, that was not true as to mines dependent upon the Chesapeake & Ohio, since that road furnished only enough cars to keep its mines going for about two and a half days out of the six. There was a very strong demand at tidewater for Winding Gulf coal.

KANAWHA

Poor Car Supply Limits Production—Kanawha Coal Goes to Tide—Limited Western and Lake Shipments.

Less coal was produced in the Kanawha field during the final week of April than at any time during the month, owing to the poor car supply. With cars so scarce it was not possible for Kanawha mines to work more than three full days out of the six. The only part of the Kanawha field in which there was any improvement in fact was that supplied by the Kanawha & Michigan R.R. The mines on this road had virtually a full supply throughout the week.

By far the largest part of the high volatile production of the Kanawha field was going to tidewater. Western and Lake shipments were still quite materially limited, despite the fact that embargoes had been removed as to Russell shipments and shipments to points west of Russell. Cars could be obtained from the East alone, and as much coal was still held in cars there, the supply of empties was necessarily limited.

LOGAN

Guyan Output Increases but Car Shortages Cause Frequent Shutdowns —Embargoes on High Volatile to Tide Lifted.

Production was increased in the Guyan field during the last week of April to the extent of about 37,000 tons as compared with that of the week ended April 24; mines had approximately 750 more cars than during the previous week although the field got away to quite a poor start. Total production for the week ended May 1 was about 155,000 tons as against only 117,000 tons for the previous week.

Production was far below normal, car-shortage losses still running well over 225,000 tons, necessitating frequent shutdowns. As mines of the field were mainly dependent upon the East for a car supply, they were forced to wait until cars could be unloaded at tidewater; comparatively few cars were being received from the West, at least during the early part of the weekly working period.

While there had been an increase in production in the Logan field, such an increase was not general insofar as the mines on the Chesapeake & Ohio system as a whole were concerned. There were decreases in every district except in the Guyan and at the mines on the Sandy Valley & Elkhorn and the Long Fork; only 8,409 cars or 420,450 tons being transported, as against 9,149 cars or 457,450 tons during the previous week.

NORTHEASTERN KENTUCKY

Output One-third Normal—Conditions Slowly Improving—Contracts Filled at Prices Much Below Market.

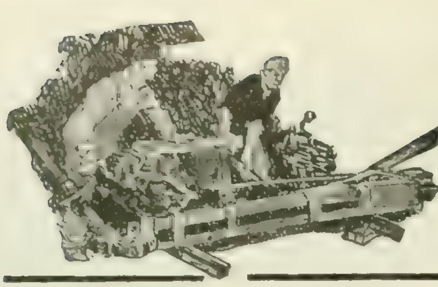
Production in the northeast Kentucky field underwent a slight increase in the final week of April, advancing from 90,000 tons to 100,000 tons, or from 33 to 37 per cent, still leaving, however, a total production loss of 63 per cent and a car-shortage loss of 167,120 tons. The increase was due to an improvement in conditions on the Louisville & Nashville R.R.

Transportation conditions on the Chesapeake & Ohio were just about the same as they had been during the preceding week, with mines working about 38 per cent of full time; mines on the Louisville & Nashville being able to work about two days out of the six.

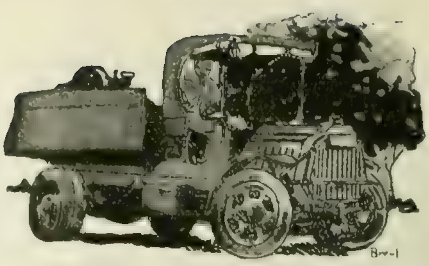
At Russell conditions were improving from day to day and operations in the yard there were just about 50 per cent of normal. However, an arrangement whereby solid trains of coal could be shipped was all that prevented the strike and its after-effects from closing more mines.

The April output of coal in the northeast Kentucky field fell about 150,000 tons behind that for March, due to the strike. The car supply for May might reach about 60 per cent of normal unless something (now unforeseen) occurs to impair transportation facilities.

High prices were being offered for coal in the northeast Kentucky field during the last week of the month, but operators generally declined to part with their coal at such high prices, continuing to supply customers (holding contracts) at prices much below current market quotations. This condition will prevail for some time.



Mine and Company News



ILLINOIS

Springfield—Several mining men of Illinois who have been suggested to fill the vacancy of Joseph C. Thompson, the late State Director of Department of Mines and Minerals of Illinois, are: Robert Medill and William Hutton, both of Duquoin; James Taylor, of Peoria, and Martin Bolt, of Springfield. William Hutton is a member of the Illinois Miners' Executive Board, the Illinois State Mining Board and has the indorsement of many prominent mining leaders throughout the state, including Frank Farrington, president of the Illinois Miners' Organization. Robert Medill was for several years with the Deering interests in Southern Illinois, also the O'Gara Coal & Mining Co.; at the present time he is general superintendent for the Union Colliery Co., of St. Louis, at its large Kathleen mine at Dowell, Ill. James Taylor, now of Peoria, was formerly State Mine Inspector of Illinois, and has held other prominent positions throughout the state. Martin Bolt has been Assistant Director of Mines and Minerals for several years, having served under Evan D. John who died three years ago.

Illinois is a great mining state, crowding West Virginia for second place among this country's bituminous coal producers.

INDIANA

Terre Haute—The Vermilion Coal Co., of Clinton, Ind., has filed a deed conveying to it from Aaron Koonce, the coal rights of 130 acres of land in Fayette Township for a consideration of $24,000. The deed conveys to the coal company outright sufficient land for the erection of tipples and switches for the operation of any mines which may be sunk. The Vermilion company has just acquired from the United States Steel Corporation the coal rights to 1,700 acres of land in Fayette Township, near Shirkieville, and material is now being delivered on the ground for the opening of a new mine. The company owns and operates another mine in the Clinton field. A. H. Spears, of the Ferguson-Spears Coal Co., which operates the Submarine mine, near Tecumseh, is at the head of the company, and other capitalists of Clinton are principally interested.

Petersburg — The Oliphant-Johnson Coal Co., after making a number of tests east of the city, has transferred its drilling rigs across White River, in Knox County, where several thousand acres of coal land are being drilled. During the last few weeks, 10,000 acres of coal land in southern Pike County have been leased by coal companies. West of this city half a dozen different coal companies are leasing coal land. The Pike County Coal Co. paid $15,000 to David Grubb for coal on his farm.

KENTUCKY

Middlesboro—The Low Ash Mining Co. has increased its capitalization from $10,000 to $100,000, to provide for general business expansion.

MARYLAND

Cumberland—The Manor Coal Co., of this place has been incorporated with a capital of $300,000 to engage in general coal-mining operations. Edward J. Ryan, Albert A. Doub, and John L. Wellington, are the incorporators.

OHIO

Columbus—The Southern Ohio Coal Exchange planned to meet on May 11 to consider the law pending in Congress providing for the appointment of a fuel commissioner to investigate every phase of the coal industry and report his findings to Congress. On the face of the bill it appears like a good move and may receive the support of the association. Another question to be considered at the meeting is that of the assignment of cars at mines where fuel is furnished to railroads. The exchange believes that the distribution of cars should be carried out without favor to mines supplying railroad fuel.

OKLAHOMA

Henryetta, Okla.—The Wise-Buchanan Coal Co. has been organized at this place, and charter filed with the Secretary of State at Oklahoma City. The company is capitalized at $400,000, and it will do a general mining and coal distributing business. The incorporators are: H. E. Wise, of Henryetta; D. C. Wise and L. P. Buchanan, of Joplin, Mo.

PENNSYLVANIA

Scranton—The report of the Delaware & Hudson Co. for the year ended Dec. 31, 1919, shows that the Coal Department of the company produced during the year (including the product of washeries) 8,205,495 long tons, a decrease of 853,733 tons, or 9.42 per cent below 1918. The year's output was 12.27 per cent of the total output of Pennsylvania mines and washeries (or 66,855,311 long tons) or 12.78 per cent below 1918. The decrease in production, says the report, compared with 1918, was almost entirely in the output of the washeries. Demand for steam sizes was much below 1918 and, as these sizes make up nearly all the coal recovered from the culm banks and prepared in the washeries, their operation was necessarily less constant and extensive than the previous year.

Wilkes-Barre—E. R. Pettebone and J. M. Humphrey, mining engineers on the Mine Inspectors' Examining Board, have withdrawn from the sessions, objecting to the decision of the miners' representatives of the board, who refused to reveal to them the question which they (the miners' representatives) would present to the candidates. The miners' appointees were willing to let the engineers submit questions without revealing them to the board, but demanded secrecy for their own inquiries. The validity of the examinations may be affected by the engineers' withdrawal.

WEST VIRGINIA

Fairmont—The Delmar Coal Co., of this city, headed by John T. Phillips, has tripled its capital. The capitalization was originally $300,000. It has been increased to $1,000,000. Another company whose capital has just been increased is the Ashford Coal & Coke Co., of Charleston, the increase being from $25,000 to $50,000.

Huntington—All coal-producing districts on the Chesapeake & Ohio R.R. were represented at a meeting held in this city recently. Operators of the various fields, including the Kanawha, Coal River, New River, Winding Gulf, Logan and Big Sandy, met to discuss the car shortage, which has become so pronounced as to seriously curtail production in all fields. Steps were taken for co-ordinated action in seeking to overcome the serious transportation handicap. While the matter has been vigorously presented to officials of the Chesapeake & Ohio since the first of the year, nothing tangible has so far been done toward relieving shortage.

Welch—The Iaeger estate in southern West Virginia will be incorporated as the Iaeger Foundation, and in connection with such a plan it is also proposed to sub-divide the Iaeger holdings of 25,000 acres into smaller parcels of land in order to encourage development of the property. The land will be leased on favorable terms so that men who have been employees will be in a position to become operators.

Charleston—If the Public Service Commission of West Virginia grants the 42 per cent increase in rates for power, applied for by the Kentucky & West Virginia Power Co., it will be over the protest of the operators of the Logan field. A delegation of 15 operators, headed by J. J. Ross, president of the Logan Operators' Association, recently attended the public hearing on the power company's application. In opposing the proposed increase in rates, the Logan operators also voiced their opposition to the proposed new form of contract.

Prominent Charleston capitalists have organized companies to operate in the smokeless field of Fayette County. One of the companies is the Old Colony Smokeless Coal Co., which is capitalized at $100,000. The other new company is the Nay Aug Smokeless Fuel Co., which will also operate in Fayette County, this company having a capital of $150,000. Those responsible for the organization of both companies were: J. A. Thayer, T. C. Beury, A. S. Guthrie, E. H. McNeil and John W. Fry, all of Charleston.

It is stated that the Winding Gulf Colliery Co., of Charleston, W. Va., is making improvements and extensions at its local operations, for increased capacity. At the present time the company is developing approximately 3,000 acres, with a daily capacity of about 2,000 tons. This company has recently increased its capital stock from $500,000 to $1,000,000, for proposed expansion. L. Epperly is local manager.

It is said the following West Virginia companies have increased their capital stock: The Morgantown Coal Co., of Morgantown, of which G. B. Hartley is president, from $25,000 to $100,000; and the Lewiston Block Coal Co., from $100,000 to $150,000.

It is recorded that 17 new resident coal corporations were formed in West Virginia in March, in addition to one non-resident corporation. The combined capital of these companies was $3,350,000. The larger of these new companies were: Guyan Collieries Corporation, Beckley, $2,000,000; McCall Coal Co., Logan, $200,000; Peacock Coal Co., Clarksburg, $150,000; Forest Coal Co., Fairmont, $200,000; Shamrock Fuel Co., Morgantown, $125,000; Glendale Gas Coal Co., of Cleveland, non-resident, $100,000.

Last week three coal-handling companies were organized by E. L. Bailey, of Williamson, and E. H. Sudduth, of Welch. The new companies are the Bailey Fuel Co., of Charleston, capitalized at $100,000; the Sudduth Fuel Co., capitalized at $100,000; the Williamson Fuel Co., of Charleston, capitalized at $100,000. The output of companies in Pike County, Ky., and in Mingo County, W. Va., will be handled by these three companies.

Queen Shoals—Organization of the Rex Colliery Co., with a capitalization of $150,000, presages extensive development on the part of that company in Clay and Kanawha counties on the line of the Coal & Coke division of the Baltimore & Ohio R.R. Among those active in the launching of the new company were: C. H. Hoyt, of Toledo, Ohio; J. B. Ramage, of Queen Shoals; W. T. Lively, F. M. Stambaugh and I. S. Adams, of Charleston, W. Va.

ALBERTA, CANADA

Edmonton—The Red Deer Valley Coal Operators' Association, including all the mines in the Drumheller field, has decided upon a summer discount on the price of coal, in order to induce dealers and consumers to put in a stock during the spring and summer. On shipments made during April, a discount of 5 per cent was allowed, and for the subsequent months a sliding scale has been adopted—4 per cent for May, 3 per cent for June and 2 per cent for July. The good effect has already been noticeable and large orders are being received, mostly from Manitoba.

Association Activities

Texas Coal Dealers' Association

The Texas Retail Coal Dealers' Association held its annual convention at McAlester, Okla., the meeting being held outside the state at the invitation of the McAlester Fuel Co., which operates large coal mines near here. An opportunity thus was given to those attending the convention to inspect the mines from which comes some of the coal burned in Texas.

The convention lasted two days, at the close of which officers were elected as follows: C. H. Lilley, Fort Worth, president; W. C. Kenyon, Amarillo, vice president; W. D. Lacy, Jr., Waco, second vice president; C. R. Goldman, Dallas, secretary and treasurer.

For the next convention, Dallas, Galveston, Fort Worth and Trinidad, Col., were bidders, and it was voted to decide the next meeting place by postcard vote of the entire membership.

More than 350 Texas retail coal dealers as well as many dealers from Oklahoma attended the convention, and at the close of the two-day meeting the coal men visited the workings of the McAlester Fuel Co.'s mines.

The keynote of the meeting was the necessity for early purchase of coal by the public for next winter's use. The secretary was instructed to write urgent letters to all members of the association, stressing the importance of conducting campaigns in their respective localities, urging the public to buy coal now for next winter's use. Liberal use of advertising was urged in furtherance of this campaign.

The convention in many respects was regarded as unusual. At the banquet on the first night there were present among others the following notables; John P. White, former international president of the United Mine Workers of America; John H. Wilkinson, president of the Mine Workers of Oklahoma; J. G. Puterbaugh, head of the McAlester Fuel Co., one of the largest wholesale coal distributors in Oklahoma; Ellery B. Gordon, secretary-manager of the National Retail Coal Dealers' Association, Philadelphia, Pa. T. Percy Ryan, executive committeeman of the National Retail Coal Dealers' Association, Kansas City, Mo.

Raleigh & Wyoming Institute

Finishing touches were put on the organization of the Raleigh & Wyoming Mining Institute, when a large number of mine executives assembled here recently. The institute elected as its first officers, John F. Absalom, as president and J. H. McLaughlin, secretary and treasurer. The meeting was called by V. E. Sullivan, one of the district inspectors, who presided over its deliberations. Talks were made by Messrs. Lilly and Stockdale (district inspectors), a Mr. Craven and by the Chief of the Department of Mines, R. M. Lambie. The Mine Chief emphasized the fact that the mining institutes of the state were not being formed as organizations to increase the pay of members, but to help members to so increase their usefulness that they would become invaluable to their companies.

Glen White Mining Institute

E. E. White, worthy president of the E. E. White Coal Co. was the principal speaker at the recent monthly meeting of the Glen White Mining Institute. Mr. White gave a plain old-fashioned heart-to-heart talk to the members of the institute. He said it was not how much in wages a man received under present conditions, but how far his wages went and how much he was able to save. The recent war, Mr. White said, among other things, had taught the people of the country how to save, yet he found a disposition on the part of many to forget that lesson and to sell their war investments below par. He pointed out that there are many forms of investment at satisfactory rates of interest, and tendered his personal service in aiding employees to make safe and judicious investments.

West Virginia Coal Association

A meeting of the executive committee of the West Virginia Coal Association was held in conjunction with representatives of various district associations of the state at Washington recently. The meeting was called especially to consider the car shortage, and it was decided to let the operators on a particular road handle the matter instead of attempting to deal with it as an association. The seasonal freight-rate bill was also under discussion. The general expression among the members was that the Frelinghuysen bills, now pending in Congress and which propose Federal control over the coal industry, are not necessary. The present source of trouble is the transportation situation alone.

Recent Patents

Apparatus for the Recuperation of Waste Fuel. Frank Laond, St Etienne, France, assignor to La Societe La Coke Industriel Societe Anonyme, St Etienne, France, a company of France, 1,334,76[illegible] March 23, 1920 Filed Nov. 15, 1919. Serial No. 338,3[illegible].

Apparatus for and Method of Mining. Lewis H. Eschelberger, Plainfield, N. J., and Raymond A. Walter, Frostburg, Md., assignors to Ransome Concrete Machinery Co., New York N. Y., a corporation of New Jersey, 1,334,894. March 23, 1920. Filed Oct. [illegible], 1916. Serial No. [illegible]49.

Dumping Hopper. Albert P. Lee, Chicago, Ill., assignor to the Leader & Body Co., Chicago, Ill., 1,334,913. March 23, 1920. Filed Oct. 31, 1918. Serial No. 260,741.

Fuse. Alfred L. Eustice, Chicago, Ill., 1,[illegible],229 March 30, 1920 Filed May 1, 1918. Serial No. 232,484.

Mine Door. Charles H Payne Soddy, Tenn., assignor of one-third to John J. Clift, Soddy, Tenn., 1,335,255. March 30, 1920. Filed Oct 11, 1919 Serial No. 329,902.

Pipe Wrench. Charles G. Martindale, [illegible], Cal 1,335,252 March 30 1920 Filed Jan. 15, 1919 Serial No. 271,245.

Coal-Handling Plant. Hobson S. Shimizu, Chicago, Ill., assignor to the Roberts & Schaefer Co., Chicago, Ill., 1,335,531. March 30, 1920. Filed May 18, 1918. Serial No. 235,234.

Rotary Pump. George Handley, Palmers Green, Eng., assignor of one-half to Percey Williams Bullock, London, Eng., 1,335,577. March 30, 1920. Filed Oct. 24, 1919. Serial No. 333,023.

Pump Jack. Arthur S. D. French, Bixby, Okla., 1,335,960. April 6, 1920. Filed June 3, 1919. Serial No. 301,394

Coal-Mining Machine. George McCarter, Denver, Col, 1,336,039. April 6, 1920. Filed Dec. 2, 1918. Serial No. 265,027.

Apparatus for Treating Fuel. Wilson L. McLaughlin, Decatur, Ill., 1,336,364. April 6, 1920. Filed Sept. 25, 1918. Serial No. 255,618

[U. S. patent specifications may be obtained from the Patent Office, Washington, D. C., at 10c each.]

Trade Catalogs

Quick Concrete Mixing. The Standard Scale & Supply Co., Pittsburgh, Pa. Catalog Y 190. Pp. 24.; 8½ x 11 in.; illustrated. Description of machines and apparatus made by the Standard company.

The Way to Increased Production. Du Pont Chemical Co., Inc., Wilmington, Del. Booklet. Pp. 15; 3¼ x 6¼ in.; not illustrated. Facts in regard to the company's sale of war surplus material.

Blawforms for Roads and Streets. Blaw-Knox Co., Pittsburgh, Pa. Catalog 9. Description of steel forms used in the construction of roads, curbs, gutters and pavements. Pp. [illegible] well illustrated.

Electric Hoists, Chain Blocks, Cranes and Trolleys. [illegible] Co., Wm. [illegible] illustrated. Descriptive, with price list.

Pneumatic Conveying Dust and Fume Recovery. [illegible] & Conveying Co., Cleveland, Ohio. Bulletin 1. Pp. 11; [illegible]. Description of special apparatus and its application to industry.

Short Course in Coal Mining. College of [illegible] University, [illegible] 6 x 9 in.; illustrated. Announcement of course to be given from June 21 to July 31; unfolding [illegible].

Sullivan Drill Steel Heater. The Sullivan Machinery Co., Chicago, Ill. Bulletin [illegible] Description of furnace or forge, operated by fuel oil, [illegible] drill and [illegible].

Diagonal Deck Concentrating Tables. The Deister Concentrator Co., Fort Wayne, Ind. Bulletin [illegible] illustrated. Description of the Deister-Overstrom type of table, calling attention to changes and improvements made.

American Trolley Carrier. The American Steam Conveyor Corporation, Chicago, Ill. Bulletin. Pp. 24; 7¾ x 10¾ in.; illustrated. Description of a one-man mechanical method of handling coal ashes, etc.

Multiwhirl Cooler. The Griscom-Russell Co., 90 West St., New York, N. Y. Bulletin 902 Pp 11, 6 x 9 in.; illustrated Description of device for cooling lubricating and quenching oils in the heat treatment of steel.

Industrial News

New York, N. Y.—The Hyatt Roller Bearing Co. announces the removal of the office of its Industrial Bearing division to a new building at 100 W. 41st St., New York City, where larger quarters have been secured for the advertising, sales and engineering departments of the division. D. Gleisen is the manager of the division.

East Pittsburgh, Pa.—The Westinghouse Electric & Manufacturing Co. has appointed **A. E. Hitchner** assistant to the manager, of the Industrial Department, in charge of mining and chemical industries. In 1906 Mr. Hitchner became engaged in the installation of coal-handling machinery for the Link-Belt Co. In 1912 he was appointed manager of the Wilkes-Barre suboffice of the Westinghouse company

Personals

Among the changes in the personnel of the plant management of some of the Solvay collieries in the northeastern coal fields of Kentucky are the following: **C. A. Warden,** who has been general superintendent over the Coaldale, Henry Clay, Big Branch and Lookout mines, in Pike County, for the past four years, goes to Huntington to assume the duties of assistant to A. B. Rawn, general manager of the Solvay Collieries Co. **Thomas DeVenny** succeeds Mr. Warden as general superintendent of the Edgewater properties. Mr. DeVenny has been superintendent of the Freeburn plant of The Portsmouth-Solvay Coke Co. for nearly four years, dating back to the time when that property was acquired from The Turkey Gap Coal & Coke Co. The normal production at that time was about 100,000 tons per annum. During Mr. DeVenny's superintendency, much development work took place including several mine openings, an additional tipple, the erection of a modern machine shop, a second company store, more than 100 additional dwellings, and the institution of various amusement and community service buildings. The normal production of coal now approximates 400,000 tons a year. Mr. DeVenny is widely known in the Tug River mining circles. **E. L. Bailey**, another well known mining man of the Williamson field, who has been superintendent of the Solvay operation at Tolland, on Pond Creek, since the installation of that plant, has taken the position as superintendent at Freeburn. Mr. Bailey made a record in the physical development of the Tolland plant and in the production of coal. The new superintendent at Tolland is **E. W. Price**, formerly with the Burnwell Coal Co. at Sprigg, W. Va.

John Jeremiah Jr., has been appointed general superintendent over the six mines of the Willisville Coal & Mining Co., in Perry County, Ill., succeeding his uncle Thomas Jeremiah, who recently died. Mr Jeremiah had been superintendent of one of the company's mines at Willisville for several years.

James Rollo has resigned his position with the American Railway and Mine Supply Co. of Chicago to accept one representing the Egyptian Powder Co., with headquarters in Marion, Ill.

E. P. Moritz, vice president in charge of sales of the Combustion Engineering Corporation, has resigned and expects to retire from active business indefinitely on account of poor health. He had been ill for some time previous to his resignation. No successor to Mr. Moritz has been named by the company which has offices at 11 Broadway, New York, N. Y.

F. A. Fitzgerald, formerly with the Sangamon County Mining Co., has been appointed manager of the Illinois and Indiana coal mines of W. H. Harris, Inc., of Chicago.

Edwin Ludlow has been elected president of the Alumni Association of the School of Mines, Engineering and Chemistry, of Columbia University, New York City. Other officers elected were: Alonzo B. Bradley, vice president; George C. Stone, secretary; John Sheafe Douglas, treasurer; and S. A. Goldschmidt, Henry C. Pelton, William W. Lightpipe and George E. Strehan, managers.

Arthur F. Martin, formerly with the West Virginia Coal & Coke Co. as auditor, is now auditor of the Boone County Coal Corporation, with headquarters at Sharples, W. Va. Mr. Martin has been connected with the Davis Colliery Co. and its successor the West Virginia Coal & Coke Co. for a period of 12 years prior to Jan. 1, 1920, when he became the sales manager for the Green Coal Co., operating at Adrian and Strader, W. Va.

J. H. Lewis is the new Western district manager of the West Virginia Coal Co., a large exporting concern with headquarters at Richmond, Va. Mr. Lewis will establish his headquarters at Huntington, W. Va. For a time he represented the Eastern Coal and Export Co. in West Virginia.

E. F. Wilson, formerly chief chemist for the Westmoreland Coal Co., stationed at Irwin, Pa., has opened a commercial testing laboratory and consulting office at 222 South Third St., Philadelphia, Pa., where he will engage in private practice, specializing in fuels, industrial waters, and so on.

H. E. Brockman, chief clerk for the Taylor Coal Co., at Herrin, Ill., recently resigned to accept a position as cashier for the Carney-Cherokee Coal Co., at Mulberry, Kan.

George Hudson, formerly mining engineer of the Old Ben Coal Corporation, at its West Frankfort, Ill., mines, has accepted a position with the Saline County Coal Co., at mine No. 6, Herrin, Ill.

Coming Meetings

Mine Inspectors' Institute of America will hold its annual meeting May 13, 14 and 15 at Cleveland, Ohio. Secretary, J. W. Paul, Pittsburgh, Pa.

Pennsylvania Retail Coal Merchants Association will hold its annual meeting June 23, 24 and 25 at Reading, Pa. Secretary, W. M. Bertolet, Reading, Pa.

The Rocky Mountain Coal Mining Institute will hold its annual meeting in Denver, Col., in conjunction with the National First Aid Meet on Aug 20 and 21. Secretary, F. W. Whiteside, Denver, Col.

M. O. I. Coal Association will hold its annual convention June 16, 17 and 18 at Cedar Point, Ohio. Secretary, B. F. Nigh, Columbus, Ohio.

National Retail Coal Merchants' Association will hold its annual meeting June 10, White Sulphur Springs, W. Va. Secretary-manager, Ellery Gordon, Philadelphia, Pa.

Kentucky Mining Institute will hold its annual meeting June 4 and 5 at Lexington, Ky. Secretary, C. W. Strickland, Huntington, W. Va.

American Society of Mechanical Engineers will hold its spring meeting May 24, 25, 26 and 27 at St. Louis, Mo. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

West Virginia Coal Mining Institute will hold its annual meeting June 7 and 8, at White Sulphur Springs, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

American Wholesale Coal Association will hold its annual meeting June 1 and 2 at Pittsburgh, Pa. Secretary, G. H. Merryweather, Washington, D. C.

The Colorado Retail Coal Dealers' Association will hold its annual meeting June 8, at Colorado Springs, Col. Secretary, E. Hopper, Denver, Col.

West Virginia Freeport Coal Operators' Association will hold its annual meeting June 3 at Kingwood, W. Va. Secretary, A. T. Carnahan, Akron, Ohio.

International Railway Fuel Association will hold its annual meeting May 24, 25, 26 and 27 at the Hotel Sherman, Chicago, Ill. Secretary, J. G. Crawford, Chicago, Ill.

American Institute of Electrical Engineers holds annual convention at White Sulphur Springs, W. Va., June 29 to July 2. Secretary, F. L. Hutchinson, New York, N. Y.

National Coal Association will hold its annual meeting May 25, 26 and 27 at the Traymore Hotel, Atlantic City, N. J. Secretary, W. B. Reed, Commercial Bank Building, Washington, D. C.

COAL AGE

The Weekly Journal of the Coal and Coke Industries

Volume 17 NEW YORK, THURSDAY, MAY 20, 1920 Number 21

Sympathy for the Railroads

NO fair minded coal man will raise a voice against the plea of the railroads for a substantial increase in rates. Only recently the coal industry went before the tribunal of the government, the Bituminous Coal Commission, asking for relief from oppressively low prices. The remembrance of those times and the spectacle of the railroads with hands tied make the coal industry halt before it sanctions any move on the part of Congress that may lead to putting their business in the same kind of harness. Senator Frelinghuysen's Coal Commissioner bill is harmless in this respect and it has many excellent provisions, but it is meeting with objection because it is seen as an opening wedge for permanent government control of the coal business.

Fair Prices for All

THIS coal industry of ours has never faced a more critical situation than that which confronts our business today. A coal operator from Chicago writes us further along this line and so well does he put it that we quote his letter. He adds, "The public is watching closely and we must see to it that the price we ask for our coal is just to all concerned. The time is here when no industry, however important or necessary, can be successful without the backing of public opinion. If we are going to sell our coal at reasonable prices and allow our sales organizations and distributors to exploit the public by asking exhorbitant prices for our coal, we are going to fail lamentably in perhaps the greatest crisis the present generation of coal men will be called upon to experience.

"Let those of us who market our coal through wholesalers be very sure that these wholesalers are of the right kind, so that we shall know that our coal reaches the ultimate consumer with only a fair and reasonable margin added for selling commissions. Let us see to it that our coal does not pass through three or four hands before it is finally sold to the consumer. It is our duty to watch these things and thus curtail at least one probable source of profiteering. It must be borne in mind that we are the ones who will suffer if the coal industry is put back under Government control.

"It is well known that the coal industry in years past has been looked upon with suspicion, although whether or not this suspicion was justified does not enter into the present situation. It remains, however, that our sales organizations are the individual points of contact we have with the public. Therefore it is entirely up to us what kind of an impression we make with the public from now on.

"The future of the coal industry is in our hands, and it is entirely up to us to decide by our own actions whether we are to manage our business ourselves or whether we are to be supervised once more by some form of Government control. Let the motto of the coal industry be, 'Fair prices for all.'"

Freight Jam May Affect Coal Market

COAL operators will get small consolation from the fact that car shortage and freight delays are crippling industries other than coal. Protests lodged at Washington with the Interstate Commerce Commission and other bodies against present transportation conditions mean that others than coal shippers are feeling the pinch. The term car shortage will have a new meaning to people hereafter and other business will better appreciate the position and the complaints of the coal man when lack of cars and freight blockades cause non-delivery of needed fuel and are made the basis for higher prices because of increasing costs.

One aspect of the present situation should be kept before the coal shipper. With industry slackened by lack of transportation to handle in- and out-bound freight, and with coal a deferred class of movement, a prolongation of present conditions may cause a slump in the stringency in demand. Whether such a slump will materialize and, if it comes, whether it will be of significant proportions, depends on the relative size of stocks of fuel and of other raw materials in the hands of manufacturers.

Our American Industries

SPEAKING generally the basal industries of the country are in the control of Americans. Perhaps that is why their regulation has been so easy and so little resisted. All through the war it was the essential industries of the country which had to bear the brunt of regulation and often it seemed as if the purpose was to make easier the operation of those not so essential. Never did the basal industries fail to respond. Laws of doubtful constitutionality, contravening all former practice, were accepted patiently and without litigation, in the hope that the war might be thereby more speedily and completely won. Concessions equally great were made without legal compulsion or even semblance of it.

The coal industry in North America is directed almost wholly by Americans and former citizens of the British Isles. It accepted every kind of regulation—a control almost equivalent to Government ownership. It made an average profit of 10 per cent, with which compare the profit of the Federal Reserve Bank, which was ten times as great. Hardly any business made as little during the period of the war as did the coal industry. The capital of one luxury-manufacturing corporation has just been increased from $3,000,000 to $100,000,000 without taking in new investors. Probably there is a little water in the stock, but what a large quantity of ploughed-in profits must be represented by that huge capitalization!

Water-Power Legislation and Coal

PERHAPS the so-called "super-power" project to study which the sum of $125,000 is to be alloted by Congress is as yet too much of a dream to excite the active interest of coal men. Coupled with water-power legislation now pending in Washington this measure would reorganize power production and distribution and transportation on the Atlantic seaboard and thereby reduce by one-half the steam coal used in this area, in which it is said 40 per cent of the bituminous coal produced in the country is consumed.

The water-power bill is designed to permit the general development of latent water power by private capital. In sections such as the South and West, where water power has been exploited, coal has lost markets and the further use of water to run the wheels of industry will still further reduce the demand for coal.

The prospect is not one, however, to frighten the coal producer, for it is inevitable that use creates new uses, and power, whether from coal, water or oil, will be demanded in ever-increasing quantity as time goes on. A single feature of the dream of the super-power project, the electrification of the railroads in the East, will so increase the effectiveness of our transportation system in this sadly congested area that new high limits on tidewater shipments can be reached.

Assigned Cars

OBJECTION to assigned cars was crystallized during the war by the extension of the practice to include commercial shipments in addition to railroad fuel. Prior to the summer and fall of 1917 the common practice was for railroads to make contracts with producers of bituminous coal guaranteeing a full car supply and often, if not usually, providing a minimum delivery that furnished the mine steady running time. The advantage of steady operation in reducing costs was as well known then as now, though not so scientifically expressed as by the Engineers Committee of the Fuel Administration. No such objection to such contracts were then made as are now voiced. Some operators regularly engaged in the business of supplying railroad fuel while others preferred to ship commercial coal. The producer who elected to tie up with the railroads was planning to take a smaller profit per ton on his product but a surer one—the operator who held his coal for the spot market was playing for larger profit.

The industry was on this basis for years, with sharp controversies each spring when the question of price came up for discussion between the operators and the fuel purchasing agents of the roads. Meetings were held at which the producers were told what price would be paid for coal that year and they usually had no choice but to accept if they desired railroad business. The certainty of a minimum of business in the dull summer time and of a full car supply in the winter if there should be a car shortage, was weighed against the low price, for beyond question the railroads used the power of the assigned car to secure a low price. The operators were unorganized, their objections were without weight and the railroads got their coal at their own figures.

A new era in the coal industry began with the contract season of April, 1917. Demand was without parallel and prices were higher than ever before recorded. The railroads were in financial straights and were trying to save on their coal bills by holding down the prices. The market for bituminous coal was so strong that assigned cars ceased to hold the lure of the past and many roads were unable to contract for their requirements, because they would not pay the going price. Such was the condition when in September, 1917, the Fuel Administration began its work. One of the first obligations assumed by the organization was the provision of coal for the railroads and certain essential industries that had failed to cover their requirements by contract. Priority orders for the roads were issued requiring shippers to give preference to engine fuel contracts. The Fuel Administration, acting with the Car Service Commission of the American Railway Association, assigned cars for industrial consumers and needy and negligent public utilities. This system of distribution failed utterly to meet the situation and was particularly obnoxious to the producers because in the stormy months in the winter of 1917-18 the assigned cars absorbed the available supply throughout the East and nothing was left for commercial customers not favored as war essentials.

After a bitter fight lasting more than a month between the Railroad Administration on one side and the operators backed by the Fuel Administrator on the other, assigned cars were, in May, 1918, forbidden by order of the President. The conditions under which they were abolished are important to bear in mind at this time. Government prices were in effect—one price for all. The railroads could not buy coal with cars. Price was eliminated from the equation. Distribution was absolutely in the hands of the Government and the roads could be and were assured of the proper share of the coal, in fact their requirements were given first preference. With the President maintaining his policy of the same price to all and the supply assured, the railroads did not need assigned cars.

In the spring of 1919, when contracts for the ensuing coal year were made, the roads were yet under Government supervision and the ban on assigned cars was still in effect. The demand for coal was so light, however, that no difficulty was experienced in making fuel contracts, although the matter of price was the subject of bitter controversy and sharp recriminations. The operators were better organized than before the war and better knew how to secure fair prices for their product. They had learned their costs and were disposed to hold prices above those costs. Government control of the railroads ceased on March 1, 1920, and on April 16 the Interstate Commerce Commission removed the restrictions on assigned cars.

Honest efforts were made by the representatives of the roads and the National Coal Association to get together on a program that would give assurance of an adequate fuel coal supply without the use of assigned cars. The effort failed, and failed because the operators are without legal power to collectively talk prices. Furthermore, the operators' associations are without power to allocate orders for coal among their members for any purpose and to insist upon and require the fulfillment of the orders. In other words, the two conditions that obtained during the period of Government control, assurance of price and of supply, are no longer in effect. The purchasers of fuel coal see in assigned cars a means to secure both, and until some plan is evolved the practice will be followed. The next move is up to the operators. Some new plan must be brought forth.

Seasonal Freight Rates Will Affect Coal Fields in Varying Degrees*

Differentials Recommended by the Engineers Greatly Increase the Incentive to Summer Buying—The Maximum Discount Proposed Is More Than Three Times the Normal Drop in Spot Prices in the Pittsburgh District

BY F. G. TRYON

At the hearings on the seasonal coal freight rate bill, Senator Frelinghuysen asked Director Smith, of the Geological Survey, for his opinion of the proposed legislation. In his testimony, Doctor Smith introduced facts which it is believed should be made available to the coal fraternity while the subject is under discussion. COAL AGE has requested F. G. Tryon, in charge of coal statistics for the Geological Survey, who prepared the exhibits, to summarize these new data.

HEARINGS on the seasonal coal freight rate bills have developed sharp differences of opinion as to the wisdom of the proposed legislation. Support of the measure has been confined largely to the fields of the Middle West, whereas the testimony presented by representatives of the Appalachian operators was generally adverse. Into this controversy it is not my place to enter. As I see it, the business of the coal statistician of the Geological Survey is to publish facts and leave the task of taking action on the basis of the facts to others. This article is therefore limited to a brief presentation of certain facts which may help to clarify the discussion. It might have been expected that the universal application of any change in the existing rate structure would produce a whole crop of unexpected developments. This has been clearly brought out by the testimony at the hearing of the Senate committee considering the bill.

Two bills are now before the committee, the original bill, introduced by Senator Frelinghuysen (S. 4,087), and a substitute bill (S. 4,278), proposed by a committee of the American Institute of Mining and Metallurgical Engineers, headed by Eugene McAuliffe. The first bill provides for a decrease of 15 per cent in all coal freight rates during the months from April to August, inclusive, of each year, and a corresponding increase of 15 per cent over the base rate during the remaining months of the year.

The substitute bill, introduced by the engineers, proposes three modifications of this plan: Fixed differentials in cents per ton are substituted for the percentage differentials; the differentials are graduated from month to month; the period of discount is from February to July instead of from April to August. At the hearings preference was generally expressed for the substitute bill, as far, at least, as the differentials were concerned.

Now what do these differentials proposed in the engineers' bill mean in terms of the average freight rate on coal? The differentials vary from minus 25 cents in March, April and May to plus 25 cents in October, November and December. According to the Bureau of Railway Economics, the average freight rate on coal is about $1.56 for bituminous and $2.28 for anthracite, both per net ton. These were the figures prevailing in 1919. They represent the average revenue per ton of revenue coal hauled by all roads in that year. The weighted average for anthracite and bituminous would be about $1.68 per net ton. In terms of this average freight rate the engineers' differentials would therefore vary from minus 15 per cent to plus 15 per cent. Table I gives the differential for each month, first in cents per ton, and then in per cent of the average freight rate. In the last column of the table the modified freight rate is expressed as an index number. Thus if the average for the year be taken as 100, the January rate will be 106; the rate in February, 95; in March, 85, etc.

Having reduced the freight rate, as it would be modified by the engineers' bill, to index numbers, we can now compare it with index numbers of the monthly changes in production. This is done in Table II. The first column represents points above or below the average freight rate, assuming the engineers' differentials to be applied. In the last three columns the production figures are shown in the same way.

The year chosen is 1913, the latest normal year. Thus in the month of April the engineers' differentials provide a discount of minus 15 points. The United States production in the same month of 1913 was 16 points below the average. Production in the Appalachian region was 15 points below, and in the Western States 17 points below.

TABLE I.

WHAT THE DIFFERENTIALS PROPOSED IN THE ENGINEERS' BILL (S. 4,278) MEAN IN PER CENT OF AN AVERAGE COAL FREIGHT RATE

Month	Average Freight Rate Per Net Ton	Differentials Proposed in Engineers' Bill (S. 4,278)	Differentials Expressed in Per Cent of Average Freight Rate	Index Number of the Modified Freight Rate ($1.68 = 100
January	$1 68	+10c	+ 6%	106
February	1 68	10c	- 6%	94
March	1 68	—25c	15%	85
April	1 68	—25c	15%	85
May	1 68	—25c	15%	85
June	1 68	—15c	9%	91
July	1 68	5c	3	97
August	1 68	+ 5c	+ 3%	103
September	1 68	+15c	+ 9	109
October	1 68	+25c	+15	115
November	1 68	+25c	+15%	115
December	1 68	+25c	15%	115

Average revenue per ton of revenue coal (both anthracite and bituminous) hauled by all roads in 1919.

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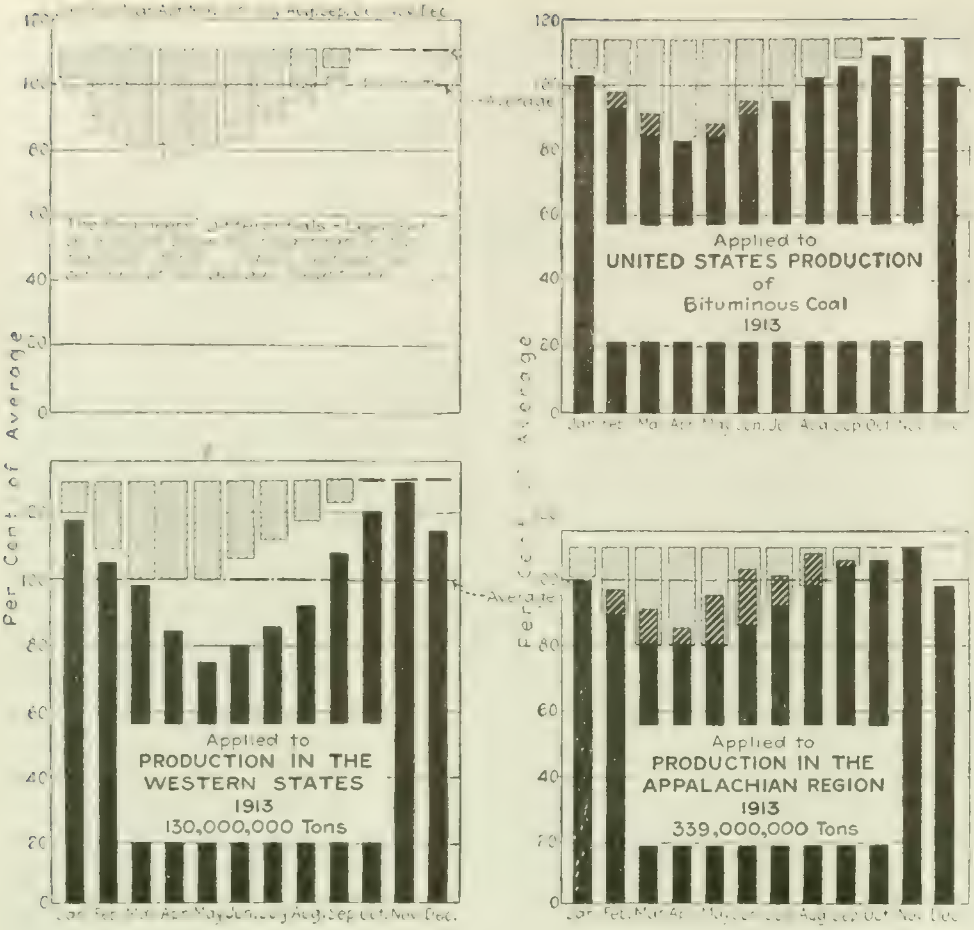
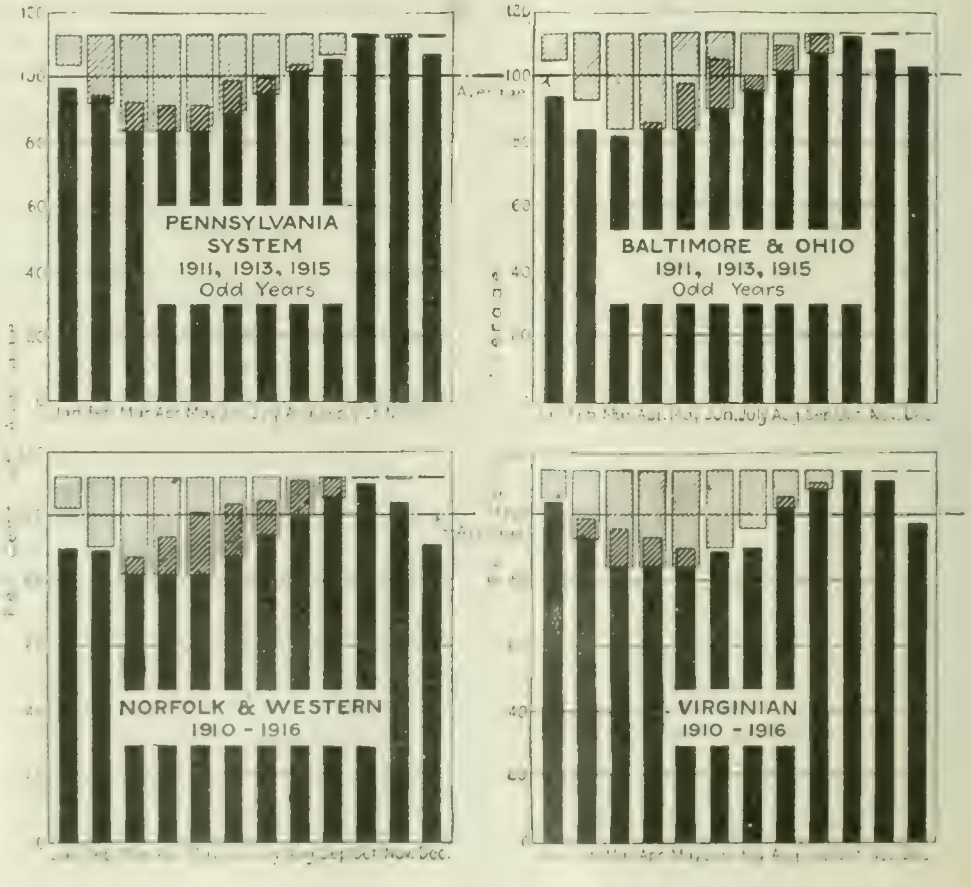


Fig. 1. Seasonal Rates Compared with Production

In this diagram the monthly differentials in freight rates on coal, proposed by the engineers' bill, are expressed as discounts below the maximum rate. These discounts are then superimposed on the diagrams of production of a normal year of the Eastern fields, the Western fiields, and of the United States. The differentials are too great for the East, not sufficient for the West, but about fit the average of the whole country.

Fig. 2. How Proposed Rates Would Affect Leading Coal-Carrying Roads

The discounts below maximum shown in Fig. 1 are here shown applied to four of the leading coal-carrying railroads. The system appears more nearly to meet the seasonal lag in production on the Pennsylvania than on the other roads. The discounts should be shifted several months to suit the Norfolk & Western, where the maximum rate of production is in August to October, rather than in the winter.



Examination of the table will show that the engineers' differentials are well in step with the fluctuations in the production of the United States as a whole, but not so well in step with either the West or the Appalachian region, if taken separately. This is because the prevailing seasonal swing in the Appalachians is different from that in the West. The high months in the West are from September to February. In the Appalachians they are, generally speaking, from June to November.

TABLE II.

COMPARISON OF THE DIFFERENTIALS PROPOSED IN THE ENGINEER'S BILL (S 4,278) WITH MONTHLY FLUCTUATIONS IN PRODUCTION—1913.

Months	Engineers' Differentials	United States Production	Appalachian Region Production	Western States Production
January	+ 6	4	0	+17
February ..	- 6	1	3	4
March .	-15	- 8	- 9	3
April	-15	16	-15	- -17
May	-15	11	5	26
June ...	- 9	4	3	21
July ...	- 3	4	1	--15
August . ..	+ 3	3	+ 8	9
September. .	+ 9	+ 7	+ 6	7
October	+15	10	+ 6	+ 20
November.....	+15	15	+10	+ 29
December	+15	- 3	- 2	+ 14

(For comparison the monthly production statistics have also been converted to index numbers in which the average for the year equals 100. The figures given here are points above or below the average.)

To bring out these differences more clearly Diagram I has been prepared. The purpose of the differentials is, of course, to fill up the hollow between the peaks in the annual production curve. To visualize the effectiveness of the discounts proposed, we may draw a picture of them and then apply the picture to pictures of the monthly production drawn to the same scale. The differentials are shown in the upper left-hand corner of the diagram as a series of inverted columns each one of which represents a total discount below the maximum rate. They provide in January for a total discount of 9 points, or 9 per cent of the average. In February the discount becomes 21 points; in March, April and May, 30 points; in June it recedes to 24 points; in July, to 18 points; in August, to 12 points; in September, to 6 points, and in the months of October, November and December, when the maximum rate is in effect, there is no discount.

Now suppose we imagine this picture of the discounts lifted up bodily and placed on top of a picture of the monthly production of coal drawn to the same scale (upper right-hand corner). We can shift the discount picture up and down until the maximum line comes to rest at the top of the black column of maximum production, which happens to be in November. The position it would occupy is shown by the shaded overprint. If the differentials were perfectly adjusted the discount columns would supplement the heights of the production columns and fill the hollow in the production diagram, and they do so supplement very neatly the 1913 production for the country as a whole. But when we come to apply the discount diagram to the hollow in the production diagram for the Western

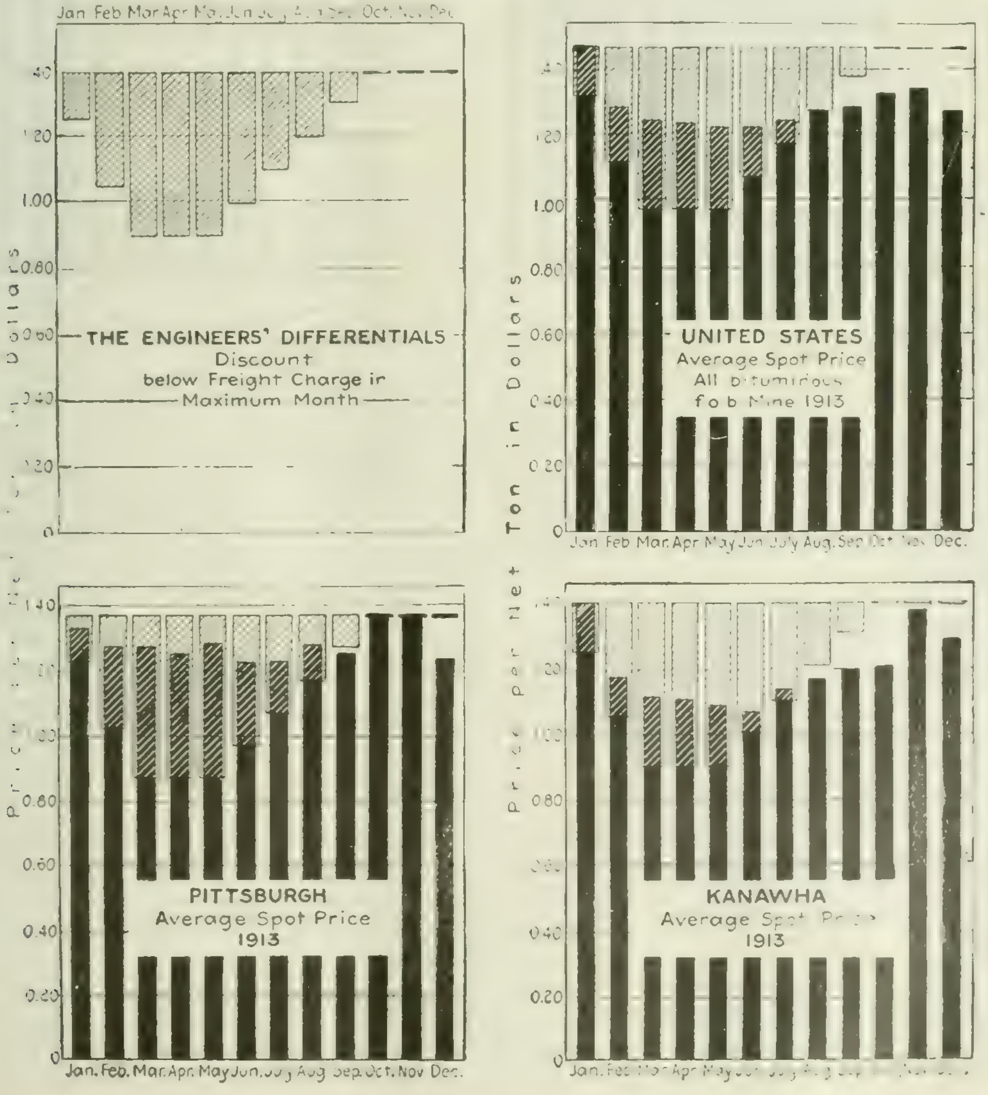


Fig. 3. Seasonal Rates Compared with Spot Prices

This diagram compares the differentials proposed by the engineers' bill, expressed as discounts below the maximum, with the range of spot prices for bituminous coal in the United States in several important fields. The discounts are plainly sufficient to encourage buying in the summer, being well below the normal summer level in spot prices.

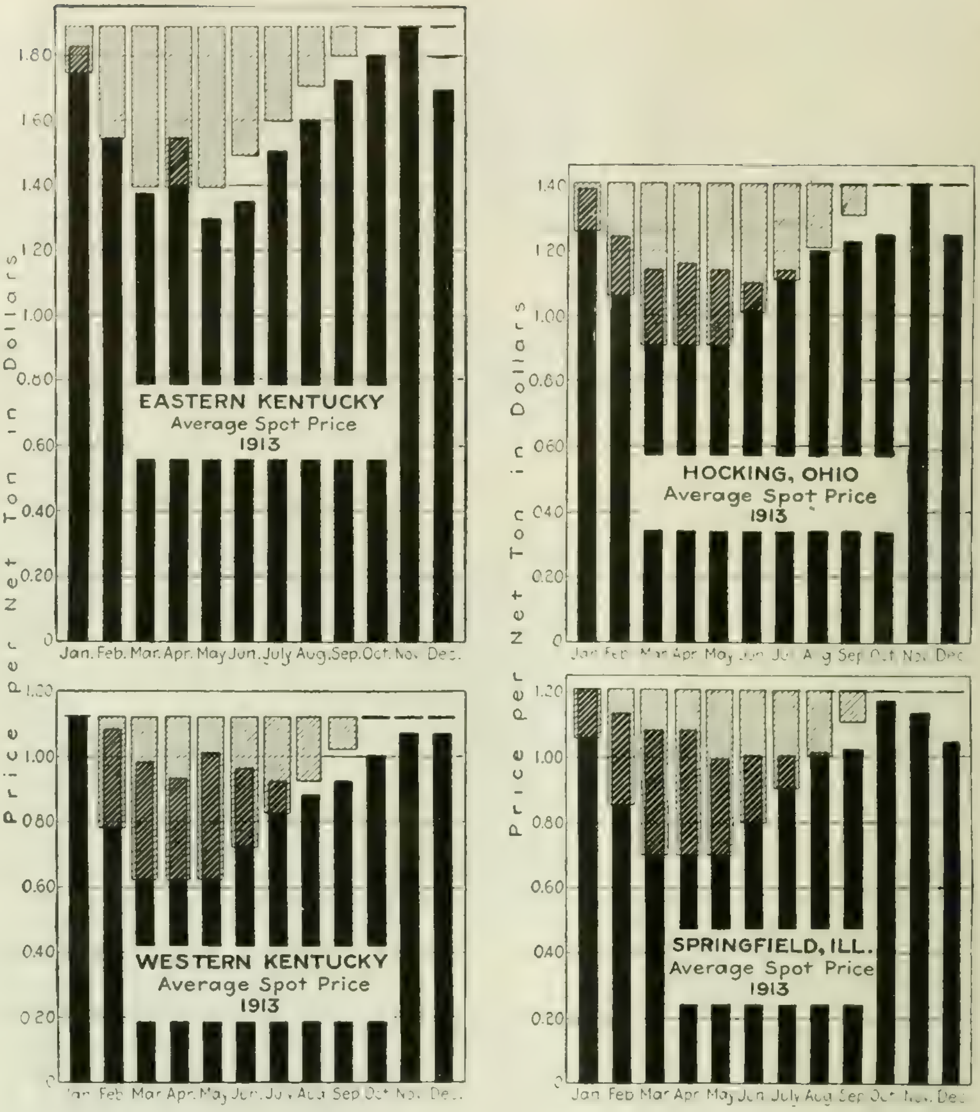


Fig. 4. Seasonal Rates Compared with Spot Prices

In three of the fields shown in this diagram the discounts offered by seasonal rates offer greater incentive to summer buying than have the drops in spot prices in the summer of a normal year. In eastern Kentucky the discounts in 1913 would not have equaled the drop in spot prices.

states, taken by themselves, the fit is not so satisfactory. It is even less satisfactory when the discounts are applied to the production diagram of the Appalachian region.

In the same way Diagram II shows the proposed discounts applied to shipments over four of the principal carriers in the Appalachian region. The discounts fit fairly well on the Pennsylvania and Virginian diagrams, but are somewhat out of place on the Baltimore & Ohio and Norfolk & Western. These examples might of course be multiplied, but they will suffice to show that there are wide variations from district to district, and that no single set of discounts can be devised to fit all cases.

It has been argued that a differential in freight rate would not be a more powerful inducement to storage in the summer than the natural slump in the market price of coal which normally occurs in the summer. To test this statement Table III was prepared. The year 1913 was one of active business in which the range of prices from winter to summer was apparently as great as may ordinarily be expected—much greater, for instance, than that in either 1914 or 1915.

The average spot price f.o.b. mine of all grades and sizes of bituminous coal in January, 1913, was $1.47 per net ton. January was the maximum month for that year. The lowest average price in any month was $1.23, in May. In other words, the maximum discount offered to the average purchaser of bituminous coal by the range of market prices was 24 cents for that year. In comparison with this figure the maximum discount offered by the engineers' differentials—50 cents per ton—appears very considerable.

TABLE III. COMPARATIVE INDUCEMENT TO STORAGE OFFERED BY PROPOSED SEASONAL RATES AND BY THE 1913 SUMMER SLUMP IN MINE PRICES

Months	Discount Below Freight Rate Maximum Month Under Engineers' Bill (S. 4,278)	Discount Below Average Spot F.o.b. Mine Price Maximum Month*
January	$0.15	0—Maximum month
February	.35	$0.18
March	.50	.22
April	.50	.23
May	.50	.24
June	.40	.24
July	.30	.22
August	.20	.19
September	.10	.18
October	0 Maximum months	.14
November	0	.12
December	0	.19

* Taken from Prices of Coal and Coke, 1913-1918, by C. E. Lesher. In 1913 the month of maximum price was January, when the weighted average spot price of all bituminous coals, all sizes, was $1.47 per net ton. In February the average was 18c. less; in March, 22c. less, etc.

To visualize the magnitude of the engineers' discounts alongside the range in spot prices Diagrams III and IV have been prepared. The scheme of presentation is the same as that used in the preceding diagrams. In this case, however, the differentials are expressed in cents per ton rather than in per cent of the average rate. The shaded overprint of the engineers' discount, it will be seen, overlaps the columns of average price in the majority of instances. Thus in the Pittsburgh district the market price at no time fell more than 15 cents below the maximum, a figure less than one-third of the discount afforded by the engineers' bill. The only one of the six districts shown in which the range of market spot quotations exceeded the engineers' discount was eastern Kentucky.

The diagrams would appear to indicate that the proposed differentials constitute a much larger incentive to store than do the ordinary fluctuations in market prices. Especially does this appear probable when it is remembered that the buyer can count upon the freight differential but has no guarantee as to what the future market price may be. The price usually goes up in the fall, but it does not always do so, and in any case there is no means of predicting how much the rise will be.

The testimony at the hearings brought out the fact that the engineers' bill as drawn was not intended to apply to intrastate rates. This is a matter of great importance, as the strictly intrastate business, exclusive of shipments to tide and to the Lakes, and of railroad fuel is about 37 per cent of the total production.

TABLE IV. DISTRIBUTION OF BITUMINOUS COAL PRODUCED IN THE UNITED STATES, 1917 AND 1918 BY ROUTES AND DESTINATIONS(a)

	1917		1918	
	Net Tons	Per Cent	Net Tons	Per Cent
Used within the State	201,000,000	37	209,000,000	36
Shipped to other States	129,000,000	23	137,000,000	24
Used by railroad	146,000,000	26	149,000,000	26
Exported by rail	9,000,000	2	11,000,000	2
Shipped to tidewater	39,000,000	7	45,000,000	8
Shipped to Great Lakes for cargo	28,000,000	5	28,000,000	5
Total production	552,000,000	100	579,000,000	100

(a) This statement does not include the tonnage re-shipped from Lake Superior and Lake Michigan [illegible]

Table IV summarizes the statistics of coal distribution in 1917 and 1918.

If the Lake and tidewater business is to be excepted from the application of the seasonal rate, the tonnage to which the plan would be applicable is restricted to the 23 or 24 per cent shipped by rail from one state to another, plus whatever part of the 26 per cent used by the railroads is revenue coal in interstate business.

Federal Trade Commission Takes Issue with National Coal Association

IN answer to the assertion of the National Coal Association that, according to the rules of the game, the Federal Trade Commission should cease to ask for monthly cost reports because the first round of the fight in the Maynard Coal Co. case went against them, Commissioner Gaskill has just sent a letter to coal operators.

Mr. Gaskill says the commission did not agree to be bound by the result of one suit. In fact, pointing out some of the advantages of monthly coal cost reports, he asks support of operators in making them a success. Many reports, he says, continue to be received. The letter is as follows:

"I am writing to acknowledge the receipt of your letter, advising the commission that your Company deems it inadvisable to furnish monthly cost reports pending final adjudication by the courts of the power of the Federal Trade Commission to require such reports from coal mining companies.

"We note your statement that this position is, as you understand it, in harmony with arrangements made with the attorneys representing the commission with relation to the suit brought by the Maynard Coal Company.

"We fear that in some way a misunderstanding with reference to the attitude taken by the commission in this regard has arisen, and for this reason desire to make it clear to you that, following suggestions made to us that it would be advisable to test the constitutionality of the statute by which the production of these reports was authorized, we consented to co-operate in the early presentation of a series of actions, but we did not agree that, in event of a decision in one of these cases adverse to the exercise of the statutory power, the commission should be bound thereby with respect to other companies not parties to the action.

"if it has been represented to you that the commission agreed to accept an adverse finding in one of these cases as conclusive as to all companies pending a final adjudication, we regret to say that the attitude of the commission has not been properly understood or interpreted to you.

"The purpose which the commission is endeavoring to serve by the collection of these cost reports, and the issue of monthly bulletins based thereon, was deemed by Congress to be in the public interest, and the commission does not believe that it should regard this determination of public interest as dispelled by the single decision recently pronounced.

"We find that a very large number of coal operators are sufficiently impressed by the value of having on record with a disinterested body the actual facts connected with their coal production as to lead them to waive any question arising out of this decision, and not only to furnish the reports but to urge that the commission to continue this collection and publication of its monthly bulletins. The existence of this body of facts and figures is valuable both to the operators and to the general public; to the former because it is their protection against suspicion and to the latter because it affords a proper basis from which to draw conclusions.

"The commission earnestly desires to obtain the results contemplated by the statute without resort to penalty proceedings, and in view of the fact that so large a proportion of the coal operators realize the value of these reports, the commissions entertains the hope that irrespective of the Maynard decision it will continue to receive through the co-operation of the operators the facts which will serve as a basis of cost ascertainment.

"The commission submits to those operators who are not now within the scope of the Maynard decision, but who are inclined to take the effect thereof to themselves, that they consider this question in the long view whether it is not to their interests as well as to those of the general public whom they serve, to record the actual facts connected with their industry."

On May 8 President Wilson issued an executive order directing the Council of National Defense to take over the records of the War Labor Board and complete any unfinished business.

A new suggestion for handling the problem of seasonal movement of coal is contained in the suggestion of prominent coal operators that in the summer months a drawback on the freight charges be allowed for coal that is put into storage, thus encouraging the very thing for which the seasonal rates are devised. What do you think of the proposal?

Seasonal Rate Bill Reported by Committee

A SEASONAL coal freight rate bill has been agreed upon by the Frelinghuysen sub-committee and reported favorably to the full Senate Interstate Commerce Committee, of which Senator Cummins of Iowa is chairman. The bill as reported embodies the rates and the months proposed in the engineers' bill. No exemptions are made for shipments to tidewater or on coal intended for transshipment over the Great Lakes. When the rate is seventy-five cents or less it is excluded from the provisions of the bill. The Interstate Commerce Commission is given more latitude than in either of the bills which had been proposed. The scope of the bill has been extended somewhat and includes anthracite and bituminous coal, coke, lignite, briquets, boulets and petroleum coke.

Since Congress apparently is determined to have some form of seasonal coal rate legislation, operators are discussing an alternative proposition. It is suggested that a form of drawback be arranged on coal actually stored. Such an arrangement, it is pointed out, would not reward the purchaser who accepts the freight reduction but who does not store the coal. Since the avowed object of the bill is to promote storage, several prominent operators, at least, are of the opinion that the drawback proposition would do more to insure storage than a blanket reduction in rates. It is their belief that such a proposition is feasible and that it could be carried out as easily as are the milling-in-transit rates and other such tariff arrangements.

In its unanimous report to the full committee the sub-committee report itemizes the beneficial results which may be expected from the seasonal rate, as well as the principal objections which are raised against such rates. Reasons are advanced in an effort to show that these objections are untenable. These analyses are those which were announced by Senator Frelinghuysen several months ago in the course of one of his speeches on the subject in the Senate. As they have been published widely, they will not be repeated here. Extracts from the report of the committee are as follows:

"The Interstate Commerce Commission, to whom was referred the bill (S. 4278) to further amend the Interstate Commerce Act, as amended, having had the same under consideration, having conducted extended hearings respecting both bills, and having heard the testimony of numerous coal operators, coal dealers and representatives of chambers of commerce and other local business associations, in addition to the testimony of the director of the United States Geological Survey, the chairman of the Interstate Commerce Commission, and a representative of the railroads, reports thereon with the recommendation that the bill be passed with amendments.

"This bill incorporates amendments suggested by Chairman Edge E. Clark, of the Interstate Commerce Commission. It has the unqualified and unanimous approval of the members of that commission. The bill S. 4087 proposed that rates on coal should be 15 per cent less than the tariff rate from April 1 to Aug. 31 in each year, and 15 per cent above the tariff rate for the remainder of the year.

"While a considerable number of coal operators appeared at the hearings and testified against the proposed legislation, the opposition of the operators was by no means unanimous. One of the most earnest advocates of this legislation is Eugene McAuliffe, of St. Louis, Mo., a gentleman who has had many years of experience in connection with the operation of railroads.

"Most of the operators who opposed the legislation founded their objections on local consideration peculiar to their own properties in relation to the changes in rates proposed in this legislation. For example, certain operators whose coal is of such inferior quality that it will not store satisfactorily feared the introduction of rates which would encourage the storage of the coal produced by their competitors. The sub-committee feels, however, that legislation which will result in incalculable benefit for the whole public and which will entail but slight disadvantages for the great majority of mine operators, should not be denied approval because it may be injurious to the interests of isolated coal operators.

"Some of the criticism aimed at the proposed legislation was based on the fact that it affected coal moving to Lake Erie points for trans-shipment by water to upper Lake ports and coal moving to tidewater, as well as coal moving but a short distance. This bill remedies the latter objection by specifically excluding from its operation coal moving on rates of 75 c. or less. It also confers on the Interstate Commerce Commission the broadest discretion to alter or modify the prescribed differentials where their enforcement might result in unreasonable hardship to individuals, communities or carriers, thus permitting the commission to examine carefully and to remedy peculiar local situations.

SUMMER STORAGE IS THE SOLUTION

"The committee realizes, of course, that the feasibility and effectiveness of the proposed legislation depend very largely upon the practicability of storing coal in large and small quantities. It therefore solicited and received a large amount of testimony from such experts as George Otis Smith, director of the U. S. Geological Survey, various coal operators and from coal dealers on this point. As a result of this testimony and from information secured from correspondence, the committee entertains no doubt whatever that practically every kind of coal mined in the United States can be stored safely, conveniently and cheaply.

"The tonnage of coal produced which cannot be stored satisfactorily is almost negligible. The committee is of the opinion that most of the testimony advanced to cast a doubt on the feasibility of storing coal is based almost uniformly on a disinclination to change the present hand-to-mouth policy under which the country now obtains its coal, scarcely knowing one day whether the next day's supply of coal will be available or not. It feels that this ultraconservative attitude, in the face of constantly recurring coal famines, bringing unemployment and possible starvation in their wake, is entirely unwarranted."

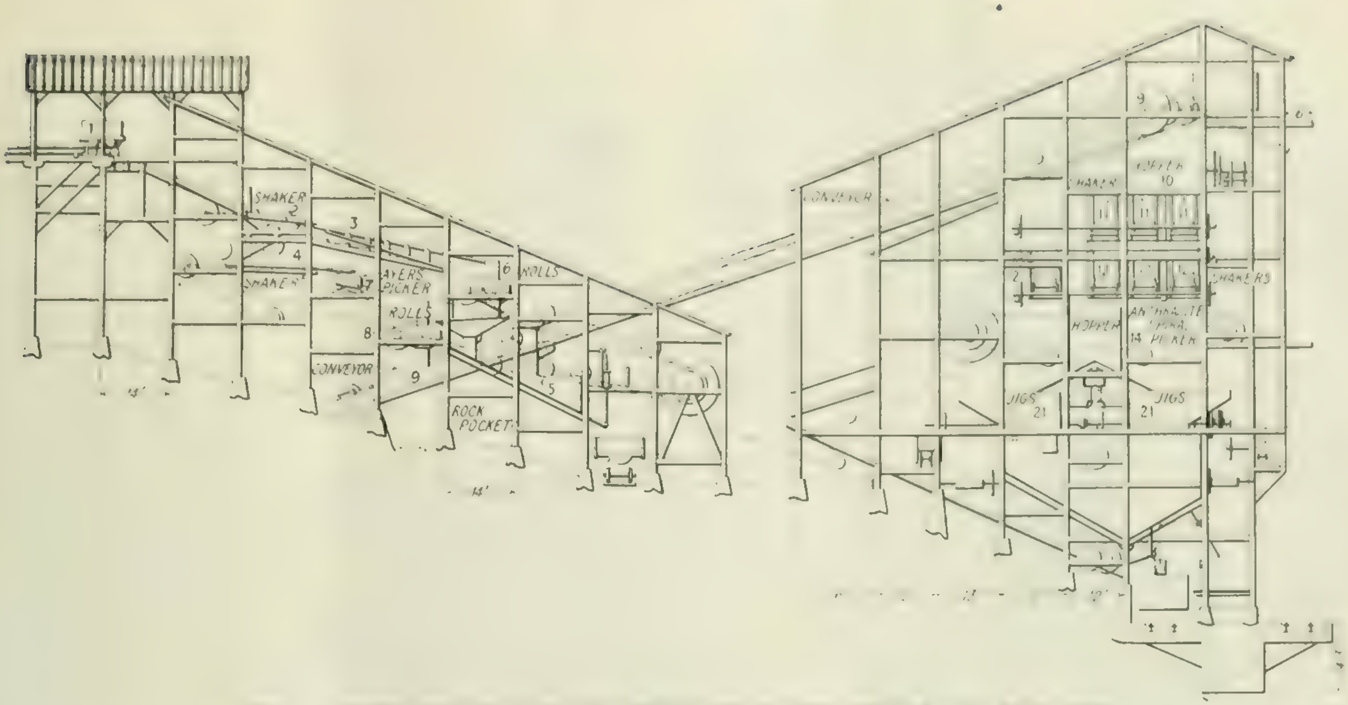


FIG 1 CROSS-SECTION OF THE ROCK-SEPARATOR HOUSE AND BREAKER

Much of the rock is separated from the coal before it goes to the breaker proper. This simplifies the problem of breaker preparation and saves much wear and tear on the breaker machinery.

An Anthracite Breaker That Is Different

Four Important Details, Differing from Ordinary Practice, Have Been Incorporated in the Design of This Breaker—These Innovations Have Been Tested and Found Satisfactory in Operation

By Dever C. Ashmead
Tarrytown, N. Y.

During the past few years breaker construction has been revolutionized. Probably the most advanced structure of this kind of all those built or rebuilt is the No. 11 breaker of the Lehigh Coal and Navigation Co., near Coaldale, Pa. This breaker has now been in operation less than a year, but the new features that were installed have been thoroughly tried out and have proved successful.

Four important details have been incorporated in the design of this breaker that are either entirely new or have been used only to a limited extent in plants previously built. Never before have all these features been combined in one breaker.

The new features, which will be described and discussed in the order named, are as follows: The rock-separator house, a different type of shaker screen from that usually employed, a combination of mechanical pickers and jigs and a system of motor drive controlled from one central point.

Rock Is Separated Outside Main Breaker

Two main divisions are made in the preparation of the coal at this breaker. These are: The rock-separator house and the regular breaker. The function of the rock-separator house is indicated by its name. All that is done in this building is to remove the large rock from the coal and crush the large coal to its proper size for treatment in the breaker. Although scarcely new this system is not common. It has been employed elsewhere chiefly, however.

The rock house is part of the original breaker and is constructed mainly of wood. The new breaker, however, is of the latest type of steel construction. The floors are of steel and concrete and no wood is used except where necessary in the machinery for the preparation of the coal. The motor houses, which will be referred to later are of concrete, while the transformer house is of brick.

Breaker Is Located Half Mile From Mine

Steam locomotives haul the coal from the mines, which are about a half mile away, to the yard tracks. Thence the cars are transferred to the dump by means of a "godevil" or barney. A Lansford dump built by the coal company at its own shops is used to discharge the coal from the cars. This type of dump is operated by compressed air. It has an hourly capacity of 150 cars, each of three tons, making a total of 450 tons that can be handled every hour if necessary.

The accompanying illustrations show a cross section of the breaker and plans of the rock-separator house. All numbers used in the text to indicate the different pieces of machinery will be found to refer directly to the plans and elevation of the rock house and the breaker as well as to the flow sheet.

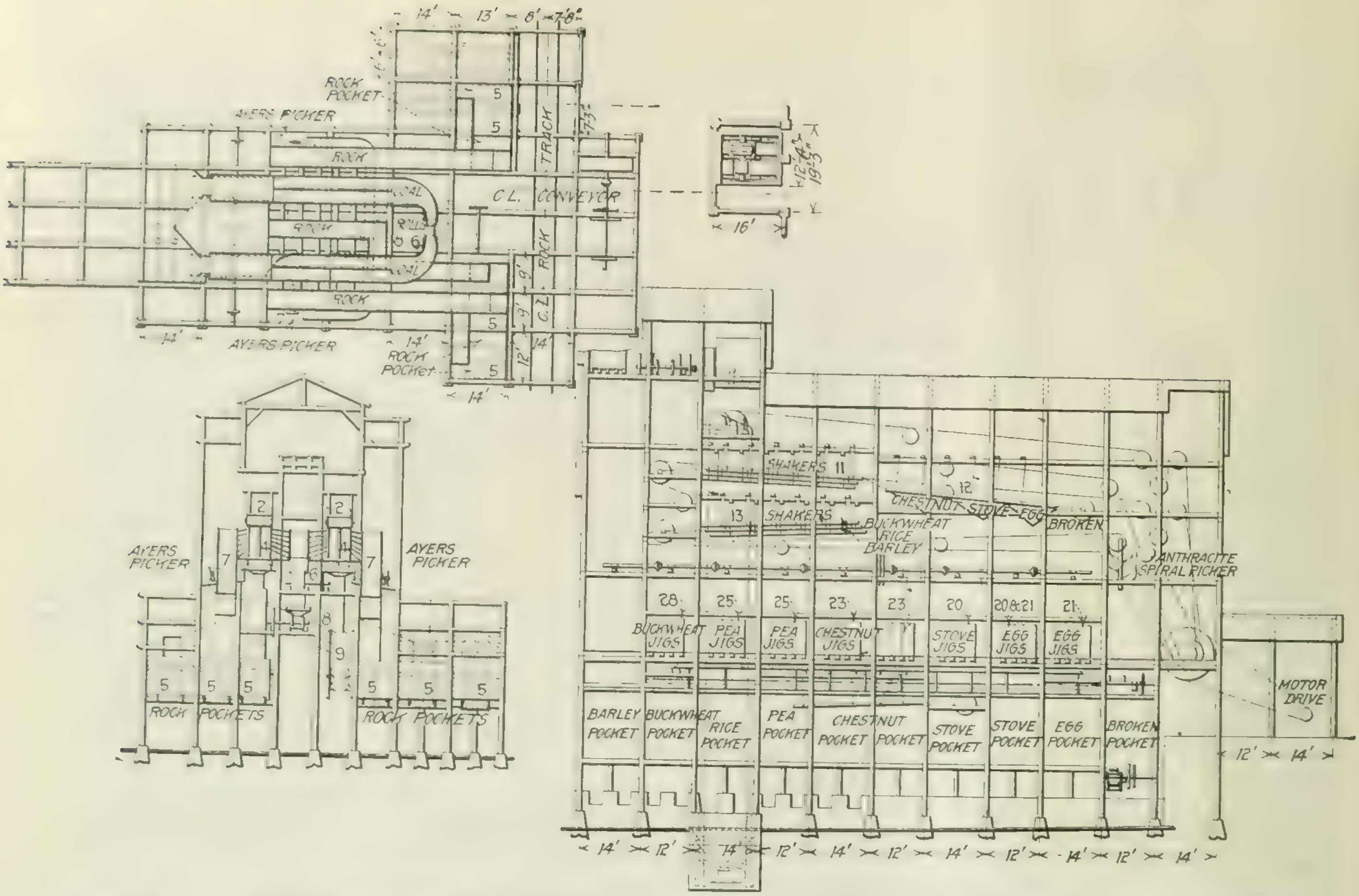


FIG. 2. PLAN AND CROSS-SECTION OF THE ROCK-SEPARATOR HOUSE, WITH SECTION OF THE BREAKER

Showing the arrangement of machinery in both buildings. The jig and shaker drives are at right angles to each other.

After being dumped the coal passes over the "bull shakers" (2), on which two sizes are made. Coal six inches and larger passes over these shakers while that under six inches passes through them. The large-size coal then goes over a picking chute (3), where the rock is separated and is sent direct to the rock pocket (5), while the coal passes through a set of rolls (6). Coal that passes through the bull shakers (2) goes over another set of shakers (4), on which two sizes are made, coal of steamboat size and larger, and coal smaller than steamboat. The larger size is picked on Ayres pickers, and the coal is passed to a set of rolls (8), while the rock is sent to the rock pocket (5). The size under steamboat coal from shaker (4) goes to the conveyor leading to the new breaker, as does the coal from the rolls (6) and (8) as shown in Fig. 4.

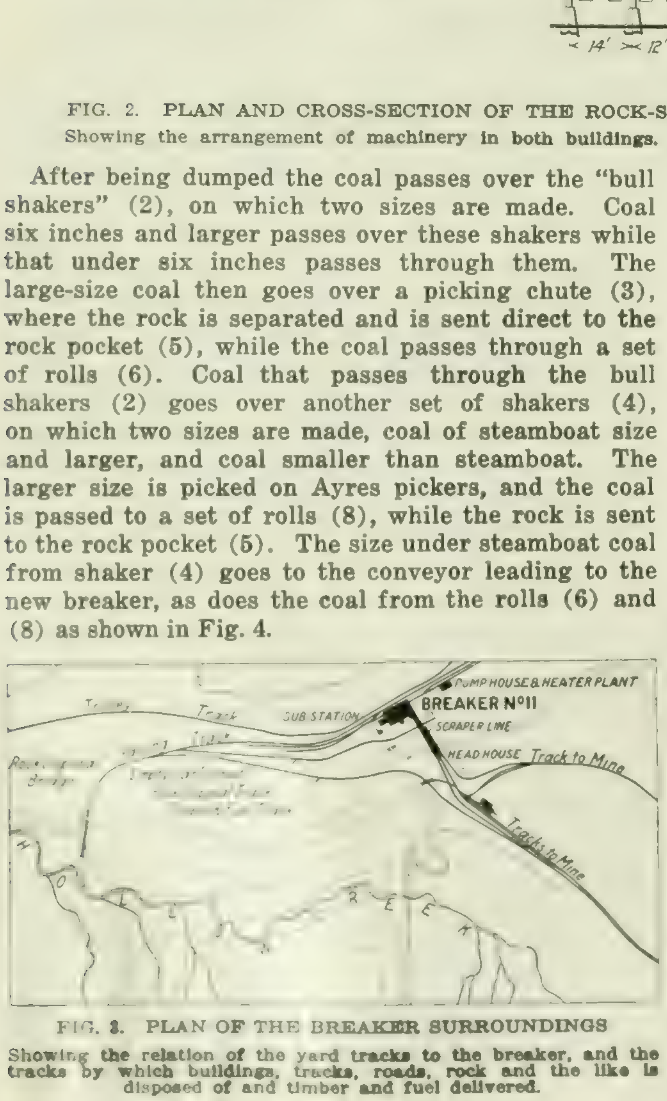


FIG. 3. PLAN OF THE BREAKER SURROUNDINGS

Showing the relation of the yard tracks to the breaker, and the tracks by which buildings, tracks, roads, rock and the like is disposed of and timber and fuel delivered.

This conveyor delivers the coal into a hopper (10) at the top of the new breaker, from which it is delivered by three feeders to three sets of shaking screens (11). On these shakers only two separations are made—over pea in size, and pea and under.

The over-pea size passes directly from the shakers (11) to the long shakers (12). As is rather unusual in the anthracite field, these long shakers have only one deck each but make four separations, namely, grate, egg, stove and chestnut coals. These shakers are thirty feet long; on the first twelve feet chestnut passes through, on the next nine feet stove coal passes through, on the last nine feet egg goes through, while the grate coal passes over. This grate coal then goes to three anthracite spiral coal pickers (14), on which the coal, bone and slate are separated. The coal is then hand picked and passes to the grate pocket, while the rock goes to the rock conveyor. The bone coal goes to a set of rolls (16), and from thence to the condemned coal conveyor (31). The rock from the spiral pickers (14) is hand picked and the coal recovered is sent to the grate pocket, while the rock is sent to the rock conveyor.

Egg coal from the long shakers (12) passes to a hopper (18) directly behind the egg jigs (21), of which there are three. They are of the double type, and the coal is fed to them uniformly from the hopper. The hopper is installed for the purpose of providing a constant and steady flow rather than an intermittent one. The hopper prevents the coal from entering the jigs so rapidly as to clog them. Consequently it tends to aid the jigs to prepare the coal more thoroughly.

The jigs are of the Elmore type and make 100 strokes per minute. The coal which leaves them goes to the egg pocket, but the rock is hand picked, the coal which is saved being thrown into the coal chute and passing with the balance of the coal to the pocket, while the rock goes to a shaking screen (33). Its subsequent treatment will be described later.

Preparation of the stove and chestnut is exactly the same as that given egg coal, just described, except that the treatment of chestnut coal differs slightly after its passage through the jigs. This slight change is that the rock from the jigs is not hand picked as is the case with the egg and stove coal. Three double jigs handle the stove coal and the same number take care of the chestnut.

FINE COAL IS SIZED ON SHAKER SCREENS

From shaker (11) the pea coal and smaller passes to another shaker (12), which makes only one separation—pea and coals finer. The pea coal passes to the pea hopper (24), and from thence is fed to the pea jig (25), where it receives exactly the same treatment that the chestnut coal received, which has been previously described.

The fine coal from shaker (13) is passed to another shaker (26). This has three decks and prepares four sizes of coal, buckwheat, rice, barley and fine. Buckwheat coal is jigged just as is the pea and chestnut and receives the same subsequent preparation. Rice coal does not receive any further treatment and goes directly to the rice pocket. The barley coal, like rice, passes on without treatment. The fine coal from shaker 26 passes to shaker 33 and is fed onto its second deck, the rock from jigs 21, 22, 25 and 28 being treated upon the upper deck of the shaker.

Oversized rock goes to the rock conveyor while the undersized and the coal passes to the second deck of the shaker. All of the particles over $\frac{3}{64}$ in. pass over this second deck and go to the condemned coal conveyor, while the finer particles pass through to another shaker (34), on which No. 2 barley is made. This size then goes to the No. 2 barley pocket, while the culm passes to the culm pump for delivery to the slush bank.

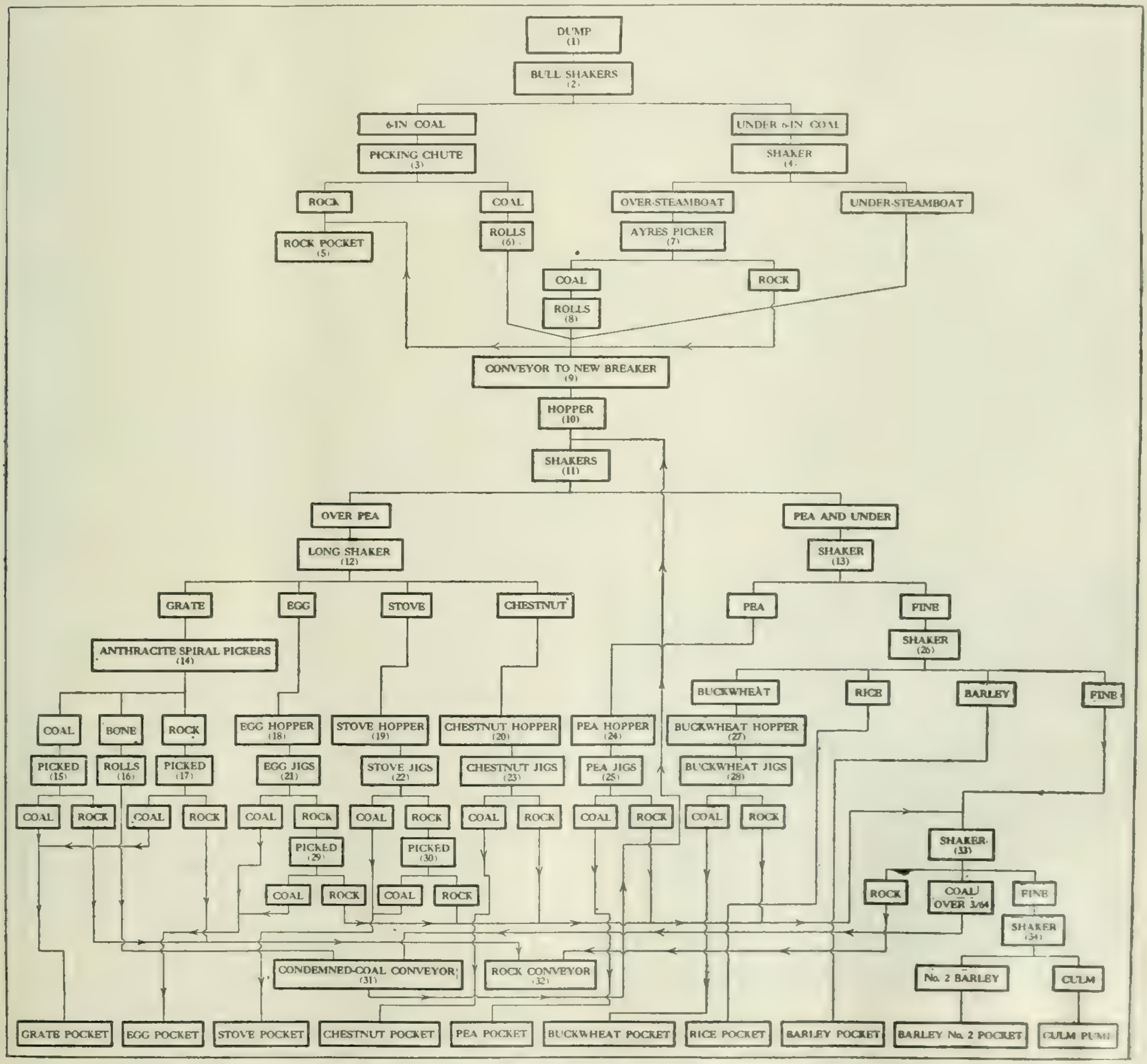


FIG. 4. FLOW SHEET OF BOTH ROCK-DISPOSAL HOUSE AND BREAKER

The coal which has been delivered to the condemned coal conveyor (31) is carried to the shaking screens (11) for retreatment. The rock which has been sent to the rock conveyor (32) is taken to the rock pocket and from here hauled to the rock bank.

Losses of Coal to Slate Pile Are Low

Some interesting results are obtained at this breaker and these may be of interest. The breaker itself has a capacity of approximately 2,000 tons in eight hours. The percentage of the different sizes of coal made, the amount of slate in the coal and also the percentage of the coal in the refuse slate are given in the following table:

Size of Coal	Per Cent of Size Made	Per Cent of Slate in Coal	Per Cent of Coal in Slate Refuse
Broken	3.8	...	2.0
Egg	7.8	2.0	2.0
Stove	9.7	3.5	2.8
Nut	17.2	5.0	3.1
Pea	10.6	8.0	3.5
Buckwheat	12.2	10.0	4.1
Rice	15.5	....	...
Barley	20.2	....	...
Barley No. 2	3.0	..	2.2

The domestic sizes of coal make 38.5 per cent of the total produced, while the fuel sizes amount to the large proportion of 61.5 per cent.

It will be noticed that thus far attention has been called to three of the reasons why this breaker is "different," but probably the most important reason is the fourth and last, which has to do with the drive and control.

Three main and two minor drives are employed in this breaker. One of the main drives operates the machinery of the rock-separator house, another runs the jigs and a third the shakers. A separate motor is used in each case, the jigs requiring a 400-hp. machine and the shakers one of 500 hp. Allis-Chalmers motors are used for both shaker and jig drives, being connected to the main shafts by 36-in. belts with pulleys on 50 ft. centers.

Shaker and Jig Shafts at Right Angles

One unusual feature in the main drives in the breaker is the fact that the shaker and the jig shafts are at right angles to each other. Besides the three main drives there are lesser ones—that required for the compressor and that necessary for the conveyor line from the rock-separator house to the breaker. This last drive requires a 250-hp. motor.

Alternating current is utilized at this breaker. It is received at 11,000 volts and is stepped down to 440 volts. The transformers used are Westinghouse 500-kva. instruments, which are housed in a separate building.

The most unusual feature of this breaker is the control. All the machinery can be started or stopped from a single control room in the breaker. This room is in telephonic communication with all parts of the building and as a result in case of accident the plant can be quickly shut down.

Morrow Returns to Washington From Western Trip

J. D. A. MORROW, the vice-president of the National Coal Association, returned to Washington Monday, May 10, 1920, after attending operators' meetings at several points in the Middle West.

Alcohol Is Already Being Produced From Coal on a Commercial Scale

ETHYL alcohol and its derivatives have been extracted successfully and on a commercial scale from coke-oven gas by Ernest Bury, of the Skinningrove Iron and Steel Works, in Great Britain. A perfect motor fuel has been produced and, as the adoption of the internal-combustion engine is rapidly extending, the importance of this development is apparent. The liquid-fuel resources of the world are strictly limited, but the consumption of these fuels is growing by leaps and bounds.

The practical working of Mr. Bury's process at the Skinningrove works, where 5,800 tons of coal are carbonized per week, has revealed an average yield of 1.6 gal. of alcohol per ton of coal carbonized, and as the total weight of coal which was reduced to coke in Great Britain in 1918 was 14,635,000 tons, the application of this process to the whole of this coal would yield 23,416,640 gal. of alcohol, representing at 2s. per gallon a sum of £2,341,664.

Having regard to the scarcity of liquid fuel that production in itself is important. It is national suicide for Great Britain or any other country to continue to burn any substance which might be converted into liquid fuel. The recovery of alcohol at the gas works of Great Britain would yield a further 27,000,000 gal., or taking alcohol and benzol together, the total quantity of liquid fuel available for extraction through the carbonizing of coal would be 114,000,000 gal., as against a present total consumption of 160,000,000 gal. per annum.

The process of extraction by contact with sulphuric acid is not a new discovery, but Mr. Bury was the first to establish it as a commercial proposition. The best results are achieved at a temperature of 60 to 80 deg. C., and in his process Mr. Bury carried utilization of the heat from the coke-oven plant to the utmost limit. Ether, chloroform, iodoform, acetic acid and acetone are among the derivatives which were obtained from this coke-oven gas after the benzol had been extracted.

Skinningrove was the only ironworks in Great Britain which during the war produced trinitrotoluol for the Ministry of Munitions and produced it on a prodigious scale. It was bombed by German aircraft on several occasions; possibly because work of this character was known to be carried on there.

Senate Sub-Committee Reports Favorably on Bill to Prevent Railroad Strikes

A SUB-COMMITTEE of the Senate Interstate Commerce Committee on May 13 reported favorably the Poindexter anti-strike bill for railroads.

Senator Poindexter, chairman of the sub-committee, said minor amendments would be attached which will not in any way invalidate or impair the efficacy of the measure, and added that the bill was designed "to prevent the tying up of interstate transportation on railroads of the country."

The bill will go back to the full committee, the Senator said, within a few days.

On May 12 the sub-committee favorably reported the Frelinghuysen bill to establish seasonal coal transportation rates, but action by the full committee was deferred.

Property Owners Try to Control a City Mine Fire by Strip Pit and Clay Bank

A Mine Fire of Unknown Origin Is Burning Under One of Pittsburgh's Most Exclusive Districts — It Has Already Destroyed Much Coal and Surface and Jumped a Clay Barrier

By Donald J. Baker
Pittsburgh, Pa

PITTSBURGH and its immediate vicinity has been the scene of many mine fires. A number of these have been of an incipient nature, being early "nipped in the bud," while others have been more or less chronic and have caused to property owners and the city losses running into thousands of dollars. The stage for these fires has been set by topographical conditions, the number of hills within the city limits making a large area of cropping and lightly buried coal which does not underlie the entire city but is found only in the hilly regions, where it is fairly easy to trace its contour lines.

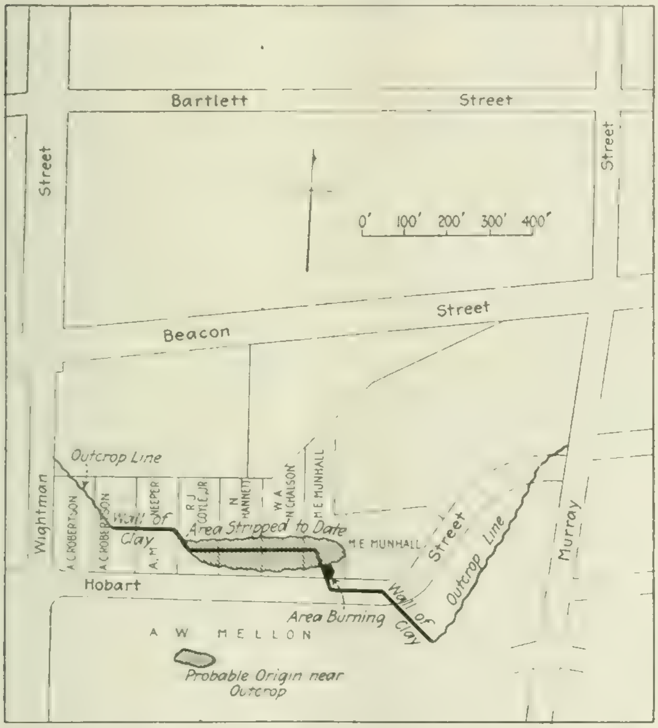


FIG. 1. MAP OF AREA WHERE FIRE IS BURNING

This shows a portion of the outcrop, the clay barrier that the fire has crossed and the property and street lines

Furthermore, the early history of the city shows that numerous small mines were opened and worked at intermittent periods, only to be finally abandoned. These make possible a rapid progress of any fires which may get started. The mines at the time of their operation were utilized exclusively for supplying the domestic needs of the suburban area adjacent.

In the eastern end of the city, which has been the section built up most rapidly in the last twenty years, there are many areas that are underlaid with coal. This particular section was mined during the early days and in a haphazard manner. The fact that the ground was undermined did tend in a small degree to make purchasers careful, but, with the proofs visible today of the disadvantages of this undermining it is safe to assume that, had the buyers foreseen the future, few if any of the lots would have commanded the fancy figures that were paid for them.

One of the latest fires that the city officials as well as the property owners have had to contend with has been in a portion of the Squirrel Hill district, which is considered one of the most exclusive residential sections of the city. Squirrel Hill, so called, lies adjacent to the Schenley Farms area of the East End, which in the last twenty years has been the scene of considerable building activity.

The section of this district which has been affected by the fire lies on a small hill, twenty acres of which are underlaid with coal averaging six feet in thickness. About forty years ago some of the coal was mined, but only to a limited extent. From appearances where the exposed portions of the mine can be seen it is safe to assume that it was developed quite crudely. The main entries are narrow, which indicates that the wheelbarrow probably was the chief means of transportation.

There is little evidence of posting having been employed in the development work while the pillars are large and in most cases untouched, though little assurance can be felt as to the manner in which the now burned-out area of the mine was worked. There is always a fire hazard present on those properties where coal crops out or where old workings have been driven.

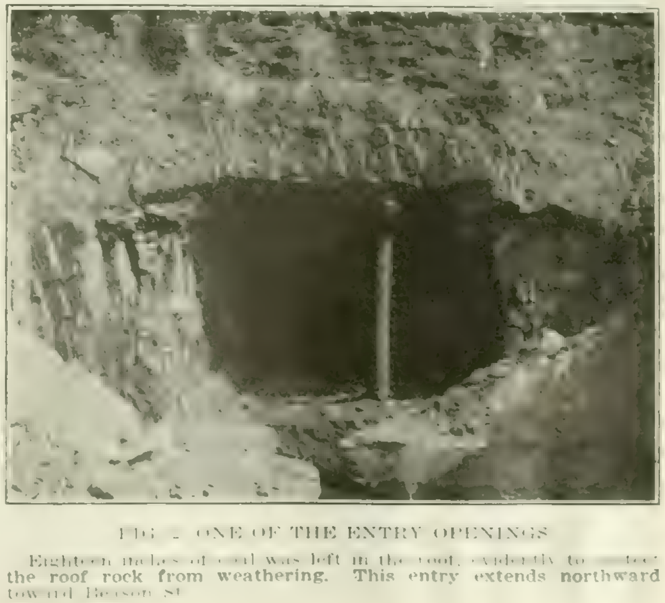
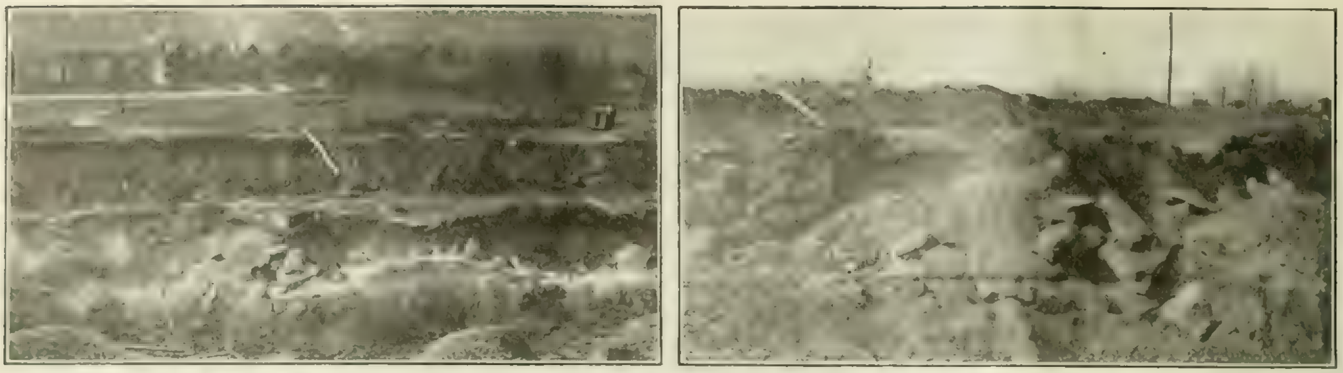


FIG. 2. ONE OF THE ENTRY OPENINGS

Eighteen inches of coal was left in the roof, evidently to protect the roof rock from weathering. This entry extends northward toward Beacon St.



FIGS. 3 AND 4. PRESENT RUINS OF WHAT WAS ONCE AN IMPROVED CITY STREET

This shows what is left of Hobart St.—a mass of asphalt, paving bricks and baked clay. In some places the ground and débris are too hot to walk upon.

As a result, great care must be exercised at all times in the building of bonfires. It is not known how the fire which has recently caused so much concern originated, but it is believed to have started from the promiscuous building of fires when the land was being cleared.

In 1914 the city constructed an asphalt pavement on Hobart Street, which lies between Murray and Wightman streets. It was only a short time after the construction of this street that the fire broke out on the property south of Hobart (see Fig. 1). The coal outcrops on this property between Wightman and Murray streets and does not come to the surface again until Beacon Street is reached on the north. Thus the section of land bounded by Murray, Beacon and Wightman streets is a small hill.

The fire made such headway after the new street (Hobart) had been built that it was necessary for the city to take some action that same year. The coal burned toward Murray Street, roughly in a northwesterly direction from its point of origin. An excavation was made by the city from the outcrop line near Murray Street and extending across Hobart Street. A 3-ft. wall of clay was built as a barrier and it was believed at that time that the fire was under control and would soon burn itself out. At the points where the wall was constructed the coal is quite near the surface, having scarcely more than eight feet of cover.

However, the fire took a different course before the efficiency of the clay wall could be tested and burned so rapidly that it was soon under Hobart Street itself. By this time the property owners on the north had become alarmed lest the fire spread under the hill toward Beacon Street, where it would have been extremely difficult to control because at that point about forty feet of cover protected the bed. The city again came to the aid of the property owners in the spring of 1917 and extended the clay wall through to the outcrop line near Wightman Street. By this time the newly-built Hobart Street had been ruined and traffic over it was impossible.

It was again believed that the fire was under control and that while it would continue to burn for some time, it would eventually burn itself out and no further damage to property would result. About this time the property owners on the north realized that at some future time a new street would have to be constructed and that it would be approximately fifteen feet lower than the original. They feared that the properties still undamaged by the fire would decrease in value by reason of the new grade and they dreaded the possibility that the fire might start up again and continue its destruction throughout the section. Therefore, in an attempt to again bring the land back to its previous value, a contract was let to strip the coal from the line of the street about 200 ft. northward.

It was believed that the coal stripped when sold would defray the expense of the operation and would at the same time give the desired grade. The shaded area in Fig. 1 shows the extent of the stripping operation to date. In the removal of the underlying coal the clay wall built by the city was broken at several places, one strip for a distance of over two hundred feet being entirely destroyed. However, this incident was of little account, as the area of the burning coal was limited by the fact that the bed had been cut. In the process of stripping, the glowing coals had been approached at several points, but never near enough to cause any delay.

The coal was stripped in a general east and west direction, which was parallel with the line of the fire. The idea was to first assure a barrier before stripping the cover from the coal on the long side of the properties. The stripping progressed without incident until a point had been reached where the clay wall crossed Hobart Street. At this point either one of two things happened, the city claiming one and the property owners the other. Either the steam shovel came into too close contact with the burning coal or the clay wall was not of sufficient thickness to arrest the progress of the fire, for it jumped across the barrier and is at present burning in the area shown in black in Fig. 1.

It can be seen that the entire unburned area is menaced by this small burning patch. Unless this portion is either stripped out at once or a barrier built around

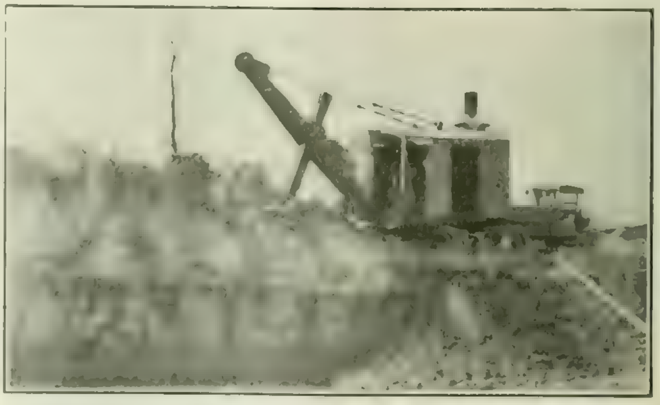


FIG. 5. STRIPPING OVERBURDEN FROM THE COAL

Stripped coal is sold to neighboring householders and other buyers at $1 per ton

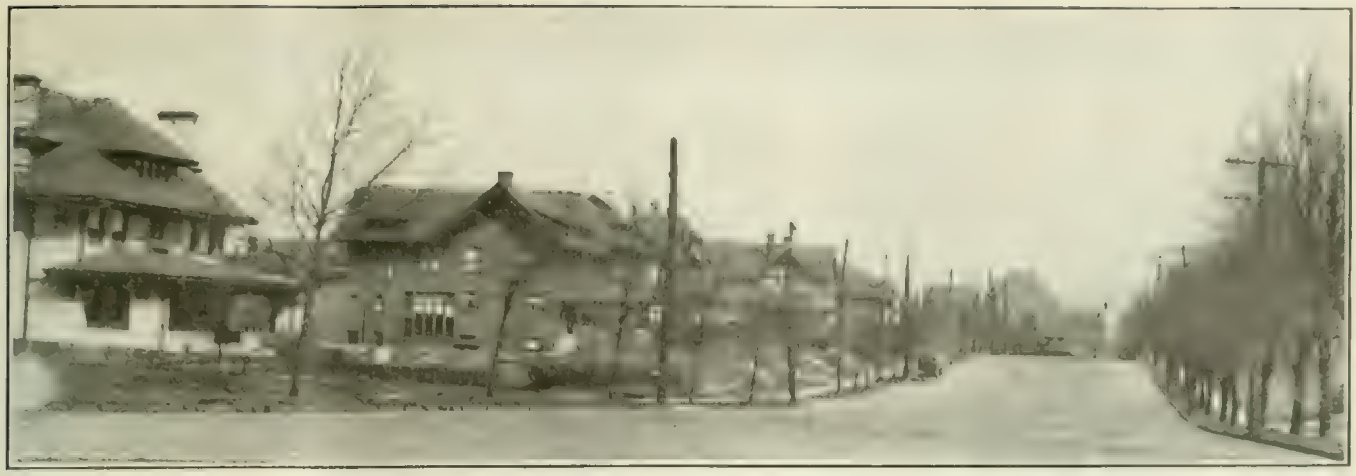


FIG. 7. PLEASING SCENE ONLY THREE HUNDRED FEET AWAY FROM THE FIRE

General view along Wightman St., showing the type of residences in the vicinity of the burning coal seam. These also will be in danger should the fire extend.

it, the coal as far as the outcrop line on Beacon Street is liable to fire through an encircling movement. It is difficult to say whether or not live coals were thrown by the steam shovel on the opposite side of the barrier at the now burning point. There are arguments and possibilities on both sides.

It is entirely possible that the clay wall built by the city did not serve its purpose. It has often been proved in large mine fires that a barrier of this thickness is of little assistance, and especially might this apply here where the coal was burning near the surface and could receive plenty of oxygen.

While the first has cost both the city and the property owners thousands of dollars, it has not been without its compensating features, small as they are. For instance, there is no project on foot at present to rebuild Hobart Street, but there undoubtedly will be some time, and when that time arrives the grade that will be given this street will correspond more closely to that of the adjoining thoroughfares than the original.

The illustrations accompanying this article show quite clearly the amount of excavation that has been done as a direct result of the fire and emphasize the importance of care being taken when fires are started on properties that are underlain with coal at a shallow depth or on those that are undermined. It is needless to say that this entire district has suffered as a result of the fire, and that building and general construction have been retarded to a marked degree.

Where coal underlies city properties at shallow depths it seems desirable that it be mined away by stripping. In many cases the expenditure will be more than an insurance; it will be a directly profitable outlay. The market for the coal will be found in the surrounding city. Where the depths at which the coal is found are greater than usual it nevertheless may be financially possible to follow the coal because fear of earlier undermining or future fires may well render the land unsalable.

Those who have noted the surface caves in the anthracite region and the fire area at Carbondale will realize what a loss to property can be caused when the underpinning is removed by excavation or a fire, especially the latter.

Extensive use of steam shovels where towns are underlaid with coal beds would do much to insure them against future trouble. The damage done to the property by a burning coal bed is not merely local, for the sulphur gases spread their pungent odors over the surrounding district, subjecting the town in which they are present to the criticism of every visiting stranger.

Labor Unrest Manifested in the Belgian Coal Industry

A REVIEW of the Belgian coal industry for 1919, published in the *Board of Trade Journal* (London) for Feb. 19, 1920, according to the *Monthly Labor Review*, issued by the U. S. Department of Labor, reveals the existence of a considerable amount of industrial unrest. During the first half of the year thirty-six strikes involving seventy pits and 16,000 workers occurred. To deal with this unrest *Commissions de Conciliation* were established in various mining localities and *Commissions Régionales Mixtes* for larger districts.

These commissions, consisting of representatives of operators and men, in an effort to settle existing disputes, established the principle of an 8½-hour day from June 1, 1919, and an 8-hour day from Dec. 1, 1919, for pit workers, and a 9-hour day from June 1, 1919, for surface workers, and endeavored to settle other minor trouble-producing matters.

Notwithstanding their efforts, however, a serious strike occurred at Charleroi Dec. 15, 1919. The strike, which was declared contrary to the advice of the labor leaders, was due to two causes: (1) The enormous profits of the colliery owners, from which the workers felt that they had not correspondingly benefited; (2) the unsatisfactory operation of the *Commissions Mixtes* due to "the procrastinating attitude of the miners' representatives and the absence of legal sanction for the decision of the commissions."

The men claimed (1) either a wage [illegible] control of owners' profits; (2) a definit[illegible] day for pit workers and an 8½-hour [illegible] workers, which should include time spent in descending and ascending, meals, etc.; (3) a pension of 2 fr. (38.6c., par) per day; (4) an improved system of health insurance.

Through the intervention of the Ministry of Industry a settlement was reached Dec. 20, 1919, in which the miners were guaranteed ("under protest from the owners") a wage increase of 2.50 fr. (48.3c., par) per day, the other disputed questions being left to further discussion by the commissions and final settlement through proper legislation.

Revolving Kiln for Making Lignite Into Made-to-Order Fuel

Thirty Per Cent of the United States Coal Is Lignite and Most of It Is Found in States Having Cold Climates—Experiments Appear to Show That a Revolving Kiln Can Be So Regulated as to Deliver Any Given Type of Fuel at the Pleasure of the Manipulator

By E. L. Broome
19 Wall St., New York City

IT IS stated upon the highest authority[1] that the minable coal resources of the United States amount to over 3½ trillion short tons, of which 30 per cent is lignite. Of this lignite over 90 per cent is in North and South Dakota and Montana. Into the territory surrounding the Dakota lignite deposits there are shipped annually over two million tons of bituminous coal and over one million tons of anthracite. During the year 1917 less than 650,000 tons of lignite were mined in North and South Dakota.[2]

Gas containing 13 per cent hydrogen and 11.6 per cent carbon monoxide is formed while volatile matter is reduced to 11.3 per cent. By varying speed of rotation, fuel feed, steam-air ratio and proportions to coal, the product can be modified to suit market for semi-coke, gas and byproducts. A percentage of the ash passes off as flue dust.

The utilization of lignite to supply the fuel requirements of the sections adjacent to the deposits would result in a saving of over $10,000,000 per year, estimated on the conservative differential of $4 per equivalent fuel ton. Furthermore, "an annual saving would be effected of $4,800,000 in freight charges alone . . . also . . . the travel of 50,000 cars and 1,200 engines and crews a distance of 600 miles."[2]

In view of the existing fuel stringency and the unprecedented shortage of the means of transportation, it seems reprehensible indifference on the part of the authorities of the states affected, if not on the part of the National Government, that means have not been found for meeting the fuel requirements of the lignite territories by commercial development of their underlying fuel deposits.

It must be admitted that prior to the outbreak of the Great War there was no considerable incentive to the exploitation of lignite as a substitute for other industrial and domestic fuels. On a thermal-cost basis lignite as available did not compare favorably with fuels brought in from the outside.

Lignite as mined is a poor fuel, averaging 7,500 B.t.u. per pound in thermal value. The moisture content is high, in some samples over 35 per cent, and in the Dakota deposits it will average over 25 per cent.

Owing to its high volatile content, lignite when thoroughly dried and pulverized makes a powdered fuel that compares favorably with bituminous coal. It also can be mixed to a proportion of 30 per cent with fuel oil[7]. The cost of drying and pulverizing is at present large and this fact offsets in great degree the value of powdered lignite as fuel except when it is used on a large scale at the collieries.

To some extent raw lignite is used on traveling chain grates for power purposes. It has found some application in producers for internal combustion engines and furnace work[3] and also for domestic purposes in special forms of furnaces or stoves,[4] but owing to the expense of transporting the moisture, it will not in its raw state be a formidable competitor of other fuels for some time to come except in the vicinity of the place where it is mined.

At the present time the most promising method of popularizing the immense lignite resources is by a large scale manufacture of briquets in plants located at the collieries. The manufacture of briquets from lignite has passed the experimental stage. Perfectly sound briquets can be made, that will stand handling and transportation well and are practically equal in thermal value to anthracite coal.[5]

During the years 1913 and 1914 a series of experiments were conducted on a commercial scale under my observation with a novel type of continuous rotary gas producer. These experiments, which were interrupted by conditions arising from the advent of the war, have been revived since and it is hoped that the results will soon be ready for publication. The principal object of the experiments was the development of a producer for the utilization of low-grade fuels and waste material such as waste wood and sawdust, peat, lignite, bituminous screenings, anthracite washery waste and bone, etc.

About the time these experiments were going on, attention was called to Dr. Babcock's report[6] on his investigations of lignite for briquetting, with the result that an experiment was made on this substance. This trial was unfortunately short because of a lack of sufficient fuel. It had as its major object the recovery from lignite of a residue suitable for making up into briquets, also incidentally fuel gas and byproducts.

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[1] Campbell: "The Coal Fields of the United States." U. S. Geological Survey, Professional Paper 100, 1917.

[2] Darling: "Notes on Lignite, Its Characteristics and Utilization." U. S. Bureau of Mines Technical Paper 178, p. 3.

[3] Philips: "The Use of Producer Gas in Texas." University of Texas Bulletin 189, pp. 59, 60, 61.

[4] Kreisinger, Augustine and Harpster: "Combustion Experiments with North Dakota Lignite." U. S. Bureau of Mines Technical Paper 207, p. 36.

[5] Babcock: "Economic Methods of Utilizing Western Lignite." U. S. Bureau of Mines Bulletin 89, p. 19 *et seq.*

[6] Babcock: "Investigations of Lignite Coal Relative to the Production of Gas and Briquets." University of North Dakota Report of the School of Mines.

LOG OF TEST

Length of test.	9 hr
Fuel per hour, as fires.	1,095 lb
Fuel per hour, moisture free.	804.30 lb
Gas per hour.	18,000 cu ft
Gas per hour per lb of fuel as fired.	16.50 cu ft
Thermal value of gas per cu ft (calculated from analysis)	145 B.t.u.
Product per hour, moisture free.	310 lb

AVERAGE ANALYSIS OF GAS

Gas	Percentage	Gas	Percentage
Carbon Dioxide	10.6	Carried forward	25.7
Ethylene	0.3	Methane	5.2
Oxygen	3.2	Hydrogen	13.0
Carbon Monoxide	11.6	Nitrogen	56.1
			100.0

PROXIMATE ANALYSES

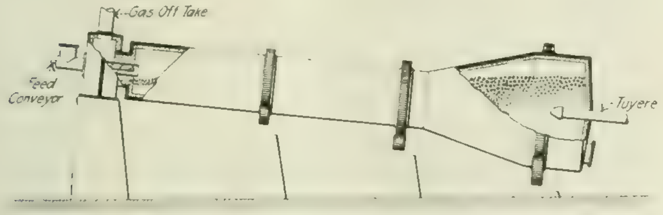
Original Condition			Moisture Free	
Lignite	Product		Lignite	Product
26.2 per cent	26.8 per cent*	Moisture	per cent	per cent
30.8 per cent	8.3 per cent	Volatile matter	41.8 per cent	11.3 per cent
28.4 per cent	46.6 per cent	Fixed carbon	38.50 per cent	63.7 per cent
14.6 per cent	18.3 per cent	Ash	19.70 per cent	25.0 per cent
7665	7785	B.t.u.	10,387	10,635

* Product collected in water tank

HEAT BALANCE

Heat in fuel as fired per hour 1,090 × 7,665 B.t.u.	8,354,850 B.t.u.
Heat residue per hour 310 × 10,635 B.t.u.	3,296,850 B.t.u.
Heat gas per hour 18,000 × 145 B.t.u. = 2,650,000 B.t.u....	5,906,850 B.t.u.
Heat used in process and lost..........................	2,448,000 B.t.u.

The apparatus used in all the experimental work is shown diagramatically in the accompanying illustration. It consisted briefly of a slightly inclined drum, revolving upon rollers and driven through gearing. The drum was lined with fire brick. The fuel treated was fed through the screw conveyor at the left and fell freely upon the interior surface of the firebrick-lined drum. Thence, because of the inclination and revolution, it was slowly transported to the right until it reached the zone of gasification, where it came into contact with a mixture of air and steam introduced through the tuyere shown at the right. During this movement the fuel was slowly heated, deprived successively of its moisture and the lighter and heavier volatile byproducts, each at its critical temperature; finally after a portion of the carbon content had been completely gasified to furnish the heat required for distillation and losses, it was discharged, a determined amount at each revolution in the form of a finely comminuted product composed of carbon and ash and a small content of volatile matter. It will be understood that the plan is merely diagrammatic, the details of the apparatus being somewhat different from that shown in the illustration.



KILN IN WHICH LIGNITE IS CHARRED

Note the resemblance of this apparatus to the ordinary cement kiln. The arrangement of tuyere, feed, and gas exit are here shown.

The gas produced was taken off at the left and passed through a condenser and scrubber and to get rid of it was finally burned. There were no means of determining the quantity or the composition of the condensate. It consisted principally of a copious, dark greenish black tar of a consistency resembling heavy cream. I wish to merely assert my belief that the gradual method of heating and the low temperature of the offgoing gas should assure a maximum of recoverable ammonia compounds, oils and tar; much more dilute, of course, than would be the case in the strict distillation method and requiring more condenser capacity.

It is not claimed that the data given are exact; the short period of time covered by the recorded observation precludes accuracy. The case is cited and the figures given in the hope that they will provoke discussion and inquiry and thereby bring out the experience of other more thorough investigators.

The fuel used was furnished through the courtesy of the Sheridan Coal Co., of Omaha, Neb., and came from its Dietz (Wyo.) No. 4 mine. It was of the grade known as slack or screenings and was quoted in 1914 at 25c. or less per ton f.o.b. mines.

The fuel used was higher in ash than would be employed for the production of briquets. This grade might be used in a producer to furnish gas for the process. It may be remarked that the quantity of ash in the original fuel is not accounted for in the residue. While this is accidental, it was found that a considerable portion of the ash was carried out as dust with the gas; as well as some of the combustible. How much of either thus escaped is not known, but a sample of flue dust analyzed as follows:— Moisture 2 per cent, volatile 15.3 per cent, fixed carbon 44 and ash 38.7 per cent.

Evidently more carbon was burned and more noncondensible gas was produced than necessary or permissible if the carbonized product were the principal object. It should be noted that a device of this character has *per se* a number of ready variables—the speed of rotation, the quantity of fuel fed, the quantity and relative proportions of steam and air, while within certain limits the temperatures are controllable and, perhaps what is more important, the process is continuous.

Let us suppose that the original fuel available for a test was equal to the average of North Dakota lignites, viz.: Moisture, 27.13 per cent; volatile, 29.11; fixed carbon, 36.16; ash, 7.6.[7] Figuring the reduction ratios as demonstrated, from 2,000 lb. of raw lignite we should have recovered 600 lb. of product of about the following proximate analysis: Volatile 10.17 per cent, fixed carbon 77.2, ash 12.67 and having a thermal value probably of more than 12,500 B.t.u. per pound.

For comparison, Babcock[8] reports with his modified beehive ovens an average recovery in products of 47.3 per cent by weight with an average analysis of:—volatile 16.66 per cent, fixed carbon 73.73 per cent, ash 9.61 per cent, and a calorific value per pound of 12,749 B.t.u.

An apparatus of the type illustrated may be readily adapted to meet the demands of market changes with practically no alteration or delay. If the market for fuel gas was strong in a particular locality the fuel could be completely gasified[9] with the recovery of byproducts as is done in the Mond process. If the gas demand was variable, residue for briquets could be produced and stored during periods of low demand for gas. If there was no local market for gas it could be used to furnish heat for the carbonizing process and probably very little, if any carbon would be burned.

Without question in the near future, the decreasing supply of anthracite coal will be so restricted that the price will be prohibitive for power or domestic purposes. The only practical relief will be the artificial preparation of fuel from high-volatile coals. The German Government has imposed a surtax of 20 per cent ad valorem upon all coal which is not distilled or treated for its byproducts.[10]

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[7] Darling: "Notes on Lignite"; p. 2.

[8] Babcock: "Economic Method of Utilizing Western Lignite," p. 44.

[9] The apparatus has since been perfected as a producer to discharge ash containing less than 5 per cent combustible.

"It is not beyond the bounds of reason to forsee a condition whereby a householder in the place of his ton of anthracite which he now welcomes for $11, will receive a ton of smokeless coal without slate, a month's supply of cooking gas, 40 miles of motor fuel, enough fertilizer to start a small garden, and tar sufficient to allay the dust in front of his house—all for far less money than he now pays for inferior coal." [11]

Worldwide British Oil Bunkering Stations To Be Established*

Conversion of Shipping to Oil Fuel Has Created a Problem of How to Keep Ships Supplied with Bunkers. Here is the British Answer

A LARGE British oil bunkering company, backed by powerful interests, is being formed to supply fuel to oil-burning ships at bunkering stations throughout the world.

The chairman of the new company will be Lord Inchape, who is a director of the Anglo-Persian Oil Co. The board also will include Sir Charles Greenway, chairman of the Anglo-Persian Oil Company, and Sir Frederick Black, who acted for the British Government in the United States during the war in connection with oil. Messrs. William Cory & Son, Ltd., will act as selling agents, and will be in a favorable position to prepare for the supply of oil fuel to ships at stations throughout the world, through its own organization and the arrangements of the coaling firms it controls.

While the reduction in the price of British bunker coals has brought a certain amount of relief to shippers, the problem of securing a sufficient supply of oil fuel for British ships has become acute, and is likely to become more so as vessels fitted for burning oil fuel leave the builders' yards in increasing numbers. In many important ports in the East supplies of oil fuel are reported to be unprocurable.

From the British point of view, the position is rendered still more serious by the merchant marine of the United States, which, being largely oil-driven, will be a heavy user of existing supplies. It is reported that highly efficient arrangements have been made for the American ships, as a result of which they have been able to obtain supplies at Rotterdam at a price equivalent to 56s. a ton, whereas British ships were quoted a price of 200s. a ton.

The new British company is said to be assured of supplies of oil in the East, and will, no doubt, be able to strengthen its position in other directions. The capital will be £1,200,000, but no public issue is expected, the necessary funds being found by the interests forming the company.

The Anglo-Persian Oil Co. is erecting large oil refineries and storage tanks near Swansea, with the object of making this the distributing center for the West of England.

The crude oil will arrive at Swansea port from the Persian oil ports in the tank steamers of the company, will be pumped direct by means of pipe lines laid from the steamer holds to the refineries, and thence back again for distribution after treatment. The oil will not be touched by hand throughout the whole process.

The site covers 400 acres of what was formerly waste land and an entirely new community will be built up.

All the principal ports are now giving special attention to the question of oil storage and facilities for bunkering ships with liquid fuel, for the use of which so many vessels are now being fitted. At Liverpool a large area of land at the extreme south end of the dock estate is being allocated for this purpose and loading and discharging jetties are being built and pipe lines laid.

At Bristol, too, the Corporation, which owns the docks is extending the oil basin at Avonmouth at a cost of £150,000, which will result in an additional 500 feet of quay space being available.

Incessant chaos in the coal industry is one of the chief factors turning the thoughts of shippers to ways and means of dispensing with coal, and for this reason the transfer to oil fuel is receiving great impetus.

On March 20 it was announced that, by agreement between the South Wales Coalowners' Association and the Government, the price of bunker coal would be reduced on and after April 1 from 100s.-115s. to 75s per ton. The reduction, however, came too late to forestall the increase in outward freights, which it was known several British shipping lines had been contemplating.

The Booth Steamship Co., in addition, has since issued a circular to shippers to the effect that it is compelled to increase the existing surcharge of 33½ per cent to 50 per cent on outward freights to North Brazil and Iquitos.

The Booth line, the position of which is typical of many others, has suffered severely by the loss of passenger vessels during the war, and has now only two passenger ships left in the service. It has also been seriously affected by the decline in coal exports, as before the war the cargo vessels of the line carried large cargos of coal to Brazil. At the present time practically two out of every three of its steamers leave Great Britain in ballast.

British Labor Leaders to Take Action To Reduce Costs

ACCORDING to a cablegram from London May 7, *The Commercial and Financial Chronicle* states, British labor leaders are gradually coming to a realization that by demanding continued advances in wages and concessions in working conditions they are in reality bringing disaster upon themselves.

The statement was made that the "Executive of the 'Triple Alliance' of the miners and transport workers, which is now in session in London, has embarked upon a determined effort to break the vicious circle of wages and increases in the cost of living." It was added that members of the Alliance discussed this question and that "they will meet again at an early date to receive the report of the joint body, and their views will be submitted to the Government with a view to the latter taking 'such action as will substantially reduce present high costs.'"

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[10] Darling: "Notes on Lignite," p. 6.

[11] Gilbert and Pogue: "Coal—The Resource and Its Full Utilization." U. S. National Museum Bulletin 104, part 2, 1918; p. 15.

*From *Anglo-American Trade*. At normal exchange rates a penny is equal to 2.029c., a shilling is worth 24.35c., and a pound $4.866.

Coal Is Saved by Automatic Regulation of Fire to Accord with Steam Used

To Secure Efficient Combustion of Coal the Amount of Air Admitted and Coal Supplied Should Be So Regulated Automatically That They May Be in Proper Proportion to Each Other and to the Amount of Steam Used, the Steam Pressure and the Depth of Fuel Bed

By T. A. Peebles*
Pittsburgh, Pa.

EVEN for the mine operator and manager the efficient combustion of fuel is an important problem. The cost of producing coal is high and there are indications that the limit has not yet been reached. It is true, transportation and labor conditions rarely restrict coal supply at mines, yet it is more necessary than ever to reduce the consumption of coal, for all the coal produced, large or small, can now be disposed of at a good figure, and the good coal used at the mine reduces by that amount the part of the output that can be sold, while the miner has to be paid for what he has mined whether the coal be consumed at the plant or shipped to the market.

Provision can be made that just as soon as the quantity of steam used is increased more air will be admitted and the fire briskened, while the grate will take on more fuel. Low pressure will have the same effect. As a result coal will not be wasted at the safety valve, nor will the pressure fall below what is needed.

The requirements for efficient combustion are so well known that they need not be repeated here. Automatic apparatus has been developed for mechanically supplying fuel to various types of furnaces and the labor involved has been reduced to a small fraction of that required for hand firing. The method of introducing both fuel and air to the furnace also has been materially improved, so that it is possible to insure that the proper quantities of both will be introduced continuously. This is a condition highly desirable from the standpoint of efficient combustion.

In order to meet changing load conditions it is necessary to regulate the fuel and air supply in accordance with the demand. Since it is absolutely indispensable to the highest efficiency that the correct relation between the fuel and air supply be continuously secured it is important that simple and effective means be provided whereby this relation may be established and maintained. Unfortunately for the development of fuel-burning apparatus, whether it be stokers for use with coal, oil burners or gas burners, the means for properly regulating the fuel and air supply has not been considered a part of the fuel-burning apparatus itself. It is, therefore, necessary that the control of fuel and air supply be effected manually or by means of some device that is not an integral part of the firing apparatus.

Since the amount of fuel and air that must be supplied depends upon the weight of the load being carried, it is apparent that the ideal method of control would consist of apparatus that would automatically control the influx of fuel and air in accordance with the demand. This would be determined by the amount of steam being used rather than by the pressure at which it was generated. In boiler plants where a careful study of combustion control has been made a method has been developed whereby regulation in accordance with the demand on the boilers is working satisfactorily.

The damper-operating levers, and the fan- and stoker-controlling devices are located at a convenient point, with the steam-flow meters and draft gages so mounted that the fireman can observe from these instruments the effect of each adjustment made. By observing the flow meter the fireman is able to determine the demand on the boiler, and by means of a large pilot gage he is informed immediately of any change in steam pressure. He is therefore able to make the necessary adjustments to meet the demand for steam and maintain a practically uniform pressure.

Draft gages and gas-analysis instruments enable him to determine whether or not the relation of air to fuel supply is being maintained correctly. With this equipment at his command the intelligent fireman can secure results which closely approximate test efficiencies. The difficulty of building up and maintaining an organization capable of doing this, however, is demonstrated by the small number of plants that are actually securing such results in daily operation. It is, therefore, important that automatic apparatus be developed which will actually make the necessary adjustments to maintain correct conditions.

An objection to controlling combustion automatically in accordance with steam flow is sometimes made on the ground that there will be a lag between any adjustment in fuel and air supply, and a resultant change in rate of steam generation. A simple calculation, however, will show that this lag is exceedingly small. At ratings commonly developed the gas velocity through the boiler passes is from 30 to 40 ft. per second, and the total length of gas passage from the fuel bed to the boiler damper varies from 40 to 80 ft., depending upon the type of boiler and the height of the setting.

It is apparent, therefore, that a particle of air will pass through the fuel bed, its oxygen will combine with the combustible in the fuel and the resultant gas pass out through the boiler damper in less than two seconds. Since about 80 per cent of the work of the average boiler is done in the first pass, it is only a fraction of a second from the time the particle of air enters the fuel bed until its temperature has been increased to that of the furnace and the gas has traveled through the first pass of the boiler, giving up four-fifths of all the heat it will deliver. A change in the rate of air flow will follow immediately upon the adjustment of a damper; it is, therefore, evident that a boiler will respond almost instantly to an adjustment in air supply. This quick response of a boiler makes it possible to control combustion by variations in the rates of steam flow. The primary cause of variation in steam pressure is thus eliminated. With the varying fuel and furnace conditions that exist in the average plant, it is, of course, impossible to secure adjustments that will be absolutely correct at all times. It is therefore necessary that an automatic regulating apparatus, actuated primarily by changes in the rate of steam flow, shall also be sensitive to pressure variations. While it develops in practice that control from flow will eliminate most of the tendency for pressure fluctuations, there will be times when pressure variations occur, and if the regulator is sensitive to these changes, the correct pressure will be maintained within narrow limits. The application of automatic regulating devices to any plant must depend upon the type of fuel-burning apparatus employed, the method of

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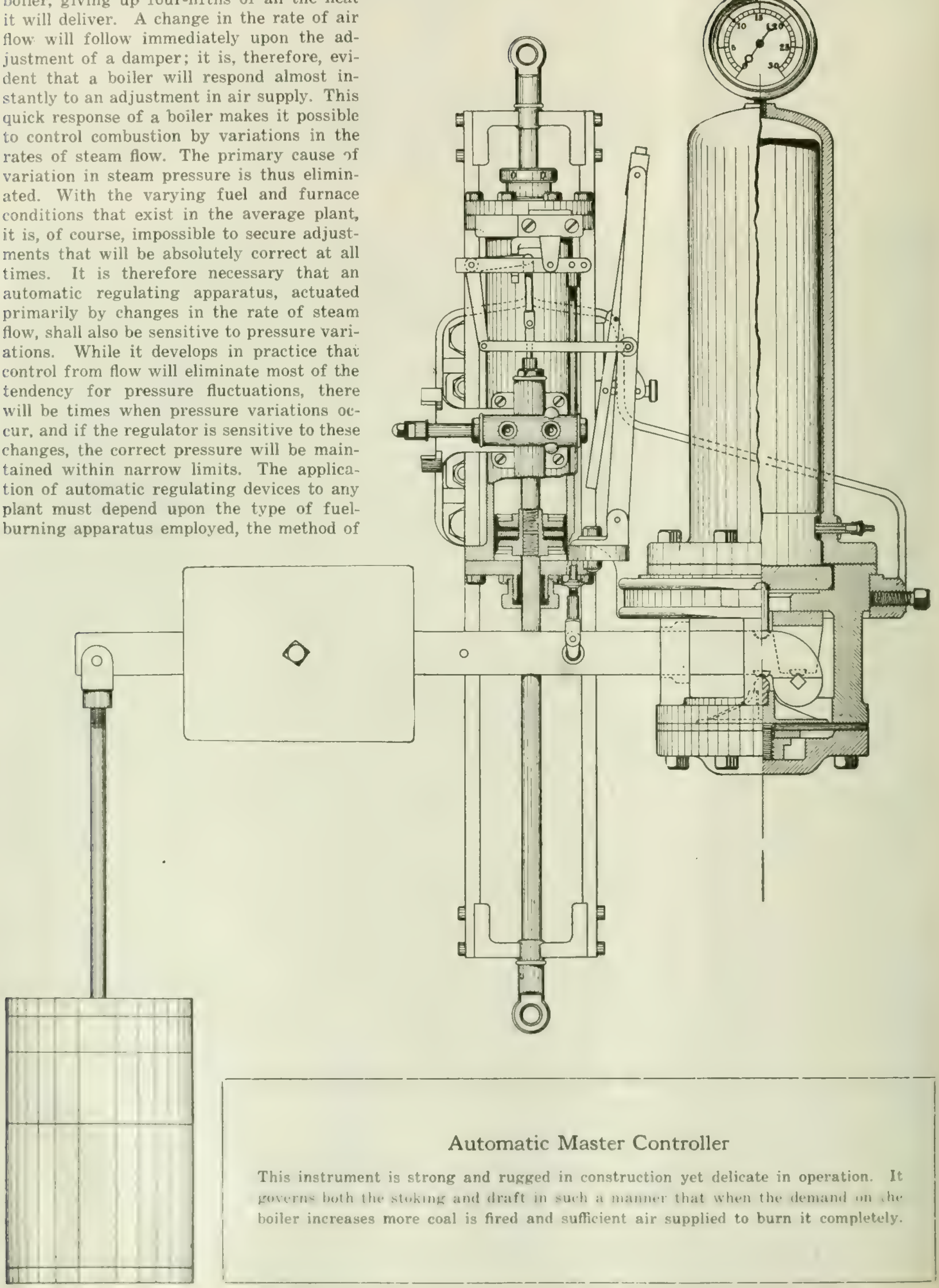
*Combustion Engineering Corporation.



Automatic Master Controller

This instrument is strong and rugged in construction yet delicate in operation. It governs both the stoking and draft in such a manner that when the demand on the boiler increases more coal is fired and sufficient air supplied to burn it completely.

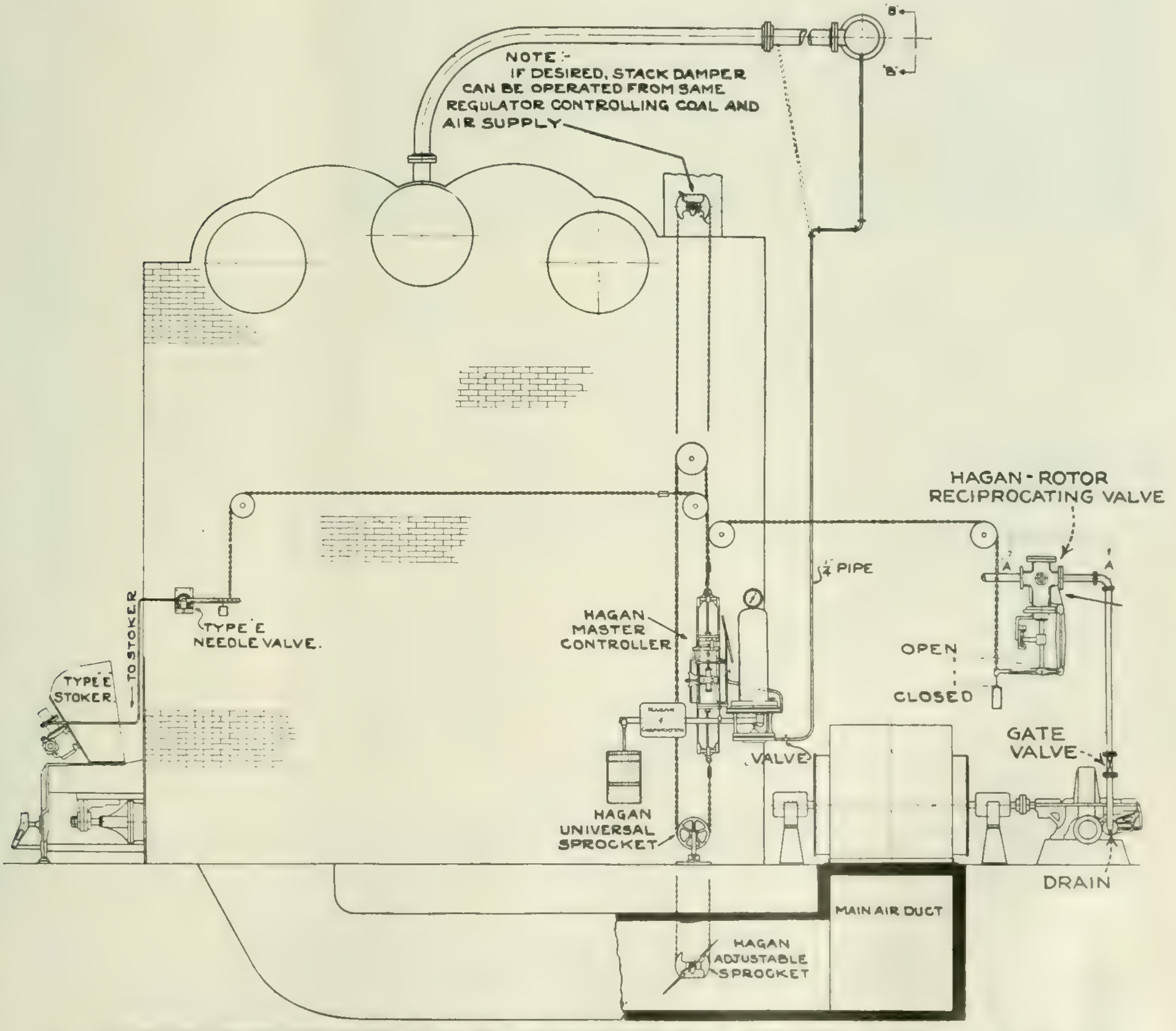
producing draft and the local conditions as to load and fuel. The personnel and organization of the plant force also are important. In large installations, where a well-trained operating organization is available, it is desirable to consider each boiler as an individual unit and equip it completely with its own automatic control, including that of fuel and air supply and the discharge of the products of combustion. With an arrangement of this kind the apparatus can be made responsive not only to steam-demand and pressure variations but also to the condition of the individual fuel bed, and no hand adjustment or manipulation will be necessary. This type of control will give the best possible results, but is not always the most adaptable to the smaller installations, where a simpler arrangement would be preferable.

Such an arrangement would automatically control the supply of fuel and air in accordance with the variations in steam flow and pressure, all boilers in service being governed from one main regulator.

If a large number of small units are in operation, it may be desirable for the purpose of control to divide the plant into two or more groups and install a separate regulator on each group. With this arrangement each boiler of a given group will receive the same fuel and air supply as each of the other units, and there will be no tendency for the fires to become too heavy under some boilers and too light under others, except when variations in fuel occur. This happens at times, but it is not a serious matter, and can be corrected by simple hand adjustment when necessary. Control of this kind will give results closely approximating those secured from the more complete system. It has the advantage, in many plants, of simplicity and low cost of operation.

Plant operators are confronted with the fact that it is impossible to secure the right kind of labor to operate a boiler plant efficiently by hand methods, and are coming to realize the necessity of a correct system of automatic regulation. The problem must be carefully studied, due attention being paid to equipment and local conditions as well as the type of control selected, which should be best suited to the existing conditions.

F. H. Crawford, a mining engineer, who has been specializing in coal problems for the Bureau of Mines, has resigned to enter private employment.



ARRANGEMENT OF CONTROL WHEN FITTED TO A STIRLING BOILER

The master controller governs the draft and stack dampers as well as the steam supply to the fan turbine and the stoker

Labor-Saving Methods of Handling Cars At Anthracite Shaft Stations

Two Types of Shaft Stations at One Shaft, One Operated in Part Mechanically and the Other Wholly by Gravity—Only Two Men Required to Handle the Cars—Simple Arrangement of Dogs to Prevent Cars from Running Away

By Dever C. Ashmead
Tarrytown, N. Y.

AT THE main hoisting shaft of the Silver Creek colliery of the Philadelphia & Reading Coal & Iron Co., near New Philadelphia, Pa., are two shaft stations of simple design that really require only two men to operate them. They are of entirely different design, one being mechanically operated while the other operates entirely by gravity.

The plan of the first or mechanically-operated shaft station is shown in Fig. 1. At this point both of the tunnels and the shaft itself are entirely in rock. Mine locomotives which in this case happen to be of the compressed-air type place the loaded mine cars on the loaded track so that the first car of the trip can be reached by the pusher. This loaded track is, as stated, in a rock tunnel and is 323 ft. long and perfectly level. If some of the cars from the previous trip have not been sent to the surface and are standing on the loaded track, then the new trip of loaded cars is coupled to those remaining.

The pusher is nothing but a long cylinder and piston operated by compressed air. It can be seen in Fig. 2 pushing a mine car. The end of the piston rod of the pusher is so arranged that it will engage the axle of the mine car and when the air is admitted to the cylinder the piston will be pushed out, driving the cars forward. The travel of the pusher is 12 ft. It causes a forward movement of the trip of equal length. It is so located that when the cars are pushed forward to their maximum distance, the first car stands on a grade of 3 per cent and is at a distance of 30 ft. from the shaft.

When it is desired to load one of the mine cars on the

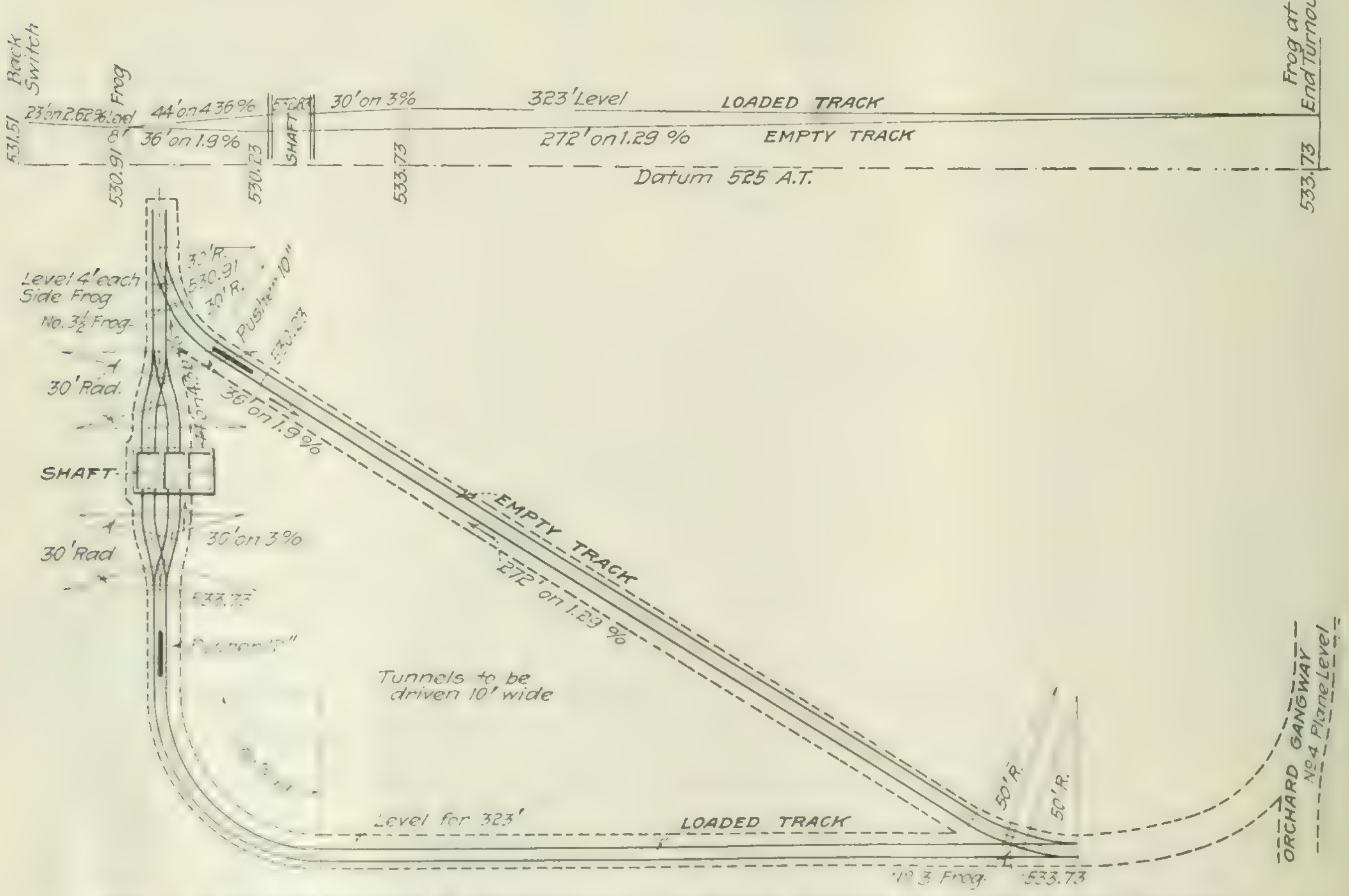


FIG. 1. PLAN AND PROFILE OF MECHANICALLY-OPERATED BOTTOM AT SILVER CREEK COLLIERY

Only two men are required to operate this bottom, one at each car pusher. Two compartments of the shaft are used for hoisting coal while the other two are employed for hoisting water.

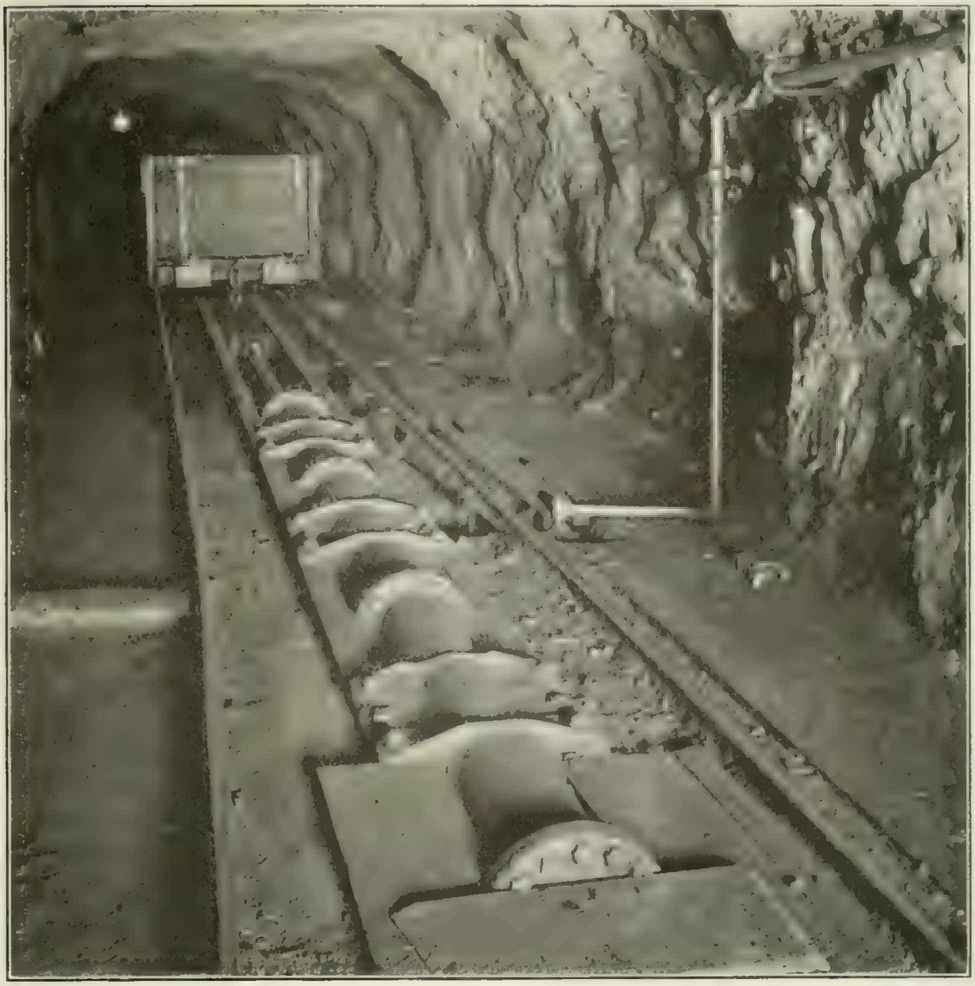


FIG. 2

Compressed-Air Car Pusher

The cylinder is 12 ft. long and the device handles the empty cars as they come from the kick-back. The control apparatus, governing the movement of the piston in the cylinder, may be plainly seen in the air pipe near the right-hand rib.

cage the first and second car are uncoupled from each other and in consequence the first car, which is standing on a 3-per cent grade, moves forward by gravity and runs onto the cage, kicking off the empty mine car which is standing there. The empty car then passes down a 4.36-per cent grade to a kick-back, which throws the car onto the empty-car track. For a distance of 36 ft. this track is on a down grade of 1.9 per cent, but it changes at the end of that distance to a 1.29-per cent grade against the empties. After rising on this grade for 272 ft. it joins with the loaded track.

Sufficient speed is given to the car when it leaves the kick-back to carry the car past the end of a pusher for empty cars located at the point of changed grade. Fig. 2 is really a photograph of this pusher, but the one pusher which moves the loaded cars is of exactly the same construction. As soon as the car reaches the end of the pusher it is pushed up the slight grade until it is close enough to couple it with the preceding car. A sufficient number of empty cars are spragged to prevent the empty cars from running back down the grade. As the cars are coupled to one another as fast

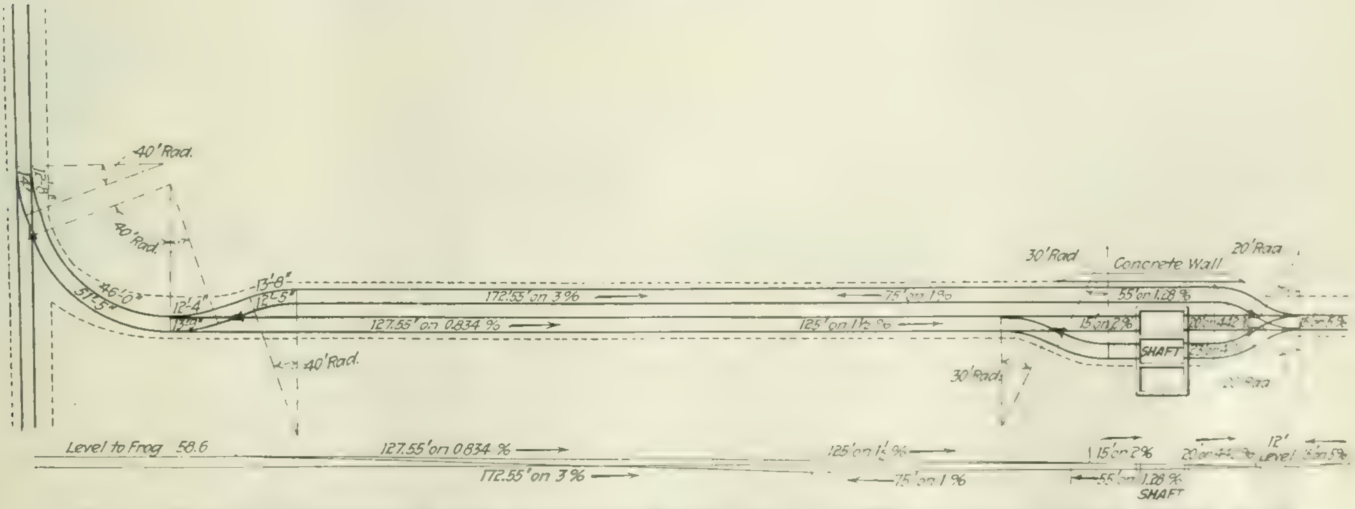


FIG. 3. PLAN AND PROFILE OF THE GRAVITY-OPERATED SHAFT BOTTOM, ALSO AT SILVER CREEK MINE

This bottom, like that illustrated, is operated by two men. The bottom is so laid out that the cars travel by gravity only, without the aid of any mechanical equipment whatever.

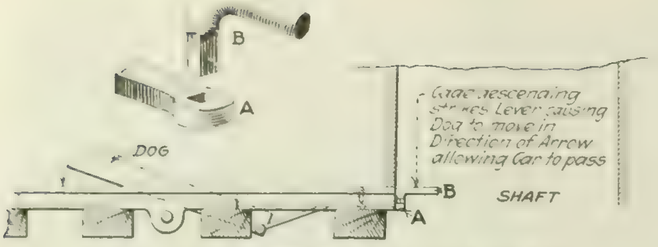

B
A
DOG
Cage descending strikes Lever causing Dog to move in Direction of Arrow allowing Car to pass
B
SHAFT
A

FIG. 1. CAGE-OPERATED CAR STOP OR DOG

as they arrive they are ready for coupling to the mine locomotive. Hence they can be hauled to the mine workings without further delay. Just enough sprags are used to keep the cars from moving back by gravity, but not enough to have any great effect on the pusher.

Two men are all that are necessary to operate this shaft station. One of these is located at the pusher on the loaded side of the shaft. He operates the pusher by a lever and uncouples the cars, releasing them one by one so that they can pass by gravity to the cage. He also operates the switch which turns the cars to the different compartments of the shaft. Another man is required on the empty side of the shaft. He operates the pusher at this point and also couples and sprags the mine cars. Although only two men are required to operate this shaft station the coal company uses four, as the shaft station on the bottom level is not as easily operated and requires the extra men, the same crew operating all of the stations in the shaft.

The second type of shaft station is at the No. 3 plane level of the same shaft. This shaft station is operated entirely by gravity and is entirely different from the one that has just been described. Instead of using separate tunnels for the loaded and the empty tracks both are here in one tunnel which has a double instead of a single track. A single track comes off the main haulage road for a distance of 58 ft. to the point of frog where the double track begins. The loaded track has a grade for the first 127.55 ft. of 0.834 per cent in favor of the loads. This grade then increases and, for the next 125 ft., is 2.5 per cent in favor of the loads. This carries the cars to within 15 ft. of the shaft. The last 15 ft. is a down grade of 2 per cent. This heavy inclination at the end of the loaded track near the cage is planned so as to give the cars sufficient force to kick off the empty car that is standing on the cage.

A compressed-air locomotive delivers the cars to the loaded track and pushes them to a point near the switch to the two cages. A sufficient number of sprags are placed in the wheels to prevent the cars from moving forward by gravity. When it is desired to place a mine car on the cage that car is uncoupled from the trip and the sprag removed and the car is allowed to drop by gravity to the cage on which it is to be loaded. As soon as the empty car has been kicked off the cage by the loaded car it runs down a very steep grade of 4.42 per cent for a distance of 20 ft. and then to a kick-back that has a grade of 5 per cent against the car. This sends the empty car to the empty track, which has, for a distance of 55 ft., a down grade in favor of the empties of 1.28 per cent and for the next 75 ft. a grade of 1 per cent. The next 172.55 ft. of the empty track has a grade of 3 per cent against the empties.

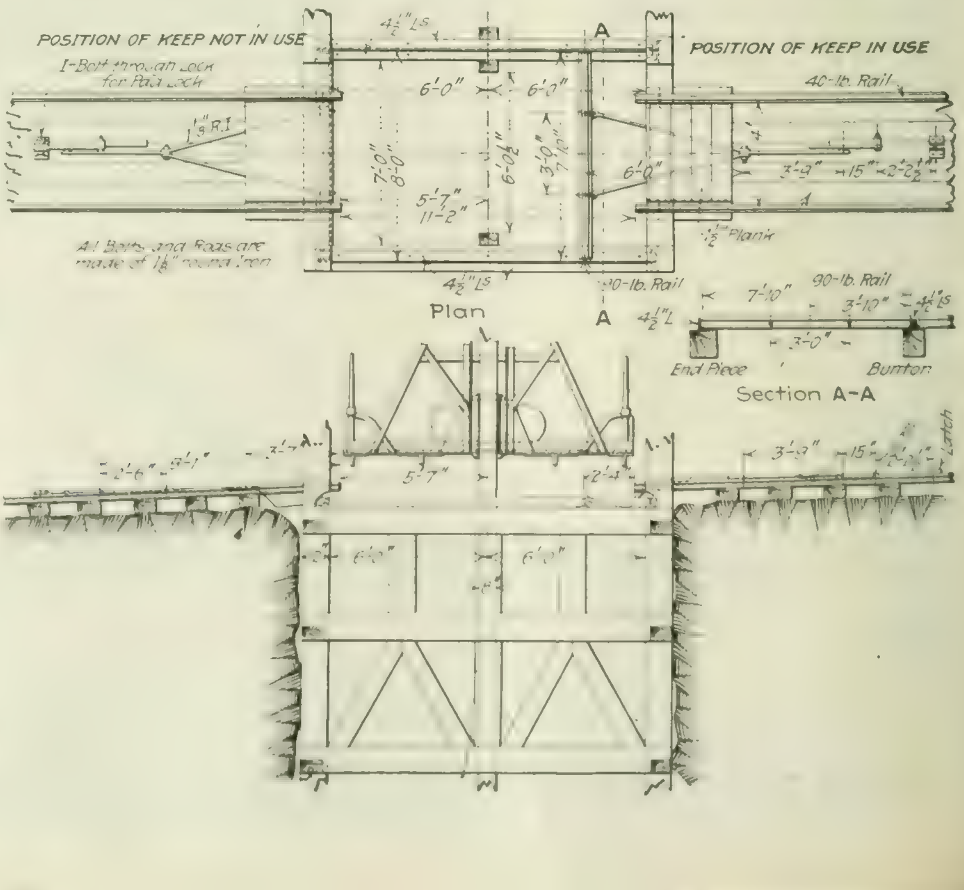
As in the previous case, only two men are required to operate this shaft station. One man tends to the loaded cars, unspragging them and throwing the switch to the cages, while the other man couples the empty cars for the locomotive.

There is a concrete wall between the empty and loaded tracks. The double-track tunnel is 16 ft. wide, whereas the single-track tunnels in the station previ-

FIG. 5

Details of Shaft Keeps

By a system of signal lights in the hoisting room the enginemen can tell whether or not the keeps are in place



ously described are only 10 ft. wide. Fig. 3 shows the plans of this shaft station in detail.

There are two other features of considerable interest in both these shaft stations. These are the dogs which prevent the mine cars from running away and falling down the shaft, the other is the method in which the keeps are operated. Fig. 4 shows how the dogs are put in and out of commission. When the cage descends it hits the lever marked *A* and this causes the dogs to drop out of sight and allows the car to pass over them and onto the cage.

Fig. 5 shows in detail the construction and the operation of the keeps. These keeps are operated by a lever which is thrown by the station tenders, and when in place for use a light is lit in the hoisting engine room indicating that everything is ready for hoisting.

U. S. Chamber of Commerce Will Study Production Data

SOUND business is evidenced in the new program of the U. S. Chamber of Commerce that calls for the organization of an industrial department to study the problems of the manufacturer with particular reference to raw materials production and the output of fabricated commodities.

This new department will study many of the problems of the manufacturer and will deal with selection and education of employees along efficiency and safety lines, wage or compensation plans, housing, workman's insurance, benefits and pensions, alien labor, Americanization, standardization of products, etc.

E. W. McCullough who has been selected to head the new department, points out that there is a great need of more definite and accurate information as to our resources of basic materials, natural and developed, and also as to the resources of the country—not mere data, but data organized and visualized to meet the needs of the average producer. The same treatment should be given partly fabricated materials, which in many instances are the raw materials of other industries.

In production, according to Mr. McCullough, much benefit of good equipment is lost unless production schedules and accurate cost reckoning are made part of the system. Too much of our industrial output is figured on a gambling basis. The day of estimating and cost-plus methods went with the war; these have been supplanted by competition which measures profits based on cost facts.

The new manager holds there is as great need in most lines for reliable production figures as there is for information concerning markets. An unnecessary surplus in production is an injury to producer and consumer alike; is, in fact, economic waste. Under-production causes starvation and suffering. Both may be avoided as far as manufactured products are concerned, except in times of stress, through the availability of accurate production data.

The majority of industries neither gather nor make statements of correct production, while that furnished annually to the Federal Census Bureau is valuable only for comparison. Up to this time defective records, or total absence of records, together with reluctance, because of competitive reasons, have prevented the gathering of figures which would be the most valuable guide to intelligent production.

The National Chamber offers to business the service of this department together with that of other new departments recently created to help solve its problems.

Commerce Commission Orders Anthracite Roads to Pay Heavy Damages

ON APRIL 6 the Interstate Commerce Commission issued an order directing the Lehigh Valley Railroad Co. to pay G. B. Markle Co. $101,200.60, with interest amounting to $13,538.91, as damages for unreasonable freight charges for carload shipments of anthracite coal from the coal company's collieries since April 1, 1916.

On a similar charge the Lehigh Valley was ordered to pay Pardee Bros. & Co. $30,146.30 with interest amounting to $3,399.79, and to the firm of Charles M. Dodson & Co. $32,509.77 with interest amounting to $3,596.39.

At the same session the commission directed the Central Railroad of New Jersey to pay the Dodson company $7,213.24, as reparation for unreasonable freight charges on anthracite coal shipments.

Winter Wheat Condition Improves

ESTIMATES on winter wheat issued by the Bureau of Crop Estimates May 8 state that on May 1 the area of winter wheat to be harvested was about 34,165,000 acres, or 4,605,000 acres (11.9 per cent) less than the acreage planted last autumn and 15,740,000 acres (31.5 per cent) less than the acreage harvested last year. The ten-year average per cent of abandonment of planted acreage is 11.2. The average condition of winter wheat on May 1 was 79.1, compared with 75.6 on April 1, 100.5 on May 1, 1919, and 87.1, the average for past ten years on May 1.

British Miners Want Share of Increase In Price of Coal

FOLLOWING closely on the announcement of an increase in the price of coal in London from $10 to $13 a ton the coal miners' executive committee called a meeting to discuss the new prices and their relation to mine workers' wages.

When approached on the subject Vernon Hartshorn, labor member of Parliament, said "If prices are going up, the miners' wages are going up as well."

Steel Rail Production for 1919 Showed Decline

STEEL rail production in United States in 1919, according to *The Wall Street Journal*, was 2,203,843 tons as against 2,540,892 tons in 1918, 2,944,161 tons in 1917, 2,854,518 tons in 1916, 2,204,203 in 1915 and 1,945,095 tons in 1914. Since 1903 the largest production in any year was in 1906, when the output was 3,977,887 tons.

Foreign Trade Shows Three Billion Balance In Nine Months

IMPORTS brought into the United States during the nine months ending with March were of a total value of $6,051,000,000, leaving a trade balance for the nine months of $3,332,000,000.

NEWS FROM THE CAPITOL

BY PAUL WOOTON

Canadian Exchange Rates Bother Coal Shippers

IN the near future the Interstate Commerce Commission is expected to announce that the carriers, on their own responsibility, may place a footnote on their Canadian coal tariffs to the effect that if the American proportion of through charges is not paid in the United States currency, exchange should be considered in making payment. The American Wholesale Coal Association requested the Interstate Commerce Commission to issue a ruling to that effect.

The commission is unwilling to authorize such a footnote itself, but it has no objection to the individual carriers taking that action on their own responsibility. It was pointed out that immediate action was imperative on coal, which must move a maximum volume at this season of the year, whereas the same question with regard to general merchandise could be threshed out later.

Private Coal Depots Will Not Be Permitted at Panama Canal

FACILITIES for the storage and handling of coal at the Panama Canal are such that private plants for such purposes will not be permitted. Adequate service for supplying shipping passing through the canal can be had only by obtaining the maximum capacity of Government plants. For that reason Chester Harding, Governor of the Canal Zone, has issued, with the approval of Newton D. Baker, Secretary of War, circular No. 704-3, as follows:

1. Circular No. 703, of July 30, 1915, announced the policy of the Panama Canal, as approved by the Secretary of War, with regard to the establishment of private coal and fuel oil depots on the Ithmus for the supply of shipping passing through the Panama Canal.

2. Pursuant thereto private fuel oil depots have been established and are in operation. Similar action has not, however, been effected in connection with the storage of coal.

3. Experience to date is now accepted as demonstrating the necessity of reversing previous policy with regard to the establishment of private coal deposits. As indicated in Circular No. 703, private wharfage and private utilities for the handling of fuel have, from the first, been recognized as undesirable. This establishment has not at any time been contemplated. So far as concerns fuel oil, the use of existing Government utilities in common connection with both Government and private storage has proved practicable, at least to the extent of justifying further trial. Similar duplicate use of utilities for storage and handling of coal cannot, however, be applied without substantial reduction in the total quantity of coal that can be stored, or without serious interference with the operation of handling. It has been found that proper service demands the maximum capacity of existing plants, and that the factors involved apply with equal force to whatever extensions may hereafter be developed.

4. It is accordingly now announced that, with the approval of the Secretary of War, the policy of the Panama Canal no longer contemplates the establishment of private coal depots in the Canal Zone.

Coal Operators Ask Help for Roads

REPRESENTATIVE ESCH, chairman of the Committee on Interstate and Foreign Commerce of the House, is receiving numerous appeals, many of them from coal operators, urging that an extension of time be granted the railroads for repayment of the amounts due the government.

Under existing conditions the proportion of the carriers' earnings available for repairs and extensions is insufficient to take care of these accounts. As a result the coal industry and other commercial activities are being handicapped because of low car efficiency and inability to secure new sidings and trackage facilities. The hard usage to which all equipment was subjected during the war has caused the proportion of cars in poor condition to be much higher than normal.

Will Divert Coal from Congested Centers

BECAUSE of congestion at tidewater ports and at large railroad centers the Interstate Commerce Commission is considering plans which will tend to divert coal to points where it can be unloaded promptly. Delays to cars resulting from congestion at tidewater and in the large city yards is regarded as an important contributing cause to the car shortage, with a consequent decrease in production. It is stated that too much coal is being loaded to points where it cannot be handled promptly, whereas small towns and the smaller industries could absorb this coal to great advantage and return the cars promptly.

Revenue Officer Addresses Operators on Coal Taxes

INTERNAL Revenue officials are very much pleased with the success of the recent trip of A. W. Gaumer, of that bureau, during which he talked on coal tax matters at a number of meetings of operators. After each address Mr. Gaumer invited those present to ask questions and to point out any inequities in connection with the operation of the revenue laws.

National Coal Association Announces Tentative Program for Convention

A TENTATIVE program for the annual convention of the National Coal Association, which will be held in Atlantic City May 25 to May 27, has been announced.

Tuesday, 10 a.m.—Roll call and reports of officials and committees. Governor J. J. Cornwell of West Virginia will address the convention in the afternoon, after which there will be reports of committees and the election of directors at large. This should be a lively session as a discussion of assigned cars will follow the report of the committee on railroad relations. The special committee on railroad fuel is expected to spring a new scheme for the solution of this problem.

Wednesday morning will be given over to business and an address by Governor Harding of the Federal Reserve Board. Dr. Eaton and A. H. Smith, of the New York Central, will talk on Thursday morning.

Taft Will Be Guest of Coal Jobbers

FORMER President William H. Taft has been invited to be the guest of honor at the banquet which will be a part of the annual convention of the American Wholesale Coal Association to be held in Pittsburgh June 1 and 2. The complete program for the convention has not been completed at this writing, but the following features have been definitely arranged:

William B. Colver, of the Federal Trade Commission, will discuss the function of wholesaling; C. B. Hurrey, of the Bureau of Internal Revenue, will talk on tax matters; Charles A. Owen will discuss the tidewater situation; George D. McElvane, Secretary of the National Tin Plate Association, will deliver an address on the work of commercial and trade associations; Vice-President Kane of the American Short-Line Railway Association will talk on "Transportation After 1920"; E. J. McVann will talk on the smokeless situation so far as experts are concerned; Milton C. Elliott will address the convention on the legal phases of control; Charles A. Allen, secretary of the Wholesale Coal Trade Association of New York, will discuss demurrage; and George H. Cushing, managing director of the American Wholesale Coal Association, has taken "Legislation" as his subject. In addition there will be talks by members of local associations on traffic subjects. The speakers at the banquet will be Former President Taft, Noah H. Swayne, 2nd, Governor Cornwell of West Virginia, and Judge Elliott.

Coal Operators Are Severely Condemned By Brotherhood Official

"COAL BARONS" and "Petroleum Pirates" came in for denunciation by Timothy Shea, assistant president of the Brotherhood of Locomotive Firemen, in the course of his final argument before the Railroad Labor Board. He said in part:

"In this connection, the public should understand that if it were not for the profiteers railroad workers could be given a square deal and a living wage without any increase in railroad rates. Next to wage earners and salaried people the railroads are the greatest victims of the profiteers. Railway equipment corporations, the steel trust, the coal barons and the petroleum pirates have grown fat on the excessive and unjustifiable profits they have exacted from the railroads, and unless some means is found to curb their greed they will gobble up the greater part of the billions which the railroads must spend for new equipment, betterments and materials of all kinds during the next few years."

Company Housing in the Bituminous Coal Fields Tends to Uniformity*

Isolation of Mining Towns, Dependence on One Industry and Shifting Character of Labor Force Compel Owners to Assume Responsibility—Houses Lack Ordinary Interior Conveniences — Streets Usually Are Dirt Roads — Sidewalks Rare

By Leifur Magnusson

IN THE latter part of 1916 the Bureau of Labor Statistics completed a comprehensive survey of housing by employers in the United States. This investigation comprised communities maintained by coal mining companies in western Pennsylvania, West Virginia, Ohio, Indiana, Kentucky, Tennessee, Alabama, Colorado and Wyoming, and included almost exclusively the better types of communities. Certain facts stand out as a result of this study.

1. The responsibility for the housing of a large proportion of the miners has been undertaken by the mine operators. The isolation of the average mining town, its dependence upon the one industry of mining, and frequently its impermanence and almost universal lack of local self-government, as well as the shifting character of the labor force, have compelled the mine owner to assume that responsibility.

2. The average company mining town has few of the amenities of ordinary community life. There is a dull uniformity in the appearance of the houses and an absence of trees and natural vegetation. Streets and alleys are open dirt roads almost without exception. Sidewalks are very rare.

3. The miner's house is without the ordinary inside conveniences found in the house of the city worker. Less than 2 per cent of the homes in the bituminous coal regions have inside toilets, and running water is rare. Stoves and grates are depended upon for heating.

4. The average house of the miner includes about four rooms, in which he must accommodate a family

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*Reprinted from the Monthly Labor Review of the U. S. Department of Labor, April, 1920.

and frequently take in boarders when there is a housing shortage.

5. The rents of the miner's houses are comparatively low, most of them (12,343 out of 18,877, or 65.4 per cent) renting in 1916 for less than $8 per month. The rent in some instances probably constitutes a subsidy to the wages of the miner who lives in a company house. (What proportion of all bituminous coal miners live in company houses is not known.)

Scope of the Housing Survey

The survey was in no sense a census of the coal companies with respect to their practice in housing their employees. Observation, however, convinced the investigator that the practice of company housing was very widespread and uniform among the coal-mining companies.

The scope of the survey in the bituminous-coal region is indicated in Table 1.

TABLE I. SCOPE OF THE HOUSING INVESTIGATION IN THE BITUMINOUS COAL FIELDS

District	Number of Companies	Number of Communities	Number of Employees	Number of Employees Housed	Percentage of Employees Housed
Pennsylvania and W. Virginia	32	[1]114	78,218	43,877	56.1
Ohio and Indiana	3	4	1,287	688	53.5
Alabama	24	29	[2]18,694	[2]15,035	80.4
Colorado and Wyoming	5	16	4,644	3,148	67.8
Totals	64	163	102,843	62,748	61.0

[1] One company did not report number of establishments.

[2] Not including one company with 500 employees, number housed was not reported.

The chief characteristic of every company mining town is its uniformity, due to a tendency to erect houses of similar plan and type and to arrange them along rectangular lines of survey. Another feature of the mining town has been its disregard of the advantages of planting trees, grass and shrubbery as beautifying elements.

On the other hand, the mining town is characterized by relatively wide streets and ample lots. The streets are usually unpaved, open dirt roads. Sidewalks are extremely infrequent and only in the better parts of the community is there evidence of fenced and grassed courts.

The desirability of locating the houses near to the mines has frequently been secured at the sacrifice of conditions of health and comfort; thus in the coking region the houses are found placed on neighboring hillsides which have been rendered barren by the noxious gases of the beehive ovens. Frequently the towns were found placed not only immediately adjoining the ovens but with no consideration as to the prevailing winds in the region. With the prevailing winds from the west, houses to the east would be constantly enveloped in smoke. Consequently conditions of dreariness and desolation were quite common in the region. On the other hand, some operators pointed out that because of improved means of communication nearness to the mines is not as essential now as it was formerly. This is particularly true in the bituminous region of Pennsylvania, where the district is fairly closely settled. Workers in the bituminous-coal region of Pennsylvania commute from neighboring cities as far as seven miles away. Isolated "patches" in the region still exist by reason of pure inertia, as one of the more far-seeing managers remarked. It is unfortunate that the scattered locations of formerly individually owned mines were not consolidated into a single town with developed community life at the same time that the mines came under a single corporation control.

There are two prevailing types of houses found in the bituminous coal regions, the single or detached house and the double or semi-detached house, though a few row houses are found in the Pennsylvania and West Virginia and the Colorado and Wyoming districts.

The prevailing plan of house in the Birmingham district is a hip-roofed cottage about twenty-eight feet square with a chimney in the center of the roof, a front porch running the full length of the house, and a small porch at the rear. The houses are generally raised from the ground by brick piers four or five feet high, the area under the house being usually *uninclosed.* In the Tennessee and Kentucky coal fields small gable-roof cottages prevail. These, too, are generally without cellars; front and rear porches are common.

A type of house more or less peculiar to all small southern towns is the so-called "shotgun" house, shaped like an oblong box and divided into three rooms in a row and frequently with the doors connecting the rooms in alignment.

A feature of the mining towns, particularly of the Pennsylvania, West Virginia and Alabama districts, is the monotony of color in the painting of the houses, all of the dwellings in many towns being exactly alike in this respect. Often, too, they need paint badly.

Considerable variations exist as between the different industry groups and the different sections of the country. The prevailing size of dwelling for a family in the Pennsylvania and West Virginia bituminous coal region is either three or four rooms; in the Ohio and Indiana coal region, four rooms; in Alabama, Tennessee and Kentucky, three or four rooms; and in the coal towns of Colorado and Wyoming, four rooms. A considerable proportion of two-room houses is found in the bituminous coal regions of Alabama, Tennessee and Kentucky.

Sanitary conveniences are rarely found in mining towns. Thus in the soft-coal regions only 312 dwellings, or 1.9 per cent, of the 16,896 reported, have inside toilets, while 16,584, or 89.1 per cent, have outside toilets. In the more thickly settled anthracite region 19.5 per cent have inside toilets and 80.5 per cent outside.

Railroad Strike Makes Mines Idle

FIFTY-FOUR men forming freight-train crews on the Morgantown & Kingwood R.R., a coal carrier in northern West Virginia, went on strike on Tuesday, May 4, and refused to work for nearly an entire week because the general management of the Baltimore & Ohio R.R., which operates the Morgantown & Kingwood R.R., had not acceded to their demand for an 8-hour day with ten hours' pay, the freight trainmen on April 30, having served notice on the railroad officials that ten days would be given them to meet the demands.

For a time during the strike it seemed certain that the striking trainmen would be dismissed from the service, the management of the Baltimore & Ohio refusing to treat with the men unless they returned to work. This they were finally induced to do by officials of the Brotherhood of Railway Trainmen under assurances that their demands would be given early consideration by the railroad labor board and that they would not lose their seniority rights.

The Labor Situation

Edited by
R. Dawson Hall

Union Would Organize Mingo Field

Labor Leaders Seek to Surround Logan Field with Union Territory and Compel Surrender—Would Elect Sam. Montgomery

MOVES made by the United Mine Workers to organize the Mingo County mines are believed to presage a general movement to organize all the non-union mines in southern West Virginia, a movement which the operators in the section mentioned made plain some time ago would be greatly resented. It will be recalled that during the latter part of January John L. Lewis, president of the United Mine Workers, appeared in Bluefield and at that time announced that a determined effort would be made to organize the Pocahontas and other non-union fields.

Mingo County is directly west of Logan County, where an effort was made last year by the United Mine Workers to force unionization on the miners of the Guyan region, although no sentiment for organization existed among the miners in that field. The effort to organize the Mingo field is construed as part of a strategic move to surround the Logan field with a belt of organized miners.

To the southeast of the Logan field lie McDowell, Mercer and Wyoming counties, and these comprise that part of the Pocahontas field which is in West Virginia. As stated, the efforts of the union to organize the Pocahontas field have been quite active. The attempt to organize the miners in Mingo County is regarded in many quarters not only as industrially significant but also as having political significance in connection with the effort of the United Mine Workers' organization to nominate S. B. Montgomery in the Republican primaries as an out-and-out labor candidate.

The movement now on foot among the United Mine Workers to organize the Mingo and other non-union fields in southern West Virginia is closely interwoven with the political move to nominate Samuel B. Montgomery as the Republican candidate for Governor, Montgomery having been endorsed by the non-partisan labor organization in this state, dominated largely by the United Mine Workers. Little doubt as to this being the relation between the two drives remained after a meeting held at Matewan, in the heart of the Mingo County field, on May 7, at which mine workers were urged to join the union and to support Montgomery.

On the date already given Fred Mooney, secretary of district 17, United Mine Workers, and W. M. Blizzard, president of sub-district No. 2, were at Matewan directing the organizers in their attempt to organize the Thacker field.

Claims are made by Mooney and others that eleven local unions have been organized in Mingo County, the total membership being 2,000. This is denied by the operators of the field, who say that so far the United Mine Workers have failed to make any material headway in inducing miners in Mingo County to join the United Mine Workers. They claim that the miners see that there is nothing to be gained by affiliating with the union. However, organizers have been, and are still at work, so far as can be learned, and if reports be true the principal argument they are using is that if the field is organized the Government will see that a better car supply is furnished, conveying the impression that mines in the organized fields are receiving a full car supply. From this it will be seen that the shortage of cars is being used to strengthen the hands of the organizers.

Not only are mine organizers circulating propaganda in the Mingo field but a representative of the Department of Labor at Washington named McRoberts spoke at Williamson during the first week of May advocating the "Plumb Plan."

Deadwork Still a Lively Issue

AS the scales for deadwork in northern West Virginia were left by the Baltimore conference in their entirety to the operators and mine workers of the various local fields a meeting was held at Fairmont on May 7 to consider these matters.

The operators at the Fairmont conference were represented by J. W. Bischoff, of Elkins Coal & Coke Co.; C. H. Tarleton, of Fairmont, manager of the West Virginia division of the Consolidation Coal Co.; A. Lisle White, Clarksburg, W. Va.; Samuel D. Brady of Fairmont; George T. Bell, executive vice-president of the Northern West Virginia Coal Operators' Association, and E. S. McCullough, Fairmont commissioner of the same association.

Representatives of the miners were, C. F. Keeney, Charleston, president of district 17, United Mine Workers; William Petry, vice-president, district 17; W. F. Ray, A. C. Porter, Nick Aiello, Scott Reese, David Ware and Ira Marks, district board members.

Kansas Miners Allege That State and Court Conspired Against Them

WHEN, on May 15, the time came for the Crawford County District Court in Kansas to consider the application made by the officials of that state that the injunction issued against the calling of a strike of mine employees be made permanent, the United Mine Workers' counsel alleged that the plea should not be granted because the Kansas Industrial Relations Court, R. J. Hopkins, State Attorney General, and A. B. Keller, County Attorney, had conspired to create strife in the coal fields of the state with purpose of using the idleness as a reason for asking an injuction or for taking criminal action against the mine workers. The mine workers denied that President Howat or the 250 union officials had conspired in any way to bring about a cessation of work.

Gompers Wins Preliminary Advantage In Debate with Governor Allen

IN the debate on the Kansas Industrial Relations Court to be held May 29 by Samuel Gompers and Governor Allen of Kansas, Mr. Gompers will have the choice of opening or closing the debate. Governor Allen has been informed by telegram that in the drawing of straws luck favored the American Federation of Labor president.

Practically all the details have been arranged. Governor Allen is writing his speech. Each debater will be allowed an hour and a half to present his argument and fifteen minutes to close.

Kansas labor unions are making arrangements to send a large delegation of labor leaders to root for Gompers.

Miners Fear Public May Learn How Much Can Be Mined in a Day

TWO miner members of the British Parliament made a $250 wager on the amount of coal they could mine in two hours. The contest to determine the bet is to take place May 24. As soon as the report of the wager reached the newspapers there was a protest on the part of the miners and 2,000 threatened to strike. It would never do to let the public know just how much coal could be produced by conscientious work.

The two members of parliament who have raised this bad feeling by their reckless wagering are Allen Clement Edwards, from the South Division of East Ham, and John Walton, from the Don Valley Division of Yorkshire. They have already selected the Yorkshire colliery, where, surrounded by admiring (or by unfriendly) spectators they intend, for two hours apiece, to demonstrate how they can make the coal fly.

Two other miners, also M. P.'s, seem to have become "peeved" over the way in which Edwards has boasted his ability to roll out coal. They are Major David Watts Morgan, from the East Division of Rhondda, who holds the Distinguished Service Order, and Charles Butt Stanton, from the Aberdare Division of Merthyr Tydivil. "Who is this Yorkshire man, Edwards, anyway?" they seem to say. Surely there are better miners in Wales than can be found in Yorkshire" and they have challenged him to a contest similar to that he has agreed to enter into with Walton.

Dan Harrington To Be Fifth Member of Wage Board in Washington State

DANIEL HARRINGTON, who is the district engineer of the Bureau of Mines station at Golden, Col., has been agreed upon by the representatives of the United Mine Workers of district No. 10, of the State of Washington, and by the representative of the Washington Coal Producers' Association as the fifth member of the committee which is to determine the wage scale in Washington coal mines.

Domestic Coinage in April

DURING the month of April, the Treasury Department announces domestic coinage totaled $2,348,990, in 14,742,000 pieces.

Michigan Miners Want to Keep Their Dime Differential

MINERS in Michigan refuse to work unless the new scale assures them of the dime a ton increase that was promised them during the war, which they say they did not receive. President William Stevenson came to New York to ascertain the attitude of President John L. Lewis to the demands of the Michigan men. The Michigan mine leader says that Lewis favored the demands of the Michiganders.

The demand was not made before the Bituminous Coal Commission, but William Stevenson justifies that omission by saying that the matter was not arbitrable. The operators through their representative, H. C. O'Brien, declare that the change in scale was merely a war-time measure, and that as it was one which placed the Michigan operators at a disadvantage it should not be regarded as a permanent provision to be operative when coal is sold under co-operative conditions.

Mr. O'Brien says that the differential has been paid and probably will be till peace is formally declared, but the operators do not want the provision to be saddled on the Michigan operators till April 11, 1922. They are willing, and have offered, to submit to the decision of these arbitrators, whatever it may be, but they demand of the miners that they promise to do likewise, whether the decision be favorable or not.

Eastern Ohio Locals Reluctantly Confirm New Contract

AFTER the scale committee of the United Mine Workers of subdistrict No. 5—Eastern Ohio—had agreed to a contract with the operators of that area it was necessary to have the document approved by the delegates of the various locals. They met at Wheeling, W. Va., on May 4 and finally accepted the agreement though not without prolonged debate.

The mine workers had constructed a marvelous document, containing forty-one demands, all more or less radical. They were displeased to see most of them discarded when the contract was finally put in shape for signature. The increase granted under the new agreement will average about 27 per cent. There will be an advance of 34.8 per cent in the tonnage scale and a 20-per cent increase in the scale for day labor and deadwork. Approximately fifteen thousand miners will be affected by the new scale. A number of miners had refused to work pending the completion of the contract. Now that an agreement has been reached, it is believed that all miners will report for duty.

Fusion of Geological Survey and Bureau of Mines Is Proposed

FUSION of Geological Survey and the Bureau of Mines into a new type of bureau to be known as a division of the Interior Department is proposed in a bill which has been introduced by Senator Henderson. The division is to be under the immediate control and direction of an assistant secretary, who "shall be technically qualified by experience and education to exercise the powers and duties imposed." He is to be appointed by the President and it to receive a salary of $10,000 a year. This is regarded as a step toward attaining a separate department of mines.

Discussion by Readers

Edited by

James T. Beard

Working Three Seams of Coal That Extend Under a River

Referring to the question regarding the best method of working three seams that overlie each other in the Kanawha River district, as described in *Coal Age*, Feb. 26, p. 419, allow me to submit the following plan of working, which has been derived from my own experience under similar conditions.

For the purpose of securing the most complete extraction of the coal, I would open and work the upper one of these three seams first. Owing to the thinness of the coal in the two upper seams, I would use the longwall method of working each of these. In that method, as is well known, all of the coal is taken out in the first working, while the roof settles firmly on the packs that are built to keep the roads open.

In Fig. 1 is shown a general plan of the longwall advancing method. Starting from the foot of the downcast and upcast shafts, marked respectively D and U in the figure, a main haulage road and return air-course are driven in the seam. These roads are 10 ft. in width, and enough roof is taken down to give a clear height of 7 ft. at the start. The material taken from the roof is used for building packwalls on each side of the roads. These roadpacks should be from 10 to 12 ft. in width and well built.

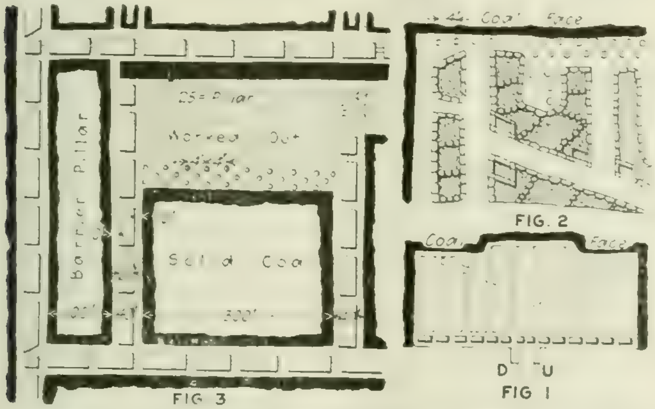


FIG. 2

FIG 1

FIG 3

GENERAL PLAN AND DETAILS OF LONGWALL WORK

As shown in the figure, branch motor roads are driven to the right and left of the main haulage road and at right angles to it, starting at a distance of from 700 to 800 ft. from the downcast shaft. A longwall face is now started on the inside rib of the inner of these entries. As the face is advanced, packwalls are built to keep open the gateroads, which are turned on 40 or 42 ft. centers, as indicated by the dotted lines in the figure. These roads or "gates," as they are called, are cut off by diagonal or slant roads, which are driven from the main haulage road about every 200 ft. apart. As each place is cut off in this manner, the coal is taken out by the slant road and the remaining portion of the old road is abandoned.

In Fig. 2 is shown a detailed section of the work at the coal face. As indicated in this figure, wooden cribs are built at the corners of the roadpacks, where a permanent road intersects a gateroad. The cribs are made of old wooden props laid across each other, the space between them being filled with loose slate. This reinforces the packwall at the point where the greatest prssure comes and helps to keep the road open while the roof settles down on the packs.

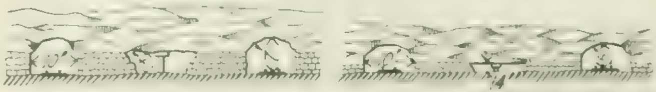
For building cribs, old timbers are more springy and yield better to the settling roof than fresh live timber, which offers greater resistance and may cause the roof to break over the road. This is a feature that must be avoided always in longwall work.

AT THE WORKING FACE

As further shown in Fig. 2, one or more rows of props are set on some systematic plan of timbering, along the face of the coal. Good cap-pieces are placed over each post, care being taken to range the caps at right angles to any joint or slip in the roof. The caps are of soft wood, 18 in. long, 6 in. wide and 2 or 3 in. thick. Each man's working face is about 42 ft. long, equally divided on either side of the gateway, which requires the handling of the coal a distance not exceeding 5 or 6 yd.

In working the middle seam, I would use a modified longwall system, such as shown in Fig. 3. In this system butt headings are driven off the main road, on centers of about 500 ft., and stalls or roads are turned off these butts, in pairs, on 300-ft. centers, after leaving a 100-ft. pillar between the main road and the first gateroad, for the purpose of protecting the main haulage road.

In Fig. 4, I have tried to illustrate the effect produced on the packs by the settlement of the roof or overburden. When the packs are well built the amount they will be compressed will range from 50 to 60 or 65 per cent, depending on the character of the roofrock and depth of cover. In the figure, the original height of the packs was 3 ft. and this is shown as reduced to 14 in. by the settlement of the roof, following the extraction of the coal.



PACKS JUST BUILT — AFTER ROOF SETTLEMENT

FIG. 4. SHOWING EFFECT OF TAKING OUT THE COAL

As shown in Fig. 3, the first gateroad is driven through to the next butt heading or airway. As the gateroads are driven up to within 25 ft. of the airway on the next pair of butts, No. 2 gateroad is connected with No. 3 gateroad by driving a cross-heading through the solid coal.

The work of extraction is now commenced and the coal worked out, in each panel, on the retreating plan, keeping the face in one panel a few yards in advance of that in the next panel adjoining. Three rows of posts are kept behind each working face, the posts in each row being staggered, as shown in the figure. The 25-ft. pillar protecting the air-course on the next butt heading, and the entry pillars, are drawn back as those headings are finished.

SYSTEM IN TIMBERING

Thoughout the entire work I would adopt a systematic method of timbering, setting the posts 4 ft. apart, center to center, and keeping three rows of posts behind the track or face conveyor, if that is used. The back timbers are drawn and reset as the face is advanced, the posts being used over and over again.

When the work has been well advanced in the two upper seams I would start to work the lower seam on the room-and-pillar system, taking care to leave pillars of ample size to avoid the possibility of a squeeze occuring in the workings. In my opinion, a good rule to determine the width of the pillars is the following: Make the area of pillars, in square yards, equal to the depth of cover in fathoms, multiplied by twice the thickness of the seam, in feet. WILLIAM DICKINSON, SR.

Oak Hill. W. Va.

Utilizing a Water Supply Struck in Sinking a Shaft

A recent reference to this subject, in *Coal Age*, has reminded me of an incident that may be of interest. It occurred in the sinking of two shafts for an operating company. The circumstances were about as follows:

In the process of sinking one of these shaft, between the Sewickly and the Pittsburgh seams, we had been in hard sandrock for a distance of 35 ft. when, on firing a sump round, we struck a stream of water that caused us to put in a pump of greater capacity. A little later, when the shaft was squared up, we found that the water was coming from the hillside, and this opinion was confirmed by the fact that some few days after, several people residing in the neighborhood reported that their wells were running dry.

At this time, the men working in the shaft were drinking the water and said it was the best they had tasted in that vicinity. Also, people came from a distance around bringing their water pails and sending them down the shaft for water. Simply as a matter of precaution, I sent a sample of the water to the laboratory for analysis.

WATER REPORTED UNFIT FOR USE

I had a plan to excavate a lodgment in the side of the shaft, that would have sufficient capacity to serve as a reservoir to collect and hold the water, which I contemplated pumping to a tank on the hill. This I thought would serve the purpose of providing a good water supply for domestic use. The management agreed to the plan; but, a few days later, a report came from the laboratory stating that the water was not sufficiently pure for domestic use and the plan was abandoned until a further investigation could be made.

That settled the question, as far as the shaft was concerned, and now it became necessary to make some provision for taking care of the water, before continuing the sinking of the shaft. In this, I was guided by two considerations: First, I knew that the flow of this water into the shaft would seriously impede the work of concreting when the bottom of the shaft was reached. Second, I was skeptical in regard to the water being unfit for use, and felt that this opinion might be changed when a further test of the water had been made. It was my purpose, therefore, to save this supply of water for future use if needed.

Having made a jackhamer bit of the right size, I drilled three 18-in. holes, horizontally, into the sidewall of the shaft where the water was coming. Into each hole, I drove a 2-in. pipe or nipple, 2 ft. in length. After corking around the pipes so as to prevent the flow of water into the shaft, the three pipes were connected with a column pipe or leader extending downward. This was provided with a valve to shut off the water and the scheme proved a practical success.

THE PLAN A WISE PROVISION

When the shaft reached the coal, an excavation was made in the seam and a large sump provided as a lodgment for the water. The standpipe was then extended to the bottom of the shaft. This 3-in. line had been carried down the shaft inside of the forms that were being placed in position for concreting the shaft from the bottom up. The 3-in. pipe terminated below the arch, on the side of the shaft near the wall, and a valve was provided at the end of the pipe to control the flow of water into the sump.

It will not seem strange that when the shaft was finished, the company decided to use this water supply and installed an electric pump at the bottom of the shaft for the purpose of pumping the water to the surface. It is clear that a greater efficiency would have been secured had the first plan been adopted of building the lodgment and installing the pump in the side of the shaft where the flow of water was struck.

The original plan would also have avoided the nuisance of a pump installed at the bottom of the shaft. Had it not been for my efforts to save this water supply, however, it would have been necessary to have made other provisions, at a considerable expense for drilling, or use other means to obtain water. The incident shows the necessity of forethought in providing for the future economical operation of the mine.

Fairmont, W. Va. JOHN E. AMBROSE.

Applying the Golden Rule in Industry Will Strengthen an Organization

No one of the letters that have appeared in *Coal Age* has interested me as that written by John Rose on Health and Industry, which appeared in the issue Feb. 19, p. 364, and which drew attention to the need of a more practical application of the Golden Rule in industry.

If the ideas expressed in Mr. Rose's letter and those given in another excellent article that appeared as a Foreword, entitled "Removing the Cause of Trouble," Vol. 15, p. 561, could be practiced by coal operators and mine workers alike, our labor troubles would cease and quickly become a thing of the past. Working men would realize their error in carrying on and supporting an unnecessary organization, because any differences that might arise between them and their employers would be speedily adjusted in the interests of both.

Ever since *Coal Age* came into existence, I have been greatly pleased with its policy in reference to the settlement of labor troubles by the Golden Rule. I much regret to say, however, that my experience in this country and at home, on the other side of the water, has convinced me that mine operators who practice fair and square dealing with their men are few indeed.

Not only in coal mining, but in all industries alike, there are many hypocrites who make a fair pretense at square dealing with their workers. To overcome this hypocrisy, the worker is compelled to devote a portion of his earnings, in an effort to secure his rights by building up and strenghtening an organization for which there should be no necessity.

Far better would it be for both employer and employed if they would come together in a spirit that regarded the common interests of each, where the result would be a lesser sacrifice than is now being made by either party. Let us hope for a more practical application of the Golden Rule, which will mean living up to our religion instead of practicing hypocrisy.

Staunton, Ill. HENRY BOCK.

Numerous Unsafe Practices of Miners in Blasting Coal and Rock in Mines

In reading the letter of John Rose, *Coal Age*, Mar. 25, p. 603, I was surprised to notice that he gives an instance of a miner pounding a charge of dynamite so hard that the men working in the next place heard him. Evidently, the man must have been using a steel tamping bar, as it would be impossible to make a noise that would be heard in an adjoining place when tamping a shot with a wooden tamping bar.

We know that all miners, more or less, have different ways of doing their work. While it is my practice to use a wooden bar for tamping a shot, I have seen miners use steel bars. Sometimes these bars are tipped with copper to lessen the danger of the steel striking a spark by coming in contact with any hard substance in the coal.

OBSERVING THE PRACTICES OF MINERS

On some occasions, I have seen miners when using a blasting barrel insert a cap in the barrel, or when using a needle they would insert the cap in the needlehole and fire the shot with a squib. Again, I have seen miners use two kinds of powder in the same hole; that is, black powder and dynamite. At times they would put a cap into a cartridge or primer, crimping the cap to the end of the fuse with their teeth. Others would use a spike to insert the cap in the cartridge.

I have seen miners use frozen dynamite instead of taking the time to thaw it. All these practices are out of date and should be abandoned. A miner will do many things, in his haste to get away and go home, that he would not do otherwise. But the man that takes his time and works safe always accomplishes more and gets the best results.

Speaking of tamping dynamite, I recommend tamping a charge of any explosive fully to the mouth of the hole. For this purpose I use the drillings of the hole made up in small cartridges and tamped with a wooden tamping bar. It has always seemed to me that there is danger in pushing a wad of paper into the hole and forcing it down onto the charge. The time when the most care is needed is when pushing anything into the hole on top of the charge or until there is a foot or so of tamping in the hole. I have always found that where a charge of dynamite is well confined in the hole the best results are obtained. BENJAMIN DEEBLE.

Pittston, Pa.

[Many will disagree with this correspondent's suggestion of stemming a hole with the drillings of the hole made up in cartridges. In blasting coal, nothing is more unsafe than to tamp a hole with coal dust or fine slack. Such a practice is almost sure to result in a windy shot and makes possible a local dust explosion that may have serious results.—EDITOR.]

To Explore a Mine with an Open Light Is Dangerous

It may be an example of either ignorance, indifference or contempt of the elementary laws taught in all textbooks treating on mine gases and ventilation, that would assume the condition of the air in an abandoned mine to be safe and such as to permit one to enter the mine either with an open light or even an electric lamp. Such must have been the attitude of mind of the two men who recently lost their lives when attempting to explore an abandoned mine, having only a small flashlight, and fell victims to their recklessness, being suffocated by the deadly blackdamp that filled the passageways.

The value of a technical education to mine foremen and firebosses, in so far as it applies to gasses and ventilation, should never be overestimated. Yet there are many who regard such a training as a burden, and do not hesitate to express for it a wholesome contempt. Others regard the need of such knowledge as a necessary evil in coal mining. Especially is that true when there are mathematical formulas to be remembered, in their practical application to the circulation of air and its distribution in the mine workings.

NEED OF MINING EXAMINATIONS

In view of the fact that legislators in many coal-producing states have not regarded this subject of sufficient importance to make a mining examination compulsory for mine foremen and firebosses, it is of little wonder that many mine officials are indifferent to this need. Such persons, it may be assumed, will present the same indifferent attitude in respect to maintaining safe and healthful conditions in the mines in their charge or under their supervision.

The advent and use of the electric mine lamp marks a most important advance in safe and efficient coal-mining practice. It is safe to say that the electric miner's lamp has come to stay; and yet it is neither logical nor practical to use such a lamp for the purpose of examining a mine for gas. The lamp gives no indication of the presence of explosive or poisonous gases; and the real danger when entering abandoned workings lies in the presence of either or both of these gases.

Therefore, when entering an abandoned mine, or in the examination of a mine, there is no choice but to use an approved type of safety lamp. To use an electric lamp or an open light for that purpose would be to invite disaster. To ascertain the presence of carbon monoxide, the only safe means lies in the use of caged birds or mice, the examiner being himself protected by breathing apparatus. In daily practice, however, this gas is suspected only under certain conditions, resulting from mine fires, gob fires, or the afterdamp of an explosion. We have no right to assume that an abandoned mine does not contain dangerous gases, and risk life itself by so doing.

We all learn by experience, and although I have entered and explored some mines that have been abandoned for a considerable time with a feeling of perfect security, in recent years it has been my almost invariable practice, on such occasions, to carry a good safety lamp, instead of either an electric lamp or an open light. There are many dangers to be met in exploring an abandoned mine, such as open trapdoors, roof falls, stoppings squeezed out by the roof pressure, gob fires, all or any of which should be suspected and provision made to avoid their danger.

Let this and similar incidents, in which good men have sacrificed their lives, emphasize for us the importance of technical training and its daily application to mining practice. **W. H. Noone.**

Thomas, W. Va.

Causes of Mine Explosions

Kindly let me refer to the account of an unexplained explosion that occurred in a coal mine working the Freeport seam, in the Cambridge district, in Ohio, and which was submitted for the consideration of *Coal Age* readers in the issue of Jan. 22, p. 197. I desire to offer a few suggestions or thoughts relating to the cause of that explosion. In the same connection, I read with interest the letter of Robert W. Lightburn, Feb. 12, p. 324, giving his view as to the probable cause of that explosion.

The inquiry fails to state clearly the exact time when the explosion occurred. It merely states that "the fireboss had examined the place about two hours before and found no gas." To my mind, the time when the examination was made would have something to do with determining the cause of the explosion. For instance, if the place was visited by the fireboss in the early morning, two hours before the men entered for work and the explosion took place, it is barely possible that the fireboss was pushed for time and made a hurried examination for gas at the most convenient point.

When a Fireboss is Rushed

Knowing that the place was generally free from gas, a fireboss who is pushed for time is quite liable to make a hurried test and assume that no gas is present. A more thorough examination, however, in the present instance, might have revealed a sufficient quantity of gas to have caused the explosion. On the other hand, if the examination was made later in the day, after the men had started to work, it is more probable that the gas that caused the trouble was liberated by reason of the heaving of the floor, which is a common occurrence in pillar workings.

Just here, I recall a remarkable instance that occurred in a mine where I was acting as fireboss at the time. The mine was being robbed out and everything had been drawn back to within 1,500 ft. of the entrance. Three men were at work drawing an entry pillar that measured about 25 x 35 ft., in area. The coal was about 3 ft. thick, underlaid with a hard rock, while the roof was a good slate. No gas had been found previously in this part of the mine; but, as may be imagined, there was a considerable open space that had been worked out behind the men and was standing on timbers.

A good current of air was passing where the men were working, mining the coal with picks and loading it into cars. Suddenly, there was heard a loud report like that of an ordinary coal shot, and a space 8 ft. in width was blown from the center of the pillar to one side, instantly killing one of the miners. The coal was crushed into fragments, the blast resembling that of a heavy charge of powder. There was no flame or smoke and no heat was felt.

Turning, again, to the inquiry before us, the fact that the loader was "holding his carbide lamp in his hand near the floor" would seem to indicate that he was suspicious that there might be gas at the roof, which is possible. His movements would naturally bring it down where it would be ignited on his lamp. If that was the case, the fireboss is probably to blame.

It does not appear to me that this was, in any way, a dust explosion, though machines were used to mine the coal. The theory of vaporized oil, to my mind, is incredible, for the reason that if there was sufficient oil seeping from the strata and vaporizing to cause an explosion, the same oily vapor would have accumulated again in a short time and caused a second explosion.

The suggestion has been offered that a heavy roof fall may have driven gas out from the waste where it had accumulated. It is stated that the pillar "was nearly all extracted," and it is probable there was a large space open behind the men. That being the case, the quantity of gas accumulated would seem to me to have been enough to have produced a disastrous explosion, much greater than what is described in the inquiry.

Emission of Gas in Mines

In my practice as a miner and fireboss, I have observed gas escaping from the coal, roof and floor and, at times, coming from all three places at once. I regard the danger less when the gas is coming from the coal than when it issues from the roof or the floor. My reason is that gas coming from the coal has more opportunity to diffuse and be carried away in the air current; while a break in the roof or the heaving of the floor may liberate a considerable quantity of gas that would cause trouble.

My experience agrees with what Mr. Lightburn has stated in regard to gas issuing in numerous small feeders, along the ribs of places that were working, where it was possible to light these small feeders with one's lamp. I recall one instance where a gas feeder in the roof of a main entry gave much annoyance, as miners passing down the entry would forget the feeder and the gas would be ignited, exploding with quite a report, as the lamp the man carried on his head came in contact with the gas.

In closing, allow me to state that my 20 years of practice as fireboss does not agree with the idea now taught that explosive gas will frequently be found near the floor of working places, while a lamp will be extinguished, at times, near the roof. I can understand how this might be the case where the floor was liberating methane and blackdamp was coming through crevices in the roof and connecting with an overlying seam. My experience has been where the conditions were normal, explosive gas is always found at the roof of working places. **John Rose,**

Dayton, Tenn. Former State Mine Inspector.

[The Inquiry page has, unavoidably, been crowded out this week by reason of necessary changes.—**Editor.**]

Examination Questions

Answered by

James T. Beard

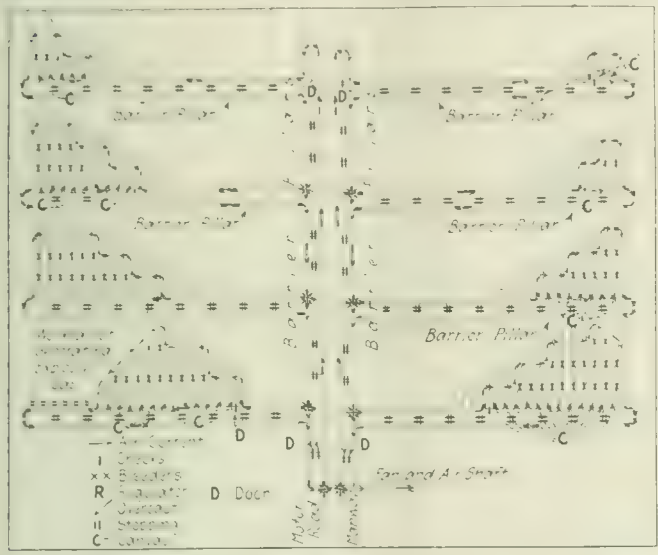
Bituminous (17th Dist., Pa.) Mine Foremen's Examination, April 6, 1920

(Second Grade, Selected Questions.)

Ques.—What is the total quantity of air, in cubic feet per minute, passing through an airway 7 x 7 ft., when the velocity of the air current is 300 ft. per minute?

Ans.—The sectional area of this airway is: 7 × 7 = 49 sq. ft. Therefore, assuming this is the clear area of passage and the average velocity of the current is 300 ft. per min., the quantity of air passing is 300 × 49 = 14,700 cu. ft. per min.

Ques.—Show on the accompanying map how you would ventilate the same, according to the instructions given thereon, with 200 men employed in this mine; 100 men on the right and 100 men on the left of the main entries.



Ans.—The direction of the air current in the several splits is indicated by the arrows in the figure.

Ques.—State briefly the duties of a miner, driver, machine runner, and motorman.

Ans.—The first duty of a miner, on entering his place in the morning, or after firing a shot, is to examine the place for any roof or coal that is liable to fall. The miner must observe also the mark of the fireboss, which shows that the place has been examined that morning. He must reset any timbers that have been discharged by the shots that have been fired, and this must be done before proceeding to do other work. The miner must use every precaution to protect himself from danger and not violate any of the mine laws and regulations.

The duty of a driver is to use every precaution to avoid accident both to himself and others, when hauling out the loads or placing the empties. He must never leave a car standing where it is liable to be struck by another car passing in or out of the mine, or where it can get loose and run out onto the main track. He must also take good care of his mule and not leave it in an unsafe place where it is liable to be injured.

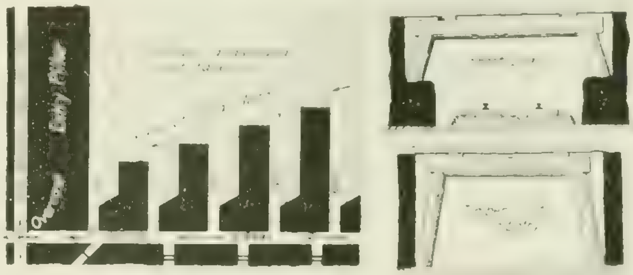
A machine runner is responsible for the proper care of his machine when in use. It is his duty to cut the coal to the required depth in each place in his district. He must observe and see that his helper works in a safe manner and to the best advantage, in keeping the machine clear while cutting the coal.

A motorman is responsible for the proper use and care of the locomotive in his charge. It is his duty to inform himself in regard to the construction and operation of the machine he must handle. Like the driver, he must use every precaution to avoid accident to himself, his helper and others.

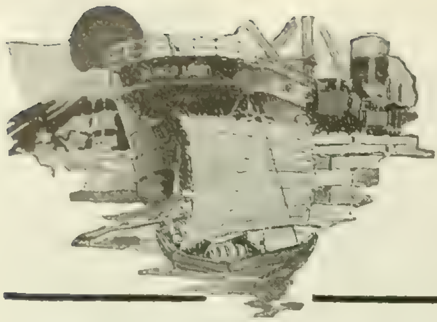
Ques.—What system of timbering would you adopt where the coal is undercut by mining machines: (a) In rooms; (b) in pillars; (c) in entries? Make a diagram showing the system employed in each of these cases.

Ans.—(a) In driving rooms, under ordinary conditions of roof and floor, a row of posts should be carried on the side of the room track opposite to and parallel to the rib along which the road is laid. At the face, a systematic method of timbering should be adopted suitable to the conditions that exist in any particular place. Ordinarily, two or more rows of posts are set parallel to the coal face, the posts being stood three or four feet apart, center to center. The rows of posts are spaced the same distance apart, and the posts in each alternate row are staggered.

(b) On the left of the accompanying figure is shown the conditions that exist when drawing back the pillars in the different rooms. The arrangement of the posts, however, will vary according to the conditions in the seam; but it should always be remembered that there must be two or more rows of posts behind the men and between them and the waste, where the roof has fallen.



(c) When driving entries, posts should be stood on each side of the road where it appears that the roof needs to be supported. Post timbering at the head of entries will vary with the conditions of roof and floor. When driving under a hard roof slate, it will seldom be necessary to set any posts at the head of the entry. On the other hand, when driving under a drawslate, this must be supported on posts, until it is taken down or the permanent timbers put in position. On the right of the accompanying figure is shown two methods of framing the permanent timber sets in an entry.



Foreign Markets and Export News

American Construction Materials Needed by Brazil

Brazil offers a market for all kinds of construction materials and machinery, not only in the immediate future but for an indefinite time to come, according to Trade Commissioner W. W. Ewing, whose report on that country has just been issued by the Bureau of Foreign and Domestic Commerce, Department of Commerce.

Mr. Ewing recently returned to the United States after a tour of investigation covering all the South American republics. He is convinced that Brazil, by reason of its vast undeveloped territory and its immense resources, is rapidly increasing in importance as an export field.

Some of the goods that it will most urgently need in the next few years are coal, iron, steel, cement, caustic soda, sulphuric acid, chemical and medical products, paper, and most manufactured materials requiring skill and experience in their production, such as engines, agricultural machinery, cutlery, the finer grades of glassware, oils, paints and railway materials of all kinds.

Coal Exports for March Show Marked Increase

Exports of coal during March, 1920, together with the revised figures for March of 1919, compiled by the Bureau of Foreign and Domestic Commerce, are as follows:

Coal and Coke	March 1919, Tons	March, 1920, Tons
Coal		
Anthracite	117,805	419 682
Bituminous	554,037	1,500,540
Exported to		
Italy	17,197	137,833
Netherlands	26,743	100,843
Sweden	None	17,706
Switzerland	None	33,763
Canada	352 883	639,635
Panama	5,290	18,306
Mexico	5 429	15,696
British West Indies	15,196	33,298
Cuba	38,107	115,982
Other West Indies	6,352	9,422
Argentina	8,670	80,346
Brazil	60 296	65,726
Chile	6,934	7,783
Uruguay	3,660	18.695
Other [illegible]	7,280	205,506
Coke	[illegible]	55,435

Imports of coal during March, 1920, were 71,126 tons. Practically all of this coal came from Canada.

The following tables show exports of domestic coal and coke from the United States by countries and by customs districts and the bunker coal supplied to vessels in the foreign trade at specified districts during March, 1920:

EXPORTS OF U. S. COAL IN GROSS TONS

	Coal		
	Anthracite	Bituminous	Coke
Azores and Madeira Isl..		5,601	
Belgium		18,003	466
Denmark	2 205	9,763	
France	896	79.458	
Germany	2	7,165	
Greece		4 496	
Italy	32	137,833	
Netherlands		100,843	
Norway....		15,161	45
Portugal		1,333	
Spain		5,523	
Sweden		17.706	
Switzerland	13,393	33,763	
England		13,078	
Scotland		6,722	
Bermuda	885	3,188	
British Honduras		47	
Canada	384,053	639,635	31,434
Costa Rica			25
Guatemala	310		
Honduras		700	
Nicaragua		224	
Panama		18,306	9
Salvador			7
Mexico	858	15,696	14,132
Newfoundland and Labrador	72		
Barbados	70	5,506	
Jamaica	25	11,172	
Trinidad and Tobago...		9,512	
Other British West Indies		7,108	
Cuba	7,380	115,982	694
Virgin Islands of U. S....		2,491	2
Dutch West Indies		4,654	
French West Indies....	3,310	2,277	
Dominican Republic...	1,949		25
Argentina	3,060	80,346	
Brazil		65,726	
Chile	248	7,783	8,440
Colombia		1,035	
Ecuador	861		2
British Guiana		2,445	
Peru	40	50	50
Uruguay	30	18,695	
Venezuela	3		4
Dutch East Indies			100
Canary Islands		1,717	
French Africa		12,292	
Egypt		17,505	
Totals	419,682	1,500,540	55.435

COAL EXPORTED BY CUSTOMS DISTRICTS

	Coal		
	Anthracite	Bituminous	Coke
Maine and New Hampshire	22	65	166
Vermont	1,711	9,137	362
Massachusetts	72		
St Lawrence	128.601	124 248	1 296
Rochester	3,215	53,795	125
Buffalo	241,792	311,338	13,510
New York	10,370	4,649	1,349
Philadelphia	23,742	22,402	
Maryland		51.868	8,461
Virginia	30	693,137	
South Carolina		46,111	
Georgia		8,272	
Florida		11,663	
Mobile		1,746	
New Orleans	3,620	9,084	100
Sabine			45
Galveston		75	
San Antonio	346	1,643	696
El Paso	249	9,177	2,965
San Diego	5	9	1
Arizona	38	1,063	10.336
San Francisco			46
Oregon	5,751		
Washington		81	71
Dakota	76	2,405	238
Duluth and Superior		23,258	50
Michigan	42	115,308	15,616
Porto Rico		6	2
Totals	419,682	1,500,540	55,435

BUNKER COAL

Districts:	Tons
Maryland	43 982
New York	280 000
Philadelphia	40,297
Virginia	256,376

Exports Increase Despite Low Exchange Rates

For several months past there have been predictions of a falling off in exports, due to the unsatisfactory exchange situation. Government figures giving the value of total exports do not bear out these predictions, however. The figures for the month of February, it is true, show a decline of $87,000,000 as compared with January, but in comparing the two months certain factors should be considered.

In the first place, in the month of February there were only twenty-two working days as against twenty-six in January. The value of the average daily exports for the former month therefore were more than $1,000,000 in excess of those for January.

Taking the Government figures for the seven months from June, 1919, to January, 1920, inclusive, and allowing an average of twenty-five working days for each month it will be found that the average daily exports for this period were $26,200,000, whereas the daily average for the month of February was $29,300,000.

In analyzing the February figures it should also be remembered that that month was the worst of the entire period under review from a transportation standpoint. During almost the entire month the railroads were blocked by snow and ice and export freight was moved to seaboard with difficulty.

It is true that for some months past the steamship operators have been complaining of a dearth of cargo, but this is undoubtedly due to the fact that there is a much greater amount of ocean tonnage available than before.

In view of these facts it would seem that the export trade of this country is continuing on a very favorable basis in spite of the many discouraging reports that have gained circulation during recent months. It is true that certain lines have experienced a depression, but on the other hand, several other lines have shown steady improvement, notably steel and machinery. Certain readjustments are to be expected, but that there will be any great decrease now seems improbable. — From *The World's Markets*, published by R. G. Dun & Co.

London Gets More Coal Than in Pre-War Times

During 1919, Alfred Nutting reports, about 2,000,000 tons of coal were brought to London by rail in excess of that so conveyed prior to the war.

Production and the Market

Weekly Review

Crisis Approaching in Transportation—Switchmen's Strike More Serious Than Most Believed Production of Coal Gains But Little and Prices Are Going Up on Spot Market, But with Little Free Coal To Be Had at Fancy Prices

CONTROL of the distribution of coal is impending, if not, at least in part, already upon us. The effect of four weeks of strikes on the railroads is now being felt by every line of business, and concerted efforts are being made to get relief on a national scale. Priority of transportation for food, fuel and "other necessities" is the answer proposed by railway men and the Commerce Commission.

From every point comes the word that consumers are each day burning more coal than they receive, if they have not already ceased burning coal at all. From the coal fields nothing but solid train movement is being attempted, for the yards and terminals present the most difficult problem to the railroad operating men.

The Interstate Commerce Commission is taking charge of the situation under the emergency clauses of the Transportation act. The National Coal Association has pointed out in detail to that body the imperative need of preferential treatment of coal. Food has already been given the right of way. From now on the big scramble will be to get priority orders and many see a return of the conglomeration of priorities and special assigned cars for commercial consumers that cluttered up the rails in the winter of 1917-1918.

Inspectors of the Government are on the road locating the traffic jams and relief is expected but slowly, so congested are the yards and gateways. Coal will be at a premium from now on and except for railroad fuel and those consumers who may obtain preferments, very little will move to inland territory until the trouble is over.

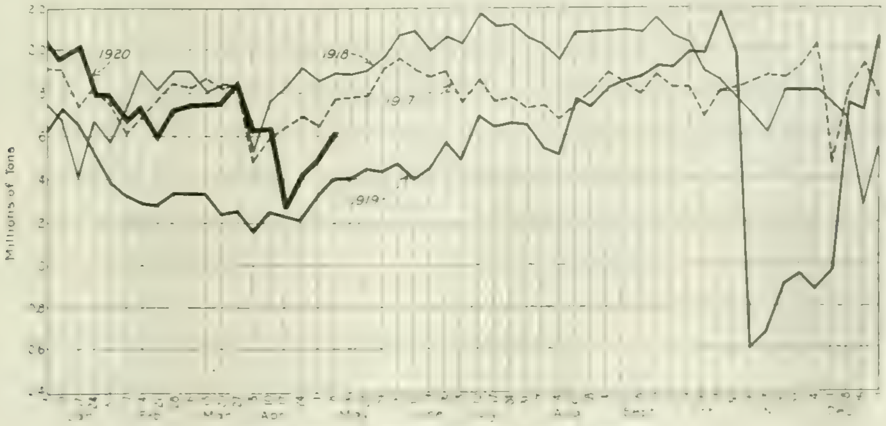
Production of both bituminous and anthracite continues to gain, but the progress is very slow. (The average daily output shown on the diagram below should read 1,511,000 tons instead of 1,615,000 for May 8.) The gain in bituminous was but 2 per cent and for anthracite but 3 per cent. West of the Mississippi River transportation appears to be about normal and the operators in Colorado, New Mexico and Washington have started buy-early campaigns. East of the river the congestion extends to the furthermost limits of New England, but not as far as Birmingham.

Prices, of course, remain firm, even advancing at certain points. At Philadelphia $7 coal is expected and $5 is a common spot mine price in the Cleveland market. There is nothing in sight to help hold prices to reasonable level except the self-restraint of the producers. Consumers have forgotten price and the jobber is out to get the coal for his customers.

The movement to tide continues in good volume. It is a movement that is easy for the railroads and profitable for the shipper. Northestern Kentucky reports heavy shipments to Hampton Roads, as does Logan. The regular tide shippers are all going strong. Lake Erie is getting little coal these days.

Anthracite is keeping up with current needs for consumption but not with demand for storage. The state of the railroads is held largely to blame for the condition. Prices are largely in abeyance, but retailers are adding on a figure to cover the expected advance.

Average Daily Production of Bituminous Coal*



*From weekly report of Geological Survey

Reports From the Market Centers

New England

BOSTON

Embargoes Resumed — Prices Soar to New Levels — Strong Demand — Railroad Confiscation of Coal General — Receipts from Hampton Roads Continue Light—Quotations Still Advancing — Anthracite Shipments Meager All-Rail, but Improve by Water.

Bituminous—Effective April 12, the Boston & Maine laid an embargo against all commercial coal from the New York Central and the Delaware & Hudson, thereby again cutting off further supply from the largest consuming area in New England. With this embargo renewed, it is difficult to say what will be the outcome. Several large plants have taken heavy consignments of steam sizes of anthracite, but practically all the smaller users have not cared to take precautions of that kind against a possible shortage of bituminous.

The present traffic situation here seems about as bad as it could be and embargoes may be intermittent throughout the season. The lack of motive power and other equipment is notorious, and roads like the New Haven must get relief from some powerful agency. Other roads are short of locomotives, though not to the same degree.

Spot coal has advanced by leaps and bounds the past fortnight. Sales have been plentiful at $7 and over for only medium grades, and there is continuous pressure to secure early shipments. Most of the high-grade coal is out of the market, a heavy volume having been sold on contract or for bunker or export requirements.

One effect of the embargoes against New England will be an increasing tonnage available for other markets, and it will be of interest to observe the trend of prices a week or so hence. Some feel that a more conservative market will follow. However, there is little on which to base a prediction.

It is certain that the demand is sustained and with much strength. Undeniably spot coal has been sold for more extended delivery than would normally be the case. Seven dollars is a highly remunerative figure, and producers are willing to undertake business on that basis for long periods.

With much of New England closed to all-rail delivery, water coal will be still more eagerly sought. The supply, however, is by no means adequate for the demand.

The railroads are still commandeering coal in large volume. Railroad practice is most arbitrary in this respect and it is the opinion that railroads must share increased costs of fuel along with other steam-users.

Despatch at Hampton Roads is now practically normal, steamers being loaded within 24 to 48 hours of arrival. Movement from the mines is good and as usual the heaviest volume of coal is moving on contract. Clearances for New England continue light, with little bidding for the smokeless coals.

High prices have been paid for small lots for prompt loading, but few of these have been for cargoes destined for this market. F.o.b. Boston and Providence, quotations on Pocahontas and New River have risen to $12.50, although sales are still reported at less.

Quotations on bituminous at wholesale now range about as follows:

	Cambrias and Somersets	Clearfields
F.o.b. mines, net tons......	5.75 @ 7.00	5.25 @ 6.25
F.o.b. Philadelphia, gross tons....................	8.30 @ 9.70	7.75 @ 8.80
F.o.b. New York, gross tons	8.65 @ 10.15	8.10 @ 9.25

Anthracite — Receipts of domestic sizes continue extremely meager by the all-rail route. The New Haven embargo is now joined by the Boston & Maine's action against all coal from off the New York Central and the Delaware & Hudson. The congestion at the gateways is unabated.

The New Haven management is willing to accept coal only in train-load to obviate the usual switching and make-up at Maybrook and Harlem River. The result is a deadlock, with only quite light shipments coming through.

NEW YORK

Anthracite Situation Grave—Receipts Care for Current Needs—No Increase in Prices—Small Sizes Are in Demand—Car Supply in Bituminous Regions Improves—Demand Forces Prices Upward.

Anthracite—Continuation of the labor troubles among the railroad employees has resulted in a serious situation here. Receipts at the loading piers are far below requirements, although the dumpings at the upper ports for the week showed some improvement. However, the difficulty in having boats towed from the lower ports are far from over.

The failure of the operators and miners to come to an understanding regarding a new wage schedule has caused considerable uncertainty in the trade. These conferences are now being held in Washington.

Not all of the big producers have advanced their mine prices, but most of the independents have advanced their quotations $1 per ton for egg, stove and chestnut, which includes the differential of 75c. allowed above company prices.

Some of the smaller operators are said to be able to obtain premiums on their domestic coals if they can promise prompt shipments. Embargoes on shipments to Buffalo and other Lake ports continue to be in force on some of the railroads.

Locally the conditions are serious. Retailers are receiving barely enough coal to meet necessities and much of their equipment is tied up. Prices are not being quoted, retail dealers waiting for their new mine prices to be announced by the large companies when the new wage agreement is announced.

There is a steady demand for the smaller sizes used in heating apartment houses, hotels and office buildings. The supply is running short and reserve stocks are now being used. For these coals, buckwheat was quoted at from $4.25 to $4.75 at the mines; rice from $3 to $3.50 and barley from $2.25 to $2.75. Loaded boats of buckwheat are in strong demand.

Current quotations for company coal per gross tons at mine and f.o.b., tidewater, at the lower ports are as follows:

	Mine	Tidewater
Broken....................	$5.95	$7.80
Egg....................	6.35–7.35	8.20–9.20
Stove....................	6.60–7.70	8.45–9.55
Chestnut....................	6.70–7.70	8.55–9.55
Pea....................	5.30	7.05
Buckwheat....................	3.40–3.75	5.15–5.50
Rice....................	2.75–3.25	4.50–5.00
Barley....................	2.25–2.50	4.00–4.25
Boiler....................	2.50	4.25

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous — The local situation shows no improvement. Receipts at the tidewater docks are slow, due to transportation difficulties.

In the mining regions, lack of cars is given as the crux of the situation. Mine workers are willing to work but because of the poor car supply are idle about half of the time. Improvement in car supply, however, is reported along the New York Central, Baltimore & Ohio and Western Maryland roads, while some operators along the Pennsylvania report a slight betterment.

Loading at the local piers has been slow due to the lack of help and the inexperience of those at work. In addition the scarcity of tugs does not permit of anything like capacity operations.

Lack of coal has resulted in many factories closing down in New Jersey and in New England, while a continuation of the present situation for another fortnight, will result in the closing down of many others.

Exporters of coal are forced to refuse new business if prompt shipments are required. There are bottoms enough but the poor car supply and the local demand prevent their being loaded.

Quotations for the various grades at the mine, per net ton, ranged from $5.50 to $6.75, according to grade. Gas coal was quoted around $6.50. There were many inquiries for smithing coal but it was not to be had, prospective buyers being advised to substitute the coals in Pools 9 and 71.

PHILADELPHIA

Anthracite Shipments in Good Volume, but Price Uncertain — Stove and Nut in Demand with Pea Strong—Buckwheat Grows as Domestic Fuel—Steam Trade Centers Around Buckwheat—Rice and Barley Quiet—Bituminous Shows No Improvement—Prices Moving Toward $7—Good Business at Tide.

Anthracite—Taken from the dealers' standpoint the week has been a fairly satisfactory one, as moderately good shipments of all sizes have come in. This has been occasioned by the numerous embargoes which it has been necessary for the railroad companies to place against outside points, on account of freight congestion.

The dealers in this territory are well above their quota of tonnage, but at times this summer they may be almost flat, on account of the producers diverting coal to outside territories.

The wholesale price uncertainty continues, as the miners and operators have been unable to get together, although results may be expected at any moment.

The biggest producing company still continues to make shipments on a retroactive basis for May, and the retailers are compelled to adjust their retail figures so as to avoid any loss. On this basis the prices for stove and nut are closely grouped from $13.50 to $13.75 a gross ton delivered. Pea coal is running from $10.50 to $11.

There is a wide range of wholesale prices, shippers notifying customers that shipments are subject to prices in effect at time of shipment. The prices of one of the large companies still continue at $7.35 for egg, $7.70 for stove and nut and $6.00 for pea, per gross ton mines.

Among the more conservative individual shippers the price range is from $8.10 to $8.55 for egg, $8.45 to 8.80 for stove and nut, and $6.00 to $6.90 for pea. These prices are f.o.b. mines.

Stove and nut continue to be the most desired sizes. However pea coal continues in demand and the dealers now have little of this size on hand. There is also a growing demand for buckwheat coal for domestic consumption.

Most of the activity in the steam trade is still focused on buckwheat and the current production is rapidly absorbed. Big users of this size are storing every ton that they can get. Rice and barley are inclined to be somewhat laggard, although the companies are able to care for the production of these sizes.

One of the large producers this week added 25c. a ton to its buckwheat price, making its mines figure $4. Some independent shippers are selling at $4.10 and still others have advanced to $4.25.

Bituminous—There is absolutely no improvement in the soft coal trade and the consumers in this territory are badly in need of further supplies. The mines are still suffering from a car shortage, with no immediate hopes of relief.

Prices for soft coal, almost regardless of grade, are fast reaching record heights. Quotations are made of $7 per net ton at mines, although the bulk of the spot business this week has been done at figures between $6.35 and $6.75.

Gas coals are extremely scarce and even at quoted prices of $6.25 to $6.50 are hard to get. Many of the really big companies are entirely out of the market on spot business.

While prices may seem high, operators declare that when mines are operating only two days a week, the cost of production alone reaches close to $6. In addition they report the men are unable to exist on the wages of two and three days a week and that they quickly drift into other lines.

With no promise of improvement in the rail situation, producers look forward to an extremely active summer, with the present extreme scarcity running right into fall. Some operators, who have accepted the railroad company's offer of locomotive fuel, are getting a fair supply of cars. The roads are still extremely short of motive-power fuel.

BALTIMORE

Poor Car Supply Continues at Mines—Record Prices Hold for Bituminous—Pool Complications Cause Slow Loading of Vessels — Big Export Tonnage Shipped — No Change in Hard-Coal Situation.

Bituminous—The coal roads do not seem to be able to provide a good car supply at the mines. At the outset of the week things looked brighter with a 79 per cent general supply, an 83 per cent supply east of the Baltimore & Ohio and with both the Western Maryland and Pennsylvania reporting a better run of empties.

By the end of the week, however, there was a supply running around 40 per cent or less, with the eastern lines of the Baltimore & Ohio down as low as 32 per cent at times. With the export demand increasing, the strictly local situation had some trials, and prices for spot coal were held at a standard hitherto unknown in the bituminous trade.

Best steam coals readily command between $6.25 and $6.50 f.o.b. mines (the net ton), with medium to good coals selling over a range of from $5.50 to $6.00 and even the poorest grades of steam coal worth around $5 to $5.25 f.o.b. mines. Gas coals of run-of-mine character are around $5.25 to $5.50 and screened high-volatile fuels generally good for $6, mine basis the net ton.

A great export business is under way, the first 15 days of May showing a total loading on export of around 250,000 tons. At this writing there are, besides four boats at the Curtis Bay and Canton piers, about 30 ships awaiting astream to load around 150,000 tons of coal for foreign delivery.

Movement over the piers has been delayed by complications of the pools, which operate against quick vessel loading and dispatch in many cases. Despite this a world record was created the past week at the Curtis Bay pier of the Baltimore & Ohio, when the steamship Malden was loaded with 6,967 tons of bituminous coal in 2 hr. 44 min. an average of 2,548 tons an hour. The ship was cargoed for the New England Coal & Coke Co., for Boston delivery, and she received a total of 146 cars of coal in the time named.

Anthracite — Watchful waiting still marks the anthracite dealers' policy. A remarkably cool spring has made some unusually late small-order business. The dealers are forced to charge at least a dollar above the old winter schedule for coal they sell now, and take orders for future delivery at a price to be set at the time of delivery.

Lake

BUFFALO

No Improvement in Bituminous Situation—Coal Growing Quite Scarce—Strikes Keep Cars from Mines — New Prices Quoted — Anthracite Shipments Irregular—Little Lake Business—Coke Situation Strained.

Bituminous—The switchmen's strike continues and that means little movement of coal or any other freight. So far the roads have been able to organize crews and work enough coal through the yards to keep needed plants in operation.

Coal shippers consider that matters are growing worse, but it could not be much worse or all operations would have to stop. The wonder is that the effects of the strike have been withstood as long as they have.

Buffalo has been a strike center for a long time. The end must be nearer, but the worst may not have been reached. One reason why the employers hold out is that the public does not sympathize with the strikers.

As to prices the average shipper declares there are none and declines to make any quotation. Allegheny Valley, all sizes, is sometimes offered as high as $6 at the mines, but as a rule it is taken on contract and single sales are few. The same is true of Pittsburgh coal.

Anthracite—The supply to the city trade is small and shipments are irregular. There is no distress and consumers are slowly getting in their winter's supply. Reports from Scranton say that the miners are uneasy and may make trouble at any time.

Some of the distributors have put up their prices $1 a ton, but the larger companies have made no change, and do not appear likely to take any steps in that direction until it is known what the cost of mining is to be.

The Lake trade is still languishing on account of the short supply of anthracite to load into vessels and also because of the lack of steamer fuel. Twenty odd cargoes have been loaded and have mostly moved out of the harbor.

Coke—The situation is much strained. The big furnace companies have contracts enough practically to supply them, but the car movement is so uncertain that it is necessary to keep in close touch with the jobbers. Some furnaces are running at a slow rate and one or two have shut down; others get coal and coke by solid trains which get into the city without any switching.

Coke prices have advanced a little, being quoted in a nominal way at $15 for 72-hr. Connellsville foundry; $13.50 for 48-hr. furnace and $10 for chestnut in the domestic trade.

CLEVELAND

Improvement Noted, but Industries Operate on Curtailed Schedule—Spot Prices Around $5 at Mines—Lake Trade One-third Normal.

Bituminous—Steam-coal receipts in northern Ohio continue from 30 to 40 per cent of normal, apparently just enough to keep most industries operating on curtailed schedules. While the outlook still is bad, some improvement is noted, and the trade is unanimous in its belief that conditions can grow no worse on the railroads and must grow better, though gradually.

Users are pressing their demands more insistently than ever but operators continue to hold them off until the car-supply question becomes more certain. The spot coal dealers are able to pick up costs them $4.75 to $5, f.o.b. mines, with more at $5 than at $4.75, and a small tonnage reported going at $5.25.

The tendency of the whole price structure is upward. Operators who saw a slight weakness possible late in the summer, now can see nothing but strength. Domestic bituminous demands continue nil.

Pocahontas and Anthracite—Anthracite demand, while seasonably low, is greater than that for Pocahontas. Anthracite prices have not yet been advanced, but dealers threaten to do this almost weekly.

Lake Trade—The end of May likely will see the Lake coal trade a good 2,000,000 tons behind the 1919 season at the end of May. In April and May, 1919, Lake Erie docks dumped 4,714,040 tons of bituminous. In April this year the Lake Erie docks handled only 307,000 tons, and if May loading goes much over 1,500,000 tons Lake shippers will be surprised.

Every effort is being made to get No. 8 coal through to Lake Erie docks, solid trainloads being resorted to, but even this expedient is falling short. Preseason figures on Lake coal prices are being revised, and $3.25, mine, likely will prove the minimum this season, against $2.50 last year.

Prices of coal per net ton delivered in Cleveland by retail dealers are:

Anthracite — Egg, $12.20 @ $12.40; grate, $12.20@$12.40; chestnut, $12.50 @$12.70; and stove, $12.50.

Pocahontas—Shoveled lump, $10.50, and mine-run, $9.25.

Domestic bituminous—West Virginia splint, $9.50; No. 8 Pittsburgh, $7.75; Millfield lump, $8.50; and Cannel lump, $11.

Steam coal—No. 6 and No. 8 slack, $8.50; No. 6 and No. 8 mine-run, $8.50; and No. 8 ¾-in. lump, $8.75.

MILWAUKEE

Market Panicky — Water Receipts Relieve Somewhat, but Rail Conditions Not Reassuring — Coal Schedule Unchanged.

Harsh spring weather, coupled with slow receipts, kept the coal market at Milwaukee in a panicky state during the first half of May. Manufacturers expected that they would have to close down, and public utilities, such as the gas and electric companies, urged strict economy on the part of their patrons.

The arrival of several cargoes from the lower Lakes has served to relieve the tension to some extent, but reports of rail conditions from the mines to Lake points are not reassuring.

Business men are making every effort to put the coal supply on a more satisfactory basis. Milwaukee must get coal regularly and in increasing quantities, from now on until navigation closes, if a fuel famine is to be averted next winter.

Illinois coal is now being marketed at $7.50 for nut, $7 for mine-run and $6.50 for screenings, at the yards. Delivery calls for 75c. more. The general coal schedule remains unchanged.

Receipts by Lake thus far fall far short of last year's record, being 64,290 tons of hard coal and 65,331 tons of soft, against 130,237 tons of the former and 289,771 tons of the latter in 1919.

Inland West

COLUMBUS

Congested Traffic on All Railroads—Output in Ohio Mines Reduced to Low Point—Demand for All Grades—Strong and Active Bidding — Prices Advancing to New High Levels.

The coal-transportation situation is worse, and a further reduction in the output is reported from all mining sections. Traffic conditions are probably the worst in years. There is marked congestion at the various gateways and junction points due to the switchmen's strike.

As a result, many public utilities are about out of fuel. In the northern part of Ohio and in Michigan this condition is quite bad. Central Ohio consumers are better supplied. Efforts are being made to divert a limited amount to take care of the worst cases.

There is active bidding for Ohio and West Virginia coal. Hocking lump is being sold at much higher levels and the same is true of Pomeroy and Cambridge coals. Efforts of the larger producers to keep down quotations have proven unavailing and prices seem to have taken a sudden rampage. Many of the coal men deprecate the tendency of prices.

Retailers are practically out of fuel. There is no Pocahontas available in this territory as all produced is going to the seaboard. West Virginia splints are also scarce and Columbus retailers have to bid actively for a small allowance. These prices have shown the greatest jumps.

The large bulk of the coal supplied to domestic users in central Ohio comes from the Hocking Valley, Pomeroy Bend and Cambridge fields. Hocking lump is retailing from $7.50 to $7 75 and mine-run about the same price. Pomeroy lump is strong at $7.75 while mine-run is selling at $7.50, delivered. West Virginia splints are retailing from $8.50 to $8.75.

Steam trade is strong as practically every line of consumer is in the market for stocks. The Lake trade is held back because of congestion and car shortage and only a small tonnage has been loaded to date. Loadings at the Hocking Valley docks at Toledo are only about one-twelfth of the tonnage loaded last year at this time.

Prices at the mines of coals used in central Ohio are:

Hocking lump	$4 25 to $4 75
Hocking mine-run	4 00 to 4 50
Hocking screenings	4.00 to 4.75
Pomeroy lump	4 25 to 5 00
Pomeroy mine-run	4 00 to 4.75
Pomeroy screenings	4 00 to 4.75
West Virginia splints, lump	5 50 to 6 00
West Virginia mine run	5.00 to 5.75
West Virginia screenings	5.00 to 5.75
Pocahontas lump	5.50 to 6 50
Pocahontas mine-run	5.50 to 6.25
Pocahontas screenings	5.50 to 6.25

CINCINNATI

Improvement in Coal Receipts as Transportation Difficulties Disappear—Market Firm on All Grades of Coal—Winter's Supply Going In.

Shipments of coal to the Cincinnati market showed an improvement the past week, owing to the gradual betterment of the car shortage as the result of the end (locally) of the switchmen's strike. As a consequence coal men are breathing easier. The market on all kinds of coal continues firm, and industrial users are finding less difficulty in obtaining their necessary supplies. There is increased production in the West Virginia fields and this situation will soon make itself felt in the local market.

Retail dealers have all the business they can handle. Domestic consumers have come to the conclusion that there is to be no letdown in prices, and consequently they are putting away their winter's supply.

The prospect of quite a serious shortage of gas for Cincinnati, forecast by the fight now on in the courts to keep the supply of natural gas going out of the state of West Virginia (from which territory Cincinnati is supplied) has proved a boon to the coal trade; wherever Cincinnatians have depended on gas for heating purposes, it is safe to say that there will be a good supply of coal on hand to offset any discomforts, should the gas give out.

ST. LOUIS

Coal Situation Growing More Acute—Little Work at the Mines in All Fields—Railroads Short of Fuel—No Change in Retail Prices.

The little improvement that was noted previous to a week ago was apparently temporary. In the last week conditions have been growing worse, at times have been acute and have threatened to become more so not only in St. Louis, but in the entire country adjacent.

The Southern Ry. has no crews at work at all. Most of the other trunk lines have the majority of their men back, but the terminal is tied up. The strikers have gone to work in other lines and were the strike to be settled today, there would be a shortage of men.

The Missouri Pacific is trying to force the operators to sell coal to the railroad at $2.60 and many of the operators will shut their mines down before they will be forced into this. The result is that the Missouri Pacific is buying hundreds of cars in the Standard field.

The Chicago & Eastern Illinois has closed its contracts for mine-run at $2.85 f.o.b. mine. Other railroads are buying in the open market, both in the Standard and Carterville fields at from $2.75 to $3 for mine-run.

Standard coal is selling at $4@$4.50 for lump and egg, from $3.75@$4.25 for mine-run and about $3.25@$3.50 for screenings. The Mt. Olive operators are maintaining their regular prices of about $3@$3.25 for domestic sizes and their mine-run and screenings are going on contracts.

DETROIT

Shipments of Smokeless Small and Irregular — Little Coal Arrives from Central Competitive Field — Public Utilities in Distress — Railroads Use Coal Equipment for Other Freight—Interstate Commerce Commission Appealed To.

Bituminous—With the market practically without free coal, wholesalers and jobbers find themselves in the position of meeting an active demand at high prices, without being able to provide coal. Except for shipments under contract, there is said to be almost no West Virginia or Kentucky coal arriving. The product from those districts now commands so high a price at tidewater markets, that consumers in Detroit and throughout Michigan cannot afford to meet the competition.

Coal from Ohio is arriving in small amount and a little coal is reported coming from Illinois and Indiana. For Ohio coal the nominal prices at the mines on short tons are about $5 for lump; $4.75 to $5 for mine-run and $4.75 for slack. West Virginia lump is reported selling at the mines at about $6, to which cost of delivery in Detroit would add more than $2.

At a conference with the Michigan Public Utilities Commission in Lansing, May 13, representatives of the utility companies placed the blame for their failure to get coal on the use of coal equipment of the railroads for movement of other forms of freight.

Anthracite—Receipts of anthracite are quite small and infrequent. Stocks in the yards of most dealers are exhausted, while the continuance of cold weather creates an active inquiry from household consumers.

CHICAGO

Little Improvement in Coal Receipts and in Strike Situation — No Eastern Coal Received on Account of Embargoes.

Chicago has been receiving some coal lately, although in quite small quantities. The prices obtained here are about the same as those maintained elsewhere in the Middle West, as good coals are being sold at circular prices which are reasonable, while fancy prices are being obtained for off-grade stuff.

The Chicago trade has been forced to run along during the past three or four weeks without any Eastern coal, as those who were fortunate enough to contract for Eastern coal earlier in the season have been unable to get their tonnage, on account of the fact that most of the Eastern terminal points have been embargoed.

South

LOUISVILLE

Car Supply Improves — Western Kentucky Prices Higher, Due to Strong Demand—Eastern Kentucky Well Sold Up and Prices Firm—River Shipments Quiet.

The car supply as a whole has been better for May, with mines working at least part of three days, and car supply reported at around 45 to 50 per cent; whereas the April supply was only about 30 per cent on Louisville & Nashville lines in the state. Empties are moving back to the mines, while embargoes are holding movement to Northern points in check.

Western Kentucky prices at mines today are higher than ever before, and still advancing. Western Kentucky block coal is quoted at $3.50@$3.75 a ton; mine-run, $3.25@$3.50; nut and slack, $2.80@$2.90; and pea and slack, $2.60@$2.75. Screenings are in heavy demand at fancy prices.

Eastern Kentucky is well sold up, and has little coal to offer. Prices as a whole are firm, while there is practically no differential between steam and block, or mine-run and screenings, as all grades are in good demand. Prices on Eastern Kentucky coals average from $5.50@$6.25 a ton for all varieties.

A few mines are billing out block at not more than $4.50 a ton, others getting full $6.25. There is also practically no differential between Hazard non-byproduct coals and Harlan byproduct coals today. No trouble is experienced in selling good byproduct mine-run at $6.25 a ton.

River shipments are rather quiet as a whole, although a few barges have been received during the week. River shipments for the year have been larger than during the previous two seasons.

BIRMINGHAM

Trade Restricted Only by Transportation Facilities — Inquiry Strong for Bunkering and Export Trade — Warrior River Moves Considerable Coal.

The local coal market is restricted only by the inability to get the necessary equipment to the mines for the movement of fuel. The supply of coal coming from the mines has to be prorated to customers and, therefore, only a limited amount of new business can be taken on.

Due to the large increase in the number of ships calling at Southern ports and boats sailing from Mobile, Pensacola and New Orleans, much bunkerage coal is now being sought in this market. Foreign interests are also in the market inquiring for a considerable tonnage.

Cars are not available for transporting export coal to shipside. But operators, whose mines are accessible to the Warrior River, are moving considerable bunker coal to Southern ports, 24,420 tons leaving the Warrior field one day the past week.

Prices as a whole are being held in check, though conditions are such as to bring about a runaway market. Quotations are practically without change since last week.

Canada

TORONTO

Coal of All Grades Scarce—Canadian Railways Demand Prepayment of Freight—Dealers Refusing Orders.

Little coal, either hard of soft, has been received during the present week, owing to the railroad embargo which held up shipments at Black Rock. The only consignments to come forward were a few carloads which had previously entered Canada.

The cause of the difficulty is the refusal of the Canadian railways to haul coal unless the freight is prepaid to destination in American funds, including the Canadian end of the haul.

Supplies on hand, especially of bituminous, are quite light and dealers are refusing orders. Consumers are unable to lay in supplies for the season ahead, such orders as have been booked being taken at the price prevailing at time of delivery.

Nominal quotations for short tons are as follows:

Retail (anthracite) egg, stove, nut and grate	$14.00
Pea	12.50
Bituminous steam	11.00
Domestic lump	12.50
Cannel	14.00

News From the Coal Fields

Northern Appalachian

FAIRMONT

Production Decreases During First Week of May — Railroads Unable To Move Coal—Assigned Cars Cut Down Commercial Fuel.

Instead of bringing any relief from the car shortage, the first week of May witnessed a further decrease in the supply, mines faring much worse than they had during the last week of April. During the first three days of the week, the Fairmont region had only 2,630 cars as against 3,247 cars received during the first half of the week ended May 1.

Similar conditions prevailed in other fields. It was the old story of a lack of cars and it forced a suspension of operations at a number of mines scattered throughout the northern part of the state, materially reducing production.

Failure of the Monongahela mines to secure more cars was due to the fact that while the Pennsylvania had been able to move coal consigned to points on its own lines and the connection from Brownsville, on the other hand the Pittsburgh & Lake Erie was not able to move any coal during the week, there being an accumulation of about 1,300 cars at the point named throughout the week.

The large number of assigned cars used by the Baltimore & Ohio during the week quite materially reduced the number of cars available for the loading and shipments of commercial fuel. Notwithstanding the rather acute shortage, the railroads managed to secure about 25 per cent of production, leaving a small output for commercial shipment, commercial coal therefore being quite scarce.

While during the early part of the week ended May 8 Curtis Bay shipments were fairly large in volume, such shipments diminished in size during the latter part of the week partly because fuel for this port could only be shipped under permit. Port Richmond was embargoed during the greater part of the week. Western shipments increased somewhat in volume from northern West Virginia points, yet little coal was shipped to Lake points, since shipments to such points could be made only under special permit.

Little credence was given a rumor, freely circulated in northern West Virginia fields during the first week of May, that the Fuel Administration was to be resurrected and was to be given plenary powers as to prices. As far as could be learned, such a rumor was started in Philadelphia, but was believed to have been inspired for the effect it might have on prices.

PITTSBURGH

Coal Movement No Better, in General—Loads Moved, but Empties Not Returned — River Shipments Heavy — Market Irregular.

The rail strike has been waning, in general, and there are more points to which shipments can be made. On the other hand cars have grown scarcer; the net result is that there is no better coal movement than formerly—if indeed the movement is as good.

The Pennsylvania and Baltimore & Ohio are now relatively free, shipments being possible to the majority of points on these lines, though subject to delays, sometimes more or less interminable. The Pittsburgh & Lake Erie is still doing little, though there has been a slight improvement on this line. The Bessemer road has almost gone out of commission.

The car shortage is due chiefly to two influences: First much more attention is being paid by the railroads to moving loaded cars than to returning empties. Second a considerable proportion of loaded cars are stalled on sidings, thus tying up equipment completely. River shipments continue quite heavy, and Pittsbugh appreciates the Monongahela River much more than ever before.

The coal market has become quite irregular, some quite fancy prices being paid, particularly to brokers. Leading coal operators endeavor to hold the market within reasonable limits, but are not entirely successful. The market is quotable roughly at \$3.75@\$4 on contract and \$4.50@\$5 for spot, per net ton at mine, Pittsburgh district.

CONNELLSVILLE

Production Rate Practically Unchanged—Spot Furnace Coke Advances \$2—Solid Trains Move Fuel—Car Supply Scant.

Coke production in the Connellsville region is running along at about the same rate as in the past three or four weeks, or about 70 per cent of the rate obtaining before the rail strike began. There are more lines of communication open for the shipment of coke, though much territory is still shut off.

The result of the widening in the field has been to bring more possible buyers into the market, and as offerings are no heavier the market has stiffened. Furnace coke for spot shipment advanced \$2 a ton.

Foundry coke prices are, in the main, held down by the policy of leading operators who do not wish to exact profits (at this time) materially greater than were obtainable before the rail strike began; but some brokers have secured altogether unusual margins in handling single carloads of foundry coke.

The market is quotable at \$14 for spot furnace coke and \$12@\$14 for spot foundry, contract foundry being \$11@\$12, all prices per net ton at ovens, Connellsville region. Some furnaces bid only \$12 for furnace coke, preferring to bank rather than pay a higher price.

Estimates of Production

FROM THE WEEKLY REPORT OF THE GEOLOGICAL SURVEY

BITUMINOUS COAL

	1920		1919(a)	
	Week	Calendar Year to Date	Week	Calendar Year to Date
April 24b	8,459,000	166,189,000	7,378,000	133,519,000
Daily average	1,410,000	1,692,000	1,223,000	1,358,000
May 1b	8,896,000	175,085,000	8,022,000	141,541,000
Daily average	1,483,000	1,679,000	1,337,000	1,357,000
May 8c	9,069,000	184,153,000	8,438,000	149,979,000
Daily average	1,511,000	1,670,000	1,406,000	1,352,000

(a) Less one day's production during New Year's week to equalize number of days covered for the two years. (b) Revised from last report. (c) Subject to revision.

ANTHRACITE

	1920		1919a	
	Week	Calendar Year to Date	Week	Calendar Year to Date
April 24	1,618,000	25,900,000	1,435,000	23,401,000
May 1	1,792,000	27,692,000	1,717,000	25,118,000
May 8b	1,848,000	29,540,000	1,782,000	26,900,000

(a) Less one day's production during New Year's week to equalize number of days covered for the two years. (b) Subject to revision.

BEEHIVE COKE

United States Total

Week Ended				
May 8 1920	May 1 1920(b)	May 10 1919	1920 to Date	1919 to Date(a)
353,000	359,000	261,000	7,727,000	7,664,000

(a) Less one day's production during New Year's week to equalize number of days covered for the two years. (b) Revised from last report. (c) Subject to revision. All figures in net tons.

Middle Appalachian

POCAHONTAS AND TUG RIVER

Idleness at N. & W. Mines Worst of Last Twelve Months—Solid Trains Going West, Empties Coming Back, but Diverted to Various Points—Tonnage Going to Tide and Inland East.

Idleness among the mines on the Norfolk & Western was most marked during the first week of May, conditions being on a par with those of the last week of April—the poorest production week since the early spring of 1919. Owing to a scarcity of equipment, mines were limited to about a 40 per cent output.

As many points in the West were still embargoed, except as to solid train movements, it became necessary to forward the largest percentage of the Southern fields to tidewater and Inland East points. Scarcely any coal has been shipped so far this season to the Lakes from southern West Virginia fields. Coke shipments were slightly larger in volume to Western markets during the first week of the month.

Stagnation was still observed in the Pocahontas field, owing to car shortage, such losses alone far outweighing total production. It was from the East that most empties were coming. This resulted in much idleness at mines, few plants being able to work more than two days at the most during the entire weekly period.

During the first week of May, Tug River mines were still feeling the effect of the "outlaw" strike, since there were not many more cars in the region than there had been in the closing week of April. As a result there was a production not much in excess of 40 per cent at any mine. Some operations were producing coal only during two full days out of the six. Such coal as was produced, for the most part was forwarded to Eastern points, the bulk of it going to tidewater.

One factor causing heavy Eastern shipments was the higher prices offered for delivery at tidewater. The volume of coal for the Lakes from the field was not large, no shipments being permitted until May 7.

Embargoes on high-volatile shipments affected the Thacker district to some extent at the outset of May, though it was possible to ship to some pools under special permit. There was still a marked shortage of cars in the Williamson field, the output being about 50 per cent of normal.

NEW RIVER

Little Coal Shipped West—Many Markets Embargoed—New River Coal Sent East for Bunker and Export—Virginian Mines on Gulf Work Four Days Out of Six.

Improvement in conditions in this area during the first week of May was so insignificant as to be negligible, all mines being short of cars throughout the week. The shortage, which has been in evidence since the first of the year, continued to be aggravated by conditions in the West.

It was neither possible to ship much coal to Western markets nor to secure any cars to speak of from Western points; many markets were still embargoed during the greater part of the week as far as West Virginia shippers were concerned. Production in the New River field, during the first week of May, reached little more than 100,000 tons.

Coke was being consigned to Western markets from the New River field in larger quantities than had been true as to the latter part of April. The bulk of New River coal was being routed to tidewater for bunkering and export purposes, though Inland East markets were securing a limited quantity.

Mines in the Winding Gulf district were probably comparatively little affected by the car shortage in the period between May 1 and May 8, owing to the fact that the Virginian Ry. succeeded in furnishing the mines on its lines with a larger quota of cars than was the case on other railroads in southern West Virginia. Mines on the Virginian were able to operate about four days out of the week or approximately 66 per cent. Mines in the same district on the Chesapeake & Ohio, however, were not so fortunate, having only about a two-day supply, being limited therefore to about a 35 per cent output. Virtually the entire output of the Winding Gulf field was shipped to tidewater.

LOGAN

Tonnage Increases in Guyan Field—Mines Still Operate Below 50 Per Cent of Capacity—Western Shipments Limited, Tonnage Goes to Tide.

With cars somewhat more plentiful in the Guyan field, there was a slight tonnage increase in the opening week of May in that region, production reaching approximately 175,000 tons, a gain of about 20,000 tons. So few cars were available, compared with the requirements of the mines, that heavy losses in production were being entailed; there being a loss due to a shortage of equipment of about 225,000 tons.

Even making allowances for the somewhat better car supply, mines were still being operated below 50 per cent of potential capacity and it was not possible to more than meet contract requirements. Hence there was little free coal available.

Of course with many Western markets embargoed, except under special permit, Western shipments were necessarily limited. But even aside from such embargoes, there was such a heavy demand at tidewater that little coal was available for Western shipment.

Effective May 6, Pools 5, 6 and 7 at Newport News were closed to high-volatile shipments from the Logan and other high-volatile fields, permits being issued only as the arrival of vessels justified. Lake buyers were still experiencing difficulty in securing coal, and there was not a particularly large tonnage movement to Lake points.

During the month of April only 647,352 tons of coal were produced in the Logan field, that being only 28 per cent of potential capacity. Total losses from all causes during the same period amounted to 1,188,561 tons, or 61.8 per cent, with transportation disability being responsible for the loss of 1,149,301 tons or 58.6 per cent.

KANAWHA

Dearth of Cars for C. & O. Kanawha Mines—Mines on K. & M. Better Off—Output Goes East.

There was a dearth of equipment for Kanawha mines from the very beginning of the week ended May 8, the shortage becoming more pronounced as the week grew older. In short, only 88,000 tons of coal were produced at Kanawha mines, excluding Coal River territory and Kanawha & Michigan territory, during the week ended May 8.

The major part of the output continued to be moved to Eastern markets, but tidewater shipments were somewhat under those of the previous week, owing to embargoes applying to high-volatile coal. Western shipments were increased somewhat, partly under special permission. Lake shipments were comparatively insignificant although there was strong pressure for coal at lake ports. Prices were still high but it was rather believed the crest had been reached.

NORTHEAST KENTUCKY

Transportation Improves and Output Increases Slightly—Mines Operate Half Time—Some Lake Trade and Much Tide and Southern Tonnage.

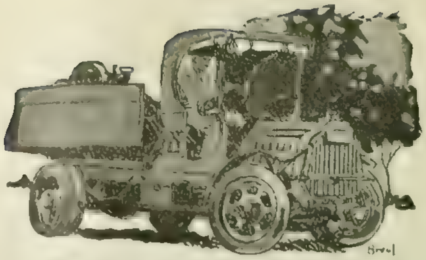
Improvement was shown in transportation facilities afforded mines in northeast Kentucky during the first week of May, and consequently production in that period was somewhat larger than during the final week of April. However, the increase in the percentage of production was rather small, there being still a loss of more than 50 per cent.

Few mines were able to operate more than half the week, and in a majority of instances operations were limited to about two and a half days out of the six. More cars were available for mines on Big Sandy and on the Sandy Valley branch of the Chesapeake & Ohio. There was no further improvement, however, during the the first half of the second week of May.

It was possible to move more Lake coal than had been the case during April, since switching in yards could be avoided. Much northeast Kentucky coal, however, was still being moved to tidewater and to southern markets.

Little spot coal was available during the first week of May, since northeast Kentucky mines found it impossible to even keep pace with contract requirements, the demand in fact far outstripping the supply.

Mine and Company News



ILLINOIS

Chicago—The Allen & Garcia Co., of Chicago, have been employed by the American Smelting & Refining Co. as engineers for the design and construction of a thoroughly modern complete coal mining plant near Rosita, State of Coahuila, Mexico. The smelting company controls approximately 35,000 acres of coking coal land and expects to use the output of the mines for coke making in connection with their smelters. Messrs. J. A. Garcia and Andrews Allen leave shortly for Mexico to make examination of the properties and arrange for the preliminary surveys, shaft sinking, etc.

The rapid strides which the Roberts & Schaefer Construction Co., of Chicago, is making toward the completion of the new plant (including a steel tipple) at the Sunnyside mine of the T. G. Ward Co., in Williamson County, indicate that the mine will probably be able to resume operations not later than the middle of May. The new tipple, which is to replace the one destroyed in a recent fire, will have many new and modern improvements over the old one.

Rumors of one of the largest mine mergers in the history of Illinois have been circulated lately. The Union Fuel & Ice Co., of St. Louis, plans to control in the neighborhood of 85 mines located mostly in St. Clair and Madison counties. The company has lately bought out and consolidated five or six of the small fuel firms in St. Louis. It is stated that the idea is to centralize the industry in the Standard field, reduce the number of small operators and stabilize production and the marketing of coal. This can be done by buying many of the smaller mines throughout the state and controlling them under one head. John Taylor, of Belleville, formerly at the head of one of the largest and oldest coal companies in southern Illinois, is one of the preliminary promoters of the scheme.

NEW YORK

New York—Plans are under way calling for a merger of Burns Brothers, William Farrell & Sons, Inc., and the United States Distributing Company. S. M. Shatzkin, former vice-president of Burns Brothers and an organizer of both that and the Farrell company, is active in promoting the merger, which will take in a number of other smaller coal companies. Directors of the Burns and Farrell companies met on May 11 and 12, respectively, at which time the proposed merger was considered and approved.

KENTUCKY

Bulan—The Tracer Fork Coal Mining Co., Lexington, Ky., is planning for the immediate development of a tract of about 1,500 acres of coal properties in the vicinity of Bulan. It is proposed to have an initial output of approximately 200 tons, this capacity to be increased at a later date. The company recently increased its capitalization from $30,000 to $100,000, to provide for the proposed expansion. John R. Pates, 1304 Fayette Bank Building, Lexington, Ky., is secretary.

OHIO

Columbus—The complete statistical report of the Ohio Industrial Commission has been made public and covers production during the year 1919. This report shows that there were 33,934,737 tons produced in 1919 as compared with 47,849,236 tons in 1918. The records of other previous years are: 41,677,986 tons in 1917; 34,526,552 tons in 1916; 22,627,046 tons in 1915; 18,736,407 tons in 1914 and 36,285,468 tons in 1913. Of the total production in 1919, 30,154,485 tons were machine mined; 2,439,975 tons were pick mined and 1,340,277 tons were stripped. Belmont County, as has been the case for several years, was the leader with a production of 9,876,953 tons. Athens County was second with 5,141,582 tons; Jefferson County was third with 4,575,054 tons and Guernsey County fourth with 3,340,815 tons. Other counties which had a production of 1,000,000 tons or more were: Harrison, 1,374,407 tons; Hocking, 1,144,963 tons; Perry, 2,477,468 tons and Tuscarawas, 1,376,164 tons.

Athens—A deal has been closed whereby the Hocking Valley Mining Co. has purchased a 2,000-acre tract, north of this place, from the Lorain Coal & Dock Co. The consideration was in the neighborhood of $225,000. The operations were abandoned about ten years ago, but it is planned to reopen them, to build a modern tipple and employ about 300 miners.

OKLAHOMA

Muskogee—The Southwestern Coal & Coke Co., which recently incorporated with a capital of $250,000, has perfected its organization and is understood to be arranging plans for the development of a total of about 2,000 acres of coal properties in the vicinity of Muskogee. Machinery and equipment will be installed. John Wheeler, and E. R. Nagle, both of Muskogee; and H. A. Boyles, Wichita Falls, Tex., are connected with the company.

Carbon—The Carbon Fuel Co., which recently increased its capital from $250,000 to $1,250,000, for general expansion, is planning for the development of a total of about 1,500 acres of coal properties in the vicinity of Carbon. The company's plans include the construction of a large new steel tipple as well as the installation of a new conveyor system. J. R. Thomas is president; W. W. Chapman is construction engineer.

PENNSYLVANIA

Ashland—Three miners were killed at the Bast colliery recently when the cage in which they were riding was overhoisted and they were hurled down the shaft. The victims were Harry Snyder, 35 years; Thomas Kilroy, 47; and Patrick Neary, 48. John Dombrowsky, a fourth occupant, clung to the cage and escaped injury.

The men had completed their shift in the mine and signalled the engineer to be hoisted to the surface. The cage failed to stop at the usual landing place and the engineer reversed the engine. The cage continued to ascend, however, until it reached the sheave wheels, where it stuck for an instant, and then dropped suddenly the length of the rope, which had become slack. The sudden stop threw the three men off the cage, but Dombrowsky held on.

Snyder fell to the bottom of the shaft, a distance of 1,200 ft.. and Kilroy and Neary to the shaft surface landing, a distance of 50 ft. Snyder was killed instantly and Neary died while being taken to the State Hospital at Fountain Springs.

TENNESSEE

Central City—The Gibraltar Coal Mining Co., of Memphis, Tenn., is understood to be having plans prepared for increased operations at its local mining properties. The work includes the sinking of an additional shaft, the installation of machinery and equipment, the erection of a new steel tipple, as well as the construction of a number of miners' houses. It is proposed to have a capacity of about 2,000 tons daily.

WEST VIRGINIA

Ivaton—The Ivy Branch Coal Co., which recently increased its capital to $100,000, is having plans prepared for extensive improvements at its plant, to provide for increased output. It is proposed to install new shaker screens, build an additional railroad siding, and erect a number of miners' houses. The daily output from this plant is to be in excess of 500 tons. Leo F. Moore is superintendent.

Lewisburg—The Nelson Fuel Co., recently organized, is arranging for the immediate installation of machinery and equipment in connection with the proposed development of about 2,500 acres of coal lands in the Lewisburg district. John B. Laing is president.

Bellwood—The Imperial Smokeless Coal Co., recently organized, is having plans arranged for the development of about 1,200 acres of coal lands in the vicinity of Bellwood. It is proposed to install machinery and equipment for a daily output of about 1,000 tons. W. S. Wood, Charleston, is president; H. H. Blackburn, Fire Creek, is vice president; and J. Wade Bell, Bellwood, is manager. Headquarters of the company are at Charleston.

Association Activities

Engineering Advertisers' Association

Engineering Advertisers' Association members discussed at length the bill proposed by C. J. Thompson (Representative in Congress) to tax advertising, at its monthly meeting recently at the Great Northern Hotel, Chicago, Ill. It was unanimously agreed to enter a vigorous protest against this proposed legislation as being unsound and unfair to business. It was said that the passing of such a bill would tend to curtail the advertising of some manufacturers, which would cause more or less depression in business, and as the crying need of the hour is for more production, it would be unwise to interfere with business now by passing the proposed tax bill. The members of the Engineering Advertisers' Association represent about one hundred of the leading manufacturers of engineering products in the Middle West and their opinions on such an important subject should be seriously considered.

Preston County Coal Operators' Association

There is a move on foot among the operators of Preston County, W. Va., to have the Preston County Coal Operators' Association merged into the Northern West Virginia Coal Operators' Association, a meeting of the first mentioned organization having been held at Kingwood, during the latter part of April, for the purpose of considering the question of affiliating with the larger association. Before taking any definite action it was decided to canvass the operators of the field and learn the wishes of individual members, a committee being appointed for that purpose. Should a favorable report be submitted by the committee, it is believed the Preston operators will join the Northern association. George T. Bell, executive vice-president of the Northern association, was present at the meeting to speak of the advantages to be derived from membership in the larger organization, of which he is an officer.

West Virginia Freeport Coal Operators' Association

The West Virginia Freeport Coal Operators' Association has dissolved. Resolutions to this effect were adopted and ordered at a meeting of the association held at Kingwood, W. Va., on April 29. Resolutions were also adopted by which members of the old organization were requested to join the Northern West Virginia Coal Operators' Association, with headquarters in Fairmont.

Mine Owners' Association of Kentucky

The Mine Owners' Association of Kentucky held its bi-annual meeting at Louisville on May 4, at which time officers were elected for a period of two years as follows: Frank D. Rash, president of the St. Bernard Mining Co., was re-elected president; J. D. Francis, of the Pond Creek Coal Co., vice-president; D. B. Cornett, of the Harlantown Coal Co., vice-president; W. H. Cunningham, of the Twin States Fuel Co., secretary-treasurer.

What Happened in April

[The bracketed figures in the text refer to the number and the page of the volume in which references to the matter noted may be found, and should the reader desire further information he can obtain it in the place indicated].

April 2—In eastern Ohio, 3,000 coal-mine workers strike [XVII, 723].

April 3—Federal district attorneys are instructed by Attorney General Palmer to receive and consider complaints of profiteering in bituminous coal [XVII, 723].

April 5—Some 2,000 Kansas mine workers go on strike against wage decision [XVII, 723] Judge T. J. McGinnis, at Beckley, W. Va., sentences Tony Stafford to serve a term in the penitentiary, as ringleader of gang shooting up mines of E. E. White Coal Co. [XVII, 759].

April 6—Attorney General Hopkins, of Kansas, summons the presidents of all the Kansas local unions of the United Mine Workers of America to appear in the new Court of Industrial Relations [XVII, 723]—Alexander Howat, president of district No. 14, United Mine Workers of America, refuses to obey summons to appear before Industrial Relations Court of Kansas [XVII, 774]

April 7—Amicable agreement is reached by scale committees of Kanawha, W. Va., field operators and miners, beginning on this date [XVII, 835]—Herbert Hoover addresses New York section of American Institute of Mining and Metallurgical Engineers [XVII, 775].

April 7 and 8—Canadian Retail Coal Association holds its Sixteenth Annual Convention at Toronto, Canada [XVII, 761].

April 8—Large flat rate increases granted in New River, W. Va., district at joint scale meeting held in Charleston [XVII, 835]—Judge Lewis of U. S. District Court, restrains U. S. attorney from presenting evidence to Grand Jury investigating charges of profiteering by Colorado Coal Co. [XVII, 836].

April 9—Alexander Howat and associates, of Kansas district United Mine Workers, are arrested and sent to jail to stay there until they consent to appear as witnesses before the Industrial Relations Court [XVII, 774].

April 11—Elias Rogers, prominent coal operator of Canada, dies at his home in Toronto [XVII, 821]

April 12—Bids for coal for the Government departments in Washington, D. C., for coal year beginning April 1, 1920, are opened by the chief engineer of the Government fuel yards [XVII, 863].

April 13—Sessions of 22nd Annual Convention of United Mine Workers of America, of Fifth subdistrict of Ohio, begin at Bellaire, Ohio [XVII, 836] —First meeting of joint board of coal operators and mine workers of New River, W. Va., field is held at Thurmond, W. Va. [XVII, 868].

April 15—Miners' Federation of Great Britain agrees to accept the Government offer of a 20 per cent increase on gross earnings [XVII, 840].

April 17—Contract is concluded between mine workers and operators of northern West Virginia fields district 17, United Mine Workers of America [XVII, 866]—After six-day session, sub-district 5 of district 6 (Ohio) votes to bar anyone from office who had not been five years a member of the organization [XVII, 866].

April 19—Justice Bailey, of Supreme Court of District of Columia, hands down decision, in case of Maynard Coal Co. vs. Federal Trade Commission, holding that the commission had no authority to require reports from coal operators concerning cost of production etc. [XVII, 809]

April 20—Second annual meeting of Industrial Car Manufacturer's Institute is held in Pittsburgh, Pa. [XVII, 869]—A new wage scale is granted to the mine workers of northern West Virginia and accepted by representatives of the United Mine Workers of America and the scale committee of Northern West Virginia Coal Operators of America [XVII, 953].

April 21—H. M. Payne speaks for group representing manufacturers of coal and oil, at luncheon of American Manufacturers' Export Association, held at Hotel Pennsylvania, New York, N. Y. [XVII, 953].

April 22—Public hearings begin on Senator Frelinghuysen's coal bills [XVII, 834]—Because of inability of miners and operators to agree, a special scale committee of ten operators and ten miners, appointed to consider demands, begins its sessions [XVII, 953].

April 26—U. S. Supreme Court sustains the Government's charges of illegal combination against the Reading company because of its holdings in various coal companies and in roads. The combination was held to be a violation of the Sherman anti-trust act and was ordered to be dissolved [XVII, 840].

April 27—Anthracite operators' scale sub-committee makes counter proposal to mine workers' representatives [XVII, 952]—After sessions continuing over period of three weeks, representatives of Central Pennsylvania bituminous operators and mine workers agree upon and sign a wage agreement, for period of two years [XVII, 947].

April 27-29—Business men from all parts of the country gather at Atlantic City, N. J., under auspices of Chamber of Commerce, to make study of means to stimulate production in industry [XVII, 834].

April 28—Offer of operators (April 27) is rejected by wage-scale committee of the mine workers after consideration at Continental Hotel [XVII, 952].

April 30—Judge A. J. Curran, of Crawford County District Court, declares the new Kansas Court of Industrial Relations to be constitutional [XVII, 954].

Personals

John A. Douglas, formerly superintendent at the Page mines for the Loup Creek Colliery Co. has accepted the position as general superintendent for the Brush Creek Coal Co. over all their mines on the big coal in Boone County.

Everett Drennen, of Elkins, W. Va., has been elected president of the West Virginia Coal Co., operating in West Virginia. Mr. Drennen, however, will continue to have his headquarters at Elkins, where he has been located for the last three years having been selected as vice president and general manager of the W. Va. Coal & Coke Co., when that company succeeded to the holdings of the Davis Colliery Co. Mr. Drennen has long been active in the affairs of the Northern West Virginia Coal Association, the West Virginia Coal Association and the National Coal Association.

George H. Baker, of Central City, Ky., for many years identified with the United Mine Workers of America, has resigned from that organization and become secretary of the Western Kentucky Coal Operators' Association. This closed 13 years of active service with the mine workers. He was elected state senator in Western Kentucky, and is now planning to run for Congress.

W. Guy Srodes, of Charleroi, Pa., has resigned as general superintendent of the Diamond Coal & Coke Co., of Pittsburgh, Pa., effective April 1, and was succeeded by E. A. Siemon, of Brownsville, Pa., chief engineer of the same company. As J. H. Hillman, Jr., of Pittsburgh, Pa., recently obtained control of the Diamond company and was elected chairman of the board, and Tracey W. Guthrie, president of the Hillman Coal & Coke Co., was made president, it is likely that the operating managements of the two companies will soon be merged, in fact, it is rumored that this will take place July 1.

John A. Penton, president of the Penton Publishing Co., was elected a director to fill the vacancy on the board of directors of the Wellman-Seaver-Morgan Co., caused by the death of Samuel T. Wellman. Mr. Penton has an intimate knowledge of the iron and steel trade and a wide acquaintance with prominent people in all lines of industry in this and many foreign countries.

H. P. Sweeny, who has been superintendent of the Fort Montgomery Iron Corporation mine at Fort Montgomery, N. Y., for the past four years, has resigned, effective May 1. His successor has not yet been appointed.

T. F. Diefenderfer has been elected secretary of the Northwestern Coal Operators' Association. This organization has its headquarters at Butler, Pa., in the county of the same name as the town, a county adjacent to and directly north of Allegheny County.

Henry Schoch, sales engineer of the General Briquetting Co., has been elected vice president of the Nukol Fuel Co., of Ontario, Canada, and will take up his work for that company with headquarters in Toronto on May 17. The Nukol Fuel Co. is manufacturing a high-class anthracite briquet for the Ontario market. One plant is operating in Toronto, another is in course of construction at Port Stanley, and three more are prospected within the next two years.

E. G. Lewis, formerly manager of the Cleveland office of the Bucyrus Co., of South Milwaukee, Wis., has been appointed central sales manager of this company, [illegible] Bldg. [illegible] C. Houston who [illegible]. The [illegible] office [illegible] on Sept. 1, 1919, will be continued under Mr. Lewis' jurisdiction.

DeWitt V. D. Reiley, formerly vice president of the [illegible] Co., Jersey City, N. J., [illegible] of the [illegible] the directors [illegible] who re[illegible] **Charles B. Wortham** [illegible] its [illegible] president, and **William G. Mc**[illegible] [illegible] The [illegible] DeWitt V. D. Reiley, Charles B. Wortham, William G. Mc[illegible] [illegible] Daniel [illegible] Evarts [illegible] H. Rowntree

Industrial News

Philadelphia, Pa.—The Harrison Safety Boiler Works, which has been carried on for many years as a co-partnership by Joseph S. Lovering Wharton, William S. Hallowell and John C. Jones, has been incorporated under the laws of the state of Pennsylvania as the H. S. B. W.-Cochrane Corporation with the following officers: Jos. S. Lovering Wharton, president; John C. Jones, vice president and general manager; William S. Hallowell, secretary-treasurer; Horace E. Sibson, general sales manager; Axel B. Wallem, general works manager. The new corporation takes over the entire business of the former firm.

New York, N. Y.—The Foundation Co., of this place on May 10, removed its offices from the Woolworth Building to its own building at 120 Liberty St., New York.

Cleveland, Ohio — The manufacturing sales department of The Wellman-Seaver-Morgan Co., which handles the company's sales of rubber equipment and machinery and which is in charge of L. N. Ridenour, moved on March 31 from the company's Akron office to its general offices at 7000 Central Ave., Cleveland.

Chicago, Ill—The bill proposed by C. J. Thompson, representative in Congress, to tax advertising, was discussed at length by the members of the Engineering Advertisers' Association at its monthly meeting at the Great Northern Hotel, here, on April 13. It was unanimously agreed to enter a vigorous protest against this proposed legislation as being unsound and unfair to business. It was said that the passing of such a bill would tend to curtail the advertising of some manufacturers, which would cause more or less depression in business, and as the crying need of the hour is for more production, it would be unwise to interfere with business now by passing the proposed tax bill. The members of the Engineering Advertisers' Association represent about one hundred of the leading manufacturers of engineering products in the Middle West and their opinions on such an important subject should be seriously considered.

Reading, Pa.—The Reading Iron Co. has announced the purchase of two of the plants of the Susquehanna Iron Co., at Columbia, Pa. This is the third important acquisition in the policy of expansion adopted by the Reading company since L. E. Thomas assumed the presidency in March 1919. Through the acquisition of the Columbia and Susquehanna plants, the Reading Iron Co., will be enabled, in spite of its ever increasing production, to continue its practice of absolutely controlling the quality of all the material entering into its wrought iron pipe, the puddle bar and skelp capacity being never allowed to fall below the capacity of its tube works.

Coming Meetings

Mine Inspectors' Institute of America will hold its annual meeting July 13, 14 and 15 at Cleveland, Ohio. Secretary, J. W. Paul, Pittsburgh, Pa.

Pennsylvania Retail Coal Merchants Association will hold its annual meeting June 23, 24 and 25 at Reading, Pa. Secretary, W. M. Bertolet, Reading, Pa.

The Rocky Mountain Coal Mining Institute will hold its annual meeting in Denver, Col., in conjunction with the National First Aid Meet on Aug. 20 and 21. Secretary, F. W. Whiteside, Denver, Col.

M. O. I. Coal Association will hold its annual convention June 16, 17 and 18 at Cedar Point Ohio. Secretary, B. F. Nigh, Columbus, Ohio.

National Retail Coal Merchants' Association will hold its annual meeting June 10-12, Detroit, Mich. Secretary-manager, Ellery Gordon, Philadelphia, Pa.

Kentucky Mining Institute will hold its annual meeting June 4 and 5 at Lexington, Ky. Secretary, C. W. Strickland, Huntington, W. Va.

American Institute of Mining and Metallurgical Engineers will hold its fall meeting a little earlier this year about Aug. 20. It is proposed to leave Buffalo by steamer and cruise through the Lakes, the first stop being at Houghton, Mich., after which the party will visit Duluth and the Iron Ranges of Minnesota, spending a day or two in Minneapolis on its return. Secretary, Bradley Stoughton, 29 West 39th St., New York City.

Southwestern Interstate Coal Operators' Association's annual meeting, June 8 at Kansas City, Mo. Secretary, A. L. Johnson, Kansas City, Mo.

Illinois and Wisconsin Retail Coal Dealers' Association will hold its annual meeting Aug. 4 and 5 at Milwaukee, Wis. Secretary, I. L. Runyan, Chicago, Ill.

American Society of Mechanical Engineers will hold its spring meeting May 24, 25, 26 and 27 at St. Louis, Mo. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

West Virginia Coal Mining Institute will hold its annual meeting June 7 and 8, at Frederick Hotel, Huntington, W. Va. Secretary, R. E. Sherwood, Chaarleston W. Va.

American Wholesale Coal Association will hold its annual meeting June 1 and 2 at Pittsburgh, Pa. Secretary, G. H. Merryweather, Washington, D. C.

The Colorado Retail Coal Dealers' Association will hold its annual meeting June 8, at Colorado Springs, Col. Secretary, E. Hopper, Denver, Col.

International Railway Fuel Association will hold its annual meeting May 24, 25, 26 and 27 at the Hotel Sherman, Chicago, Ill. Secretary, J. G. Crawford, Chicago, Ill.

American Institute of Electrical Engineers holds annual convention at White Sulphur Springs, W. Va., June 29 to July 2. Secretary, F. L. Hutchinson, New York, N. Y.

National Coal Association will hold its annual meeting May 25, 26 and 27 at the Traymore Hotel, Atlantic City, N. J. Secretary, W. B. Reed, Commercial Bank Building, Washington, D. C.

National Conference of Business Paper Editors will hold its next meeting June 4 at the Congress Hotel, Chicago, Ill. Secretary, R. Dawson Hall, 36th St. and 10th Ave., New York City.

Trade Catalogs

Portable Air Compressors. The Sullivan Machinery Co., Chicago, Ill. Bulletin 75 T. Pp. 8; 6 x 9 in.; illustrated. Description of gasoline-engine driven type, Class WK-31.

Centrifugal Pumps. The De Laval Steam Turbine Co., Trenton, N. J. Catalog B. Pp. 44; 8½ x 11 in.; illustrated. Description of centrifugal pumps of the single-stage and multi-stage types for various services.

Water, Plenty of It for Man and Beast. The Humphreys Manufacturing Co., Mansfield, Ohio. Bulletin. Pp. 28; 7½ x 10½ in.; illustrated. Description of methods and appliances for furnishing supply of water for various industries.

Publications Received

Seventh Annual Report of the State Inspector of Coal Mines. Colorado, 1919. Clothbound book. Not illustrated; 78 pp. 6 x 9½ in. Practically all statistical data about the five state mining districts.

Approved Explosion-Proof Coal-Cutting Equipment. By L. C. Ilsley and E. J. Gleim. Department of the Interior. Bureau of Mines. Bulletin 78. Illustrated; pp. 53. 6 x 9 in. Report on work done by electrical section of Bureau of Mines at its Pittsburgh station.

Abstract of Current Decisions on Mines and Mining. By J. W. Thompson. Department of the Interior. Bureau of Mines. Bulletin 183. Law Serial 20. Not illustrated; pp. 167; 6 x 9 in. Reported May-August, 1919.

Obituary

Eugene H. Olds, aged 47, died at his home in Fort Wayne, Ind. He was president of the Olds Coal Co. and was also interested in other business enterprises of his home city.

Arthur Benedict Bellows, first vice-president of the Pittsburgh Testing Laboratory, died on April 17.

Guy M. Freer, the executive secretary of the National Industrial Traffic League, of Chicago, Ill., died of pneumonia, at his home in Chicago, after an illness of but [illegible] hours.

CURRENT PRICES—MATERIALS & SUPPLIES

IRON AND STEEL

PIG IRON—Quotations compiled by the Matthew Addy Company

	Current	One Month Ago
CINCINNATI		
No. 2 Southern	$45 60	$44 60
Northern Basic	42.80	42.80
Southern Ohio No 2.	46.80	43 80
NEW YORK, Tidewater delivery		
2X Virginia (silicon 2 25 to 2 75)	49.65	47.65
Southern No. 2 (silicon 2.25 to 2.75)	49.70	47.70
BIRMINGHAM		
No 2 Foundry	42.00	41.00
PHILADELPHIA		
Eastern Pa., No. 2 x 2.25-2.75 sil	45.35-45.65*	45.35-46.35*
Virginia No. 2	43.25*	43.25*
Basic	44.50†	43.00†
Grey Forge	43.50*	42 50*
CHICAGO		
No. 2 Foundry Local	44.25	43.25
No. 2 Foundry Southern	47.00	46.60
PITTSBURGH, including freight charge from the Valley		
No. 2 Foundry Valley	45.65	43.65
Basic	44.40	42 90
Bessemer	44.90	43.40
MONTREAL		
Silicon 2.25 to 2 25%	43.25	43.25

* F. o. b. furnace. † Delivered.

STRUCTURAL MATERIAL—The following are the base prices, f.o.b. mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

	Mill Pittsburgh	New York Current	New York One Year Ago	St. Louis	Chicago
Beams, 3 to 15 in	$2.45@$4	$3.97@$5	$3 47	$4.04	$3 97
Channels, 3 to 15 in	2.45@ 4	3 97@ 5	3 47	4 04	3 97
Angles, 3 to 6 in., ¼ in. thick	2.45@ 4	3.97@ 5	3 47	4.04	3.97
Tees, 3 in. and larger	2 45@ 4	4 02@ 5	3 52	4.04	4 02
Plates	2.65@ 4	4.17@ 5	3 47	4.24	4 17

BAR IRON—Prices in cents per pound at cities named are as follows:

Pittsburgh	Cincinnati	St. Louis	Birmingham
4.50	5@6	4.59	5.00

NAILS—Prices per keg from warehouse in cities named:

	Mill Pittsburgh	St. Louis	Chicago	Birmingham	San Francisco
Wire	$4.00	$4.50	$4.15	$5.75	$6.00
Cut		5.40	7.00	....	8.50

TRACK SUPPLIES—The following prices are base per 100 lb. f.o.b. Pittsburgh for carload lots, together with the warehouse prices at the places named:

	Pittsburgh	Chicago	St. Louis	San Francisco	Birmingham
Standard railroad spikes $\frac{9}{16}$-in. and larger	$4.00	$3.62	$5.34	$5.65	$5.50
Track bolts	6@6.50	4.62	Prem.	6.65	7.50
Standard section angle bars	3@4	3.02	Prem.	4.90	....

COLD FINISHED STEEL—Warehouse prices are as follows:

	New York	Chicago	Cleveland	St. Louis
Round shafting or screw stock, per 100 lb. base	$6 25	$5 80	$6.00	$5.00
Flats, squares and hexagons, per 100 lb. base	6.75	6.30	5-6.50	5.50

HORSE AND MULE SHOES—Warehouse prices per 100 lb. in cities named:

	Mill Pittsburgh	Cincinnati	Chicago	St. Louis	Birmingham
Straight	$5.75	$7.50	$7.00	$7.25	$7.00
Assorted	5.85	7.50	7.15	7.50	7.25

Cincinnati—Horseshoe nails sell for $4.50 to $5 per 25-lb. box.

CAST-IRON PIPE—The following are prices per net ton for carload lots:

	New York Current	New York One Month Ago	New York One Year Ago	Chicago	St. Louis	San Francisco	Dallas
4 in	$79.30	$75.30	$60.70	$78.80	$78 00	$93.55	$74.30
6 in. and over	76.30	72.30	57.70	75.80	75 00	90.55	71.30

Gas pipe and 16-ft. lengths are $1 per ton extra.

STEEL RAILS—The following quotations are per ton f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5c. per 100 lb. is charged extra:

	Pittsburgh Current	Pittsburgh One Year Ago	Chicago Current	Chicago One Year Ago
Standard Bessemer rails	$45@60	$45.00	$45.00 @$55 00	$45.00
Standard openhearth rails	47@60	47 00	47.00 @ 57 00	47.00
Light rails, 8 to 10 lb.	2.585*@3 75	2 585*	2.585*@ 3 75*	2.835*
Light rails, 12 to 14 lb.	2.54* @3 75	2.54*	2.54* @ 3.75*	2.79*
Light rails, 25 to 45 lb.	2.45* @3.75	2.45*	2.45* @ 3.75*	2.70*

* Per 100 lb.

OLD MATERIAL—The prices following are per gross ton paid to dealers and producers in New York. In Chicago and St. Louis the quotations are per net ton and cover delivery at the buyer's works, including freight transfer charges:

	New York	Chicago	St. Louis
No. 1 railroad wrought	$29.00	$27 00	$29 00
Stove plate	29.00	30.00	32 50
No. 1 machinery cast	39.00	37.50	39.50
Machine shop turnings	15.50	12 50	15.50
Cast borings	16 00	14 25	16 50
Railroad malleable cast	27 50	28 00	28 50
Rerolling rails	29 00	32@33	31 50@32
Relaying rails		40@50	50@55

COAL BIT STEEL—Warehouse price per pound is as follows:

New York	Cincinnati	Birmingham	St. Louis	Chicago
$0 10	$0 16½	$0 18	$0 11	[illegible]

DRILL STEEL—Warehouse price per pound:

	New York	St. Louis	Birmingham
Solid	14c	13c.	15c
Hollow	16c.	....	....

PIPE—The following discounts are to jobbers for carload lots on the Pittsburgh basing card, discounts on steel pipe, applying as from January 14, 1920, and on iron pipe from January 7, 1920.

Inches	Steel Black	Galv.	Inches	Iron Black	Galv.
BUTT WELD					
⅛, ¼ and ⅜	47	20½	¾ to 1½	34½	18½
½	51	36½			
¾ to 3	54	41½			
LAP WELD					
2	47	34½	2	28½	14½
2½ to 6	50	37½	2½ to 6	30½	17½
BUTT WELD, EXTRA STRONG PLAIN ENDS					
⅛, ¼ and ⅜	43	25½	¾ to 1½	34½	19½
½	48	35½			
¾ to 1½	52	39½			
LAP WELD, EXTRA STRONG PLAIN ENDS					
2	45	33½	2	29½	16½
2½ to 4	48	36½	2½ to 4	31½	19½
4½ to 6	47	35½	4½ to 6	30½	18½

Stocks discounts in cities named are as follows:

	New York Black	New York Galvanized	Cleveland Black	Cleveland Galvanized	Chicago Black	Chicago Galvanized
¾ to 3 in. steel butt welded	40%	24%	40%	31%	54%	40½%
3½ to 3 in. steel lap welded	35%	20%	42%	27%	50%	37½%

Malleable fittings. Class B and C, from New York stock sell at list + 23%. Cast iron, standard sizes, net.

WIRE ROPE—Discounts from list price on regular grades of bright and galvanized are as follows

	New York and St. Louis
Hercules red stand, all constructions	20
Patent flattened strand, special and cast steel	20%
Patent flattened strand, iron rope	5%
Plow steel round strand rope	30%
Special steel round strand rope	30%
Cast steel round strand rope	22½%
Iron strand and iron tiller	5%
Galvanized iron rigging and guy rope	+12%

San Francisco: Galvanized, less 5%, bright less 25%.
Chicago. +12½ on galvanized, 30 off on bright

SHEETS—Quotations are in cents per pound in various cities from warehouse; also the base quotations from mill:

Blue Annealed	Large Mill Lots Pittsburgh	St. Louis	Chicago	San Francisco	New York Current	New York One Yr. Ago
No. 10	$3 55@$6 00	$7 09	$7 02	$7 50	$6 62@$8 00	$4 57
No 12	3 60@ 6 05	7 09	7.07	7 55	6 67@ 8 05	4 62
No 14	3 65@ 6 10	7 09	7 12	7 60	6 22@ 8 10	4 67
No. 16	3.75@ 6.20	7 09	7.17	7 70	6 82@ 8.20	4 77
Black:						
*Nos. 18 and 20	4.15@ 6.30	8 10	7 80	7 85	7 80@ 8 80	5 42
*Nos. 22 and 24	4 20@ 6.35	8 10	7 85	7 90	7 85@ 8 85	5 47
*No. 26	4.25@ 6.40	8 10	7 90	7 95	7 90@ 8 90	5 52
*No. 28	4 35@ 6.50	8 10	8 00	8 05	8 00@ 9 00	5 62
Galvanized:						
No. 10	5 80@ 7 50	9 60	8 50	8 60	8 25@10 00	5 97
No. 12	4 80@ 7 60	9 60	8 60	8 60	8 35@10 10	6 02
No. 14	4 80@ 9 60	9 60	8 60	8 60	8 35@10 10	6 07
Nos. 18 and 20	5.10@ 7 90	9 60	8 90	8 90	8 65@10 40	6 37
Nos 22 and 24	5 25@ 8 05	9 60	9 05	9 05	8 80@10 55	6 52
*No 26	5 40@ 8 20	9 60	9 20	9 20	8 95@10 70	6 67
*No. 28	5 70@ 8 50	9 60	9 50	9 50	9 25@11 00	6 97

* For painted corrugated sheets add 30c. per 1,000 lb. for 5 to 28 gage; 25c. for 19 to 24 gages for galvanized corrugated sheets add 15c ; all gages

SHOP SUPPLIES

NUTS—From warehouse at the places named, on fair size orders, the following amount is deducted from list:

	New York Current	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago	St Louis Current
Hot pressed square	+$4 00	$ 75	$1 90	$ 50	$1 28	$2.25
Hot pressed hexagon	+4 00	.75	1.90	.50	1.08	2.25
Cold punched square	+ 4.00	.75	1.90	.50	1.30	2.25
Cold punched hexagon	+ 4.00	.75	1.90	.50	1.30	2.25

Semi-finished nuts, $\frac{9}{16}$ and smaller, sell at the following discounts from list price:

	Current	One Year Ago
New York	30%	50-10%
Chicago	50%	50%
Cleveland	50%	50 10%
St. Louis	45%	

MACHINE BOLTS—Warehouse discounts in the following cities

	New York	Cleveland	Chicago	St. Louis
¾ by 4 in. and smaller	list	40%	30%	50-5%
Larger and longer up to 1 in. by 30 in.	+20%	20 10%	20%	40-5%

WASHERS—From warehouses at the places named the following amount is deducted from list price:

For wrought-iron washers:
New York........ list Cleveland.........$3 00 Chicago...... $3 00

For cast-iron washers the base price per 100 lb. is as follows:
New York....... $7 00 Cleveland........ $4 50 Chicago . $4 25

RIVETS—The following quotations are allowed for fair sized orders from warehouse:

	New York	Cleveland	Chicago
Steel $\frac{7}{16}$ and smaller	30%	40% off	35-10%
Tinned	30%	40% off	35–10%

Boiler, ½, ¾, 1 in. diameter by 2 in. to 5 in. sell as follows per 100 lb.:
New York..$7.00 base Cleveland..$4.00 Chicago..$5.37 Pittsburgh..$4.72

Structural, same sizes:
New York..$7.10 Cleveland..$4.10 Chicago..$5.47 Pittsburgh..$4.82

CONSTRUCTION MATERIALS

LINSEED OIL—These prices are per gallon:

	New York		Cleveland		Chicago	
	Current	One Year Ago	Current	One Year Ago	Current	One Year Ago
Raw, 5-bbl. lots	$1.87	$1.59	$2.00	$2 30	$2.05	$1 78
5-gal. cans	1.87*	1.72	2.25	2.45	2.30	1.98

*To this *oil* price must be added the cost of the cans (returnable), which is $2 25 for a case of six.

WHITE AND RED LEAD—Base price.

	Red				White	
	Current		1 Year Ago		Current	1 Year Ago
	Dry	In Oil	Dry	In Oil	Dry and In Oil	Dry and In Oil
100-lb. keg	15 50	17 00	13 00	14 50	15 50	13.00
25 and 50-lb. kegs	15.75	17.25	13.25	14.75	15.75	13.25
12½-lb. keg	16.00	17.50	13.50	15.00	16.00	15.50
5-lb. cans	18 50	20 00	15 00	16 50	18 50	15 00
1-lb cans	20 50	22 00	16 00	17 50	20 50	16.00

500 lb. lots less 10% discount. 2000 lb. lots less 10-2½% discount

COMMON BRICK—The prices per 1000 in cargo or carload lots are as follows:

Chicago	$14.00	Cincinnati	$24 00
St. Louis, salmon	16.00	Birmingham	15.00

PREPARED ROOFINGS—Standard grade rubbered surface, complete with nails and cement, costs per square as follows at manufacturing points:

	1-Ply c.l.	2-Ply l.c.l.	3-Ply c.l.
No. 1 grade	$2 40	$2 90	$3 45
No. 2 grade	2 15	2 00	3 10

Slate-surfaced roofing (red and green) in rolls of 108 sq. ft. costs $3.50 per roll in carload lots and $3.75 for smaller quantities.

Shingles, red and green slate finish, cost $7 75 per square in carloads; $8 00 in smaller quantities, in Philadelphia.

ROOFING MATERIALS—Prices per ton f.o.b. New York and Chicago:

Tar felt (14 lb. per square of 100 sq.ft.) per roll	$3.50
Tar pitch (in 400-lb. bbl.) per 100 lb.	1.85
Asphalt pitch (in barrels) per ton	46.50
Asphalt felt (light) per ton	118.00
Asphalt felt (heavy) per ton	119.50

HOLLOW TILE—Price per block in carload lots for hollow building tile:

	4x12x12	8x12x12	12x12x12
Minneapolis	$0.087	$0.158	$0.248
St. Louis		none on market	
Seattle	.09	.175	.30
New Orleans	.198	.264	.37
Chicago	.132	.2387	3581
Cincinnati	.125	.2186	.3286
Birmingham	122	.224	

LUMBER—Price of pine per M in carload lots:

	1-In. Rough 10 In. x 16 Ft.	2-In. T. and G. 10 In. x 16 Ft.	8 x 8 In. x 20 Ft.
St. Louis	$53 00	$46.00	$42.00
Birmingham	63.00	70.00	58 00
Cincinnati	55 00	50 00	50 00

EXPLOSIVES—[illegible] of dynamite in small lots and price per 25-lb. keg for black powder:

	[illegible]	Gelatin			Black Powder
		40%	60%	80%	
New York		$0 3425	$0 3425		$2 30
Boston	$0 2475	27	30	$0 3425	2 45
Kansas City	.235	.26	.385	.3275	2.40
New Orleans	[illegible]	2275	2475		
Seattle	18	2175	2475	29	2 45
Chicago	2175	2525	2975	34	2 45
St. Paul	.185	.2275	.2525	....	2.25
St. Louis	2175	26	.285	295	1 90
Los Angeles	25	30	35	275	2 95

MISCELLANEOUS

GREASES—Prices are as follows in the following cities in cents per pound for barrel lots:

	Cincinnati	St. Louis	Birmingham
Cup	8 5	3.7 3.8	8 5
Fiber or sponge	9	7.2	8 5
Transmission	10	14	8 5
Axle	5	5	4 5
Gear	6 5	6 5	8 5
Car journal	12 0	4 7	8 5

BABBITT METAL—Warehouse prices in cents per pound:

	New York		Cleveland		Chicago	
	Current	One Year Ago	Current	One Year Ago	Current	One Year Ago
Best grade	90.00	87.00	74.50	79.00	70.00	75.00
Commercial	50.00	42 00	21.50	18.50	15.00	15.00

HOSE—Following are prices of various classes of hose:

Fire

	50-Ft. Lengths
Underwriters' 2½-in.	78c. per ft.
Common, 2½-in.	35%

Air

	First Grade	Second Grade	Third Grade
¾-in. per ft.	$0.55	$0.35	$0.25

Steam—Discounts from list
First grade...... 25% Second grade..... 35% Third grade...... 40%

LEATHER BELTING—Present discounts from list in cities named:

	Medium Grade	Heavy Grade
New York	20%	10 5%
St. Louis	40%	35%
Birmingham	35%	30%
Chicago	45%	40%
Cincinnati	30–5–2½%	40-2½%

RAWHIDE LACING— For cut, best grade, 25%, 2nd grade, 30%.
For laces in sides, best, 81c.

PACKING—Prices per pound:

Rubber and duck for low-pressure steam	$1.00
Asbestos for high-pressure steam	1.70
Duck and rubber for piston packing	1.00
Flax, regular	1.20
Flax, waterproofed	1.70
Compressed asbestos sheet	.90
Wire insertion asbestos sheet	1.50
Rubber sheet	50
Rubber sheet, wire insertion	.70
Rubber sheet, duck insertion	.50
Rubber sheet, cloth insertion	.30
Asbestos packing, twisted or braided, and graphited, for valve stems and stuffing boxes	1.30
Asbestos wick, ½- and 1-lb. balls	.85

MANILA ROPE—For rope smaller than ¾-in. the price is ½ to 2c. extra: while for quantities amounting to less than 600 ft. there is an extra charge of 1c. The number of feet per pound for the various sizes is as follows: ⅝-in., 8 ft.; ¾-in., 6; ⅞-in., 4½; 1 in., 3⅓; 1¼-in., 2 ft. 10 in.; 1½-in., 2 ft. 4 in. Following is price per pound for ¾-in. and larger, in 1200-ft. coils:

Boston	$0.35	Birmingham	$0.32
New York	.29	Atlanta	.295
St. Louis	.265	Kansas City	.30½
Chicago	.275	New Orleans	.31
Minneapolis	.275	Seattle	.28
San Francisco	.27	Los Angeles	.31

PIPE AND BOILER COVERING—Below are discounts and part of standard lists:

PIPE COVERING		BLOCKS AND SHEETS	
Pipe Size	Standard List Per Lin.Ft.	Thickness	Price per Sq.Ft
1-in.	$0.27	½-in.	$0.27
2-in.	.36	1 -in.	.30
3-in.	.45	1½-in.	.45
4-in.	.60	2 -in.	.60
6-in.	.80	2½-in.	.75
8-in.	1.10	3 -in.	.90
10-in.	1.30	3½-in.	1.05

85% magnesia high pressure		List
For low-pressure heating and return lines	4-ply	40% off
	3-ply	42% off
	2-ply	44% off

WIRING SUPPLIES—New York prices for tape and solder are as follows:

Friction tape, ½-lb. rolls	55c. per lb.
Rubber tape, ½-lb. rolls	60c. per lb.
Wire solder, 50-lb. spools	46c. per lb.
Soldering paste, 2-oz. cans	$1.20 per doz.

COPPER WIRE—Prices per 1000 ft. for rubber-covered wire in following cities:

	New York			Birmingham			Cincinnati		
	Single Braid, Solid	Double Braid, Stranded	Duplex	Single Braid, Solid	Double Braid, Stranded	Duplex	Single Braid, Solid	Double Braid, Stranded	Duplex
14	$12 00	$13 90	$28 50	$12 23	......	$33 60	$12 00	$14 66	$29 07
10	18 30	23 85	41 50	24 00		57 02	21 11	24 98	49 58
8	25 54	32 70	56 70	33 60	......	75 94	30 83	35.33	
6		51 40		94 41				54.27	
4		70 00			93 41			76.19	
2		101 80	..	.	120 40		..	109 60	
1		131 86	......	......	155 23	......	......	141 20	
0		160 00	..	.	188 77	...	....	171 20	
00		193 50	....	..	229 19	....	...	207 60	
000		235 20	..	. .	278 64	..	.	257 40	
0000		288 60	......	......	338 41	......	......	306 80	

FREIGHT RATES—On finished steel products in the Pittsburgh district including plates, structural shapes, merchant steel, bars, pipe fittings, plain and galvanized wire nails, rivets, spikes, flat sheets (except planished), chains, etc., the following freight rates per 1000 lb. are effective

Boston	$0 30	New Orleans	$0 385
Buffalo	0 17	New York	0.27
Chicago	0 27	Philadelphia	0 245
Cincinnati	0 23	St. Louis	0 24
Cleveland	0 17	St. Paul	0.495
Kansas City	0 59	Pacific Coast (all rail)	1 25*

Note—Add 3% transportation tax. *Minimum carload, 80,000 lb.

COAL AGE

The Weekly Journal of the Coal and Coke Industries

Volume 17 NEW YORK, THURSDAY, MAY 27, 1920 Number 22

Your Help Needed

THE country is worried about the transportation crisis. Suddenly awakening to the fact that we are running behind, with no possibility in sight of production overtaking demand, the public has demanded of the Government action and relief.

Lack of coal is one of the principal causes of complaint. You as a producer of coal are not to blame for this condition, but that is no reason why you should not voluntarily assume your share of the job of putting things to rights. There is one way above all others in which you can help, and that is by selling your meager shipments of coal where in your judgment, based on the experience of the war, that coal is needed the most. To do this requires nerve, for contracts may appear to bind you, and to do this may mean foregoing some profits. You are interested in seeing normal and healthy conditions again, in having the railroads back on their feet, in being able to ship all the coal you can load. While your co-partners in distress—the railroads—are under such handicaps, ship your coal where it is needed to keep the country in food and transportation.

Remember that it was not until the members of the coal industry, individually and collectively, joined hands with the Government that even a start was made toward fulfillment of the program "Coal Will Win the War."

An Opportunity Not Yet Lost

SOME weeks ago we remarked that for its present status in regard to cost studies the Federal Trade Commission had but itself to blame. We still hold to that opinion. Mr. Reed, the able secretary of the National Coal Association, who is also pre-eminently qualified as a cost accountant, worked with the representatives of the Trade Commission in an effort to bring about harmony of ideas as to what shall be included in these self-same cost reports. On the one side was Mr. Reed, backed by the best thought and full experience of able, successful coal men; on the other the theoretical students of economics of the Trade Commission. They worked together to effect an agreement on this important problem. The Federal Trade Commission would not accede on basic points, and the test suit before Justice Bailey was the outcome and the answer of the Coal Association.

It is understood that the Trade Commission has met the desires of the anthracite operators, and that reports of costs of production will be forthcoming from that part of the industry.

If ever the bituminous industry needed the support afforded by cost figures from a Governmental source it is now. No fuel administrator stands sponsor for advancing prices, none but *ex parte* arguments and statistics are available to show the justification for higher prices in this period of unduly inflated costs.

The Trade Commission will try to get the reports from the bituminous operators, notwithstanding the adverse court decisions. The information is needed for the protection of the good name of the industry. Voluntary response to the call for monthly cost reports will show a real desire of the industry to lay its cards on the table.

Plight of the Postal Employees

NO greater argument exists against state socialism with its inevitable injustices than is afforded by the plight of the Post-Office employees. But one cannot wonder at their misfortunes, for no workingmen have been as shamefully neglected as those in the Government service. Government officials have repeatedly given vent to pious ejaculations about the rights of the workingmen to join unions, to make collective bargains, to demand wages proportional to the cost of living and to have not only a living wage but workmen's compensation. They have defended labor unrest with insinuations regarding the injustice of employers, men who were nevertheless paying relatively liberal wages.

But everywhere the bureaucracy has been the slowest of any to move in the adjustment of stipends. It has failed utterly to meet the needs of those who have faithfully served the state for years. It has been hidebound in opposition to a liberalization of its policies. While the cry has ever been to give more power to the Government and allow less to the people, there has been no clear sense of the obligation of the Government to those whose services it commands. The example of the Post Office Department warns us to what a degree the Government is likely to misuse its power. It should not be allowed to extend its industrial activities. Its functions should be solely of a regulative character and not those of a super-capitalist.

The Government service tends to draw to itself men of steady habits, men of a peculiarly accommodating mold. Most of them enter the Government employ with the intention of making it a life work. The postmen of the country are a body of men uniformly courteous in their behavior. They take their work seriously. Nowhere can more accommodation be found. Their cheerful courtesies do much to soften the asperities of life and to most of them the visiting from house to house with messages of cheer or sorrow has been a pleasure that has made them continue as postmen despite the inadequacy of their pay.

The wage of regular employees in the entrance grade is only 41½c. per hour, or $23.07 a week. The highest pay per week if there is no overtime is only $31.73. For carriers to attain this maximum salary frequently requires ten years of service inclusive of substitution and passage through the different grades. Under the law the shortest time is four years and to this must be added the inevitable period of substitution.

As proof that the letter carrier is not paid what he deserves it may be said that the Government has provided that 60c. per hour shall be paid to temporary employees. Men without qualifying experience get that larger sum, while relatively qualified men get 18½c. less. But 60c. per hour is found to be not enough. Postmaster Patten testified to the joint Commission on Postal Salaries that he found it difficult to get men at that figure. Strikers in other industries would accept employment from the Post Office Department while the strike lasted, but after it was over they would return to trades which paid more adequate wages. The substitutes that could be obtained at 60c per hour were found lacking in industry, efficiency and honesty and several had to be removed.

A commission has been appointed by both branches of Congress to investigate salaries. For fourteen months it has made no report and brought in no bill to alleviate conditions. Let every good citizen write to his Congressman and demand that justice be done to these public servants immediately. Do it, if not for justice at least of business expediency. The postal service is slow, it is undependable and it is getting worse. Its good men are going. Many have gone. The men that remain are soured. They are apt to carry a message of discontent from house to house. They have been 100 per cent Americans in the past. Their word was inspiriting and sympathetic. It will be an ill day when they and the school teachers cease to be "sold on America."

Scrapping Old Mine Cars

RARELY is a proper degree of courage shown in the scrapping of old mine cars. Seeing that the actual life of the older type of car is short it is hardly worth while to retain an old-type inefficient car in unwilling service. It is true cars may be shown which have had twenty or thirty years of active service, but if all the parts renewed during the previous five years were available almost a new car could be constructed. The sides become worn and broken, the bolt holes enlarge in the bottom, the bumpers break off, the whole car is racked and twisted, the wheels wear flat, the axles are bent and all parts have to be replaced. Badly wrecked cars are worth repairing only if they are up to date. Oftentimes enough wrecks to repay the cost of the change will be saved by ridding the mine of twisted, worn and broken cars.

In one of the articles this week a change of this sort is recorded, and some of the hundreds of rejected cars are shown in an illustration. Here, by the introduction of a new form of dump, the haulage system was freed of breakdowns, the roads were kept clean, repairs were cut to a minimum, dumping time and labor were decreased and a saving of some $12,000 a year is expected. Where the time of dumping had been eight minutes it was reduced to thirty seconds. The expenses of maintaining old equipment often far exceed the losses resulting from scrapping it, but as the losses in the one case are spread over some years of operation and do not openly appear on the cost sheet as "losses due to worn-out cars" while the costs arising from a change of equipment are obvious and immediate, the first form of sacrifice is preferred even though greater than the second. The secret losses from the use of obsolescent equipment are preferred to the smaller loss due to a radical discarding of antiquated material.

Mine Inspectors Will Meet in Cleveland

MINE inspectors of the United States and Canada will meet this year at Cleveland, Ohio, the occasion being the eleventh annual meeting of the institute. Since the organization of the institute at Indianapolis, in 1908, interest in these annual gatherings has grown steadily, with the result that every inspector in attendance has gone home from each meeting strengthened and renewed in spirit and better fitted for more efficient performance of his duties.

The membership now includes most of the strongest and more practical men engaged in the work of mine inspection, and the discussions of the many problems confronting them have been helpful and of benefit to all. In 1915, the scope of the organization was broadened to admit inspectors of metal mines, and this has been a source of instruction to those whose associations had previously been restricted to coal mining.

It is hoped that the coming meeting to be held at Cleveland, July 13, 14, 15, will draw together large delegations from every mining state. There are important questions that will be discussed, and every inspector should be on hand to gain the benefits of the views of his fellow inspectors.

Inspectors are urged to forward papers they desire to read, or subjects they wish to have discussed, to James W. Paul, secretary of the institute, Bureau of Mines, Pittsburgh, Pa., as early as possible. A cordial invitation is extended to all inspectors of mines, coal and metal, to be present, whether members of the institute or not; all will be welcome.

It is hope of *Coal Age* that the governor of every state will see that a good delegation of the mine inspectors of the state is sent to the Cleveland meeting, and adequate provision made for the expenses of the trip.

Shall We Have Priorities Again?

THE last resort in a desperate situation is priority orders. Surely there are enough veterans of the war in official Washington who, remembering the failure of this method of solving the transportation tie-up, will advise the administration of its futility as a remedy. Except as to causes, conditions today closely resemble those in January, 1918, when Garfield issued his famous five-day closing order. Factories now, as then, are closing through lack of fuel and raw materials and because of a lack of transportation to carry away finished products. Business is uneasy because new production must be financed at prohibitive rates of interest, or plants closed down.

The present situation is not the result of a shortage of cars and engines, but of men. What we are suffering from today is the accumulated effects of four weeks or more of the "outlaw" switchmen's strike. True, the roads need more equipment, but that which is available now would be, if in repair, scarcely less than that which carried the peak loads during the war. Freight is not moving today because railroad labor has no heart to move it.

Priority orders are but promises to pay—valueless unless the operating officials and the men below write their endorsements thereon. Will the public be satisfied with this sort of a remedy when it is realized that it produces not more transportation but better transportation for the few as against the many.

Rope-Haulage Methods and Equipment That Have Given Success at Lethbridge, Alta.

Anyone Can Install a Rope Haulage, but Most of Such Installations Receive in Process of Time Many Improvements in Detail—Here Are Some That Helped the Lethbridge Rope Haulage to Meet the Needs of the Colliery

BY J. B. DE HART AND J. H. TURNER
Nacmine, Alta.

ALL mining men are familiar with the general principles of endless-rope haulage. There are numerous details, however, in connection with the operation of such haulage the importance of which is appreciated only by those who have come in close contact with such installations. Any mining engineer can install an endless-rope haulage that will operate, but it will be found in most cases that many necessary details have been overlooked and that improvement has to be made from time to time to materially assist in the movement of large quantities of coal.

Endless-rope haulage has now been used at Lethbridge Colliery, Coalhurst, Alta., for five years, and during that time many small changes have been made all of which aid in making the installation efficient. This article is not a treatise on endless rope haulage in general; it is merely a short paper showing drawings of such details of a haulage system of that character which experience has suggested and to which practice has given its seal of approval. Some of these can no doubt be used to advantage in other mines where endless-rope haulage is employed, while others will be found to be unnecessary where conditions are different.

The haulages described are not by any means permanent. As a matter of fact, they might be said to be makeshifts, as they are only temporary and when permanent engines are finally installed the existing machines will be moved further inbye, where they will act as feeders to the main haulages. Nevertheless, the mine has produced 29,706 tons of coal in one month hoisting ten hours per day for twenty-four days, or at an average rate of 1,238 tons of coal per ten-hour day. The maximum day's output handled by these haulages was 1,437 tons of coal and 113 cars of rock. It will be seen, therefore, that fairly large outputs can be handled by the haulage system even as it is at present.

Three haulages are used in the mine and these are marked on the plan shown in Fig. 1. Figs. 2, 3 and 4 show the profiles of the haulage roads for Nos. 1, 2 and 3 haulages respectively. The coal bed is intersected by numerous small faults whose throw varies from almost nothing to twenty feet. In many cases it can be seen from the profiles that the grading of the roads is not yet completed, only sufficient having been done to enable the haulages to work with reasonable efficiency.

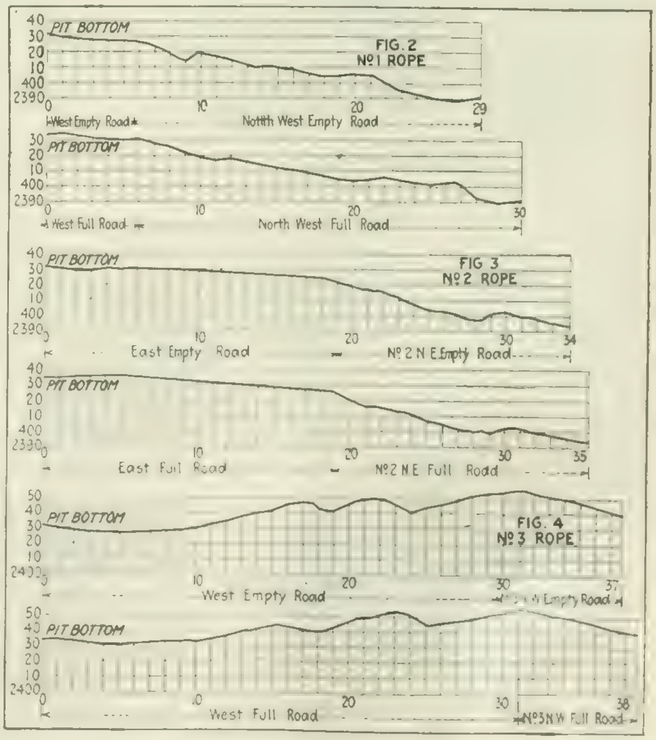
The roads are not as straight as they should be. Considerable straightening was done when the haulages were put in, but this work likewise is still incomplete. The roads were driven on sights, but when the mine was first started the economy of straight roads for rope haulage was apparently overlooked and the machinemen and miners at times were allowed to drive their places off the sights. All three haulages are similar. All are motor-driven and use ¾-in. Lang lay crucible cast-steel haulage ropes.

The No. 1 haulage machine was the first to be installed. The engine is shown in Fig. 5. It consists of a 25-hp. induction motor operating on 440 volts through gearing, shafting and a clutch. One countershaft and a No. 45 Hill clutch are used. The gear ratios are shown on the drawing; they give the fleet wheel a speed of 178 feet per minute. The details of the gearing and shafting are all shown in the figure.

On this machine the second shaft was too light and a third bearing had to be put in to reduce the span. This bearing is shown in the drawing. Details of the fleet wheel and cast-steel lagging are shown in Fig. 6.

No. 2 machine is quite similar to No. 1, except that the countershaft was made heavier so that a third bearing is unnecessary. The fleet wheel and lagging also are similar to those of No. 1 haulage engine and the rope speed is 161 feet per minute.

No. 3 machine is a composite mechanism made up partly from one which was bought second-hand and partly from some spare shafting, gears and clutches formerly used to drive the picking tables at a mine now long since abandoned. It is shown in Fig. 7. Fig.



FIGS. 2, 3 AND 4. PROFILES OF THE EMPTY AND LOADED HAULAGE ROADS

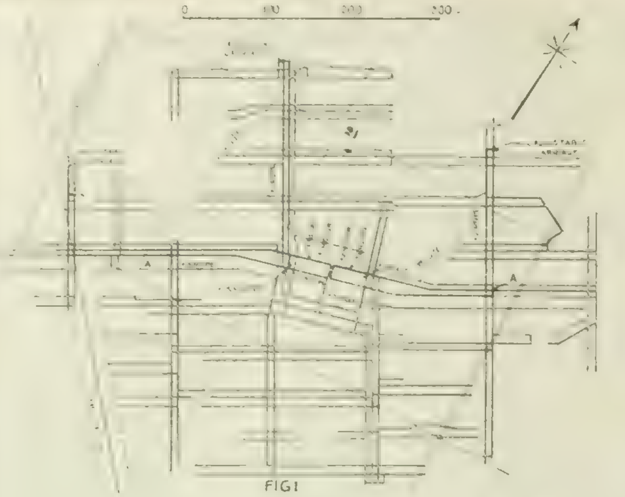


FIG 1

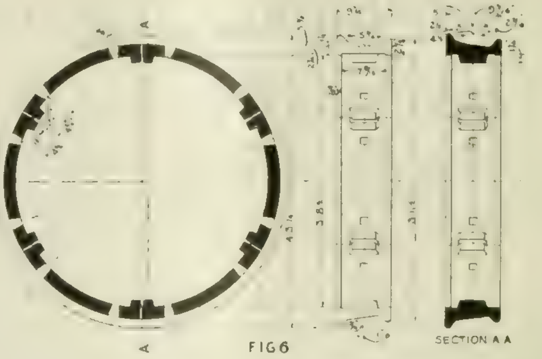


FIG 6

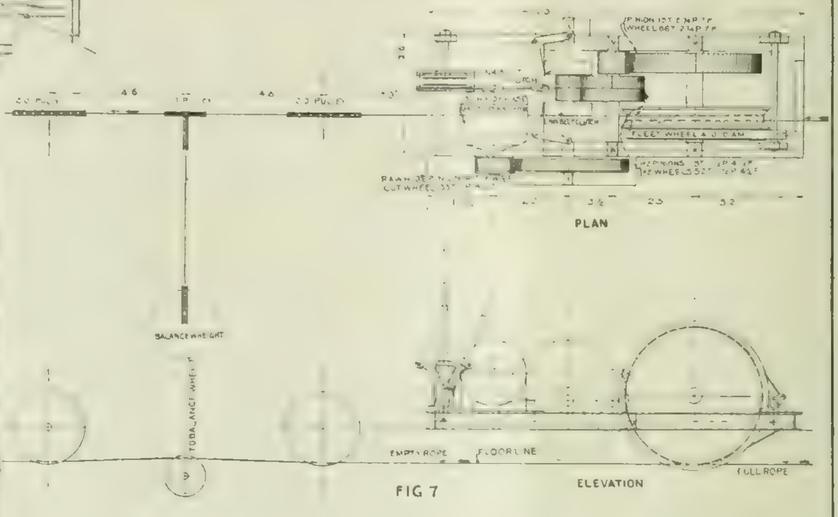


FIG 7

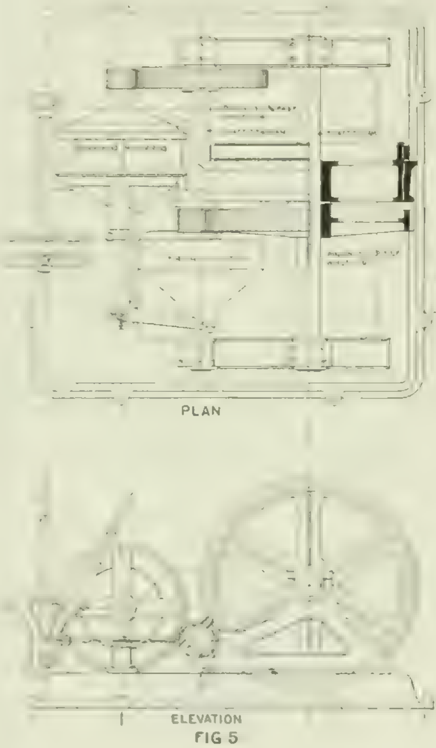


FIG 5

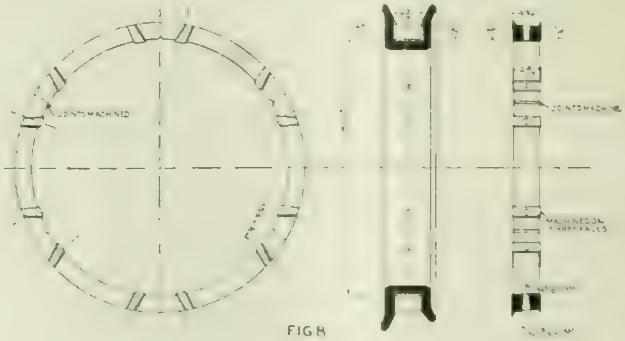


FIG 8

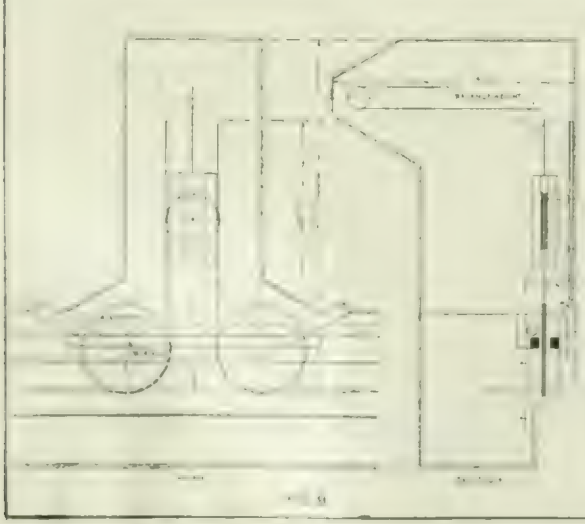


FIG 9

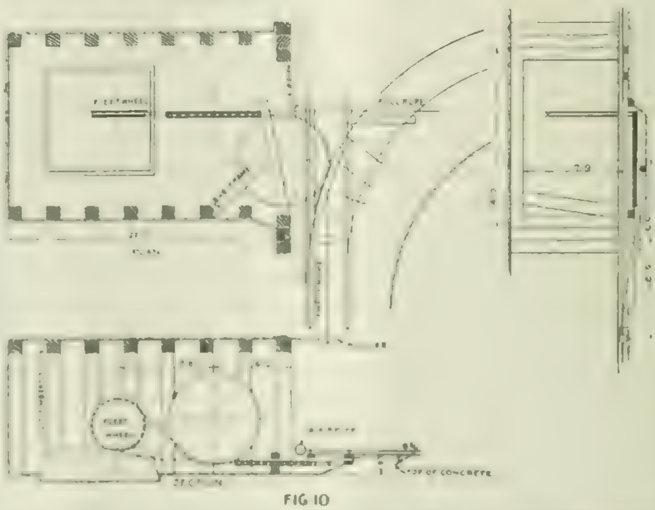


FIG 10

FIGS. 1, 5, 6, 7, 8, 9 AND 10.—LAYOUT OF HAULAGE ROADS TOGETHER WITH SOME MECHANICAL DETAILS

8 shows the fleet wheel and lagging. It will be noted that this is a different type of wheel with a different lagging from the others. It is constructed of cast iron and not of cast steel and is possibly more suitable to conditions in this part of the country in that new lagging when needed can be cast locally and does not require any machining. Details of the gearing are shown in Fig. 7. The rope speed is 177 feet per minute.

The engine houses are located as shown in Fig. 1, marked as No. 1 motor, No. 2 motor and No. 3 motor. Nos. 1 and 2 machines are located at the pit bottom and the two rooms are connected so that one man can attend to the two machines. No. 3 engine is located in a crosscut as shown.

The tensions for Nos. 1 and 2 ropes are on the empty rope near the engines as shown in Fig. 1. The arrangement of these tensions is shown in Fig. 9. The tension for No. 3 machine is placed immediately behind the machine—shown in Fig. 7. This is a better arrangement, where it is possible to get sufficient room, than the Nos. 1 and 2 tensions, as it is nearer to the machine and does not make necessary so sharp a bend in the rope. The total length of each rope in the different haulages is as follows: No. 1 haulage, 5,125 ft.; No. 2, 7,500 ft.; No. 3, 7,325 ft.

The arrangements of pulleys used at No. 1 engine house and where the loads come into the pit bottom are shown in Figs. 10 and 11 respectively.

At the inside end of each haulage is an adjustable carriage to take up the slack in the rope or to loosen it for splicing. The carriage works on rails—shown in Fig. 12. Rollers are used wherever necessary to keep the rope off the ground. Three types of rollers are employed. Wooden rollers, shown in Fig. 13, are

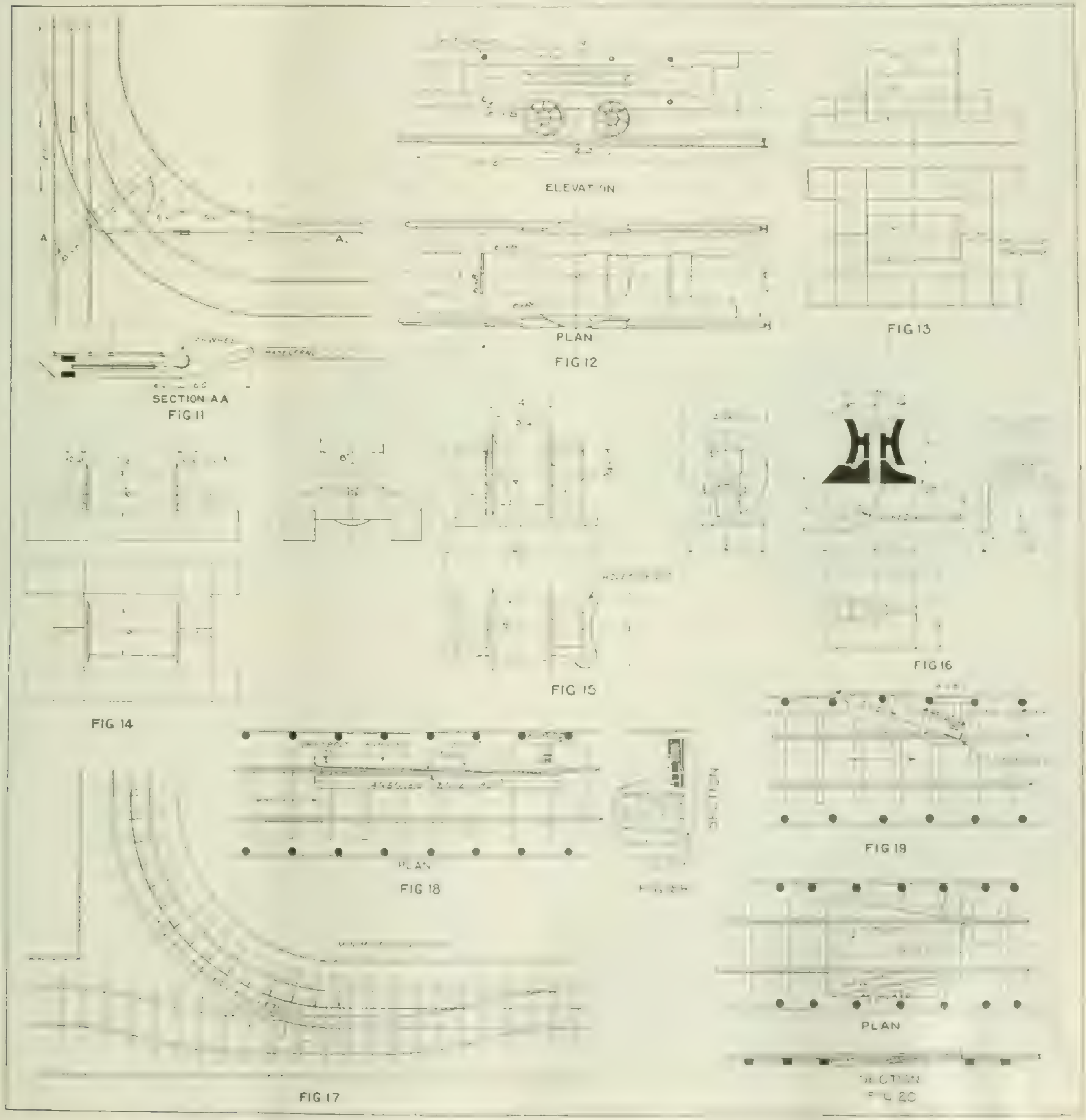


FIG 11
FIG 12
FIG 13
FIG 14
FIG 15
FIG 16
FIG 17
FIG 18
FIG 19
FIG 20

FIGS. 11 TO 20. DETAILS OF TENSION CARRIAGE, ROLLERS, RERAILERS, STOPS, GUIDE PULLEYS, SQUEEZERS, ETC.

mounted as shown. They are made by drilling prop ends and inserting the spindle and turning in a wood lathe till smooth. The size within reasonable limits is not material. Steel rollers, as shown in Fig. 14, are used in certain places and mounted in the same manner as the wooden rollers. A second type of steel roller used is shown in Fig. 15. By fitting up the bearings with babbitt these rollers can, where necessary, be employed also as holding-down pulleys.

These narrow rollers are used only in places, such as the pit bottom, where there is no possibility of the rope jumping the rollers. The wooden rollers are used where the rope rubs only lightly. In such places they are more efficient than the steel ones as they turn more easily. In many places a wooden roller will revolve where a steel one would stick.

Where the rope dips under the track at the pit bottom special heavy home-made rollers are used. These are extra heavy plain rollers with no flange. Bottle chocks are used on the curves, as shown in Figs. 16 and 17. They are spiked to special ties. These bottle chocks on curves should be replaced by large pulleys and the rope taken around the curve under the track. This, however, would necessitate a large amount of grading in order that the cars might run around the curve by gravity, and so far this work has not been started.

Where cars run downgrade onto the rope and there is any liability to collision "squeezers" are used. These are constructed as shown in Fig. 18. On upgrades numerous stop blocks are put in to prevent cars from running back in case of a broken coupling. The stop blocks are constructed as shown in Fig. 19 and they work quite satisfactorily. The spiral spring used is an ordinary furniture spring. Rerailers are installed in places, constructed as shown in Fig. 20.

The cars are run in trips, a Smallman grip being used to attach them to the rope. This is a cast-steel grip—shown in Fig. 21. A gripper goes with each trip. The maximum trip on No. 1 haulage consists of twenty-three cars, on No. 2 twenty cars, and on No. 3 haulage twenty cars up the grades to the points *A* in Fig. 1, and from there on fifty cars. The cars hold approximately one and one-half tons each and have a tare weight of about 1,500 lb. The track is laid with 20-lb. rails, fishplated.

The rope is not lubricated because it was found that when the rope was lubricated more damage was done to the rope by the tearing consequent on the slipping of the grips than occurred by natural wear when the rope was run dry.

The average life of a haulage rope is between two and three years. Some of the ropes last much longer than this but it is impossible to satisfactorily splice old rope to new and it therefore always pays to have an old rope on hand which has not been run to destruction and to use it for repairing the ropes in use. For instance, the last rope put on the No. 1 haulage was installed on July 19, 1915, and is still good for about another year. It will be run to destruction.

FIG. 21. DETAIL OF THE SMALLMAN GRIP

This device is employed to attach a car or trip to the rope

No. 2 haulage rope was put in place on June 13, 1916, and taken off May 24, 1918. It was in fair condition except for a number of bad spots. Two thousand three hundred feet of good rope was cut out of it to extend No. 3 rope and, the bad spots having been cut out, the rest is kept as a spare to use for repairing the ropes in service. No. 3 rope was put on March 4, 1917, and ran until Oct. 1, 1916. It was a poor rope and worn out. When all of No. 2 rope has been used for repair work another rope in fair condition will be replaced by a new one and the removed portion kept for repair work.

The cost of the three ropes above mentioned was about $4.50 per working day. This amount is accordingly charged against operations to the haulage-rope account each day so that the changing of a rope does not show a large charge against operation in any one month, the cost being spread evenly throughout the year. This figure—$4.50—naturally needs frequent revision because of increasing cost of rope, increasing lengths of haulages and the variable life of rope.

All around the rope roads two bare wires are strung on insulators. These are connected to a bell at the engine room, and by short circuiting the wires with a lamp or other piece of metal the bell is rung. The system of signals employed at this mine is as follows: One bell, stop rope for one minute; one bell followed of four bells, stop rope until starting signal is given. Four bells followed by two bells, start rope, this signal to be given by men who stopped rope.

TRIP SIGNALS WHEN STARTING

No. 1 rope	5 bells
No. 2 rope	5 bells
No. 3 rope	4 bells

The installation of such a haulage as has been described above can be accomplished without delay to the working of the mine. All the large pulleys, tension carriages and the like, engine and signal wires can be in place before the rope is installed. Rollers and bottle chocks can be put along the roads beside the tracks. It is only necessary to lead the rope around and splice it and the haulage is ready to run. The rope is best taken around by hauling the drum on skids (or on a truck if there is sufficient height) with horses, the rope unwinding as the drum moves forward. The rope is then spliced and while this is being done the bottle chocks can be put in place. The tension carriage is then lightened and the rope run so that it will come into line, when the rollers can be put in. More rollers can be added afterward.

It is best to set the wooden rollers off center so that when the rope has cut them nearly through they can be turned end for end. In this way their life is doubled. When an old rope is to be taken off it is cut close behind the engine and the end of the new rope is spliced to the end of the old rope. The engine is then started and the old rope wound on a drum as it comes off the fleet wheel while the new rope is unwound from its drum.

No. 2 haulage was installed over a week-end and where the cars were pulled by horses on Saturday the rope was operating on Monday.

Linn Mine-Car Dump Is Largest in the World

This Dump Is Nearly 300 Feet Long and Is Operated by Compressed Air—By This Machine Twenty-eight Cars in a Single Trip May Be Discharged Simultaneously—Old Bottom-Dump Cars Are Replaced by Cars with Solid Bottoms

By Ralph W. Mayer
California, Pa.

ALL THE coal produced by the Snowden Coke Co. at Linn, Pa., is made into coke at the mines. The charging larry runs along the top of the ovens and proceeds on a level track to a point directly under the bottom of the coal bin at the tipple.

This bin is nearly 300 ft. long and is of sufficient height to afford storage for the coal. The dump is installed upon the top of this bin and is supported by heavy steel I-beams extending across its top. This places the dump at a considerable elevation. It is reached by an incline, of such a length that the grade is slight. The dump is wired to accommodate a trolley locomotive.

The bin was built and used before the new method of dumping was introduced. In former days when a trip of cars was run over the bin, each car was dumped separately without being uncoupled, the cars being provided with bottom doors. To make this possible the bottom of the car was cut in two crosswise in a direction at right angles to the track, the two pieces being hinged along one edge. When open these pieces swung downward, allowing the coal to fall through the bottom of the car. They were held closed by a chain attached to the free side of the door and fastened to the side of the car. The axles passed through the inside of the car box and above the bottom doors, allowing them to swing freely.

This type of car had many faults. When the doors became worn they leaked and coal was scattered along the road, necessitating the employment of a small

FIGS. 1 AND 2. SIDE AND QUARTERING VIEWS OF THE DUMP AND SUPPORTING TRESTLE
The bin in which the coal is deposited extends the entire length of the dump, as may be seen. Twenty-eight cars can be discharged simultaneously. Coal from the bin is drawn by a charging larry and conveyed to the coke ovens.

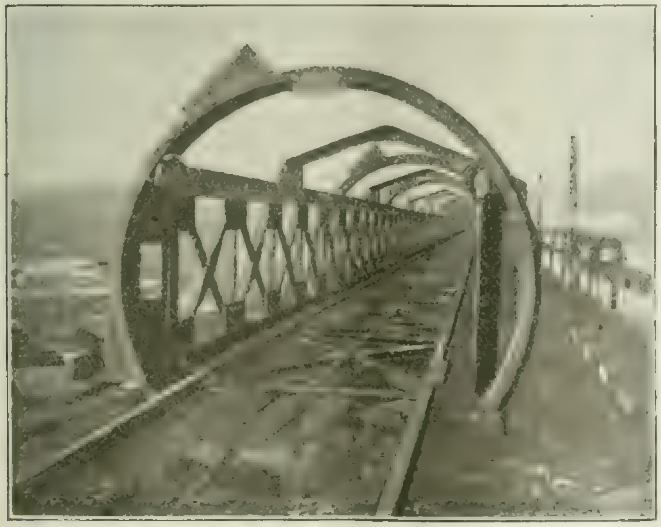


FIG. 3. LOOKING INTO THE END OF THE DUMP
Note the stops attached to the circular supporting rails. They prevent the dump from rolling too far over

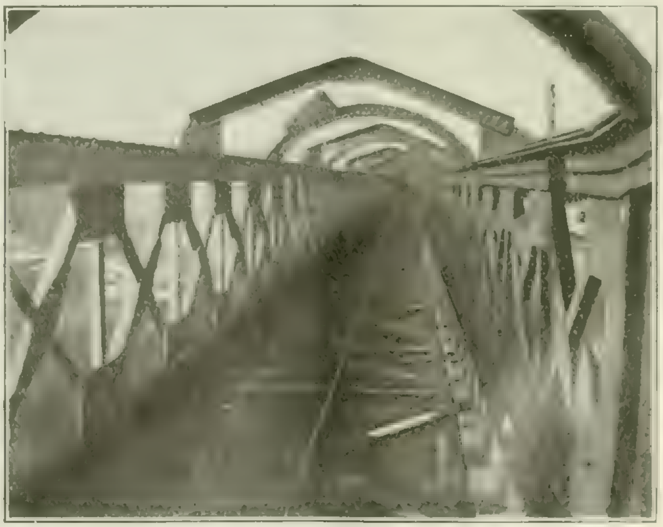


FIG. 4. VIEW STRAIGHT DOWN THE DUMP
Note upper and lower car-retaining angles which hold the cars when they are being dumped

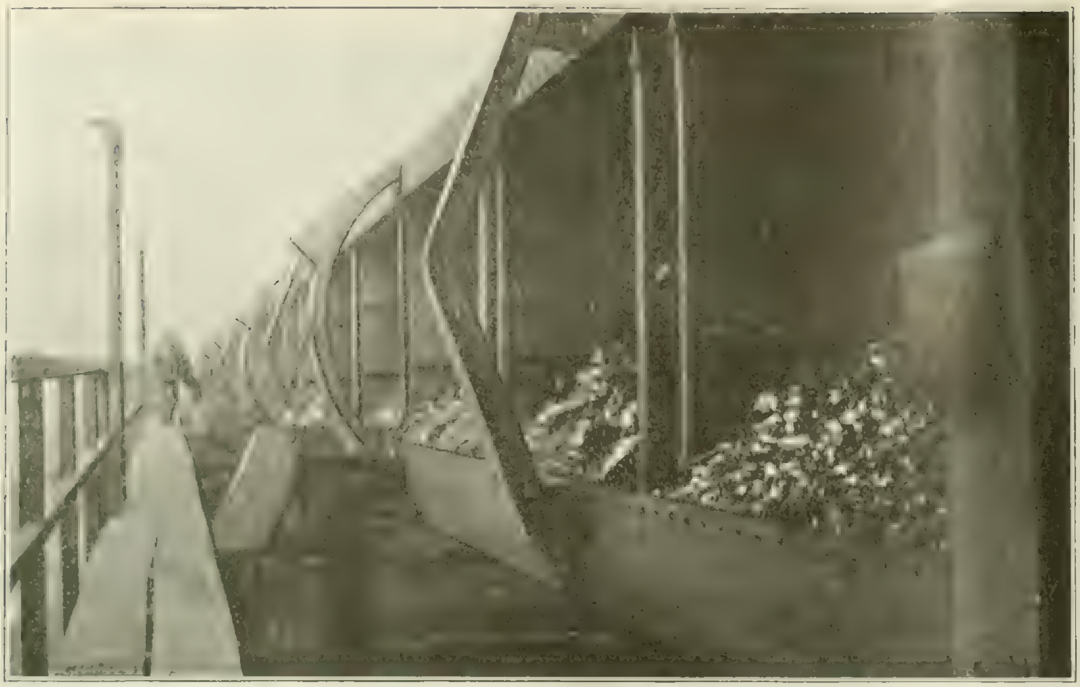


FIG. 5

Dump at the Half Turn

The cars, the ends of which look like vertical partitions in the dump, are held securely in place by the steel plate on the top of the mechanism. Most of the coal is already discharged.

army of men in cleaning up. Frequently the doors would come open accidentally and cause wrecks and derailments. The cars were about worn out when the dump was installed, and accordingly they are discarded for cars of a more modern type.

An all-steel car was adopted. It is manufactured by the Koppel Industrial Supply Co., of Koppel, Pa. The brake with which it is equipped is provided with shoes that press against each car wheel. The body of the car has an offset on the side which extends out over the wheels. All around the top of the car the sheet steel is bent outward for three inches and then bent down, forming a 3-inch flat edge around the car top.

An ordinary harness snap is used to hold the miners' checks. This snap is fastened to the center of the side of the car by a small bolt. When the car is dumped all the coal slides out on the side of the car opposite to that on which the snap is fastened.

The cars are coupled together by a single flat link and coupling pins. They have solid bodies, and each holds fifty bushels of coal. The cars are not weighed before dumping, as the miners are paid by the car and not by the ton, that being the custom throughout the Connellsville coke field. The machine men who cut the coal are paid by the number of working places which they cut. The drillers receive 17c. for each hole drilled. The men who shoot down the coal, or "blasters," as they are called, are paid by the day.

Car Dumper and Equipment

The coal is discharged by a pneumatic rotary dump made by the Car Dumper and Equipment Co., of Chicago, Ill. This holds twenty-eight of the cars (which are almost ten feet long over all) and dumps them all at one operation. It discharges the twenty-eight cars in eight seconds. The daily output of the mine is about six hundred cars. The dump is set at a slight in-

FIG. 6

Discarded Mine Cars

When these bottom-dump cars began to wear out it was decided that it did not pay to buy [illegible] them. The tracks were constantly littered with coal, wrecks were frequent and repairmen [illegible] busy. The cars were hard to dump and as wasteful of coal as of labor.

clination so that the cars will run out of it by gravity. It is supported by ten rings made of track steel, which rest upon flanged wheels, the flange being placed on the downgrade side of the ring. Each ring rests upon two wheels, one on each side of the dump.

Four of the rings, at equal distances along the dump, are provided with narrow drums attached to their sides, around which several turns of cable are taken. This cable is firmly clamped to the drums, and an end passes down on each side of the dump, so that, by pulling on the proper cables, the dump can be made to revolve in either direction. The cables pass around sheaves, and from thence lead to a point near the middle of the dump. Here four cylinders are placed, two upon each side of the mechanism. These have long piston rods and are operated by compressed air. Each piston rod carries a sheave on its end.

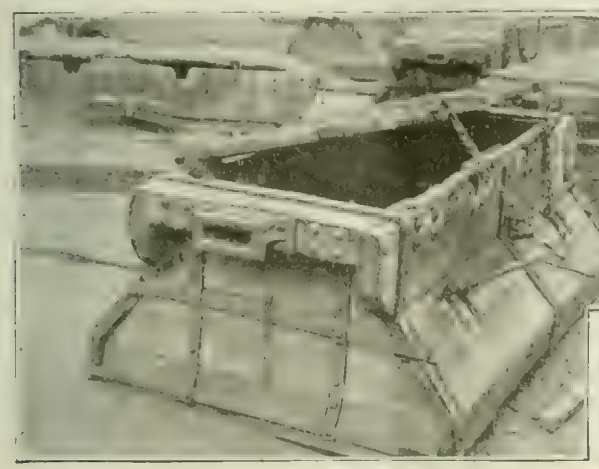


FIG. 7.

Mine Car Now Replaced

With no drawbar this car soon got "wabbly." Its two bottom gates leaked like the upper half of an hourglass and a force of men was kept busy gathering up coal that should never have been spilled.

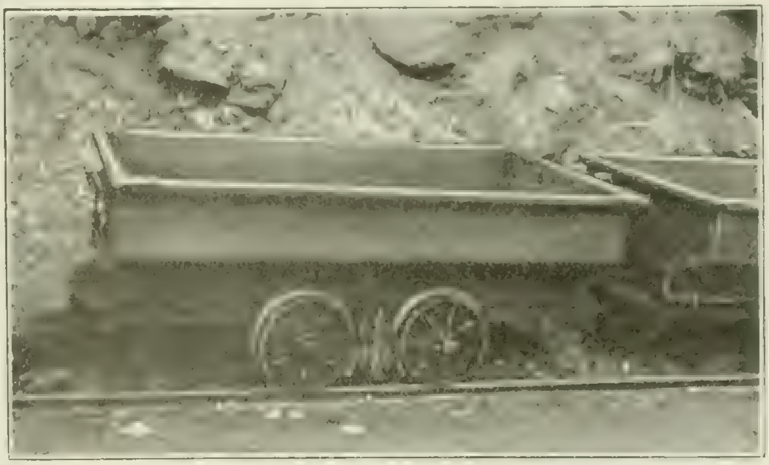


FIG. 8.

New Steel Sided Car

Without gates of any kind this car, with steel sides and wood bottom, spills no coal except when loaded over the car edge. It has no bottom doors to drop down and derail the trip and is much cheaper than the more complex bottom-dump car.

Each piston may thus be made to exert a pull on two of the cables, the sheave around which the cables pass equalizing the pull on each. There are, as stated above, four cables on each side of the dump, and each piston pulls on the two which are on its side and nearest its end. The pistons are controlled by a two-way valve placed in the air line at the top of the dump. This valve will be later moved to the end of the dump, where its manipulation will be more convenient.

The movement of the pistons on one side of the dump pulls it over, that is, revolves it until the cars are discharged. When the pistons on the opposite side move they reverse the direction of rotation of the dump, again bringing it right side up. The mechanism is simplicity itself; there is nothing complicated or likely to get out of order. An air receiver is placed near the cylinders to insure a steady air pressure while operating the dump.

Lugs, or stops, are placed on the rings of the dump to arrest its rotation as soon as it has reached the right position. These are shod with wood blocks so as to prevent excessive jar. Whenever they become broomed on the end they can be replaced. The dump with a loaded trip in it can be revolved so gently that it would hardly break an egg when the stops strike the stop blocks. This is accomplished by properly manipulating the air valve, so that the cables on both sides of the dump exert the proper pull.

A square steel frame runs the entire length of the dump and is supported by the ten rings. The four corners of this frame are made from angle iron, whose sides are the same width as the wheel treads. Two bottom angles serve as the track upon which the car wheels run, their outside legs keeping the wheels from leaving the track. The two upper angles barely touch each side of the car at its top. One leg of the angle extends over the top of the car box, while the other lies along the side. These four angle irons thus hold the cars in place while the trip is being revolved and the cars emptied.

The four angle irons are firmly held in position by x-braced crosspieces. These are placed upon three sides of the steel frame, only the top being left open for the passage of the coal in dumping. The mine car comes into contact with the dump at only four points and is held in place by the L-shaped angle irons—two under the wheels and two along the sides and top of the car.

Rope From Hoist Passes Through Dump

An electric hoist is installed at the head of the incline to pull the cars out of the mine and its cable passes through the rotary dump. The mine is a drift operation, the coal pitching slightly away from the opening, which is at the end of a narrow valley down which a small stream flows. From the drift mouth the mine track is carried slightly up grade, along the side of this valley, until the end of the hill is reached. The track is carried from that point on a trestle to

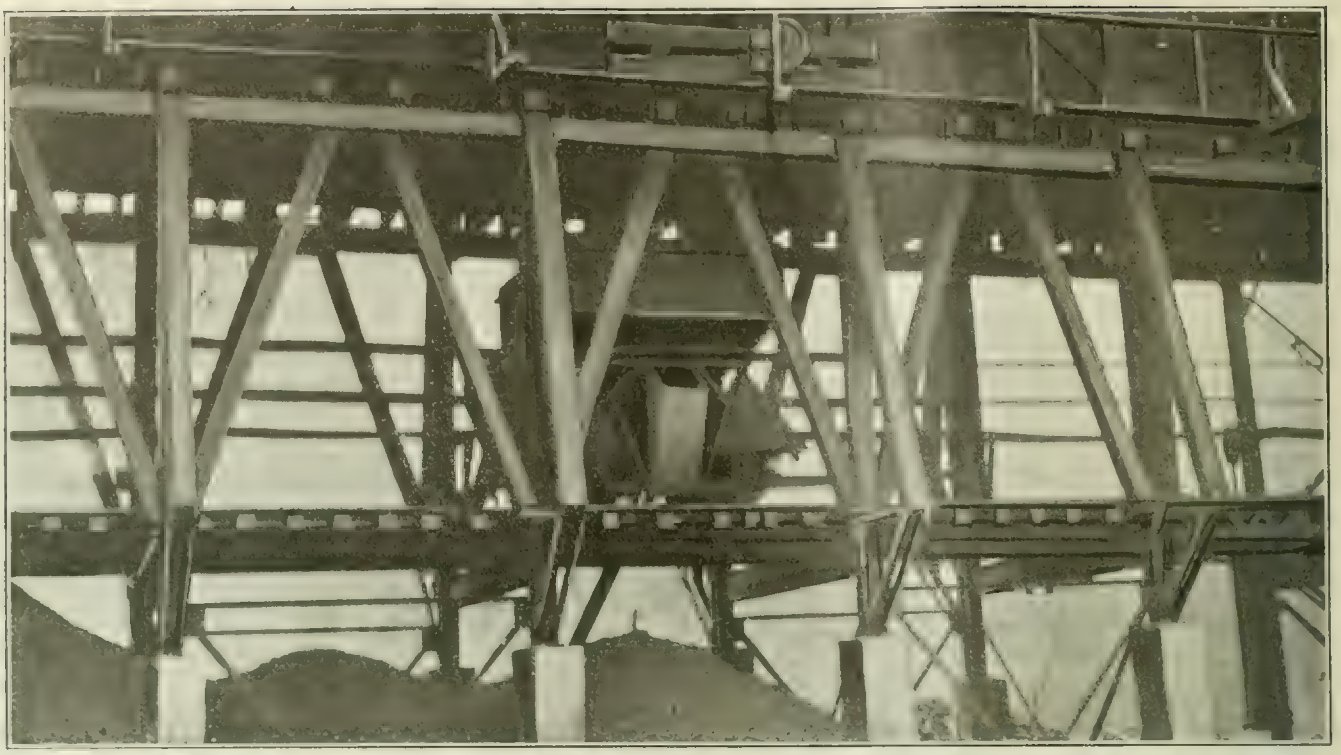


FIG 10. COKE-OVEN LARRY FILLED BY THE LONG STORAGE BIN SUPPLIES COAL TO 265 OVENS

The bin shown was constructed many years ago. In order to keep it completely filled with coal when using the rotary dump it was necessary either to run the dump full length of the bin or to use a short dump with swivel connections on the mine cars and to provide machinery to carry the coal forward or back to the sections of the storage bin not provided with a rotary dump. Though the biggest dump heretofore built accommodated only eighteen cars, being located at the H. C. Frick Coke Co.'s mine at Lemont, Pa., it was decided to install at this mine a 28-car dump and so avoid swivel couplings, and a conveyor system.

the dump over the bins. At the town of Braznell the valley opens out into a wide flat, allowing plenty of room for the ovens and town.

E. H. Coxe, general manafer of the Snowden Coke Co., estimates that $9,000 will be saved annually through the prevention of wrecks, the saving of labor in the cleaning of the haulageway and in the repairing of cars, and from the greater amount of coal that can be handled per hour. Under the old arrangement, in dumping twenty-eight cars of coal into the storage bins the hoist engineer, the trip rider and an extra man had been employed in removing and replacing the pins that support the bottom gates of the cars. Now the trip rider can dump all cars without uncoupling them in less than thirty seconds. From records that have been made it has been found that more coal can be dumped in eight hours than was formerly dumped in ten.

From the saving in overtime caused by handling the trips in a shorter length of time it is believed by the general manager that $3,000 will be saved annually. This saving along with the other previously mentioned makes a total yearly saving of about $12,000. At this rate the installation will pay for itself in less than three years.

Operators, Railroad Men and Commission to Confer on Coal Handling at Tidewater

STEPS are being taken to arrange a conference between traffic officials of the railroads and representatives of the coal operators with members of the Interstate Commerce Commission to discuss rules for the handling of coal at tidewater. Coal consumers and operators are hopeful that an arrangement will be perfected to remedy present conditions that now exist at tidewater.

Do You Favor a Coal Exchange At Hampton Roads?

THE Wholesale Coal Trade Association of New York has addressed a letter of inquiry to the coal trade asking shippers to get together one way or the other in reaching a decision on the advisability of continuing or abolishing the Tidewater Coal Exchange at Norfolk. The letter follows:

"Those of our members who use Hampton Roads have been concerned about the likelihood of discontinuance of the Tidewater Coal Exchange at Norfolk, the report having gained circulation that the carriers, with the possible exception of the Chesapeake & Ohio Ry., were opposed to the continuance of the exchange. We are reliably informed to the contrary, and that the Norfolk & Western and the Virginian are really in favor of an exchange, with the limitation, however, that instead of being general, involving all three carriers, there shall be a pooling arrangement effected for each individual carrier.

"While this is not so desirable as a general pool, at the same time it is much better than having none at all.

"The missing factor, apparently, is a general expression from the shippers that they desire the arrangement to be continued. To supply this you are invited to address a letter to Charles S. Allen, secretary, stating tentatively your willingness to participate in the formation of an exchange, somewhat upon the lines of the Tidewater Coal Exchange, Inc., at the Northern ports, with the modification referred to above, upon receipt of which the same will be transmitted to the carriers with a view to perfecting the more necessary details."

Labor Held Blameless for Price Increases*

Coal Industry Held Up as Huge Profiteer, with Other Large Businesses, by Railroad Brotherhoods in Hearings Before the U. S. Railroad Labor Board—Increased Wages Held Not Responsible for High Cost of Living

This summary from the report of Mr. Lauch is reprinted because it gives coal operators the opportunity to learn how they are being pictured to the public—by labor in particular—and also to make comparisons of the coal industry with various other businesses.

A CAREFUL analysis of the data bearing on the causes of high prices and the relation of cost of production to prices leads to the following specific conclusions:

1. Profiteering—by which is meant the exaction of profits greatly in excess of pre-war profits on the part of producers, middlemen and retailers—is a fundamental cause of the high prices of practically all commodities.

2. Increased wages to labor are in no way responsible for increased prices.

To cite increased wages as a cause of increased prices is to betray an ignorance of the facts. Wage advances have been an *effect* of price advances, not a *cause*. An examination of the experience of every industry shows, practically without exception, that wage increases have lagged behind price increases and usually very far behind. In a period of rapidly rising cost of living it is inevitable that wages also rise in some measure, if the great body of wage earners, living as they do at best not far above the line of poverty, is not to suffer complete degradation.

But in no way has labor been the initial influence. Prices were pushed up by factors over which the workers had no control. They have merely struggled as best they could and in the only way they could to keep their old standards of living. In this struggle they have met with only very partial success. For the great body of wage earners wages have not kept step with prices.

As a result labor as a class is now worse off than it was before the war. Almost without exception a day's wage buys less than it did in 1912 to 1914. In other words, in the distribution of the income of the country labor is receiving a smaller proportion than it did before the war, while capital—in the form of profits, interests and rent—is receiving a very much larger proportion.

It is not contended that profiteering is the sole cause for the maintenance of prices at their present level. It is contended, however, and data are submitted in proof below, that profiteering has been responsible for a very large proportion of the price increases—probably one-half. Moreover, the other possible factors are more or less intangible and perhaps not susceptible to immediate remedy. But profiteering is a perfectly tangible thing, and one which can be remedied by intelligent statesmanship. And it is only by striking at this root cause of our present troubles that permanent remedy may be obtained.

It is not possible to compute the full extent of the profiteering that has taken place and is now taking place. The complete information is not available and probably never will be. Too many hands have dipped into the golden stream of war-time profits. Too many ways have been discovered by corporations and business men for concealing the full measure of their earnings. But, in spite of these difficulties, sufficient evidence does exist to establish a conclusive case of "profiteering"—of profiteering on a scale that makes one almost despair of the future of the country.

The evidence referred to is of an entirely authoritative character. It includes the financial statements of corporations, the Federal income tax returns, the investigations of Governmental bodies such as the Federal Trade Commission, the Tariff Commission and the Bureau of Foreign and Domestic Commerce, and various reports, studies and statements by other official agencies and men in close touch with public and business affairs.

Perhaps the most conclusive evidence of profiteering is contained in the financial reports of the corporations themselves. In order to develop this point a careful analysis has been made, for the years 1912 to 1918, inclusive, of the financial reports of all corporations of $1,000,000 annual income in certain lines of business in which the ordinary consumer is particularly interested. The sources used were the well-known financial manuals such as Moody's and Poor's.

The table on page 1090 summarizes the results of this study. It shows for a large number of corporations by industry groups the average annual net income and the per cent of net income to capital stock for the three pre-war years 1912-1914 in contrast with similar data for the three war years 1916-1918.

The outstanding fact in this table is simply stated. The corporations listed—including all with incomes of $1,000,000 or over in any one year in so far as they are listed in the financial manuals—earned during the years 1916-1918 an average income of nearly $1,250,000,000 a year, or nearly 24 per cent on their capital stock. This appears to be nearly three times the average for the pre-war years 1912-1914, and the figures for production, where these are available, show conclusively that these increased profits were not due to increased production. They were due in large measure to the fact that the corporation took a larger proportion of every dollar spent by a purchaser. This fact will be shown conclusively in another part of this study. Here it is sufficient to note that for the three years 1916-1918 the annual profits of these corporations averaged approximately $800,000,000 more per year than during the three-year period preceding the war, 1912-1914.

This is a startling fact. Basing our calculations upon the reported net corporation income as shown in the income tax returns these corporations represent about one-sixth of the total corporate income of the

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*From report on "The Relation Between Wages and the Increased Cost of Living" presented to the U. S. Railroad Wage Board by W. Jett Lauch.

United States. If these other corporations did as well as those of which record is available, and there is reason to believe they did, then the combined corporations of the country earned approximately $4,800,000,000 more *per year* during the three war-years 1916-1918 than during the three pre-war years 1912-1914.

A total of $800,000,000 means $40 per family of five throughout the nation. A total of $4,800,000,000 means $240 per family of five throughout the nation. Consider that each family of five paid as a toll, not to so-called legitimate profits, but to excess of war profits over pre-war profits, $240 per year, and one gains an idea of the total burden which profiteering meant to the country. Yet it is a conservative estimate of what actually happened, and it must be remembered that this huge figure does not represent the whole profit but only the part in excess of the pre-war level.

Even such stupendous figures do not tell the whole story. For the most superficial investigations reveal the fact that during late years the companies have been resorting to numerous devices for concealing profits. Excessive deductions for depletion and depreciation reveal themselves very quickly when we turn to such basic industries as copper and coal. In other industries huge sums are found set aside for Federal Tax Reserves—sums out of all proportion to the necessities of the case.

In other words, there are very good grounds for concluding that the figures given above very much understate the real profits taken by corporations during the war years. An average of $1,200 per family of five during the years 1916-1918 is probably a highly conservative estimate of the actual cost of corporate profiteering to the consumer.

During the three years 1916-1918 the consumer has been paying the food corporations whose reports are available over two and one-half times as large profits as were considered acceptable before the war.

In the clothing group the increase in profits was proportionally even greater, the price of clothing carrying a charge for profits nearly three times the pre-war figure.

Turning to the corporations which produce various kinds of fuel, together with certain building products, we find the profits for the war years 1916-1918 nearly two and one-half times those for the pre-war years 1912-1914. For the three years 1916-1918 the average was nearly a quarter of a billion dollars a year. The accumulation of profits for the four years 1916-1919 undoubtedly totaled more than a billion dollars. This means that during the years mentioned these corporations earned, after every possible deduction had been made, enough to replace their entire capital stock.

The profits of the basic metal industries, however, outdistance those of any other group. These industries are the ones which produce commodities—such as iron, steel and copper—which the consumer never buys directly, goods which are bought by other intermediate producers. But the cost of these basic products enters into the price paid by the consumer.

The war, with its demand for munitions, greatly increased the opportunity to profiteer in these lines. As a result the industries whose services the nation needed most more than trebled their profits. The profits taken during the war years 1916-1918 were, in fact, nearly three and one-half times those taken during the years 1912-1914—$590,138,605 as opposed to $172,729,195. In other words, the excess war profits amounted to over $400,000,000, which eventually reached the consumer in the prices which he paid for the various commodities into which these basic metals entered.

For a corporation here and there to find itself in a strategic position which enabled it to make huge profits, there was precedent before the war. But for practically the entire business organization of the country, the

INCREASE IN NET INCOME AND PERCENTAGE EARNED ON CAPITAL STOCK OF CORPORATIONS IN SPECIFIED INDUSTRIES DURING THE PERIODS 1912-1914 AND 1916-1918 †

[illegible]	No. of Companies	Capital Stock 1918	Average Annual Net Income for Period *		Per Cent Net Income Is of Capital Stock for Period ‡	
			1912-1914	1916-1918	1912-1914	1916-1918
[illegible]	14	$253,290,655	$46,357,451	$137,046,514	19.7	54.0
Miscellaneous mineral mining	6	182,764,263	17,571,427	27,998,792	7.7	13.6
[illegible]	19	1,384,433,855	74,849,117	334,888,406	6.1	[illegible]
[illegible]	7	220,809,152	15,745,728	38,676,951	7.3	17.7
[illegible]	11	167,716,560	18,205,471	51,527,942	11.8	31.1
Total	57	$2,209,014,485	$172,729,194	$590,138,605	8.4	28.2
Textile manufacturing	8	$100,251,744	[illegible]	$21,551,064	3.9	22.6
[illegible]	11	242,352,056	15,299,288	33,621,247	6.2	13.8
[illegible]	19	[illegible]	[illegible]	$55,172,311	5.8	15.8
[illegible]	5	$172,477,050	[illegible]	$58,644,468	14.4	36.9
[illegible]	12	179,257,338	11,306,923	34,174,794	6.5	[illegible]
[illegible]	12	296,733,193	18,535,621	39,857,473	6.9	13.6
[illegible]	29	$648,467,581	$49,989,328	$132,676,735	8.6	21.3
[illegible]	32	$262,672,277	$16,098,691	$40,195,220	7.6	[illegible]
[illegible]	22	478,758,480	73,989,006	178,779,091	18.7	[illegible]
[illegible]	10	[illegible]	10,154,722	27,729,685	5.7	[illegible]
Total	64	[illegible]	$100,242,419	$246,703,996	12.3	27.6
[illegible]	7	$179,691,396	$22,790,700	$37,632,491	13.9	21.3
[illegible]	7	316,005,600	22,901,434	37,895,558	7.4	[illegible]
[illegible]	[illegible]	757,183,933	50,976,849	134,139,992	7.1	[illegible]
[illegible]	[illegible]	$1,252,880,929	[illegible]	$209,668,041	8.1	[illegible]
[illegible]	[illegible]	[illegible]	$438,663,427	$1,234,359,688	8.7	23.9

[illegible]

sum total of the corporations, to be in such a strategic position that it could hold up the public for enormous profits upon everything, no precedent can be found.

After all expenses of operation and maintenance had been paid—after all charges for replacement of capital had been set aside—in fact, after every conceivable or imaginary expense had been met—these great groups of corporations, controlling the various products essential to our life, made profits which were sufficient to replace the entire value of the capital stock within a period of slightly over four years. This is proved by their own published reports.

INCOME TAX RETURNS DISCLOSE PROFITEERING

Statistics compiled by the Commissioner of Internal Revenue from income tax returns show that the corporate profits of the companies listed in the financial manuals are representative of the whole tendency throughout the country's business. For the years 1912-1914 the average of net corporate income was approximately $4,268,000,000. For the years 1916-1917 it had increased to approximately nine and three-quarter billions of dollars. In other words, the net income for the war years was more than double that for the preceding years, despite an excessive deduction of $74,000,000,000 from gross income before net income was reached in 1917. Detailed data on this point will be found in a separate study. The significant fact is that in 1917 reported corporate income was over ten and one-half billion dollars.

As in the preceding analysis of the financial reports of corporations, so here it is found that the most extraordinary increase in profits during the war appeared in the industrial and mining group, where the corporate income returned for 1917 was approximately four times the pre-war average—$6,500,000,000 as contrasted with $1,669,012,000.

If from the figure given for the total net corporate income for 1917 we deduct the approximate value of the excess profits taxes, and further deduct 10 per cent on all additional capital invested to expand industry to meet war demands, the profits of corporations are still found to be over three and one-half billion dollars above the pre-war average.

Such enormous profits made at the expense of the consumer were too large to be divided all at once, especially when a large proportion of high incomes went to help the country carry the enormous expense of war. So only a part of the profits was disbursed. The remainder swelled reserves to huge proportions. Thus the consumer discovers that he has been taxed not only to pay high dividends during the war period but also in order that these same high dividends may be continued over the recession of industry which is bound to follow. Some of these reserves will find their way into stock dividends, thus creating more paper value upon which the country will be expected to pay a fair rate of profit.

TREASURY REPORT ON CORPORATE INCOME

The extraordinary nature of the profits of industry during the war years is manifest in so incomplete a document as that submitted to the Senate by the Treasury Department in 1919, entitled "Corporate Earnings and Government Revenue." This document purported to show the incomes of approximately 20,000 of the 31,500 corporations in the United States reporting incomes over 15 per cent on their capital stock.

Altogether these corporations earned an average return on capital stock of 33⅓ per cent after all taxes had been deducted. In other words, with three years of such good fortune as war brought, these corporations would make profits totaling the whole value of their capital stock.

The following table shows the great increase in profits enjoyed by the leading industrial groups.

CORPORATE EARNINGS IN 1917 BY MAIN GROUPS OF INDUSTRY

(From "Corporate Earnings and Government Revenue," Senate Document 259)

Industry	Per cent of net income for the year 1917			
	To capital stock		To invested capital	
	Before deducting Taxes	After deducting Taxes	Before deducting Taxes	After deducting Taxes
Fisheries	90 95	55 07	50 15	30 37
Baking and brewing, beverage industries	55 09	28 10	10 98	8 77
Business pursuits and personal service	36 56	29 01	22 28	17 68
Chemical and allied industries	52 36	41 76	34 89	22 08
Food and food preparations	41 89	33 48	31 57	23 19
Iron and steel industries	50 52	36 43	33 59	23 26
Leather and leather goods industries	33 32	26 41	23 41	18 55
Metal and metallurgical industries	28 79	22 89	22 03	16 93
Mining and mineral extraction	49 27	36 02	32 74	22 75
Paper, printing, bookbinding and publishing	35 82	27 41	22 71	16 90
Special manufacturing industries	38 90	30 43	24 70	18 57
Stone, clay and glass industries	36 89	28 22	26 86	21 00
Textile industries	47 23	34 26	28 24	20 76
Timbering, logging, lumbering and woodworking industries	40 98	33 88	15 73	12 97
Trading	44 30	33 99	25 07	19 20
Transportation and public utilities	26 63	20 98	16 38	12 88
Total	44 34	33 51	25 95	19 11

There is no business group listed here with an average net income under 20 per cent. Over one-fourth of these corporations, 5,724 in number, showed net profits of over 50 per cent on capital stock. And over one-tenth of them (2,030) showed net profits of over 100 per cent. In other words, there were over 5,000 corporations which in 1917 earned over one-half the value of their capital stock and over 2,000 that earned the entire value in a single year.

Thus the statement that tremendous profits and high prices are closely associated is substantiated by data from two authoritative sources which certainly lean toward conservatism.

Small Quantities of Arsenic Have Been Found in Samples of Coke

CHEMISTS working in other industries than that of coal have occasionally referred to the presence of arsenic in coke. Investigation as to the occurrence of minute quantities of that substance in beer developed the fact that the malt used in brewing, when dried by direct contact with hot fuel gases derived from either coke or anthracite, absorbed or obtained by surface deposition a part of the arsenic which was volatilized during the burning of the fuel. The source of the arsenic was directly traced to the fuel, being originally derived from the iron pyrite or "brasses" which the coal contained.

Several years ago investigations in this direction were carried on at the Breslau Technical High School, in Germany, and this institution reported the following percentages of arsenic in the various samples of coke then under examination: Rhineland coke, 0.002 per cent; Westphalian coke, 0.011 per cent; Saar coke, 0.0052 per cent; American beehive coke, 0.0037 per cent.

Of course these percentages are exceedingly small and in practice would probably be lost sight of, yet the presence of the arsenic is interesting from a theoretical standpoint. Messrs. Archbutt and Jackson have formulated a satisfactory method for the determination of arsenic in coal and coke.

Designing Furnaces to Suit High-Ash and Non-Coking Coals of Varied Volatilities*

Making Chain-Grate Stoker Settings to Suit the Low-Grade Coals of the Southwest—Long High-Set and Steep Arches Spanning Large Percentage of Grate Best Suit High-Volatile High-Ash Coals

BY W. M. PARK†
East Chicago, Ind.

PRODUCTION of coal in the Southwestern fields of the United States has not kept pace with that of Eastern fields, owing to the smaller demand. This demand is affected by the extensive oil developments of that section and by the lesser density of population and fewer manufacturing enterprises. The quality of coal in this region varies from a good grade of anthracite containing 14,000 B.t.u. to low-grade lignite of 6,000 B.t.u. The anthracite field, which is in New Mexico, is of limited area and is mentioned merely to indicate the contrast in fuel quality found in small radius. The majority of the fuels of the Southwest contain ash in excess of 15 per cent which is of a composition that fuses readily into a sticky clinker.

> **Furnaces that will burn high-volatile coal running up to 40 per cent ash make it possible to make use of the bone from picking tables and so provide for great savings in the power bill. To this end it is necessary to secure plenty of radiant heat from the arch without introducing the disadvantage of an excessive throttling of furnace gases.**

During the last eight years furnace design has developed beyond the experimental stage, however, and engineers can rationally design furnaces to use these fuels with the same assurance of ultimately satisfactory results that is felt when designing furnaces for Eastern coals. This article will describe a few modern settings with which creditable performance has been secured.

Fig. 1 shows a horizontal-pass boiler with a chain-grate stoker having a ratio of grate area to heating surface of 1 to 52. This grade readily comes to ignite and burns 40 lb. of coal hourly per square foot of grate area. Under test conditions it gave 72 per cent efficiency when burning a northwestern New Mexico coal of the following analysis:

Moisture, per cent	17
Volatile, per cent	33
Fixed carbon, per cent..	33
Ash, per cent	17
B.t.u., commercial basis.	8,500

The higher grade coals of New Mexico are used quite extensively in El Paso, Tex., on a number of chain-grates. All these coals are rich in volatile gas and some appear to contain, either in the volatile matter or in the lighter particles of ash, some element which attacks even the best grades of firebrick if the furnaces are so designed that the gas travels past the brickwork at a high velocity.

A furnace for a vertically baffled boiler is represented in Fig. 3. The outstanding features of design are the ample combustion chamber provided by setting the boiler 11.5 ft. under the front header, the high set and steeply sloped arch which in connection with the vertical bridge wall allows intense reflection and radiation of heat on the entering fuel, and a large opening between the arch and bridge wall to insure nominal gas velocity. This type of furnace has given highly satisfactory performance, operating continuously at averages of 15 per cent carbon dioxide and a loss due to fine coal passing through the grate openings to the ash pit of 2 per cent to 3 per cent when burning northeastern and north central New Mexico coals which have the following proximate analysis:

Moisture, per cent..................................	2.87
Volatile, per cent..................................	34.27
Fixed carbon, per cent	46.08
Ash, per cent	16.78
B.t.u., commercial basis..........................	12,023

About sixty miles west of Fort Worth, Tex., is an isolated bituminous coal field of small area. The screened lump grades of this coal have a heating value of 12,500 B.t.u., and a large percentage of the output is used by the Texas & Pacific Ry., leaving a limited amount for domestic consumption in a territory traversed by this railroad. The screenings are burned on chain-grate stokers at several of the mine plants and at a large public service plant in Forth Worth. The better grades of screenings have a heating value of 10,500 B.t.u., while the lower grades run as low as 8,300 B.t.u. and have a proximate analysis of:

	Per Cent.
Moisture..	3.50
Volatile..	30.70
Fixed carbon......................................	26.24
Ash	39.56

To burn this coal successfully it is necessary to cover approximately 90 per cent of the furnace with an arch set with a steep slope and ample height which in combination with a vertical bridge wall will cause intense reflection of heat upon the fuel bed at the entrance to the furnace. Such a furnace is shown in Fig. 4. Naturally, it is necessary also to provide unusually large grate surface to permit of burning large quantities of this low-grade fuel. Some of the stokers in operation at the mines have ratio of grate area to heating surface as low as 1 to 25.

In the western counties of Arkansas there is mined a

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*Reprint of article entitled "Burning Low-Grade Coals of the Southwest" from *Electrical World*.

†Construction engineer, Green Engineering Co.

grade of coal known as semi-anthracite, having the following average analysis:

Moisture, per cent	3.5
Volatile, per cent	14.0
Fixed carbon, per cent	60.5
Ash, per cent	22.0
B.t.u., commercial basis	11,400

In regard to the glossy appearance of freshly broken pieces and the nature of the fracture this fuel is similar to Pocahontas coal. The percentage of volatile matter and moisture also approximates that of the latter fuel, but the different nature of the volatile content and the considerably higher percentage of ash give the coal characteristics in burning which are quite different from Pocahontas coal. When heated the tars appear to volatilize before they reach the temperature at which they would become plastic, in contrast with Eastern coking coal.

Instead of coking together in lumps, the smaller chunks disintegrate under heat so that the fuel bed is like a mass of loose sand. Because the coal has these characteristics it produces a dense fuel bed, and therefore the depth of fire must be less than that used with coals of high volatility for corresponding drafts and combustion rates. These low-volatile coals are perhaps the most difficult fuels to burn of all encountered in this district, on account of the difficulties of ignition. Even with the furnaces designed for the most intense concentration of heat at the ignition point, semi-anthracite coals will ignite only on the surface if radiant and reflected heat alone are depended upon. The ignition of fuel in the lower part of the fuel bed can be accelerated by use of a special gate having corrugated face tile in contact with the fuel.

ANALYSES OF SIX VARIETIES OF COAL

Name of Coal	Gallup, N. Mex.	Raton, N. Mex.	Strawn, Tex.	Dewar, Okla.	Jenny Lind, Ark.	Huntington, Ark.
Moisture	19.55	2.45	2.81	6.27	4.25	3.88
Volatile content	69.53	34.99	35.41	27.93	14.28	16.93
Fixed carbon		46.08	40.23	46.37	58.89	56.06
Ash	10.92	16.48	21.55	19.43	22.58	23.13
B.t.u. per lb. as fired	8,367	12,059	11,200	10,706	10,874	10,912
Percentage of combustible in refuse		15.9	22.3	26.9	22.9	19.8
Furnace draft...........	0.27	0.12	0.11	0.23	0.27	0.38
Flue gas temperature.....	584	507	477	520	463	444
Carbon dioxide at furnace	15.5	15.6	12.2	12.6	13.5	12.4
Carbon dioxide at uptake.	10.0	11.7	9.7	10.0	12.9	11.6
Coal burned hourly per square foot	40.2	26.6	24.65	27.5	32.1	28.5
Per cent builder's rating developed	146	154	134	139	170	148
Combined efficiency	71.8	72.8	73.6	71.7	74.1	72.2

Fig. 2 shows an experimental design of furnace first worked out in connection with semi-anthracite coal-burning problems. It involves an expensive lot of special tile shapes, and the cost of maintenance of the brickwork is high.

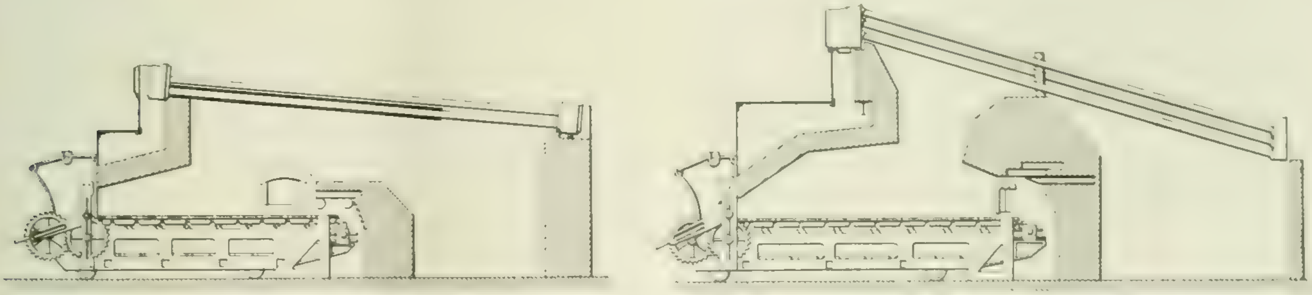
Equally good results may be expected with a simpler type of arch shown in Fig. 3, though for the boiler and for the length of stoker shown in Fig. 2 the furnace projection and length of arch should be increased when the reversed arch is eliminated.

From a long series of tests of from eight hours to twenty-four hours' duration, six are presented in the accompanying table. Efficiencies as high as 78.5 per cent were obtained where unusual pains were taken to maintain steady conditions, but the list chosen does not include the maximum results. Tests typical of results readily obtainable are of greater value to the engineer, and this point was borne in mind in making the selection.

My experience in burning the Southwestern coals leads to the following conclusions:

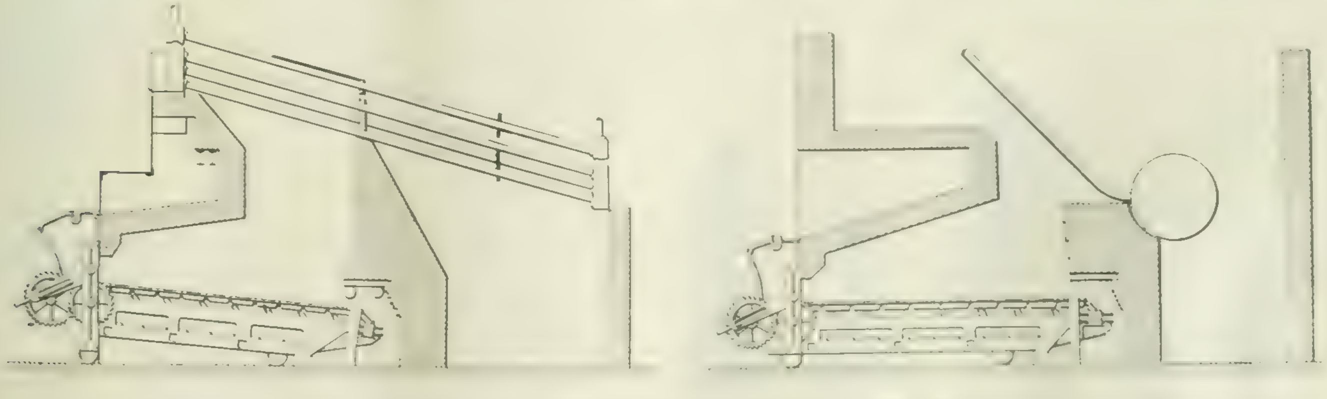
1. On account of the high-ash content and fusible nature of their ash, these coals can be burned with highest efficiency and with least labor by use of a chain grate.

2. Most of the coals are of high volatile content,



FIGS. 1 AND 2. TWO SETTINGS THAT SUCCESSFULLY BURN THE FUELS FOR WHICH THEY WERE DESIGNED

In Fig. 1 the tile on the lower boiler tubes aid in maintaining high temperature. Fig. 2 is an experimental setting intended for semi-anthracite



FIGS. 3 AND 4. TWO OTHER EFFICIENT SETTINGS

The first embodies a spacious combustion chamber, a high, steep arch and an ample gas outlet. In the second the high, steep arch and vertical bridge wall afford intense heat reflection.

ignite readily and burn freely if provided with long, high-set arches.

3. Semi-anthracite coal ignites least readily, but if load conditions permit maintenance of steady furnace conditions, this fuel can be burned with high efficiency. Good overload also can be secured with liberal grate area.

4. As semi-anthracite crumbles in the fire rather than cokes together it is desirable, by the use of a stoker chain with finely divided and ample air space, to reduce sifting of the fuel and resulting holes in the fire.

5. To secure high furnace efficiency at high rating a large furnace volume is desirable. This is insured by setting horizontal water-tube boilers at a front header height of 8 ft. to 10 ft. if horizontally baffled and 10 ft. to 13 ft. if vertically baffled.

6. Provision should be made for furnace draft of 0.30 in. to 0.60 in., and liberal grate area should be furnished to insure good overload capacity when burning the medium and lower grades of these coals.

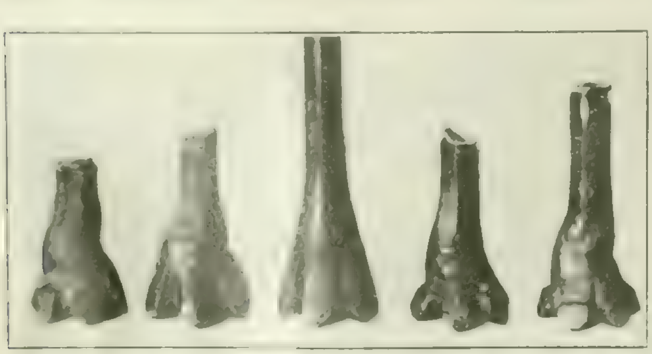
Good Blacksmithing Is Necessary to Obtain Good Drill Bits

By R. E. Dunn
New York City

MANUFACTURERS of rock-drilling machinery can and do make good rock drills and drill-steel sharpeners. They are unable, however, to eliminate the personal equation of the blacksmith. It would seem that the least informed person would realize that success in rock drilling is almost entirely dependent on the blacksmith turning out good steels. Although the drill-steel sharpener has gone far toward improving the quality of bits, yet, even with this improved and special machine, proper steels can be made only if care and judgment are exercised by the blacksmith.

One of the large manufacturers of rock-drilling machinery not long ago received a complaint that one of its jackhamers was "falling down" on the job. In the customer's own words, "the drill didn't have any pep." One of the company's representatives investigated this case and the accompanying illustration shows the actual condition of the bits that were used in this mine. The bit shown in the center was made by this representative with the same machine that formed the other four bits shown. This demonstrates clearly that the difficulty was not the fault of the sharpening machine. Is it any wonder that the drill "didn't have any pep"?

It is found that a large number of drill complaints can be traced directly to bad blacksmithing, against which the manufacturers are waging a continual campaign of education. The photograph also illustrates the problem with which the representatives of mining-machinery companies are frequently confronted, that is, complaints and dissatisfaction on the part of sincere but not thoroughly informed operators.



PROPERLY AND IMPROPERLY FORGED BITS

Geological Survey Issues Supplement on Coal Mining in Alaska

AS IT is tributary to the Government railroad and because of the coal-mining developments carried on by the Department of the Interior through the Alaskan Engineering Commission, the Matanuska coal field, in Alaska, is just now of special interest. The United States Geological Survey, of the Department of the Interior, has therefore issued, in its Bulletin 712-E, a paper by Theodore Chapin entitled "Mining Developments in the Matanuska Coal Field."

Mr. Chapin is in charge of the branch office of the Geological Survey at Anchorage, Alaska, and is actively co-operating with the Alaskan Engineering Commission in the development of these mines. His report is part of the Geological Survey's regular annual account of mining in Alaska and is based on several weeks' field work done at different times in the summer and fall of 1918 and on an intimate knowledge of the mining and prospecting that were done in that year.

The report includes a brief description of the general geology of the coal field, a statement of the results of tests and analyses of the coal, a detailed account of the mining and prospecting done in 1918, and descriptions of the geologic features at the mines and maps of areas near them, as well as many sections showing the geologic relations of the coal beds. The report is supplemental to the more general accounts of the geology and coal of the Matanuska Valley that have already been published by the Geological Survey.

The same bulletin contains also a short paper by Mr. Chapin entitled "Lode Development in the Willow Creek District," which is the customary brief annual statement of the developments of the year of the gold lode mines of that district.

Bulletin 712-E can be obtained free of charge from the Director of the U. S. Geological Survey at Washington, D. C.

Income Tax for 1919 Will Amount to $3,500,000,000

INCOME and excess profits taxes aggregating $908,829,172 were paid as the first installment of the tax bill for 1919. While these figures do not represent an exact one-fourth of the taxes for last year, they indicate collection for the entire year of approximately $3,500,000,000, Treasury officials say. The State of New York paid $214,644,232 and the Second District of New York paid $154,505,989.

To Report on Coal Traffic Rates

A FAVORABLE report has been made to the House on a resolution by Representative Thompson of Ohio, calling upon the Secretary of Commerce to report on the cost of transportation of coal by canals and other navigable waters as compared with costs for transporting coal by rail. The committee points out that there are wide differences in existing estimates of costs for coal carriage on both rail and water carriers.

Costs Constitute the Only Fair Basis For Fixing Prices

In Figuring Costs, It Is Held, Allowance Should Be Made for Reasonable Wages for the Proprietors and Equitable Interest on Capital Invested—Industries Will Prosper in Proportion to Their Freedom from Artificial Restraint

By Frank Wilber Main*
Pittsburgh, Pa.

As IS sometimes pointed out, history confirms the fact that it is a trait of human nature for each generation to feel that the problems confronting it are more difficult, more unusual and more far-reaching in their effect than those that have ever been met by mankind before. It is also a universal human trait to feel that the solutions that are used in working out these problems are new and original. This is the *new* day of costs and cost accounting, so we are told, and in one way or another every business concern and every association and business man are being urged to base the selling price of their products upon the cost thereof.

Mr. Main's message, while not so intended, fits the present case of the coal operator. The impelling incentive for accurate cost keeping should come from within and not through orders with penalty provisions from a Governmental agency. Standardized fundamental methods of cost accounting are advocated. Writer believes with the coal operator that industry will prosper most when artificial restrictions are removed.

This latter I, of course, subscribe to and agree with, but I am afraid that the impression is often created that the calculating of costs is something new and something peculiar to our own day and generation, and yet I believe that if we will but stop and think we must realize that in every day and every age costs were obtained, not perhaps in all of their refinement, but costs nevertheless. Some nineteen hundred years ago the Greatest Teacher of all times made a statement in a manner which indicated that the obtaining of costs was a well recognized custom of procedure even at that time: "Which of you, intending to build a tower, sitteth not down first, and counteth the cost, whether he have sufficient to finish?"

The subject of costs is a branch of the science or art of accountancy and has been developed by accountants. These gentlemen, though not then so named, were in existence at the time of Caesar and helped calculate the costs of his foreign conquests. When Columbus discovered America the profession of accountancy was well established and this presupposes a knowledge and use of costs. This is true today, for the *Encyclopedia Britannica* defines accountancy as "a science by means of which all mercantile and financial transactions, whether in money or in money's worth, including operations completed and engagements undertaken to be fulfilled at once or in a future, however remote, may be recorded; and this science comprises a knowledge of the proper methods of preparing statistics . . . and of ascertaining or estimating on correct bases the cost of any operation, whether in money, in commodities, in time, in life or in any wasting property."

Speaking generally, and, of course, recognizing individual exceptions, costs have always, and of necessity, determined selling prices. The great trouble in the past was that while you would never fail to get attention when you talked of selling prices, each man thought his cost system was either too secret to be discussed or too unimportant to require special study. The price his competitor charged was sufficient cost system for him.

Herbert Hoover in a very interesting article on "Agricultural Readjustment and the High Cost of Living," in a very recent issue of *The Saturday Evening Post*, has stated that the cost of raising various farm products in this country is not the determining basis of selling prices, but that these selling prices are fixed by the impact of world wholesale prices. In other words, in respect to certain farm products which are grown the world over, the world cost rather than the United States cost is the predominating factor in this country. While with certain modifications this perhaps is true, yet it only confirms the fact that taking any product over a wide enough field, the selling price for any long-continued period cannot be less than cost.

I know that many will say that it is possible, even over a wide territory, to omit certain costs and to still continue production for a long period of time, also that it is possible for large business groups to carry on expensive side lines at the expense of more productive products. I, however, still contend that the cost of any product over a sufficiently wide area of territory, including reasonable wages for the proprietors and reasonable wage or interest return on the invested capital, is the dead level below which business or industry cannot indefinitely survive.

The instinctive struggle for life is so strong that no human being will willingly suffocate, and likewise no business will forever continue on a basis from which it cannot grow or develop. I am not speaking of unwarranted individual business enterprises; I am speaking of business trades and industries as a whole.

If cost is the basis for prices it is well to consider briefly just what is included in cost. I am not now speaking of "cost" as a technical accounting word, which in many cases includes only part of the actual elements that determine the basis of prices, nor am I including in cost the profit which is and must be the inherent and natural reward of industry, ingenuity and genius (which profit is just as necessary for the continuation of any form of civilization as the elements of cost itself). The cost I am speaking of includes:

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*Senior partner in the accounting firm of Main & Co. and president of the Pennsylvania State Board of Examiners of Accountants.

1. Wages and salaries.
2. Materials and supplies.
3. Overhead or burden, including administrative, general and selling expenses, depreciation, depletion, etc.
4. Remuneration of proprietors for own services.
5. Remuneration of investment for use thereof.

There can be no question as to the first three classes of expenditures. Our farming friends are just beginning to realize that their farming costs include a reasonable remuneration for the farmer and the members of his family for their own labor. This is also true in all other enterprises. The individual merchant often feels that he has made, say $15,000 in a year, when as a matter of fact he has made only that part of $15,000 which is in excess of a reasonable remuneration for his own services and a fair return on his capital invested.

There has been a great deal of discussion among accountants as to whether interest is or is not an item of cost. It is certain that that part of the investment in any business which is represented by borrowed capital carries an interest charge as a remuneration thereof which must be provided for. That part of the investment in excess of borrowed capital has just as much right to a fair remuneration as a farmer has for his own labor on his own farm, and unless properly rewarded capital gradually wastes away of dry-rot.

In these days when men are considering very seriously the various phases of industrial democracy and when so much emphasis has been placed upon the interest of the worker in the profit of the business, the inherent right of a return for capital on itself for its own services should always be kept in mind.

While costs are a basis of prices, I am nevertheless opposed to any attempt to place selling prices generally upon a cost plus basis. Cost plus contracts and cost plus arrangements have almost always been found, and I believe usually will be found, productive of waste, inefficiency and extravagance. I am in favor, however, of each industry, as far as possible, standardizing its fundamental methods of cost accounting procedure.

I am so certain of the economic principle that cost forms the basis of all prices, and am so opposed to *en masse* regulation, believing that the same stifles individual initiative and enterprise, whether governmental or association, that I believe that industries as a whole will prosper most naturally and effectively according to the degree that all artificial restraints are removed. Accurate knowledge by each association and by each business man of their own costs is the one unfailing safety valve.

While it probably is true that limited governmental regulation is necessary in respect to certain industries, I believe that the public could be far more protected if our Federal trade agencies were directed to the correction of abuses as the same arise, rather than to the regulation of all businesses and industries, as now seems to be attempted. I also feel that there is grave danger in individual associations attempting a regulation in their own trades which when exerted by the Government has been found to be most unsatisfactory and which I believe will be found almost unequally unsatisfactory by whomever it may be attempted.

We are realizing that any addition to normal cost, as, for instance, unscientific excess profit taxes, automatically and unfailingly raises prices to the customer. From general comment we might be led to believe that such a result was something that could not be foreseen. Yet in 1767, 153 years ago, there appeared in the *London Magazine* the following statement:

"Every new tax does not only affect the price of the commodity on which it is laid but that of all others, whether taxed or not, and which at first sight it seems to have no manner of connection. . . .

"Taxes, like the various streams which form a general inundation, by whatever channels they separately find admission, unite at last and overwhelm the whole. . . .

"The increase of taxes must increase the price of everything, whether taxed or not, and this is one principal cause of the present extraordinary advance of provisions and all the necessaries of life."

This is not a time to discuss taxes and I am mentioning this matter only to illustrate that any unnatural addition to cost cannot do other than produce unfavorable and distressing results, whether it be unscientific taxes, expensive regulation, unwarranted profit, or any other undue addition.

From a purely selfish standpoint, I am opposed to the addition of any excessive or unusual profit and I believe that no trade association can do any more important work than to agitate against unreasonable profits. Unreasonable profits will, in the long run, and looked upon from a world viewpoint, bring untoward results just as certainly as inadequate profits, and will do just as much to upset business conditions.

Peat, Widely Used as Fuel in Europe, is Much Used as Fertilizer in U. S.

PEAT may be utilized in numerous and varied ways. In the countries of northern Europe, a bulletin of the Geological Survey notes, it is used for fuel and as the basis for many manufacturing industries. Gas, charcoal, coke and a number of valuable byproducts are produced from it. Owing to the scarcity of raw materials in Europe peat and peat moss are employed also as substitutes for absorbent cotton in the preparation of surgical dressings, for wood, and for cotton and woolen cloth.

In the United States peat is utilized chiefly as fertilizer filler, as stable litter, and as an absorbent for the uncrystallized residues of beet and cane sugar refineries in the manufacture of stock feed.

Peat has long been used in fertilizing the soil, having been either applied as a direct fertilizer or used as a filler for commercial fertilizer. Analyses of the peats of the United States show an average nitrogen content of about 2 per cent, a proportion somewhat higher than that found in some commercial fertilizers.

The value of peat in soil fertilization is found in its nitrogen content and in the beneficial mechanical effect it produces upon certain lands. Black, thoroughly decomposed peats are most satisfactory for fertilizer, as such peats are generally heavier and more compact and contain more nitrogen and less fibrous material than the brown types.

What Barrier Coal Has Been and Should Be Left to Protect Anthracite Mines—I

Records Several Cases Where Barrier Pillars Were Provided, What Rock Overburden and Water Pressure They Sustained, Their Thickness, Height and Character and Their Ability to Satisfactorily Function—Some Experience Is Given as to Longitudinal Draw

By W. B. Richards*
Hazleton, Pa.

ONE of the most important subjects connected with the laying out of a mining property is the determination of the necessary, and therefore the required, width for barrier and shaft pillars. A barrier pillar is a coal rib left in place between the workings of adjoining mines. A shaft pillar is the coal reserved on either side of a shaft to protect the surface from subsidence and the shaft from distortion and injury. A fire pillar is a coal block into which normally a breast would have been driven, but which is left unworked in order to provide a solid pillar where a dam can be constructed. In case of a fire, the portion of the mine controlled can be sealed off by such a dam or flooded, without the balance of the operation being affected.

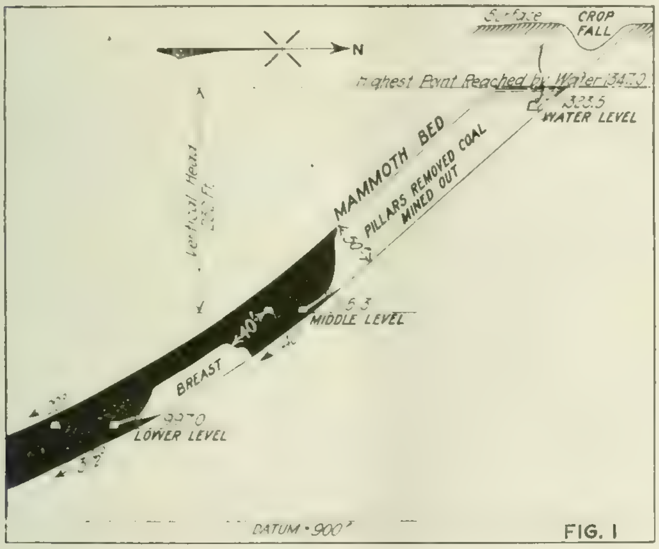


FIG. 1. SECTION THROUGH KEHLEY RUN MINE

This mine was flooded to extinguish a mine fire, the pressure of a 232-ft. head of water coming upon a pillar 40 ft. thick. This pressure was successfully sustained.

If adjoining mines are owned by a single company the barrier pillars usually are established approximately midway between the main openings of the two operations, so as to divide the territory equally. If adjoining properties are owned by different companies or individuals, the land line becomes the dividing line, and the barrier pillar is established on either side of this line as a center. Sometimes barrier pillars run lengthwise with the strike of the bed, and then one mine is below the other and the pillars run in the direction of the gangways. When they run parallel with the dip, they separate two mines that are side by side. In the event of a mine fire, a barrier pillar of sufficient strength would permit of flooding the burning mine to extinguish the fire, and there would be no danger to the employees in the neighboring operation. If a mine had reached the stage where it was unprofitable to work, it could with equal safety be abandoned and allowed to fill with water.

Barrier Pillars Have to Meet Three Forces

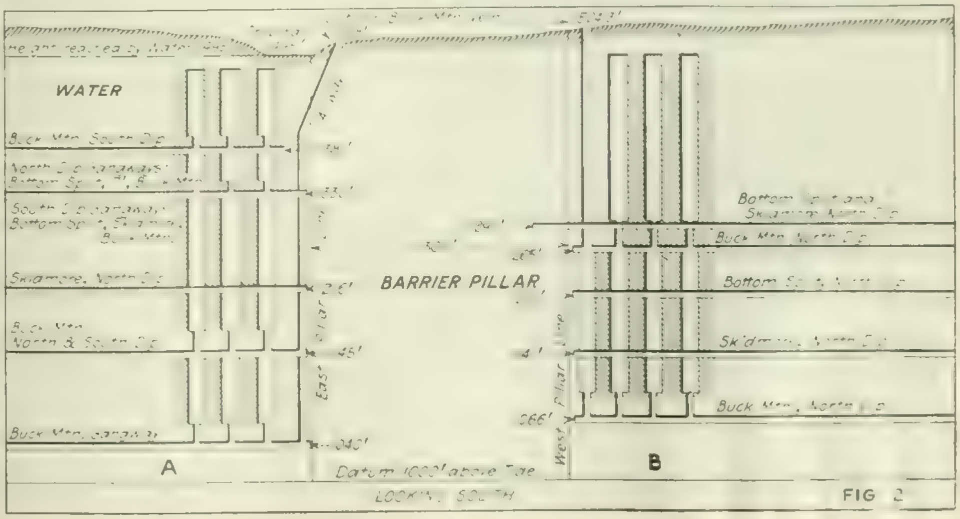
The decisive test of a barrier pillar comes when the bed has been completely robbed on both sides of the pillar. This coal must then bear the full weight of the overlying strata, and will be affected by the lateral draw. When one mine is abandoned and allowed to fill with water, the pressure of the water also pushes against this pillar, and these three combined forces have to be resisted.

The Anthracite Mining Law of Pennsylvania, Art. 3, Sec. 10, states that it shall be obligatory on the owners of adjoining coal properties to leave, or cause to be left,

FIG. 2

Plan of Barrier Pillar

This pillar, 300 ft. wide, resisted, without seepage, a 455-ft. head of water for fifteen years on the side marked "A," the workings on that side being allowed to fill with water. The pillar will be maintained at that width to a depth of 570 ft.



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*Consulting engineer, Cranberry Creek Coal Co.

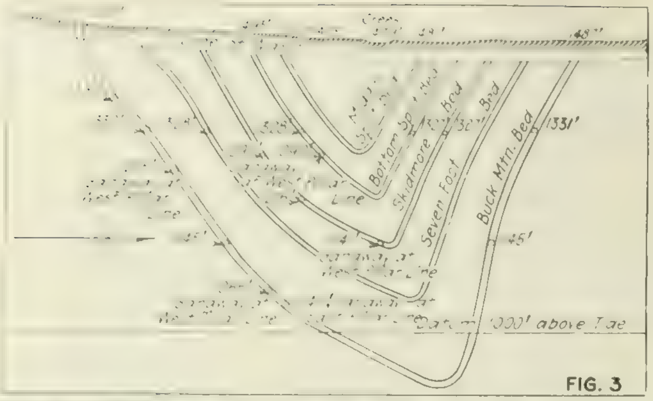


FIG. 3. VERTICAL SECTION ON THE LINE OF THE BARRIER PILLAR SHOWN IN FIG. 2

Four beds were worked. On one side of the barrier three beds and on the other side two beds were robbed to the pillar

a pillar of coal in each seam or bed of coal worked by them along the line of the adjoining property, of such width that, taken in connection with the pillar to be left by the adjoining property owners, it will be a sufficient barrier for the safety of all employees of either mine in case the other working should be abandoned and allowed to fill with water; such width of pillar to be determined by the engineers representing the adjoining property owners, together with the inspector of the district in which the mine is situated. The surveys of the face of the workings along such pillar shall be made in duplicate and must practically agree.

The prime factors governing the determination of the width of pillar required are: (1) The depth of the bed below the surface, which is the measure of pressure; (2) the compressive strength of the coal; (3) the inclination of the bed; (4) the thickness and nature of the bed, whether the coal is soft, shelly or hard; (5) the nature of the overlying strata.

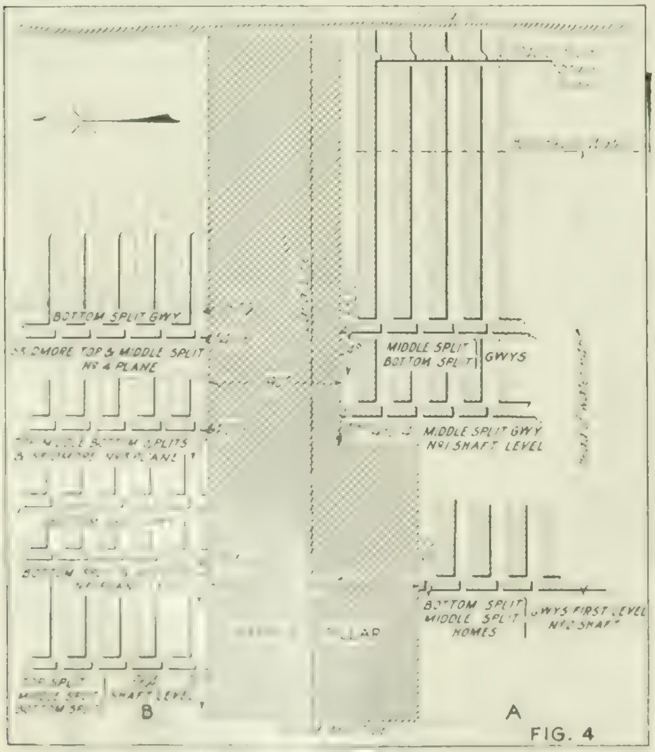


FIG. 4. LONGITUDINAL [illegible] OF A BARRIER BETWEEN TWO [illegible] MINES

Mine [illegible] worked. A [illegible] and allowed to fill with water. The pillar [illegible] fully withstood the pressure of water to which it [illegible]

The following factors for determining the width of barrier pillars required have been investigated:

The squeezing and crushing strengths of anthracite coal have been tested under the auspices of the Anthracite Engineers Club of Scranton, Pa. The specific gravity and weight per cubic foot of the strata overlying the coal beds have been determined by John H. Savage, chemist of the Lehigh Coal & Navigation Co., of Lansford, Pa.

Barrier pillars have been tested under working conditions in the southern and western anthracite fields. Here pillars have been established, the mines abandoned, and allowed to fill with water, to depths ranging from 300 to 800 ft. from the surface, in coal varying from 10 to 50 ft. thick and inclined from zero to 70 deg.

By tests made on samples from the several coal fields, it has been found that a pressure of 216 tons to the square foot will cause the ordinary mine pillar to begin cracking, while a pressure about twice as great will crush it to powder. In general, other things being equal, the crushing strength of mine pillars varies inversely to the square root of the thickness of the bed. The same general rule apparently holds true for the squeezing strength in all cases where the height of the pillar is less than its width.

CRUSHING STRENGTH 3 TONS PER SQUARE INCH

In tall pillars, having a height greater than their width, the squeezing strength remains nearly constant, while the crushing strength continues to diminish with the height. The average squeezing strength of a mine pillar is about three thousand pounds to the square inch. The average crushing strength is about twice as much, or six thousand pounds to the square inch.

The pressure or weight upon a pillar varies directly as the depth from the surface, multiplied by the cosine of the angle of the dip. In general, the greater the depth, the larger must be the pillar. As the load producing the first crack in a mine pillar, that is a load such that the coal beings to scale on the outside of the block, is 216 tons to the square foot, and the weight of the overlying strata averages 163 lb. to the cubic foot, a level bed at a depth of 2,650 ft. below the surface supporting only the roof immediately below it would be under such a pressure that it would commence to squeeze. This statement is based on the assumption that the mass of strata resting on the pillar does not overhang. If the strata overhang, the pillar would commence to squeeze at a lesser depth.

The following table shows the average specific gravity and weight per cubic foot of slate, pea conglomerate, and hard gray sandstone from the mines at Lansford, Pa.:

	Specific Gravity	Weight per Cu.ft., Lb.
Slate	2.60	162
Pea conglomerate	2.65	165
Hard gray sandstone	2.68	167

The average weight of the strata overlying the Mammoth bed in the basin at Lansford is 163 lb. per cubic foot.

At the Harleigh Mines near Hazleton in the year 1877 the surface subsided, owing to the robbing of the pillars, and Black Creek broke into the mines. The barrier pillar established between the Harleigh and Ebervale mines was 45 ft. thick and the bed was 30 ft. in thickness and composed of good hard coal. The vertical

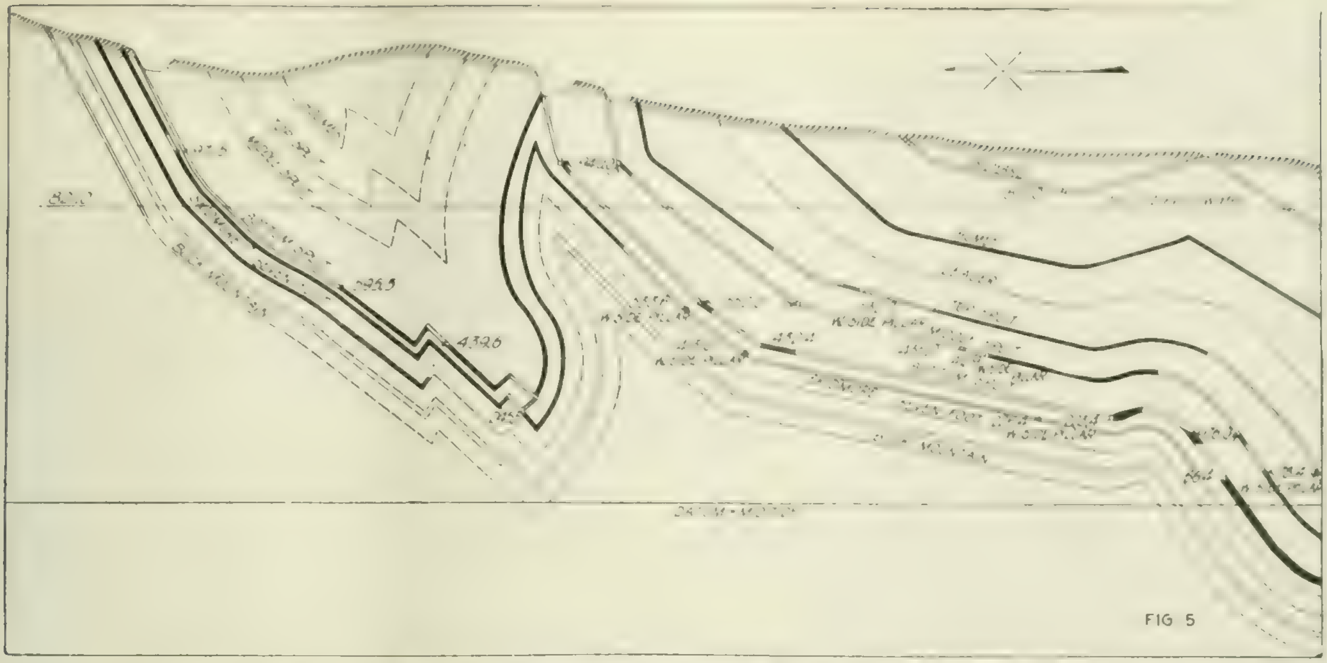


FIG. 5. VERTICAL SECTION ON THE LINE OF THE BARRIER PILLAR SHOWN IN FIG. 4
The pillar was made 190 ft. wide for a portion of its depth and 300 ft. wide for the balance

distance to the surface was 300 ft. When the water in the basin, or Lower Level, of the Harleigh mines had risen to height of 45 ft. it commenced to ooze through the barrier pillar into the Ebervale operation. The mine inspector did not consider this pillar strong enough to resist a head of water of this height, and notified the owners of the Ebervale mines of the conditions existing and of the danger that the barrier pillar might fail.

This was alarming news to the Ebervale people, as they did not anticipate that the caving-in of the Harleigh mines would be of so damaging a character to their operations. For their own safety, however, they were compelled to install at a great expense three additional pumps, column lines and steam lines. They then tapped the water by six 3-in. drill holes through the barrier pillar. They were thus compelled to handle the water from the Harleigh mines, as these workings by this time had been abandoned, and the pumps taken out.

PILLAR ALMOST COLLAPSES UNDER PRESSURE

At a colliery where a serious mine fire occurred an attempt had been made to extinguish it by sealing it up, and also by flushing, but both methods were unsuccessful, and the operators were compelled to flood the mines. The depth from the surface was 600 ft. and the bed was 16 ft. thick, while the barrier pillar was 130 ft. wide. When the water reached a height of 235 ft. the officials in the adjoining mines were alarmed by the large amount of water that percolated through the coal in the pillar. The coal was cracking and squeezing, and it appeared as if the pillar was yielding under the pressure of the water from the adjoining mine.

The mine inspector was called, and after an examination of the pillar he notified the company into whose mines the water was percolating through the barrier to suspend operations. He then notified the company that was flooding its mine to stop pumping water into it until the barrier pillar could be strengthened by flushing. A borehole was then drilled from the surface and two inside breasts were flushed full of culm. The flooding was then continued until water rose to a height of 415 ft. and the fire was extinguished.

In another mine a chain pillar 80 ft. thick was reserved as a barrier pillar. When the mine on the high side of this pillar was abandoned and allowed to fill with water, it percolated through the pillar in large quantities. The operators in the lower workings had to stand the extra expense of pumping this water.

In any given basin the mines will not all be exhausted at the same time. The mining company first to work out its coal will remove its pumping machinery, and allow the abandoned mine to fill with water. The barrier pillar must be of sufficient strength to resist the pressure of water that will then come against it.

This proves the importance of leaving barrier pillars or a dividing wall of sufficient strength between mines. Some mines have nearly reached the point of exhaustion, and will be abandoned and allowed to fill with water

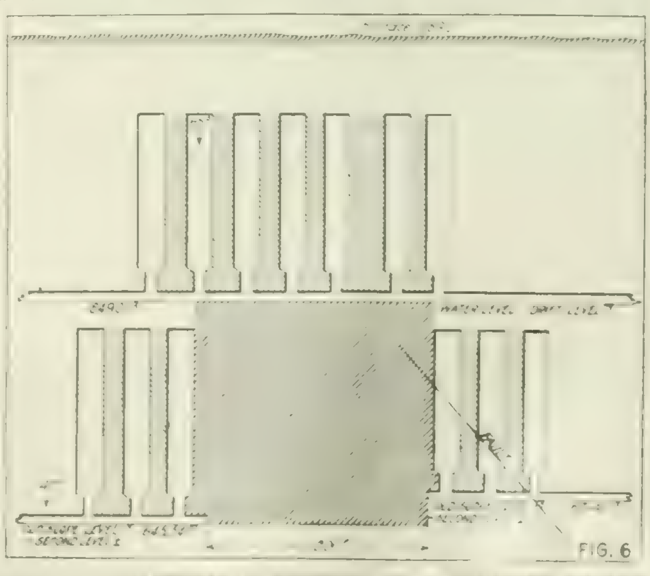


FIG. 6. LONGITUDINAL SECTION OF A BARRIER PILLAR LEFT BETWEEN SLOPES
The pillar [illegible] head of [illegible] ft. [illegible] pressure [illegible]

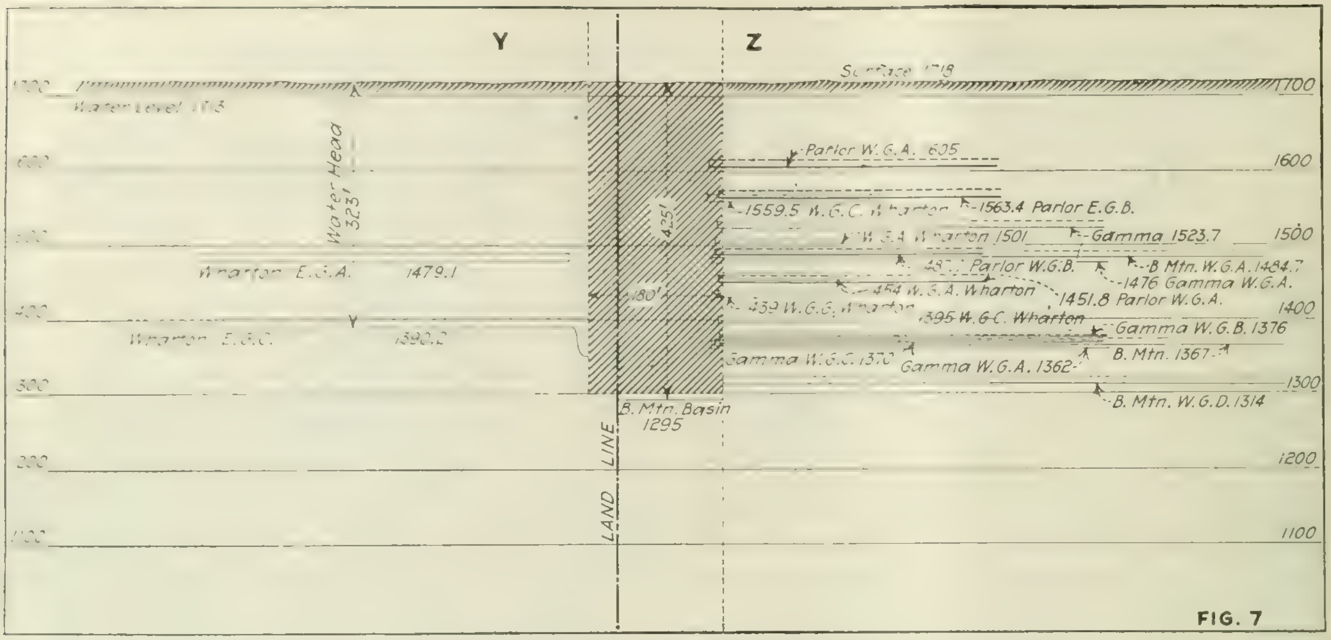


FIG. 7. LONGITUDINAL SECTION OF A BARRIER PILLAR 180 FT. WIDE
For years this pillar has successfully withstood a 323-ft. head of water, the mine marked "Y" being abandoned

without pillar strength being considered. The question will then arise: Is the barrier pillar of sufficient strength to resist the pressure of water that will come against it?

If it is the opinion of the engineers and mine inspector that it is not safe, the owners of the mine still operating will have to go to great expense in installing additional pumps, pump house, sumps, column lines, power lines, etc. In order to protect themselves they have to tap the water by drill holes through the barrier pillar and pump it from the abandoned mine. If the necessary width of barrier pillar had been left much trouble and worry for all parties concerned would have been obviated and an unnecessary expenditure of thousands of dollars would have been avoided.

FORTY-FOOT PILLAR WITHSTANDS WATER-HEAD

Fig. 1 is a cross section through the Kehley Run mine at Shenandoah. It shows the Water, Middle and Lower levels. In 1880 a serious mine fire occurred in the Middle Level. On the Lower Level to the west the workings were connected with the Kohinoor mines, which were developed at lower elevation. This prevented the flooding of the Kehley Run mine. In order to prevent the water flowing westward into the Kohinoor mines, the construction of a dam was considered. This would throw a 252-ft. head of water, equivalent to 110 lb. pressure per square inch, onto the chain pillar that was left between the Middle-Level gangway and the face of the breasts that had been driven up from the Lower Level.

On line of breast No. 12, which is shown on the section, the chain pillar was only 40 ft. thick, and this was supposed to be the point of least resistance. The bed was 50 ft. in thickness and of good hard coal. It was inclined at an angle of 40 deg. On the Middle Level the breast pillars had been robbed down to the stump heading and the top rock had fallen. On the Lower Level the breasts were worked 30 ft. in height, leaving in place 20 ft. of the top of the bed. The breast was 26 ft. wide.

It was the opinion of the mine inspector and the engineers that under these conditions the chain pillar, which was 40 ft. wide, would be of sufficient strength to hold the water. Brick dams were accordingly constructed on the Middle and Lower levels, and the mine filled with water. The chain pillar of 40 ft. width successfully held the hydraulic pressure thus imposed.

ANOTHER PITCHING PILLAR HOLDS BACK WATER

Packer No. 2 Colliery was flooded to extinguish a mine fire in the Mammoth Vein. The bed at this point was 37 ft. thick and was composed of good hard coal, dipping 43 deg. A chain pillar 66 ft. thick successfully resisted a head of water of 315 feet. The breast pillars were all in place. This illustrates the strength of a bed on the pitch where it is in good condition and hard.

Fig. 2 is a longitudinal section showing a barrier pillar that was established between adjoining mines. It was 300 ft. wide and was to remain that width from the surface to the basin, a depth of 570 ft. The mine marked "A" was abandoned and allowed to fill with water. The lowest gangway worked was at an elevation of 1,040 ft. above tide. The elevation of the overflow at the surface was 1,495 ft., giving a head of water of 455 ft. There were three beds mined and robbed at the pillar line—the Bottom Split 9 ft. thick, the Skidmore 10 ft. thick, and the Buck Mountain 23 ft. thick.

In the mine on the right marked "B" the Skidmore and Buck Mountain Bed had been worked and robbed to the pillar line. The latter bed from the bottom slate upward consisted of 1 ft. of dirt, 14 ft. of good coal, 8 ft. of slate, coal and dirt, and a hard sandstone top.

The width of this pillar was established by the mine inspector, although the engineers for the adjoining mines did not believe that so wide a pillar was necessary. This pillar was in existence and successfully held back the water for about fifteen years when the water was pumped out and the mine re-opened. Fig. 3 is a cross-section on the line of this pillar.

Fig. 4 is a longitudinal section showing a barrier pillar that was established between adjoining mines by the mine inspector and the engineers of the adjoining operations. Mine marked "A" was abandoned and filled with water. The elevation of the lowest gangway was 176 ft. above tide, while that of the overflow at the surface was 821 ft., thus giving a head of water of 645 ft. The gangway was 800 ft. in depth from the surface. At this depth a barrier pillar 300 ft. thick was left. The bed was 20 ft. thick, and consisted from the bottom slate upward of 3 ft. of good coal, 1 ft. of dirt, 12 ft. of good coal, then 4 ft. of dirt, soft coal and clod; the inclination was 25 deg. The bed was completely robbed on both sides of the barrier pillar.

In the same mine, in a different bed at a gangway elevation of 432 ft. above tide and at a depth of 600 ft. from the surface, there is a head of water of 390 ft. The barrier pillar at this level is 190 ft. in width. The bed is ten feet thick and of good hard coal, inclined from 25 to 45 deg. The bed was completely robbed at the pillar line in mine marked "A". In the adjoining operation, marked "B," breasts were driven in the Skidmore bed 5 ft. thick, the bottom split 20 ft. thick and the middle split 10 ft. thick, that is in the same beds as those worked in mine marked "A," but the breast pillars have here not yet been drawn. This barrier pillar for years has resisted the pressure of water to which it has been exposed.

In Deep Mines 300-Ft. Ribs Have Been Left

At the level located 432 ft. above tide the workings in the mine marked "A" had been driven years ago to within 40 ft. of the land line. When the mine adjoining, which was developed at a later date, approached that line, 150 ft. of pillar on its side of the line was left in place, making the barrier pillar at this level 190 ft. wide. Below this level the mine inspector and engineers of the adjoining mines decided that a pillar 300 ft. wide would be required, each mine to leave 150 ft. on its side of the land line. This pillar was established to the basin, a depth of 1,400 ft. from the surface. The bottom split of the Mammoth Vein was 1,200 ft. from the surface. Fig. 5 is a cross-section on the line of this pillar.

Longitudinal section, Fig. 6, shows a barrier pillar 200 ft. in width that was established in the Primrose bed between the workings of adjoining slopes. Both slopes were abandoned and filled with water. There were two levels, namely, the Water and Slope levels. The former was robbed completely. On the slope level the bed was robbed on both sides of the barrier pillar. This level was 450 ft. in depth from the surface, and the head of water was 205 ft. The bed was 12 ft. thick. Starting from the bottom slate it consisted of 1 ft. of shelly coal, 8 ft. of good coal and 2 ft. of dirty coal. The bed pitched 50 deg. This pillar stood the test for years. The water was finally removed from one slope, but the other is still full.

Longitudinal section Fig. 7 shows a barrier pillar 180 ft. in width. The mine marked "Y" was abandoned and allowed to fill with water, the head being 323 ft. This pillar was established to the basin, a depth of 425 ft. The Wharton Vein is 10 ft. thick, and contains 2 ft. of shelly coal. This pillar has stood for years.

How Much Pillar Must Be Left Under Tunnel?

In a mine where a pillar 300 ft. wide was left under water-level tunnel the depth from the surface to the gangway was 500 ft., the vertical height from the gangway to the tunnel was 315 ft., the pitch distance 410 ft., and the bed was 50 ft. thick, inclining 48 deg. The breast and gangway pillars were completely robbed on both sides of this reservation pillar, and the lateral draw did not reach to the tunnel.

In another mine where a pillar 140 ft. wide was reserved under a panel tunnel the vertical height was 270 ft., the pitch distance 400 ft., inclination 50 deg. and the bed 14 ft. thick of good coal. The bed was robbed on both sides of this pillar, and the lateral draw did not affect the tunnel. If in such a case as the above the reservation pillars had not been left wide enough, the lateral draw would have injured the tunnel, causing the rock which formed its roof to fall, and it would then have required timber for its support.

The problem of the extent to which the horizontal draw over a barrier pillar will extend when coal is extracted on either side of it is a matter demanding careful consideration and a factor of safety must be allowed to prevent the break from occurring at the tunnel which the pillar is intended to protect.

While driving a breast on line along a barrier pillar, in the top split of the Mammoth bed, which was at that point 14 ft. thick and on a 30-deg. pitch, a jump or roll in the bottom was struck, rising vertically 40 ft. The breast was driven up over the roll to the surface. When the breast pillars were being robbed, and additional weight was thrown on the barrier pillar, the coal squeezed out for 12 ft. along the roll, and weakened the pillar materially.

At another place where a barrier pillar had been established for the Buck Mountain bed, which was here 15 ft. thick and inclined 35 deg., when driving the breast along the pillar on line a slip was encountered in the bed and the coal slid out of the pillar 15 ft., thus decreasing by this much the width of the established pillar.

In many instances the miners, when driving a breast on line along a barrier pillar, encroach upon it, especially if the coal is good and they are being paid by the car. Frail coal and coal that disintegrates rapidly when exposed to the air, together with a soft bottom, require a larger pillar than when the coal is hard. If the strata overlying a barrier pillar overhangs, it throws additional weight on the pillar. This acts as a lever on the coal, crushing the pillar along its edge. Accordingly coal is often squeezed off the pillar for a depth of 10 to 15 ft. from its edge. Since barrier and shaft pillars must stand for a long time and are subject to disintegration and atmospheric effects, such conditions should be considered when determining the width of these pillars.

(To Be Continued)

Geological Survey Issues Map of Coal Fields

THE U. S. Geological Survey, Department of the Interior, is now distributing a large map showing the coal fields of the United States. This map, which measures 4½ x 7 feet, shows the coal fields by a series of colors indicating the seven different kinds or grades of coal as it is classified by the Geological Survey—anthracite, semi-bituminous, high-grade bituminous, low-grade bituminous, lignite and coking coal. The map is sold by the Geological Survey for $1, or for 60 cents each if five or more maps are ordered together. Besides the coal fields this map shows all the cities, railroads, lakes and other features usual on a map of this size.

Coal Beds Near Panama Promise Big Coal Industry in Colombia

Engineers Agree That Exploitation for Commercial Purposes Is Practicable—Government Officials Are Anxious to Lend Encouragement

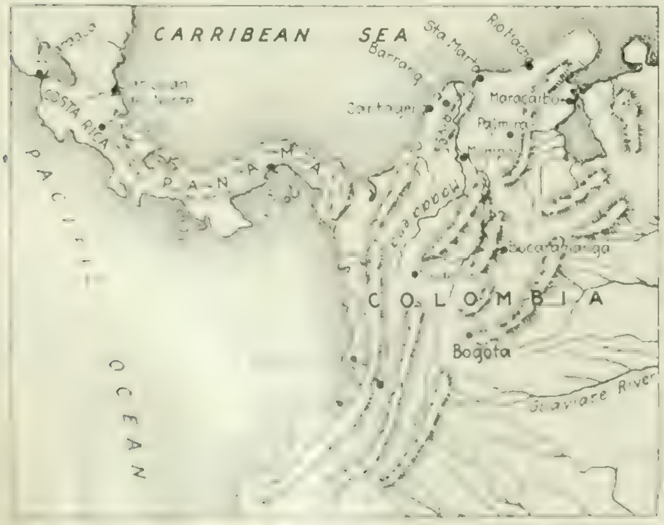
IN THE foothills of the Western Andes near Cali, Colombia, Trade Commissioner P. L. Bell reports, the general dip of the outcroppings of coal and the shape and position of the valley are generally conceded to indicate the presence of coal beds under the level floor of the valley.

The veins so far discovered extend from Guachinte, southeast of Cali, to Punta Yumbo, northwest of Cali, a distance of approximately 83 km.—on the map herewith Cali will be seen southwest of Bogota. This coal is bituminous, somewhat friable, steams easily, and will coke nicely. The following analysis indicates its quality: Volatile matter, about 23 per cent; ash, between 5.38 and 7.66 per cent; sulphur, about 0.77 per cent; and free carbon, between 68.05 and 70.58 per cent.

The importance of this coal reserve so near the Panama Canal is well understood, and it is confidently predicted that coal mining will be one of the important industries of the future. Good coal is badly needed for both rail and water transportation on the west coast of South America.

Engineers who have examined the Cali deposits agree that their exploitation for commercial purposes is entirely practicable; and the Government officials are anxious to encourage the development of the department. There is one serious drawback to the development of these reserves, namely, the limited carrying capacity of the Pacific Railway between Cali and Buenaventura.

Five or six mines are now in operation near Cali with a total monthly output of approximately 3,000 tons, but the work is not carried on steadily, and the mine equipment is antiquated. An average of from 250 to 300 men are employed at the mines, but the tonnage production per man is low and the mining costs are high. At present little coal is used locally except by the Pacific Railway, which purchases most of the output of the Cali mines. Some coal was shipped recently to Peru and Ecuador, but the high cost of handling made it an unprofitable business. The cost of coal at Cali, delivered at railway freight sheds, is $7 per ton.



MAP SHOWING THE LOCATION OF CALI, NEAR WHERE IMPORTANT COAL DEPOSITS HAVE BEEN RECENTLY DISCOVERED

No real development work has been undertaken by foreign interests. Some prospecting was recently started by two Americans; and the Canal Commission at one time offered to take steps toward the exploitation of the Cali coal beds, but abandoned the idea because of the excessive prices demanded by the owners of local coal lands for the purchase of their property.

Coal lands do not come under the existing mining laws, and are, therefore, not open for location of claims. Coal reserves are generally held to be the property of the Government unless the title of the owner of the land antedates the land laws of 1876. Most titles in the Cali district to antedate 1876 and therefore give the owners free right to sell or work their coal fields, but any foreign company entering the field in the future should have some arrangement with the Government before making any purchases.

Sulphite Liquor Makes Briquet Binder and Cheap Fuel

ONE of the troublesome paper or rather pulp-mill wastes is the spent sulphite liquor, but at least four classes of useful materials are now made from this material. Of these alcohol has received the most publicity. It is secured by providing for the fermentation of the carbo-hydrates, gums, etc., in the liquor. Several such alcohol plants are in operation and in the United States the Government has been interested in a plant erected to obtain alcohol for military purposes.

If sulphite liquor is neutralized with lime and magnesia and then evaporated under vacuum, a thick syrup results, and upon carefully drying this a gum, or adhesive, is secured. It has been used successfully as a binder for fuel briquets. Some regard it as being more suitable than pitch for briquetting purposes, being cheaper and more effective. Less binder also is required. It burns completely in the ordinary fire.

In Sweden a unique method for using the lignin in the liquor for fuel purposes has been worked out and a few mills recover enough to furnish their own fuel. The process is known by the name of the inventor—Strehlenert. The solid substances in sulphite liquor are precipitated under conditions which permit of the recovery of from 60 to 90 per cent of the sulphite dioxide in the liquor, and this can be used over again, while the lignin secured, when ready to burn, has a thermal value of some 7,000 calories (12,600 B.t.u.). One hundred and fifty pounds of the finished fuel are required from each 1,000 lb. to carry on the process, leaving a net result of 850 lb. This plan of conserving fuel, while utilizing a large volume of waste, was suggested about 1913, since which time progress has been made in Norway and Sweden, where fuel conditions are favorable to such processes.

Spruce turpentine is a comparatively recent product of the sulphite process, and it has been recently shown that carvacrol may be made commercially from it. Carvacrol has been proved an efficient substitute for thymol, and thymol is much in demand for fighting the hookworm (still so prevalent in certain European mines) and for general antiseptic manufacture. The supply of thymol is far short of the demand.

Department Seeks Operators' Help In Leasing Coal Lands

Safe, Efficient Operation of Mines Opened Under Leasing Act on Public Lands Assured by Supervision of Bureau of Mines

PREPARATORY to the issuance of final regulations to govern coal mining under the Mineral Leasing Act, a conference was held of Interior Department officials and those interested in operating regulations. Representatives of the governors of the public land states were present as well as representatives of the National Coal Association, the American Institute of Mining and Metallurgical Engineers and the American Mining Congress. The opening address of Assistant Secretary Vogelsang sets forth clearly the purposes of the meeting and the difficulties which must be met. His remarks, in part, were as follows:

"I wish to make a short preliminary statement to the effect that you, representing the coal operators of the country, have been called together by this department, and you have been named by various authorities, governors of the different states in which the Government's fuel reserves—coal reserves—are located, to confer with us with reference to the operating regulations that shall be adopted for the conduct of coal mining henceforth on the public lands of the United States.

"You realize that in the passage of what is known as the Leasing Act, on Feb. 25 last, the Government has made a very radical departure from its former conduct of the acquisition of these mineral lands. By that act the relation of landlord and tenant practically has been established, and we wish to prepare at this meeting the chart by which the operation of coal mining on the Government leases shall be conducted.

HUMAN WELFARE INVOLVED IN COAL MINING

"That act, of course, embraces the oil reserves as well as the coal reserves, and we had a meeting [of oil operators] similar to this, much more largely attended because it appeared to be of very much greater interest, owing to disputed titles and operation already in the field on lands claimed by the Government, and these gentlemen, representing the various oil interests of the country, were called in and we passed upon and adopted a set of operating regulations governing oil mining.

"Mining of coal, I need not say, is a very different proposition. The number of men employed in coal mining is infinitely greater and the question of human welfare is more intimately associated with coal mining. The question of safety of life and methods of operation, in order that the reserves may be properly extracted, lives may be preserved, etc., is a much more vital element in this discussion than it was in that of the oil leases.

"So we want you to approach this subject with perfectly open minds and to advise us as carefully and conscientiously as possible, to the end that what we are attempting to achieve here may not hereafter need very copious amendment or change. As public landlords we are charged with the duty of achieving as best we may the most desirable result with reference to extraction of the minerals and products of mines and miners."

George S. Rice, the chief mining engineer of the Bureau of Mines, made the following statement:

"The Alaskan Leasing Act did not make the same specifications as to the welfare of the miners as called for in this present new leasing act, but the administration to a certain extent has been in the hands of the Government through the Inspector of Alaska in the Department of the Interior. In the case of public domain, the state furnished inspection regulations, but they are not always adequate, and vary from state to state. Therefore to formulate regulations which under the act must take care of the safety, health and welfare of the miners it necessarily means going carefully into details.

"I also suggest that one of the important things for a prospective lessee is to have before him specifications of all the requirements of his contract before he signs it, so that he may open a mine with the full understanding of what is expected of him. Otherwise there are bound to arise difficulties, if a Federal inspector later on tries to enforce, without specified regulations, what he considers are proper requirements for safe and efficient mining.

"The Government has been very severely criticized, in fact as recently as this last winter, by one of the most eminent coal mining engineers of the country, who has had experience on the Indian lands under supposed Government supervision. He stated that the worst mining, so far as safety and conservation are concerned, was being practiced by the Government on Indian lands. This was true, but I do not think it is true now, as the Bureau of Mines is furnishing technical advice.

"It has been an extremely difficult thing to remedy early conditions. There were no regulations of any value when those leases were undertaken, and it has been an uphill job for the representatives of the Bureau of Mines, since this organization was charged with supervision, to bring the operations under safe control and to obtain more efficient mining practices. There have been great losses of coal in the past, as well as avoidable losses of life, and it was with these thoughts in mind that these regulations were prepared."

Transportation Act Provision To End Tie-ups

An emergency provision of the new Transportation Act under which the Interstate Commerce Commission will take steps to end freight tie-up reads: "Whenever the commission is of the opinion that shortage of equipment, congestion of traffic or other emergency requiring immediate action exists in any part of the country the commission shall have authority at once to suspend the operation of rules, regulations or practices with respect to car service; to make such directions with respect to car service without regard to ownership of locomotives, cars and other vehicles during such emergency as in its opinion will best promote service in the interests of the public; to require joint use of terminals, and to give directions for priority in transportation, embargoes or movement of traffic."

The Labor Situation

Edited by

R. Dawson Hall

Men Want Alien Union Officer Ousted

ONLY the presence of a large number of deputy sheriffs of Harrison and Marion counties prevented a riot among the miners of the Consolidation Coal Co's plant at Wyatt, W. Va., on Wednesday, May 12, the trouble arising from a statement that a foreigner was holding an office in the local union. When the superintendent at the plant sought to act as peacemaker he was threatened with violence.

An official announcement was made late Wednesday afternoon at the offices of the Consolidation Coal Co. in Fairmont that the trouble had been satisfactorily settled at a meeting of company officials and officers of the United Mine Workers and that the men would return to work Thursday morning.

Prospects of Unionism in Mingo County

OUTSIDE of the trouble at the village of Lynn, in which 11 persons were killed, conditions remain practically unchanged with reference to the organization of the Mingo (W. Va.) field, although officials of the United Mine Workers are making claims of growth in the number of miners organized, Fred Mooney, secretary of district 17, stating that 2,600 miners among fourteen different locals have joined the United Mine Workers, but that all such men have been dismissed from the service of the coal companies and were living in tents.

If such were the case it would be causing a heavy loss in production. Production reports, however, disclose only a negligible loss from labor shortage, so that little credence is given the report that any considerable number of miners have been organized. The movement to organize the field is in a sense a hybrid one because at such meetings as have been held time is divided between organization speeches and addresses urging the nomination of Samuel B. Montgomery, State Labor Commissioner, for governor, Montgomery posing as the special friend of labor.

Fairmont Field Asks "What Is a Bonus?"

IT WAS necessary to continue throughout the second week of May the conference between the operators of the northern West Virginia fields and the officials of district 17, some difference of opinoin having arisen between the miners and operators as to what had in the past constituted a bonus, this question having arisen in connection with the effort to agree on a deadwork scale. Operators advanced the claim that yardage in narrow work had always been regarded as a bonus, while, on the other hand, the miners' representative stated that payment for yardage in narrow work had always been made to correct local deficiencies in the coal seam.

As a step toward settling the matter in controversy it was decided to make an investigation of conditions at Wendell, at the Bertha mine near Morgantown and at the Purseglove mine also in Monongalia county.

It was deemed advisable to designate a committee to visit the Galloway mine and to ascertain the labor required in connection with narrow work. On the committee so appointed were C. J. Ryan, Hepzibah; John W. Bischoff, Elkins, and George S. Brackett, of Elkins, the miners' representatives being J. F. Farnasch, Grafton; Nick Aiello, and W. F. Ray, district-board members of Fairmont.

German Mine Workers to Open Up Spitzbergen Mines

A CHRISTIANIA firm known as A. S. Isefjord Kulkompani has been recently formed to operate the coal measures bordering on Isefjord, Storfjord, Green Harbor (west side), Advent Bay Point, and Kap Boheman in Spitzbergen. The capital of the company is German, Norwegian and Dutch. If circumstances favor the project, five hundred German mine workers will be sent out, in June next, with the necessary housing material and machinery for an immediate start.

From time to time, beginning in 1885, claims have been staked out by Nilsson and Schroeder, wire fences have been built around them and a watch set over them. They have been registered on the Norwegian Foreign Office Chart as 19 and 49, and were finally sold to the new company. The directors are Herman Jensen, chairman; Baron von Fuchs, and Henry Dysselhuys, Rotterdam, with G. Siewers as managing director.

Indiana Strikes Against Wage Scale

ELEVEN mines in the Clinton coal field of Indiana have been closed because the shot firers refused to work under the new wage scale fixed by the operators. It provides a maximum remuneration of $1 per hour, or $8 per day, for that class of work. At twenty-one mines operations are suspended because the mine workers refuse to work on Saturdays, protesting against the Bituminous Coal Commission's refusal to grant a five-day week.

Men at Anthracite Colliery Want More Pay

MINERS employed at the Evans colliery at Beaver Meadow, near Hazleton, Pa., went on strike May 17 for a wage advance of $2.50 per car. The company has offered to grant an increase of $2.19, but the men reject this offer.

Three Thousand Alabama Miners Quit

FROM Birmingham, Ala., come reports that on May 19 nearly three thousand men quit work in widely separated sections of the coal mining district of Alabama. A number of mines were compelled to suspend operations because of a shortage of labor.

Discussion by Readers

Edited by

James T. Beard

Interesting Facts Regarding the Working of Coal Under a River or the Sea

THE inquiry of Arthur L. Sheldon, *Coal Age*, Feb. 26, p. 419, interested me, as I have worked seams of coal varying from 2 ft. to 8 ft., in thickness, under conditions similar to those he has described. It may be that my experience will be of some help to our friend, Mr. Sheldon, and I give it for what it is worth.

The three seams overlying eact other, in this proposition, can be worked by either a shaft or a slope opening. Judging from the data given, however, a slope driven on an inclination of 1 in 7, or 1 in 8 appeals to me as having an advantage over a shaft opening. By installing a main rope-haulage system in such a slope, it would be possible to handle any desired output at the least possible expense. In slope haulage, a trip of empties can be dropped onto the landing, in any of the three seams, and a corresponding trip of loaded cars hauled to the surface with much less delay than will generally occur in hoisting in a shaft.

My experience in the working of the room-and-pillar and longwall systems of mining coal inclines me to think that the only proper method to adopt in this field is to work No. 1 seam, lying at a depth of 50 ft. below the surface, by the longwall advancing system; and apply the longwall retreating system to the middle or No. 2 seam, lying 50 ft. lower down. Further investigation might suggest the use of the room-and-pillar system, however, in No. 2 seam, and I would use the last named system in working the lowest or No. 3 seam, which lies at a depth of 160 ft. below the surface.

ONLY NARROW WORK TO BE DRIVEN UNDER THE RIVER OR AN OVERLYING SEAM

In all three of these seams, only the necessary narrow places should be driven under the river, and I would recommend supporting the roof of these headings securely, with either steel girders or good timber. In addition, I would give the roof and sides of the headings a coat of gunite, to prevent the slacking of the coal on the ribs or the cutting of the roof by the air, either of which will cause much trouble later. There should also be left sufficient pillars, in all three seams, on both sides of the river, to avoid the possibility of any break extending to the river bed, whereby water would flow into the workings.

In working these seams, it is absolutely essential that nothing but narrow work must be driven in an underlying seam, until the same area in the seam above has been worked out and abandoned. This applies to the driving of narrow rooms or stalls, in a lower seam, only when the roof is good and care is taken to see that the designated width is not exceeded by the men. Thus, for any given area, the coal must have been taken out and the roads abandoned in No. 1 seam before extraction is begun in No. 2 seam. Likewise, the extraction must be complete and roads abandoned in No. 2 seam before the same work is started in No. 3 seam below.

Working the coal in one of the lower seams in advance of the extraction in an upper seam would simply mean the ruination of that field. Judging from a long experience in the mining of coal by both of these methods, I have every confidence in saying that if the work is conducted in the manner I have indicated, the output of coal from these three seams can be maintained at the desired maximum and at a minimum cost of production. The timber supply will be reduced to a minimum and the extraction of coal will reach practically one hundred per cent.

DRAW NO PILLARS UNDER THE RIVER

Just a word, in closing, to sound a warning against the proposal made by one of the contributors in this discussion, who stated that it might be possible, with due care to withdraw the pillars in No. 3 seam, under the river, when finishing. Let me say that this would be a great risk and endanger the life of every man underground, from the very first day the work of drawing these pilars was started. With only 160 ft. of cover, there would be the danger of an inrush of water occurring at any moment.

When engaged in a mining operation near the Atlantic Ocean, where the workings extended two-and-one-half miles from the coast line under the sea, at this distance out we had 1,500 ft. of cover separating the seam from the bed of the ocean. In that case, the mining law required that only the necessary haulage road, airway and manway could be driven under the sea, until the thickness of strata above the seam between it and the bed of the ocean exceeded 500 ft. of solid rock strata.

In another instance, I had the experience of being in a locality where the river broke into a mine, drowning out the men. In the same district, about three miles distant, a canal flooded another mine. These experiences lead me to state that under no conditions should the pillars be drawn under the river in these seams.

McKeesport, Pa. ANDREW O. BAIN.

Workers Must Use Good Judgment When Asking for a Change of Work

THE incident cited in the inquiry of A. H., *Coal Age*, Feb. 12, p. 327, giving his experience and opinion regarding the treatment he received at the hands of a mine superintendent, was interesting to read. Unfortunately, there are many instances of this or a similar nature happening daily in the industrial world; and yet it is my belief that the world is growing better in respect to the treatment of workers by their employers and *vice versa*.

It may be said with much truth that complaints of the kind here mentioned are less frequently heard than formerly, and when such a condition does come to our attention we wonder that it is possible in an up-to-date organization, today.

One can recall many instances that occurred in past years, similar to this one. Often, they were loudly exploited but seldom satisfactorily settled. Indeed, such conditions were expected to exist, at that time, between individuals or groups of men. In other words, a spirit of antagonism was natural instead of the get-together spirit of today. Now, however, it is safe to say that a case of this kind, becoming known in an organization, generally reaches the man higher up; and he, recognizing the true worth and value of men, starts a thorough investigation to ascertain the true facts.

CHANGE IN DISPOSITION OF WORKERS

Again, it is true that all classes of workers, from officials to common laborers, have changed in their disposition from that which prevailed but a short time ago. Requests such as the one set forth in this inquiry, asking for change in the work or the position of an employee, is handled with consideration. When necessary, diplomacy takes the place of the brusque and profane rejoinder formerly so commonly made to a man asking for a change.

However, there are many phases of this subject that require analysis. In his reply to the inquiry, the editor has truly stated, "It is up to the worker to earn his advancement." Frankly, I believe that a man, studying and striving to improve his condition and having an ambition to advance, should be shown just cause for being kept back when an opportunity is open to him.

In my opinion, a superintendent who could express himself in the manner this man is said to have assumed is not entitled to the position he holds. Today, it is unbelievable that a company would tolerate such treatment of their men. Consideration should be given to a faithful and efficient worker and he should be afforded every opportunity to advance in the line of his own inclination, provided he is capable.

ENCOURAGE MEN TO ADVANCE

Let me suggest, here, that all workers should be instructed in regard to the importance of advancing, and the danger of falling into a possible rut. In performing work of his choice, a man will not only be more interested, but he will prove more efficient than when attending to other duties. I am referring now to a worker whose ideals are worth considering and who is trying to follow methods that will accomplish the end he has in view. Such a man needs not to wear a placard announcing his intentions, as they will be quickly detected by any up-to-date official.

I recall an instance where an excellent miner, by hard and constant work, gained the position of mine foreman, after many years of service in the same company. His success brought him an offer, a little later, and he accepted a position in another company, although his better judgment told him he was not, as yet, qualified to fill the place. In a short time, realizing that he was not handling the work with entire satisfaction, he asked for a change and his request was met with a [illegible] from the [illegible].

The man, however, I am glad to state, now holds a position with an up-to-date company where he is doing well. The incident shows the need of prudence and the exercise of good judgment in respect to the work and one's capability and ambition to advance. This man had proved efficient and worthy of the confidence of his employers, in his former position, which he should have retained.

It is my opinion that a company should never make a hard-and-fast rule in respect to the transfer of a worker from one department to another. I recall many instances where men were changed, with the result that more good was accomplished than had even been expected in making the change. Every such request from a worker should be properly considered, and fair and just treatment accorded the man. In this present instance, where it is stated the man had an experience of 12 years, working at various jobs in and around the mine, it is quite probable that he was a good subject for advancement and should have been given every opportunity to develop the best that was in him. BEN.

Thomas, W. Va.

What the Bodily Health of Workers Means to Our Industries

I HEARTILY support what John Rose has said in his letter *Coal Age*, Feb. 19, p. 364, regarding the importance of good health in obtaining the greatest success in the coal industry. The discussion of this question is vital and if conducted in the proper spirit cannot fail to be profitable to all concerned.

My belief is that all this disjointedness, contention, tumult and misery can be traced directly to a disordered state of health, in the case of a large number of workers. Indeed, the same remark will apply to social as well as industrial affairs. It should be a matter of the deepest concern to us all that so much indifference is manifest in respect to the possession of good health, whatever our position in life.

Industrial prosperity depends to such a degree on health that it is idle to discuss any question of efficiency, without due regard to those conditions that affect the health of all concerned in the undertaking in hand. This truth cannot be too strongly emphasized, since health and disease are physical conditions that affect the mind and the accomplishment of every purpose. A diseased body is very apt to be the counterpart of a diseased mind and thwarts the best intentions and loftiest aims.

HEALTH OF WORKERS IMPORTANT

Health is to industry what the sun's heat is to all forms of life, stimulating growth and action. Healthy faculties enable us to overcome the perplexities that are ours at every turn. But in spite of all that has been written in regard to this vital force, we blindly follow our selfish inclinations and stupidly resign ourselves to conditions that encourage a morbid frame of mind, which keeps us in a constant state of uncertainty, fear and dread of the future. The result is a universal disturbance in the minds of men that is manifest in the unrest prevailing throughout the world, today.

In summing up, we are confronted with the fact that the essentials to good health are plain, wholesome food, proper clothing, pure air and comfortable sanitary living conditions. There are numerous agencies that affect the health of the miner, and these must be taken into account in considering the welfare of the coal industry. The temperament of the worker must be regarded as a strong factor in his ability to produce. In general the miner is of a nervous temperament and readily agitated, which renders his body more susceptible to nervous disorders that seriously impede his activity and comfort.

Change of Mind Needed Industrially

My opinion is that a complete change of mind is required in respect to our industrial affairs, and this is a factor that cannot be measured in dollars and cents. It is important for the operator to remember that the mind of the worker must be imbued with sane ideas respecting his position and consequence as a productive unit. Every effort should be made to effect this transition in the worker, instead of permitting his mind to become poisoned and impressed with the false idea that he is only a machine guided and controlled solely by the will of his employer.

Allow me to say, in closing, that I am convinced that a sound and well balanced mind in every worker will make them, as a class, more efficient workers and less open to those influences that impair industrial operations. A sound mind in a sound body is, indeed, a great possession; and men thus endowed seek the best and loftiest aims, instead of striving for gain at another's expense. The latter can only cause a stagnation in the world's industries, for which there is no remedy, until all opinions become reconciled to a common truth, and brotherhood and differences are argued on a basis of reason and common sense.

Ladysmith, B. C., Canada. William Wesnedge.

Daily Routine of an Efficient Fireboss

In all my firebossing, it has been my custom to examine the fan and observe the water gage, before going into the mine; then, to place a danger signal at the entrance or lock the gate so as to prevent anyone from entering the mine until the examination is finished and the report made.

It has always been my habit to start the examination at the intake end of the mine or section and follow the air current. The fireboss should enter the first working place with caution, and, lowering his flame, make a careful test for gas. He should wear no headlight, but depend wholly on his safety lamp. He should examine each place for any danger that may exist therein; see that all timbers are properly set and that there is no loose slate or coal that is liable to fall.

In making his rounds, the fireboss should note the condition of all doors, stoppings, overcasts and brattices. In each place examined he must mark the date on the roof, not more than five feet from the face of the coal, so that the workman can see plainly that his place has been inspected that morning. The examination should not be started more than three hours before the time when the men enter the mine for work. A fireboss must give particular attention to all places driven to the rise, to see that they are clear of gas. Such places are generally more difficult to ventilate.

Having completed his examination, the fireboss must make out a report and enter it in a book kept for that purpose, stating whatever dangers he may have found and giving their location. This done, he must remove the danger signal, at the mouth of the mine, in time for the men to enter for work. As a danger signal, I very much prefer the red light.

Every fireboss should run the abandoned workings, in the mine or section of the mine in his charge, at least once a week, or oftener if he thinks there is liable to be danger in such places. When making his second round of the mine, the fireboss must examine all falls and waste places and be particular to note any potholes or kettle-bottoms which are liable to fall without warning. It is also his duty to see that the required volume of air is circulating in the mine and the air current sweeping the face of the coal in every working place.

Where danger is discovered the fireboss must place a danger signal at each entrance to the place, so that no one will enter there without warning. He must see that there are no accumulations of fine dust, particularly where the coal is being mined with machines. A fireboss must know the properties and behavior of all kinds of gases found in the mine. He must be capable of making a careful test for gas and understand the proper use of the safety lamp, so as to be able to give any needed instructions to the men in his charge. He must be conscientious and faithful in the performance of his duty, as on his work depend the lives of all the men in the mine. Fireboss.

Roda, Va.

Height of Flame Cap as Index of Percentage of Gas

In the issue of *Coal Age*, Mar. 25, p. 587, James Ashworth, commenting on a recent report of the Minister of Mines for the province of British Columbia, quotes the following statement as taken from that report: "It was taken for granted that a half-inch gas cap was equal to 2½ per cent of gas . . . and, checking with the Burrell gas detector, it has been proved that a quarter-inch cap in the Wolf safety lamp is equivalent to 2½ per cent of gas."

In the same report, according to Mr. Ashworth, the chief inspector of mines recommends the withdrawal of the men from the mine when the lamp shows a quarter-inch cap, indicating the presence of 2½ per cent of gas. Commenting on this statement, Mr. Ashworth says, "It is with some satisfaction that I read this recommendation from the chief inspector, which follows up my own suggestion regarding the need of more exactly defining what is understood in the reports of gas by firebosses."

Now, turning over the pages of a little booklet entitled "Mine Gases and Ventilation," by J. T. Beard, I find a diagram or table (page 90), giving the percentages of gas indicated by different heights of flame caps, in different lamps. The same table is given on page 335, in a book entitled "Mine Gases and Explosions," by the same author. The table gives the height of flame cap corresponding to 2½ per cent of gas, in an unbonneted Davy lamp, as 0.22 in. (¼ in., nearly). The same table gives, for the Wolf lamp, a flame cap of 0.72 in. (¾ in., nearly), as indicating 2½ per cent of gas, while a quarter-inch flame cap would indicate less than one per cent of gas, in the same lamp.

It would appear that there is some divergence of opinion on the question of the height of flame cap indicating the presence of 2½ per cent of gas, which the chief mine inspector recommends as the "withdrawal percentage," in the mines of the province. The Wolf lamp is the only lamp I have yet seen used by firebosses in the Canadian Northwest.

Now, I think it is safe to say that nearly all men get their knowledge of gases and the general theory of mining from textbooks. How then, let me ask, is it possible to expect firebosses to give a report of the percentage of gas found that would be exact and correctly understood. Taking the table to which I have referred as correct, the withdrawal percentage (2½ per cent) of gas would be indicated by practically a three-quarter-inch flame cap in the Wolf lamp used by the fireboss, instead of the quarter-inch cap mentioned in the report of the chief inspector.

What Should Be Standardized

Further, referring to the request of the chief inspector of mines that a limit be placed on the percentage of gas allowable in mines where blasting is permitted, as Mr. Ashworth remarks, "Few will agree with the views of the chief inspector on standardization, if it is his meaning that the provisions of Rules 1 and 2, part 11, of the Coal Mines Regulation Act, is not sufficiently explicit." He might have added, also, Rule 12, part 3, which limits the use of explosives except when the men have left the mine, to blasting in rock drifts or to the sinking of shafts where the return air passes directly out of the mine, provided inflammable gas issues so freely that a blue cap is formed in the lamp.

In this province, firebosses and shotfirers are responsible for the firing of shots and are equipped with Wolf safety lamps, a box of caps and a firing battery and cable. To my mind, it would be more to the point to standardize the safety lamp. Suppose, for example, firebosses or shotlighters were to use an unbonneted Davy lamp in one mine, while Wolf lamps were used in another mine for the same purpose.

Then, if the law established a limit to blasting, indicated by a quarter-inch cap, the use of the unbonneted Davy lamp would permit blasting when there was 2½ per cent of gas in the air, while the Wolf lamp would show the same height of flame cap when there was less than 1 per cent of gas present.

Temperature and Intensity of the Igniting Flame Proves a Factor in Explosion

Studying over this matter, I find the following reference to the explosive condition of mine air, in the booklet "Mine Gases and Ventilation," p. 90, "The Intensity of the initial impulse or the higher temperature of the igniting flame. will often cause the explosion of a gaseous mixture that would burn quietly if ignited by a less intensive source of heat energy," Attention is drawn to the rapid dissipation of heat in a burning gas greatly affecting its explosion.

Reflecting on this statement, I have wondered if the naptha flame of the Wolf lamp is a more intense source of energy than the sperm or cottonseed oil flame of the Davy lamp, and if that can be the reason of a lower percentage of gas, indicating an explosive condition in the Wolf lamp, while a like explosive condition would be shown only by a higher percentage of gas, in the use of the Davy lamp.

Most of us working in mines will be interested to know when it is safe and when it is not safe to remain in a working place when a gas cap shows on the safety lamp in use, whether this is a Wolf or a Davy lamp.

Cumberland, B. C., Canada. Coal Digger.

Steel vs. Wood for Mine Timbering

The question of the growing scarcity of mine timber is becoming more acute each day, and, as the supply of timber decreases, the demand increases, which greatly increases the expense of timbering. The mines in this neighborhood require a large amount of timber for the support of the roof and, as a consequence, steel I beams, channel bars and other structural shapes of special design have come into use for supporting the roof, on main entries and other roads that must be maintained for a considerable length of time.

In my opinion, the high first-cost of steel is largely offset by the necessary expense of retimbering roads and air-courses where the roof is supported by wooden timber frames. Moreover, the use of steel for this purpose gives a greater degree of safety, as it does not lose its strength by corroding, as rapidly as wood does through decay. The average life of mine timber is from 5 to 10 years, while steel used for the same purpose will last indefinitely.

Another feature that must be considered in this connection is the fact that much timber is lost when rooms or a section of the mine is abandoned. It is my belief that a gang of three laborers headed by an experienced timberman should be kept busy, in a large mine, recovering timber from places that are abandoned. Such timber should be carefully sorted, as much of it can be used again, while the rest can be sawed into short lengths and split for cap-pieces.

It Pays to Recover Timber in Mines

Men engaged in recovering old timber, in this way, will easily make their wages by the amount of timber saved. Also, the drawing of posts in abandoned places will have a good effect in caving the roof and thereby relieving the pressure on entry stumps and pillars. The coal mined from these pillars and stumps will be in better condition, and there will be a larger percentage of recovery, which will lower the cost of production. The work of drawing back the pillars will also be rendered less dangerous.

In my practice, I have seen millions of feet of timber practically wasted in maintaining the roof on main haulage roads where, if steel timbers had been used in the first place, this great cost of maintenance would have been eliminated. In mining low coal where headroom on the roads was limited, the use of steel rails in place of crossbars has proved a great advantage. Such timbering has lasted longer and given better support to the roof than would have been possible had wood timber frames been used. The latter would have had to be changed twice over and the roof brushed or the bottom lifted in order to give the necessary headroom. All of this was avoided in the use of the iron rails.

Another instance that came under my notice was in a mine where the wood crossbars would be broken in a few weeks and required constant changing. Later, steel I beams and rails were substituted for the wooden bars and that ended the trouble. In closing, let me say that a good crossbar is made by putting two 6-in. I beams side by side, and riveting, at each end, an angle already drilled to receive a 10-in. I beam having a plate at the top and bottom to furnish the required support.

Johnstown, Pa. F. W. S.

Inquiries of General Interest

Answered by

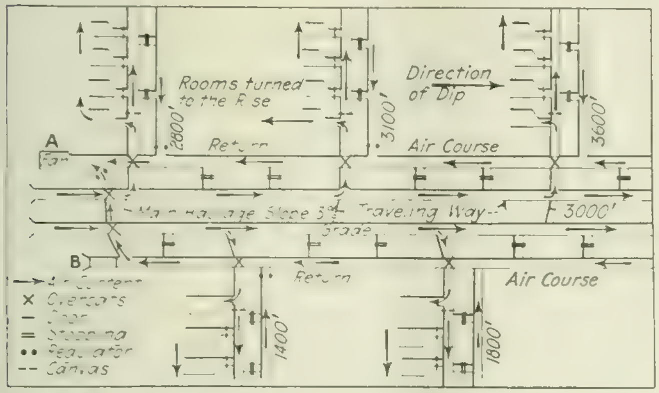
James T. Beard

Proper and Efficient Ventilation of a Slope Mine

I am sending to *Coal Age* the plan of a slope mine opened in a seam dipping about three per cent. As shown in the plan, the slope entries are driven, four abreast, on the full dip of the seam. The gangways or levels are driven to the right and left of the slope entries, with rooms turned to the rise only. It is desired to produce 2,000 tons of coal per day of eight hours in this mine; and I want to ask how such a mine should be ventilated, using as few doors as practicable. The seam generates gas in considerable quantities, but the company has the means to supply ample ventilating power.
SUPERINTENDENT.

————, Pa.

In the accompanying figure, we have reproduced the plan submitted by this correspondent, and indicated thereon the desired circulation. As the mine generates much gas it should be ventilated on the exhaust system, making the two center slope headings the intake and the two outer headings the return airways for their respective sides of the mine.



SHOWING THE REQUIRED PLAN OF VENTILATION

As shown in the figure, one of these two center entries is the main haulway of the mine, while the other serves as a travelingway. Each pair of cross-headings or levels is shown as ventilated by a separate split of air, which is conducted at once into the main return air-course and passes out of the mine. In order to avoid the use of doors, an overcast is built at the mouth of each pair of cross-headings, as indicated in the figure.

A regulator is placed at the mouth of the back entry, on each level except the last pair of headings, which present the greatest resistance. A regulator is also required at the crossover near where the return current enters the ventilating fan. The purpose of this regulator is to proportion the amount of air required on each side of the mine. Also, as indicated in the figure, a canvas is hung at the mouth of each room, except the first room, on each level, and on the gangway just inby of the mouth of that room. By this means, the air is made to circulate through the rooms and keep the working places clear of gas.

The two sides of the mine being unequally developed, doors or canvas will be required on each crossover connecting the opposite side of the mine with the main haulage road. Double doors will also be required at the mouth of the air-course on the opposite side of the mine from the fan.

Inasmuch as the mine generates much gas, it would insure greater safety to provide another fan at the mouth of the air-course, at the point marked "B," in the figure. In that case, the two fans could be operated in parallel, by the proper regulating and balancing of the air, or they could be operated alternately, one fan being always held in reserve against accident to the other. If the mine is very gaseous and much dust is present, it may be advisable to operate the two sides of the mine separately, by providing two haulage roads instead of one and building substantial stoppings in the crossovers between them.

Drift Half-Filled With Water

If a drift, in a mine, measures 6 ft. wide at the roof, 9 ft. wide at the floor and has a vertical height of 6 ft., at what depth will the water stand when the drift is half-full? In other words, how far up the timber will the water reach when the wetted area is one-half of the sectional area of the drift?
W. E. WOOD.

Alverda, Pa.

In this case, the width of the entry decreases, $9 - 6 = 3$ ft., in a height of 6 ft.; or at the rate of one-half foot for each foot of height. Then, calling the depth of the water when the entry is half-full x, the width at the surface of the water will be less than the width at the floor and will be equal to $9 - x/2$. The area of the wetted section, or the cross-section of the water, being a trapezoid, is

$$\tfrac{1}{2}(9 + 9 - x/2)x = 9x - \frac{x^2}{4}$$

But, the form of the drift being also a trapezoid its sectional area is $\frac{1}{2}(9 + 6)6 = 45$ sq.ft. One-half of this or the wetted area, is, therefore, $22\frac{1}{2}$ sq.ft. Then, to find the value of x, which is the depth of the water when the entry is half-full, we write,

$$9x - \frac{x^2}{4} = 22\tfrac{1}{2}; \qquad \text{or } x^2 - 36x = -90$$

$$x^2 - 36x + 18^2 = 18^2 - 90 = 234$$

$$x - 18 = \pm\sqrt{234} = \pm 15.3$$

$$x = 18 - 15.3 = 2.7 \text{ ft.}$$

Therefore, the depth of the water when the entry is half-full of water is 2.7 ft.

Examination Questions

Answered by

James T. Beard

Bituminous (17th Dist., Pa.) Mine Foremen's Examination, April 6, 1920

(Second Grade, Selected Questions)

Ques.—As a mine foreman, how would you provide for the health and safety of persons employed in and about the bituminous coal mines of this state and for the protection of the property connected therewith?

Ans.—The first duty of the mine foreman is to see that the mine in his charge is operated in accordance with the requirements of the Bituminous Mine Law, giving particular attention to the quantity of air in circulation and its distribution in the mine; the frequent and thorough examination of the mine and inspection of each working place while the men are at work; the supply of timber of the required size and type; the prompt and proper timbering of each working place and of all roads, airways and travelingways; the safe use of explosives and the drilling, charging and firing of all shots; and, lastly, the maintenance of strict discipline in the mine and compliance with all mine regulations for health and safety.

Ques.—Give your reasons why mechanical ventilation is superior to furnace ventilation.

Ans.—Furnace ventilation cannot be employed with safety where a mine is generating gas. Moreover, mechanical ventilation, by means of an approved type of ventilating fan, is under better control at all times. Particularly is this true where there is no nightshift employed in the mines and the furnace cannot, therefore, receive the same attention after the daymen have left the mine, or during periods of idleness when the mine is not running. In case of an explosion or other accident occurring in a mine ventilated by a furnace, the only means of ventilation may be entirely shut off and rendered useless for the time. On the other hand, a good fan located on the surface is always available and under control.

Ques.—What dangers may arise from coal dust, in a dry and dusty mine, and what precautions would you take to guard against them?

Ans.—In a dry and dusty mine, the fine dust is thrown into the air by the daily operations performed in the mine, and accumulates, not only on the roads and in the passageways where it lodges on the timbers, roof, floor and sides of the entry, but also in considerable quantities at the working faces, especially if machines are used for cutting the coal. The presence of the dust in the mine air increases the explosive condition of the air, and is particularly dangerous where a small percentage of gas is present.

To guard against these dangers it may be necessary to install an efficient spraying or sprinkling system on the roads and travelingways. Strict regulations should be made and enforced in regard to blasting; and it is advisable that all shotholes should be inspected, charged, tamped and the shots fired by competent shotfirers, after the men have left the mine. Every precaution should be taken to avoid undue accumulations of dust at the working faces and on all roads, airways and passageways in the mine. Particular attention must be given to reduce the danger of dust in pillar workings.

Ques.—What precautions would you take to guard against danger from the following causes: (a) Falls of roof, slate, coal and sides; (b) cars, motors and machinery; (c) use of dynamite and fuse in blasting?

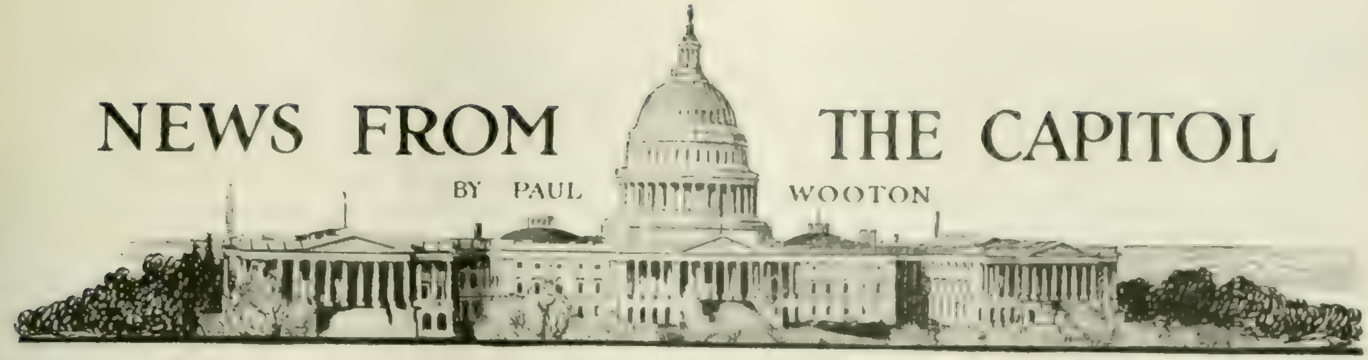
Ans.—(a) All roads, airways and travelingways in the mine should be well timbered by competent men. A systematic method of timbering should be adopted in the working places, which should be inspected, at regular short intervals, by the mine foreman or his assistants, while the men are at work. Where the coal is undercut by hand or by machine, the mining should be carefully spragged. All miners should be instructed to reset any timbers that may have been discharged by a shot, before proceeding to do other work in the place.

(b) All rolling stock and haulage equipment of every kind should be carefully inspected, at frequent intervals, and any needed repairs promptly made. The same is true of all machines and appliances of any kind employed in and about the mine. All roads, tracking and switches should be kept in good repair. The track should be well ballasted; competent motormen should be employed; and strict regulations should be enforced to prevent men from riding on loaded cars or trips when going to and from their work.

Separate travelingways must be provided so that men will not be obliged to travel the haulage road, on their way in and out of the mine. Where this is impracticable, a good clearance space should be provided on one side of the road to allow men and animals to pass the cars without danger. Also, refuge holes must be provided at frequent short intervals, except where rooms are turned off the entry, which would serve the same purpose. All refuge holes must be whitewashed and kept free from obstructions of every kind. Finally, suitable regulations should be made in regard to the movement of all cars and trips. No cars must be left standing in the mouths of rooms, or on sidetracks, without being carefully blocked to prevent their running out onto the main track.

(c) The grade of dynamite in use in a mine should be adapted to the work in hand, and the charging, tamping and firing of the holes should be performed by competent men. No one should be permitted to use a short fuse or to crimp the cap on the end of the fuse with his teeth. No dynamite should be used in the same hole with black powder. A safe method of transporting the dynamite in the mine and distributing it to the workmen should be adopted. Care should be taken that the explosive is not frozen before being fired. If frozen, it must be thawed in a proper manner on the surface, before being carried into the mine.

NEWS FROM THE CAPITOL



BY PAUL WOOTON

Ask Commerce Commission to Forbid Preference in Car Supply

ACCORDING to a statement signed by nearly one hundred members of the House of Representatives railroads operating in the coal-producing districts of the Middle West are interpreting recent emergency orders of the Interstate Commerce Commission in a manner which leads to serious discrimination against coal supply to the public.

A committee including Representative Israel M. Foster, Republican, of Ohio; William Green, secretary of the United Mine Workers of America, and John Moore, president of the Ohio district of the same organization, arranged to present the statement before the Interstate Commerce Commission.

The commission is requested in the statement to put in force sections of the Transportation Act which particularly forbid any preference in the supply of coal cars.

"Unless the practices are stopped and something is done to remedy the situation we will have next winter a coal shortage as bad as that of 1917," Representative Foster asserted. "The railroads, which consume about 30 per cent of all the coal mined, are moving cars in a fashion which gets only that 30 per cent mined."

Miners are joining in the plea, according to the statement of their representatives, because the failure to furnish cars has closed down many mines and left them out of employment.

Michigan Petition for Priority on Coal Not Likely To Be Heeded

THE Michigan public utilities have petitioned the Interstate Commerce Commission for a priority on coal from mines on the Chesapeake & Ohio, Baltimore & Ohio, Louisville & Nashville, Norfolk & Western, Hocking Valley, Pittsburgh & Lake Erie, Kanawha & Michigan and Pennsylvania railroads, and state in their petition, "That if in the judgment of the Interstate Commerce Commission the coal mine operators of the country are in any degree to blame for the present shortage of coal and if in the opinion of said commission the coal mine operators and owners are profiteering to the injury of the public, then and in such case said Interstate Commerce Commission recommend to the Congress of this United States the enactment of such legislation as may be necessary in order that the coal consuming public of Michigan and every other state may purchase the coal it absolutely needs at reasonable prices."

It is pointed out that this is exactly what the Fuel Administration did early in its existence and that it resulted in a very serious situation which required months to undo. In view of that recent lesson it is not believed that the Interstate Commerce Commission will start assigning cars to any particular consumers.

Bituminous Commission and Industrial Cabinet Favor Zoning System

PRESIDENT Wilson's Bituminous Coal Commission apparently did not conclude its activities with the submission of its recent award. It is understood that the commission continues to advise what is known as the "industrial cabinet," which consists of the six secretaries who form the United States Council of National Defense. These are the Secretaries of War, Navy, Interior, Agriculture, Commerce and Labor. Just at this time these secretaries are taking a very active interest in the coal situation.

It is known that pressure is being brought to bear for a return to the zoning system for coal transportation. Some are of the opinion that a considerable saving of open-top equipment can be effected by this plan. There is little reason to believe, however, that any effort will be made to restore the zones, because it is believed that an injunction could be obtained almost immediately to prevent such an order going into effect.

Uncertainty Felt Regarding Committee Action on Frelinghuysen Bill

MUCH indefiniteness surrounds the probable action of the Committee on Interstate Commerce of the Senate on the Frelinghuysen bill. Senator Townsend of Michigan is the temporary chairman of the committee. It is understood that he has been appealed to by certain members of the committee to defer action on the bill until after the convention recess. On the other hand he is being urged by Senator Frelinghuysen to consider the bill and call for a vote at the earliest possible moment. It is practically certain that a majority of the committee will vote for the bill, but it is not improbable that Northwestern Senators will insist upon certain changes in the bill, which may be agreed to.

Dr. Cottrell Will Address American Iron and Steel Institute

DR. F. G. COTTRELL, who will become director of the Bureau of Mines June 1, has just completed an inspection visit to the helium laboratory at Petrolia, Texas. He addressed the Chicago chapter of the American Chemical Society on "International Scientific Relations" on May 21. He will address the American Iron and Steel Institute at its New York meeting May 28.

Evictions in Williamson-Thacker Field End in Eleven Killed

Attempts to Extend Union Into Mingo County Result in Shooting Affray—Stories Conflict—Union Claims That It Has 3,000 Members in Thirteen Locals

ALLEGED attempts to check the progress of the union in Mingo County, West Virginia, by evicting the leaders of the newly-formed organization are said to have been the cause of a pitched battle on May 19 which resulted in the death of eleven men—seven detectives, the mayor of the village of Matewan, a union organizer, a miner and a boy. The detectives were driven off, some taking to the Tug River, which flows past the village, and some hiding in the country nearby.

Many are the stories told and only an investigation will reveal the true facts, if indeed the truth is ever known. Lynn, where the shooting fray occurred, lies three miles from Matewan, twelve miles southeast of Williamson, along the line of the Norfolk & Western R.R. and the Tug fork of the Big Sandy, or Tug River, the railroad crossing the river into Kentucky for a short distance at Matewan.

The union has been trying to get a foothold in Mingo County and it had secured at least a toehold at the mine of the Stone Mountain Coal Co. Apparently that corporation determined to prevent further unionization of its mine by the eviction of the union men and Baldwin-Felts detectives were introduced. According to reports, eight families were evicted.

AT LEAST TWO STORIES OF SHOOTING ARE TOLD

The detectives, having completed their work, are said to have been waiting for the train when the mayor, Cabell Testerman, approached Albert Felts, the leader of the detectives, and demanded to know by what authority the detectives had acted and who empowered them to take one of the mine workers prisoner. This report declares that Felts shot the mayor from his coat pocket and that Felts in his turn was killed by "Sid" Hadfield, the chief of police of Matewan, and that then the shooting became general.

Another story is to the effect that Robert Mullens demanded of Albert Felts whether he had a warrant for his (Mullens') arrest. When Felts declared that he had and started to read the warrant he was cut short by a shot fired by Mullens. Mullens, in his turn, it is said, was killed by J. M. Ferguson, a detective, who was himself shot by an unidentified mine worker.

Whatsoever the originating cause, a fight to the death followed, the upshot of the shooting, first and last, being the deaths of Cabell Testerman, the mayor; Albert Felts, L. C. Felts, E. O. Powell, A. J. Booker, J. M. Ferguson, L. N. Brown and C. B. Cunningham, detectives; Robert Mullens, a union organizer; William Rohrer, a miner, and Patrick Kinsley, a boy of 17 years of age.

From other sources the statement comes that Robert Mullens was a local preacher, serving the spiritual needs of the mountaineers and miners, and that so far from being a labor organizer and the man who fired the first shot he was an innocent bystander. His office of local preacher, however, would not make it imposible for him to be a moving spirit in the union, as earlier reports state, but rather furnish him with an opportunity to carry on his labors without interruption.

The Baldwin-Felts organization is a well known detective agency which has been active in many such labor troubles, especially in West Virginia. At the congressional investigation in 1914 Felts testified that he had been employed by coal operators for four years and had brought a machine gun from West Virginia to be used for the defense of those miners in the southern Colorado mines who desired to continue at work through the long strike.

After the affray Sheriff Blankenship commissioned 100 deputy sheriffs to guard the streets and sent word to Charleston that the state constabulary was needed to maintain order, and Col. Jackson Arnold, superintendent of the Department of Public Safety of West Virginia, assembled his entire force, which was scattered all over the state. All the men will be used to keep order in Mingo County if conditions indicate that the full force is needed. Company B left Nitro for Matewan under command of Sergeant Harvey N. Rexroad, formerly an army captain.

Secretary-Treasurer Fred S. Mooney of the United Mine Workers of America, District 17, declares that the union has thirteen or fourteen locals in Mingo County and a membership of 3,000.

"This terrible affair may prove a blessing in disguise," commented Mr. Mooney. "I firmly believe that it will mark the beginning of the end of thug rule in some of the mining counties.

"When coal companies were serving their notices, Sheriff Blankenship called together the miners who had been organized and inquired whom they preferred as the instruments of their eviction—the sheriff's office or the detectives. The workers assured the sheriff that they would interpose no obstacle to the execution of the law by Sheriff Blankenship.

"The sheriff then told the miners that he would protect them from unlawful acts of the detective agency. In making his word good, he ordered the arrest, on due complaint, I believe, of twenty-seven of the detectives for arbitrarily evicting workers in advance of the trial of their cases in court."

Bids for Supply of Navy Coal Are Still Inadequate

ACTING Secretary of the Navy Roosevelt announces that on May 18 at the opening of bids for coal under schedules Nos. 5459, 5460 and 5461 seven proposals were received, aggregating a total of 319,000 tons of bituminous coal and 3,700 tons of anthracite coal. The annual requirements, as stated in the proposals, are 2,174,800 tons of bituminous coal and 38,215 tons of anthracite coal.

At the principal point of delivery—Hampton Roads, Va.,—there was offered 185,000 tons of the 1,200,000 tons called for. The prices in the bids submitted range from $4.20 to $4.816 per gross ton f.o.b. mines. The lowest price quoted, which is on 40,000 tons, is $0.168 per ton less than the lowest price received for the same form of delivery under an opening of bids held April 6, 1920.

The base price at present being paid by the Navy under commandeering orders for coal taken at Hampton Roads is, including allowance for the advance in wages of April 1, about $3.70 per gross ton.

Trade Commission Publishes Bituminous Coal Production Costs for February

Increase of Ten Cents Per Ton in Mine Cost Caused a Decrease of Operators' Margin - Commission States That Decision in the Maynard Case Has Had Little Effect on the Number of Operators Submitting Reports

DESPITE the victory of the National Coal Association in the Maynard case and its advice to members that they need not file reports, the Federal Trade Commission advises that no important percentage of operators have discontinued sending in the reports. It is also stated at the commission that the number of companies declining to send reports is decreasing.

The commission on May 24 issued the second of its bituminous coal bulletins, furnishing current information on the cost of production. In connection with its second bulletin the commission, among other things, states:

"The commission has collected considerable information on the investment necessary for operation in the various districts, in part derived from balance sheets required from operators and in part from information previously reported by them or obtained direct from their books. When such investment figures are available it then will be possible, after deduction of any sales expense and income and excess profits taxes paid, to show the relation which the remainder of the margin bears to the investment."

In the following tables are shown for the principal regions the claimed costs, sales realizations and margins of the 1,431 operators from whom complete reports for February, 1920, have thus far been received. With these costs are also shown the costs (revised by the commission), sales realizations and margins of the 2,482 operators from whom reports were received for the entire twelve months of 1918. The 1,431 operators had a production of 18,133,477 tons of commercial coal during February, 1920, and the 2,482 operators mined 497,416,437 tons of commercial coal during 1918 (an average of 41,451,370 tons monthly). Detailed figures for each of the 74 districts and 24 States will be found in Table 5 at the end of this bulletin.

The relative change in the situation between January and February, 1920, is shown in Table II herewith, where figures for 1,372 operators are given. The increase of 10 cents per ton in the average claimed f. o. b. mine cost is primarily attributed to the decrease in output, since there was no general increase in the rate of wages paid in February over that paid in January. The table also shows the percentage which the time actually worked formed of the possible full working time each month, which in the case of January was taken as 26 days and in the case of February, 23 days. The average production per day of possible full working time for the 1,372 operators was 801,846 tons in January and 766,354 tons in February, a decrease for February of 4 per cent.

TABLE I. FEBRUARY, 1920, SALES REALIZATIONS AND CLAIMED COSTS OF 1,431 OPERATORS AND SALES REALIZATIONS AND REVISED COSTS OF 2,482 OPERATORS FOR THE YEAR 1918 BY GENERAL COMPETITIVE REGIONS

	February, 1920							Year, 1918						
			Claimed Costs per Ton							Revised Costs per Ton				
General Competitive Regions	No. of Operators	Sales Realization per Ton	Labor	Supplies	General Expense	Total F. O. B. Mine	Margin per Ton	No. of Operators	Sales Realization, per Ton	Labor	Supplies	General Expense	Total F. O. B. Mine	Margin per Ton
Central Competitive "Interstate"[1]	421	$2 45	$1 60	$0 27	$0 30	$2 17	$0 28	765	$2 45	$1 39	$0 25	$0 26	$1 90	$0 55
Eastern Adjacent[2]	458	2 79	1 73	28	45	2 46	33	966	2 81	1 45	28	32	2 05	76
Western Adjacent[3]	82	2 87	1 94	24	34	2 52	35	138	2 75	1 75	26	25	2 27	48
Southern Appalachian[4]	223	3 03	2 00	34	47	2 81	22	288	2 81	1 61	29	36	2 26	55
Southwestern "Interstate"[5]	145	3 42	2 52	26	44	3 22	20	171	3 13	2 15	25	34	2 74	39
Rocky Mountain[6]	102	2.97	1 89	29	38	2 56	41	154	2 73	1 63	26	30	2 19	54
United States	1,431	$2 74	$1 78	$0 28	$0 37	$2 43	$0 31	2,482	$2 65	$1 49	$0 26	$0 29	$2 04	$0 61

[1] Includes all of Illinois, Indiana, Ohio and the southwest district of Pennsylvania
[2] Includes all of Maryland, West Virginia, Virginia and the central district of Pennsylvania
[3] Includes all of Michigan, Iowa and district No 1 of Kentucky
[4] Includes all of Alabama, Tennessee and districts Nos. 2, 3 and 4 of Kentucky.
[5] Includes all of Missouri, Kansas, Arkansas, Oklahoma and Texas
[6] Includes all of Colorado, New Mexico, North Dakota, Montana, Wyoming, Utah and Washington.

TABLE II JANUARY AND FEBRUARY, 1920, SALES REALIZATIONS AND CLAIMED F. O. B. MINE COSTS PER TON OF 1,372 IDENTICAL OPERATORS BY GENERAL COMPETITIVE REGIONS

		January, 1920					February, 1920							
General Competitive Regions	No. of operators	Production, Tons	Per Cent of Time Worked	Sales Realization	Claimed f. o. b. Mine Cost	Margin	Production, Tons	Per Cent of Time Worked	Sales Realization	Claimed f. o. b. Mine Cost	Margin	Increase of claimed cost, Feb. over Jan.		Decrease in output per day in Feb. from Jan.
Central competitive "Interstate"	405	9,150,136	73	$2 43	$2 11	$0 32	7,945,061	70	$2 46	$2 18	$0 28	$0 07	3%	2
Eastern adjacent	445	4,449,221	69	2.80	2 34	0 46	3,637,596	65	2 81	2 46	0 35	0 12	5	8
Western adjacent	79	1,170,787	79	2 82	2 33	0 49	930,709	78	2 83	2 50	0 33	0 17	7	10
Southern Appalachian	203	2,408,501	73	3 03	2 69	0.34	2,031,386	72	3 02	2 81	0 21	0 12	4	5
Southwestern "Interstate"	140	[illegible]	81	3 49	3 05	0 44	937,552	74	3 41	3 21	0 20	0 16	5	9
Rocky Mountain	95	2,508,352	92	3 07	2 48	0 59	2,134,829	91	2 98	2 56	0.42	0 08	3	4
United States	1,372	[illegible]	73	2 75	2 33	0 42	17,626,133	69	2 74	2 43	[illegible]	[illegible]	[illegible]	4

The increase of 10c. per ton in the average claimed f. o. b. mine cost of the 1,372 operators together with the decrease of 1c. per ton in their average sales realization resulted in an 11c. decrease in their margin for February as compared with January.

There is a general correspondence between the decrease in percentage of time worked and the decrease in output per working day. The closeness of this correspondence, however, is modified by changes in the number of men actually at work from day to day.

Continuing, the report says that, as compared with the year 1913, the average sales realization of the 1,090 identical operators in another table was 13c. higher in January, 1920, and 12c. higher in February. Their average claimed cost, however, was 23c. higher in January and 33c. higher in February. As a result their average margin, which was 61c. per ton in 1918, fell to 43c. in January and to 32c. in February. The average increase of claimed f. o. b. mine cost for January, 1920, was 11 per cent over that for the year 1918, and for February was 16 per cent. This increase is attributable to two chief causes: (1) the higher wage scale put into effect in November, 1919, as a result of the Food Administrator's recommendation of 14 per cent increase in the wages of mining labor, and (2) the decrease in the monthly production for February, 1920, from the average monthly production of 1918.

Morrow Refutes Profiteering Charges Made by Lauck and Senator Walsh

Vice President of National Coal Association Shows Unfairness of Selecting a Few Fortunate Operators as Typical—Critics in Citing Prices, He States, Ignore Operating Expenses, Fixed Charges and Taxes

PROFITS of coal operators again was the subject of discussion in Washington last week. In addition to the allegations made by W. Jett Lauck before the Railroad Labor Board, Senator Walsh of Massachusetts charged, on the floor of the Senate, that huge profits had been made by coal operators. This led J. D. A. Morrow, vice-president of the National Coal Association, to issue an open letter to the Massachusetts Senator, in which he attempts to refute the charges made.

Senator Walsh's remarks as to coal profiteering were as follows:

"The income-tax data compiled for the Senate by the Treasury Department showed profits for the bituminous mine operators out of all proportion to the increased wages of miners. Of the 392 bituminous coal companies cited, 334 showed net profits, after every possible deduction, of over 25 per cent. More than half the companies—218 to be exact—showed earnings of over 50 per cent on capital stock. And 118, or nearly one-third of all, showed net profits of over 100 per cent.

"The financial manuals show that the net incomes of seventeen of these companies increased from $13,000,000 in 1914 to $48,000,000 in 1917, and their average net profit per ton from 20 to 60c. If the average profit per ton of these companies was representative of the whole industry, then the bituminous mine operators of the United States during the four years 1916, 1917, 1918, and 1919 gathered a total profit of more than $1,000,000,000, of which more than two-thirds was excess.

"The anthracite coal operators show still larger percentages of net profits. The average prewar incomes of four of the larger companies were $7,000,000, which was 15 per cent on the capital stock. In 1917 this average had risen to $16,000,000, or over 34 per cent on the capital stock. The income-tax returns show that the net income of six smaller companies, which was already 57 per cent in 1916, increased to 94½ per cent in 1917.

"The statistics presented to the Railroad Labor Board by the railroad brotherhoods tend to show how these huge profits were obtained.

"In 1914 the average cost of anthracite coal at the mine was $2.28 per ton, of which $1.59 was paid for labor. Transportation to New York cost $1.80 per ton, and the retail price was $7.54, leaving margins totaling $3.46 for the operator, the sales corporation and the retail dealer. In December, 1918, the cost at the mine was $4.22, for which $2.97 went to labor. Transportation had risen to $2.30, and the retail price to $11.82, leaving $4.80 for the distributor's margin. Thus the retail price increased three times as much as the increase in miners' wages."

In his open letter to Senator Walsh, Mr. Morrow says:

"I have read your speech on profiteering with much interest, but I am constrained to deny your statements concerning the profits of the bituminous coal industry. To my mind it is necessary to refute the indiscriminate charge that the bituminous coal industry made preposterous profits during the war. Let me, therefore, direct your attention to official figures on this subject which you have either overlooked or disregarded.

"You cite Mr. McAdoo's report on corporate earnings printed as Senate document No. 259 as your chief authority. The unfairness of that report is notorious. Mr. McAdoo's letter of transmittal itself states that he selected only companies which in 1917 earned 15 per cent or more on their capital stock. In 1917 there were about seven thousand separate coal producers. His report, therefore, covers only about 6 per cent of the total number. It includes only the fortunate 392 who, because of specially favorable mining conditions, with low production costs compared with selling prices, or on account of merely nominal capitalization, made 15 per cent or more on their capital stock. It says nothing of the other 94 per cent, some 6,600 operators, who admittedly made less than 15 per cent. Even the percentages quoted for the 392 concerns are no true measure of profits, because they are based on capital stock, when the report itself shows that many of these companies had invested far more than their capitalization. Consequently, any such conclusions as yours, based on that report, are manifestly unfair and misleading.

"Further, with regard to alleged huge profits in 1917, the United States Geological Survey report on coal production for 1917, page 958, shows that the total output of bituminous coal in 1917 was sold by the operators at an average price of only $2.26 per ton at the mines, out of which all operating expenses, fixed charges and taxes had to be paid before any profit remained.

"Throughout 1918 prices were under control of the Government. On Nov. 19, 1919, Dr. Garfield, United States Fuel Administrator, stated publicly that the average price allowed the bituminous operators for 1918 was only $2.61 per ton. He stated further that this permitted them an average margin of 46c per ton. Dr. Garfield was careful to explain that out of this margin Federal taxes of 30c per ton and some other deductions had to be made before the operators had any profits. Let me refer you also to the report of the United States Bituminous Coal Commission, page 41, where the tax returns to the Treasury of some 1,551 bituminous coal mining concerns are tabulated for 1918.

"These companies produce about one-third of the total output of bituminous coal, and after examination of the companies included, the United States Geological Survey advised the commission that these companies represented fairly the conditions throughout the industry. Please observe that 337 of the 1,551 operators reported losses and that after deducting taxes the average per cent of net income to invested capital for the 1,214 companies reporting profits was less than 11 per cent, and for the entire number of 1,551 companies, was only 9.72 per cent.

"In this connection I trust you will remember that coal mining is a hazardous business and cannot be judged by the standards of return which are properly applicable to safer enterprises. At the outset the operator must invest in hundreds of acres of coal land, parts of which may afterward turn out to be unworkable. He must sink his money in miles of underground tunnels and install expensive machinery far below the surface, all of which investment is subject to rapid destruction or total loss by explosions, fires, falls of slate, sulphurous mine water and other physical conditions. At any time he may encounter irregularities in the coal deposits which will run his mining costs up to prohibitive figures. No 6 per cent or 8 per cent return is adequate for capital which must encounter such risks.

"As for 1919, the evidence obtained by Senator Frelinghuysen's sub-committee of the Senate which has been inquiring into coal conditions since last August shows that, following the lifting of Fuel Administration control, prices under competition in the open market sank to less than the Fuel Administration maximum limits. The only exceptions to this general downward price movement were certain high grade coals of special value which have always commanded a premium in the open market. At the same time, on account of the additional increase in the cost of material and on account of greater lost time, mining costs advanced. It is common knowledge that in 1919 profits were less than in 1918.

"The Federal Trade Commission has recently issued two reports on costs and selling prices of bituminous coal, showing that the operators' margins in January and February, 1920, were only about half the 'margins' of 1918. The reports state that the 'margins' shown are not profit, because selling expenses, interest on investment and Federal taxes still remain to be deducted.

"The sale of a few cars of coal at high prices may be heralded broadcast as evidencing the general level of bituminous-coal prices. Nothing is ever said of the millions of tons moving currently at low prices. Some bituminous coal is doubtless being sold today at relatively high prices, but under present operating conditions high prices are inevitable.

"An acute transportation shortage, rendering mine operation very irregular and costly, has been accentuated by unfair discrimination in the distribution of empty coal cars to the mines. Under special authorization from the Interstate Commerce Commission and in the face of the most vigorous protests from the bituminous coal operators, the railroads are giving a full supply of cars to those mines supplying their locomotives with coal and are running these mines six days per week. They are scattering the remaining handful of cars among the other mines which supply the public utilities, the industrial plants and the domestic consumers of the country.

"Hundreds of mines thus discriminated against are prevented from shipping coal on more than four or five days per month, but all the expense of maintaining these mines goes on just the same. Some of them normally hoist ten, fifteen and twenty tons of water daily for every ton of coal produced. This water must be pumped regardless of whether coal is being shipped or not. The workings must be kept ventilated, tracks cleaned of falls of slate and rock and the property maintained. Such irregular operating conditions in the last few weeks have increased production costs at hundreds of mines from $1 to $3 per ton. Thus, at the same time that this system of discriminatory car distribution is depriving the industrial consumer and ordinary householder of his coal it is doubling the cost of producing the little tonnage which is available for him.

"There can be no permanent improvement of social conditions in America proceeding from misinformation and misunderstanding of the elemental facts. I am satisfied that you are sincere in your desire for constructive betterment and therefore I am taking the time to bring this information to your attention. We shall be glad at any time to give you or any other public official the facts on conditions in this industry.

"Since your speech has been so widely quoted, I deem it only fair to make this letter public."

Pittsburgh Wage Contract Signed at Last

AFTER a delay of weeks the Pittsburgh wage contract is signed, the difficulty regarding house rents being settled to the satisfaction of the mine workers. The rent clause reads:

"It is agreed that house rents shall remain as they are during the life of this agreement, except as to houses completed after April 1, 1920, it being distinctly understood that operators will be privileged to charge a reasonable rent for the same."

It will be observed that the clause sets forth very clearly what is indeed a fact, that the rent on houses completed before April 1, 1920, is less than what is reasonable. In fact mine houses are no longer a source of profit but of loss to their owner. They are built merely because without them men cannot be obtained, and with no men it is impossible to mine coal. The date of the signature of the contract is May 18, but it is operative as from April 1.

President Wilson Forbids Strike of Men in Anthracite Mines

Will Appoint Commission to Consider Wage Increase—Urges the Ill Effects to National Prosperity of a Strike at This Time

ON May 22 President Wilson issued an ultimatum to the anthracite miners and operators through Mr. Gorman, the secretary of the Joint Scale Commission, advising both sides that, if it appears necessary, he will appoint a body similar to the Bituminous Coal Commission to take up the whole subject and demanding that the miners await its decision before going on strike. The President's letter ran as follows:

"I have watched with more than passing interest your efforts to negotiate a new wage scale for the anthracite coal fields. The arrangement to continue work at the mines after April 1, pending the adoption of a new agreement which you entered into when the previous wage scale was about to expire, was highly commendable and filled us all with hope that a new contract would be mutually worked out and the supply of anthracite coal continued without interruption.

"I have, however, been advised that there is a possibility you may not come to an agreement. I am sure I need not remaind you that we have not yet recovered from the economic losses incident to the war. We need the fullest productivity to our people to restore and maintain their own economic standards and to assist in the rehabilitation of Europe.

"A strike at any time in a great basic industry like anthracite coal mining would be a very disturbing factor in our lives and industries. To have one take place now, while we are actively engaged in the problems of reconstruction, would be a serious disaster.

"I am not familiar with the technical problems affecting the making of your wage scale. You are. You should therefore be able to effect an agreement. If for any reason you are unable to do so, I shall insist that the matters in dispute be submitted to the determination of a commission to be appointed by me, the award of the commission to be retroactive to April 1, in accordance with the arrangement you have already entered into, and that work be continued at the mines pending the decision of the commission. I shall hold myself in readiness to appoint a commission similarly constituted to the one which I recently appointed in connection with the bituminous coal mining industry as soon as I learn that both sides have signified their willingness to continue at work and abide by its decision."

Interstate Commerce Commission Acts To End Freight Tie-up

IN an effort to relieve the nationwide freight congestion and car shortage, the Interstate Commerce Commission on May 20 issued to the railroads of the country three orders relating to the hauling of freight.

Service order No. 1 suspends all rules and regulations as to car service and directs the carriers to forward traffic by the most available routes without regard to the routing thereof made by shippers or by carriers or to the ownership of cars.

Service order No. 2 suspends all car service rules and orders the relocation of open-top cars from Western territory to Eastern territory, naming the number of cars which each carrier must send east each day. This order relates to the roads operating west of Chicago.

Service order No. 3 is similar to order No. 2, except that it applies to Eastern roads and orders the relocation of box cars from Eastern and Southeastern territory to Western territory. The order stipulates the number of cars daily that must be moved.

The second order is of most interest to the coal trade, inasmuch as it orders a number of important carriers, located principally west of the Mississippi River, to turn over a specified number of open-top cars daily to their Eastern connections. This should have the effect of increasing the coal-car supply. The reciprocal part of this arrangement is service order No. 3, which requires Eastern and Southeastern carriers to turn over to the Western lines daily a specified number of box cars.

Order No. 1 also provides for the charging of the rate of freight applicable over the route indicated in the bill of lading or shipping instructions, regardless of the fact that a higher or lower rate may be applicable via the route over which the shipment actually moves.

Service order No. 1 in full is as follows:

The subject of route of freight traffic being under consideration, and it appearing, in the opinion of the commission, that, because of shortage of equipment and congestion of traffic, an emergency exists on the lines of all carriers by railroad in the United States subject to the Interstate Commerce Act, which requires immediate action,

It is ordered that until the further order or direction of this commission all said common carriers by railroad are hereby directed to forward traffic to destination by the routes most available to expedite its movement and relieve said congestion, without regard to the routing thereof made by shippers or by carriers from which the traffic is received, or to the ownership of the cars, and that all rules, regulations and practices of said carriers with respect to car service are hereby suspended and superseded in so far only as conflicting with the directions hereby made.

It is further ordered and directed that inasmuch as such disregard of routing is deemed to be due to carriers' disability, the rates applicable to traffic so forwarded by routes other than those designated by shippers, or by carriers from which the traffic is received, shall be the rates which were applicable at date of shipment over the routes so designated.

It is further ordered and directed that in each instance where the traffic is routed or rerouted by carriers by railroad under the authority of this order the carrier responsible for such routing or rerouting shall within twenty-four hours thereafter deposit in the United States mail a notice addressed to the consignee of the traffic stating the car numbers and initials, places and dates of shipment, the routing and respective routes over which the traffic is moving, and that charges for the transportation of the traffic, including transportation, and schedules of rates, fares and charges, as those terms are defined in said act, will be the same as they would have been if such routing or rerouting had not taken place.

It is further ordered and directed that in executing the directions of the commission contained in this order the common carriers involved shall proceed without reference to contracts, agreements or arrangements now existing between them with reference to the divisions of the rate of transportation applicable to said traffic; that such divisions shall be, during the time this order remains in force, voluntarily agreed upon by and between said carriers, and that upon failure of the carriers to so agree, said divisions shall be hereafter fixed by the commission in accordance with pertinent authority conferred upon it by said act.

And it is further ordered that copies of this order and direction be served upon all carriers by railroad in the United States subject to the Interstate Commerce Act, and that notice of this order be given to the general public by depositing a copy of the order in the office of the secretary of the commission, at Washington, D. C.

Foreign Markets and Export News

Increase Ruhr Miners' Wages

In the Ruhr coal fields, according to *The Colliery Guardian*, an arrangement has been concluded under which, with the presumption that the price of coal will be raised to correspond, all underground workers above twenty years of age are to receive an increase of 5.50 mk. per shift from April 1, the basis price for contract workers also being advanced by 5.50 mk. Surface workers are to be paid another 90 pf. per hour. All under twenty will receive increases in proportion to their age, on the same basis of calculation.

Alabama Coal Goes to France and Italy

Seven thousand tons of high-grade Cahaba vein coal, the *Age-Herald* (Birmingham, Ala.) states, left the port of Pensacola recently for Italy, and similar movements are to take place through that port about twice a month. Much more would move at this time but for the car shortage. France is also a taker of Alabama coal in quantities that are limited principally by car shortage.

The rate to Pensacola is $1.60 per ton, while the ocean rate to Europe is from $16 to $20 per ton. Even at this high cost, Italy and France, especially Italy, must have coal. An agency in touch with this business declares that contracts for 500,000 tons for Italy could be booked any day if there were facilities for moving that amount in the time desired.

At this time last year there were few ships in Southern waters. Now, owing to allocations by the emergency fleet corporation, there is a supply ample apparently for all current needs, but the car shortage prevents full utilization of this ocean-going transportation capacity. An expert declares that the present car shortage, as it affects the Alabama coal mines, is at least 30 per cent. Under these circumstances, and with the domestic consumer clamoring for far more than the present coal production, the export demand cannot be cared for in the measure which the operators would desire.

Both the Louisville and Nashville and the Georgia, Florida and Alabama have coal tipples at Pensacola for placing the coal on ships.

What Birmingham coal operators especially desire, and are now working hard for, is ample coal terminals at Mobile, which would prove a double advantage, because the 20 per cent rail differential for shipment down the Warrior would also be available.

Not long ago an Alabama coal company turned down a firm offer of contract for several hundred thousand tons of high-grade Alabama coal for Italy on account of lack of handling devices at Mobile.

The matter of having the government build a coal terminal with 25,000 tons capacity at Mobile, interest on the investment to be guaranteed by the Alabama coal operators, has received strong backing, but no final decision has been rendered by the authorities.

Coal Shipped Through Panama Canal During March

Shipments of coal through the Panama Canal during March totaled 3,336 tons, while the coke carried through amounted to 4,360 tons.

Coal Exported from New York During March

Exports of coal and coke through the Port of New York during March of this year total 16,368 tons valued at $153,609, as compared with $16,664 in 1919, $61,721 in 1918, and $132,579 in 1917. Fourteen countries received anthracite in March of this year as compared with four countries in March of last year.

	Anthracite		Bituminous		Coke	
	1920 Tons	1919 Tons	1920 Tons	1919 Tons	1920 Tons	1919 Tons
Argentina	3,060		20			
Barbados....	70	25				
Brazil						77
Canada	2,843	586				
Chile	248				445	
Costa Rica					25	
Cuba	121	5			694	2
Dutch E. I.					100	
Ecuador	861				2	
France	896					274
Guatemala						20
Germany....	2					
Italy........	32		15			
Jamaica.....	25					
Mexico.	220			134		
Netherlands			4564			
Norway					45	
Panama ...					9	6
Peru........	40		50			1
San Domingo	1,949	288			25	10
Venezuela	3			6	4	
Totals	10,370	904	4,649	140	1,349	390

Coal Imported by Dutch East Indies

Consul Harry Campbell reports that the Soerabaya consular district, comprising the Celebes, New Guinea, the Moluccas, Bali, Lombok, Soembawa, Soemba, Flores, and all islands east of 120 deg. east longitude; all that portion of Borneo east of 112 deg.; and in Java the Residencies of Soerabaya, Madioen, Rembang, Kediri, Pasoerean, Madoera, and Besoeki, imported 31,999 tons of coal in 1918, compared with 29,124 tons in 1917.

Coal Production in South Africa 1910-1919 Inclusive and During January and February, 1920

Period	Transvaal				Cape				Orange Free State				Natal				Union of South Africa	
	Tons Sold	Value at Pit Mouth £	Value per Ton s.	d.	Tons Sold	Value at Pit Mouth £	Value per Ton s.	d.	Tons Sold	Value at Pit Mouth £	Value per Ton s.	d.	Tons Sold	Value at Pit Mouth £	Value per Ton s.	d.	Tons Sold	Value at Pit Mouth £
June to December, 1910..	2,345,427	584,069	4	11 77	56,840	36,444	12	9 88	303,002	84 931	5	7 27	1,455,506	418,105	5	8 94	4,160,775	1,123,549
Year, 1911	4,343,680	1,020,539	4	8 39	89,023	51,550	11	6 98	482,690	137,616	5	8 42	2,679,551	725,448	5	4 98	7,594,944	1,935 153
Year 1912.	4 751,850	1,044,986	4	4 78	74,701	41,257	11	0 55	525,459	141,380	5	4 57	2,765,068	771 755	5	6 99	8,117 078	1 999,378
Year 1913...........	5 225,036	1,142,598	4	4.48	67,481	38,752	11	5.82	609,973	167,409	5	5 87	2,898,726	891,699	6	1.83	8,801,216	2,240,458
Year, 1914...........	5,157,268	1,150,746	4	5.55	53,621	31,167	11	7 50	699,217	191,064	5	5.58	2,567,817	885,919	6	10.80	8,477,923	2,258,896
Year, 1915	5,202,805	1,145 060	4	4 82	46 850	26,591	11	4 22	727 553	188 364	5	2 14	2,304 116	782,464	6	9 50	8 281,324	2,142,479
Year, 1916 .	6,136,913	1,382,680	4	6 07	41,752	24,092	11	6 49	762 576	198,699	5	2 54	3 066 261	1,134,194	7	4 77	10,007 502	2 739,665
Year, 1917...........	6 641,229	1,586,062	4	9.32	8,300	5,950	14	4.05	843,095	217,292	5	1.86	2,890,296	1,466,304	10	1.76	10,382,920	3,275,608
Year, 1918...........	6,438,961	1,632,361	5	0.84	4,654	3,566	15	3 89	826,577	229,736	5	6.70	2,607,133	1,358,934	10	5.10	9,877,325	3,224,597
Year, 1919...........	6 622,313	1,694,131	5	1.40	4,759	3,750	15	9 12	838,059	231,332	5	6.25	2,801,004	1,487,031	10	7.41	10,266,135	3,416.244
1919—February......	510,172	131,563	5	1.89	367	278	15	1 80	63,757	17,662	5	6 48	223,888	121,042	10	9.75	798,184	270,545
March..........	538,332	137,802	5	1.44	335	261	15	6 99	69,597	19,217	5	6 27	238,059	128,747	10	9.80	846,323	286,027
April..........	545,081	140,496	5	1.86	383	298	15	6.74	68,386	18,843	5	6 13	223,806	120,062	10	8.75	837,656	279,699
May..........	559,566	142,073	5	0.94	419	355	16	11 34	77,511	21,694	5	7 17	231,995	124,646	10	8.95	869,491	288,768
June..........	554 954	139 482	5	0.32	459	384	16	8 78	67 027	18,682	5	6 89	203,117	111,855	11	0.17	825,557	270,403
July..........	524,745	132,781	5	0.73	469	363	15	5.76	76,697	21,068	5	5 93	241,570	126,955	10	6.13	843,481	281,167
August.........	554,920	141,726	5	1.30	387	311	16	0 87	73,205	20,059	5	5 76	196,084	103,509	10	6.69	824,596	265,605
September.......	605,422	153,691	5	0.93	357	290	16	2.96	77,900	21,290	5	5 59	264,185	140,860	10	7.96	947,864	316,131
October........	590,922	153 267	5	2.25	403	311	15	5.21	67,022	18,381	5	5 82	263,091	142,609	10	10 09	921,438	314,568
November.....	532,955	137,346	5	1.85	467	352	15	0 90	59,406	16,267	5	5 72	229,352	120,931	10	6.55	822,180	274 896
December.......	531 267	135,907	5	1.40	398	312	15	8.14	70,535	19,189	5	5 29	250,288	136,114	10	10.52	852,488	291 522
1920—January.......	525,496	141,127	5	4.45	440	359	16	3.82	77,603	21,450	5	6.34	230,880	131,917	11	5.13	834,419	294,553
February	494 954	137,917	5	6 88	553	417	15	0 98	71,000	20,215	5	8 33	212 610	122,736	11	6 55	779,117	281 [illegible]

Scarcity of Coal Forces Down Tonnage Rates to Europe

W. W. Battie & Co.'s coal trade freight report states that, owing to the scarcity of coal and the large number of foreign steamers that are offering, freight rates to Europe have crumbled very materially. Owing to the poor outlook for homeward business, rates to South America are particularly firm. The situation in business to the West Indies is unchanged.

Rates quoted are as follows:

	Rate	Tons Displaced
Copenhagen	About 23 00	1,000
Stockholm	About 24 00	800
Gothenburg	About 23 00	1,000
Antwerp Rotterdam	18 50 19 00	1,000
Hamburg	20 50 21 00	1,000
French Atlantic, excluding Rouen	19 00 19 50	700
Barcelona	About 22 00	1,000
Algiers	21 00 22 00	800
Genoa/Leghorn	About 22 00	1,000
Spezia Savona	About 22 00	1,000
Piraeus	25 00 26 00	1,000
Trieste Venice	25 00 26 00	1,000
Port Said	25 00 25 50	1,000
Constantinople	25 00 26 00	500
Pernambuco	14 50 15 00	500
Bahia	14 50 15 00	500
Rio	14 50/15 00	1,000
Santos	15 00 15 50	600
Buenos Aires or La Plata or Montevideo	13 50 14 00	1,000
Para	About 14 50	500
Rosario	About 15 00	750
Bahia Blanca	About 15 50	1,000
To Nitrate Range	9 00 10 00	750
Havana	6 50 7 00	600
Sagua or Cardenas	About 8 50	300
Cienfuegos	8 00/ 8 25	500
Caibarien	About 8 50	300
Guantanamo	8 00/ 8 25	500
Manzanillo	About 9 00	300
Bermuda	7 00/ 7 50	300
Bermuda p. c. and dis. free		
Kingston	About 9 00	400
St. Lucia	About 10 00	500
Barbados	About 10 00	500
Santiago	8 00/ 8 25	500
Port of Spain, Tr.	About 10 00	500
Curacao	9 00 9 50	500
Free p. c. Curacao		
Demerara	13 00	400
St. Thomas	About 9 00	500

All above rates gross form charter.

Great Britain Builds Few New Coke Ovens

Progress in coke oven constructional work in Great Britain during the past year, according to *The Colliery Guardian*, was not very marked. Beyond a certain number of small extensions to existing batteries which had been put in hand in 1917 and 1918 under the auspices of the Ministry of Munitions no great amount of new work was started. This, of course, is attributable to a variety of causes, but mainly to the state of the colliery and coal businesses generally, where the vacillating policy of the Government, combined with the attitude of the Miners' Federation, has caused owners and capitalists to be unwilling to go forward with schemes until the situation is clearer.

Coal Prices Issued in Paris

Prices of the several kinds of coal, effective from March 16, 1920, Consul General A. M. Thackara, Paris, France, reports, were issued by the préfet of the Seine for the city of Paris, as follows: Anthracite, nut, 450 francs, or $86.85, per ton; anthracite, large, 430 francs, or $82.99; anthracite, small, 390 francs, or $75.25; run of the mine (tout venant), 400 francs, or $77.20; boulets and briquets, 425 francs, or $82.02. Wood belonging to the municipality will be sold at a uniform price of 160 francs, or $30.88, per ton. The conversion rate used above was $0.193 to the franc.

Coal Demand of Japan Exceeds Supply

Wheelock & Co.'s coal market report issued at Shanghai, March 25, states that there is no change to report in the Japanese coal market since a fortnight previous and that there has been practically no new business done. Stocks on the spot are up to the average and deliveries to consumers are going on as usual. In Japan supplies are not nearly enough to cope with the demand and sellers are experiencing great difficulty in meeting requirements for bunker coals.

The market for Kaiping coal has ruled quiet but firm during the past fortnight. Although coal has been taken regularly under contract there is little new business to report. Stocks are much below the average and the demand for lump and the better grades exceeds the supply.

Coal prices are quoted as follows:

JAPAN COAL

			Taels
Muke lump	ex wharf	Contracted for	
Muke small	ex wharf		
Muke dust	ex wharf		
Kishima lump	ex wharf		14 00
Kishima dust	ex wharf	no stock	10 00
Shakano lump	ex wharf		13 00
Arate lump	ex wharf		12 00
Shimoyamada kirigomi	ex wharf		11 00
Shin shakano kirigomi	ex wharf		11 00
Yoshinotani No. 1 lump	ex wharf		12 00
Yoshinotani No. 2	ex wharf		10 00

KAIPING COAL

	Taels per Ton ex Wharf
Loco lump	13.50
Lanst lump	10 00
Washed nuts	13.50
Washed slack	10 50
No. 1 slack	9 00
No. 2 slack	8 50

Switzerland Can No Longer Depend Upon Germany for Coal

As Germany's Production of Coal Has Considerably Decreased and the Fatherland Has Had to Cede the Saar District to France, the Swiss Must Look Elsewhere for Fuel

Consul General Leo J. Keena, Zurich, transmits the following translation of a report made by the Secretary General of the Swiss Department of Public Economy on the Swiss coal situation:

During normal times the Swiss consumption of coal amounted to from 3,300,000 to 3,600,000 tons per year. As Switzerland has no coal mines of importance, its coal consumption is about equal to the quantities of coal imported. Coal, briquet, and coke imports during 1913-1918 were as follows (metric ton = 2,204.6 pounds):

	Metric Tons
1913	3,379,007
1914	3,107,796
1915	3,311,412
1916	3,151,521
1917	2,269,872
1918	2,141,381

On an average this import consisted of coal 60 per cent, briquets 7 per cent, and coke 33 per cent. The chief source of supply was Germany, with coal from the Saar and Ruhr regions; Belgium and, to a small extent, France also contributed.

Prior to the war the coal was consumed as follows:

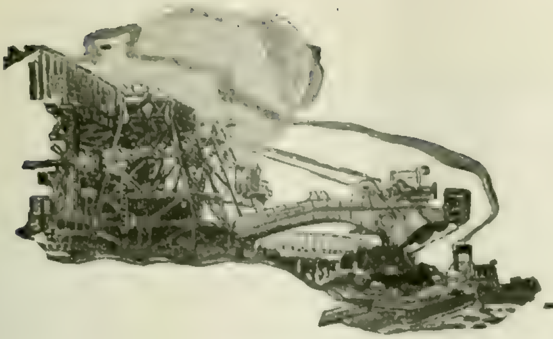
	Metric Tons	Per Cent
Transportation of all kinds	720,000	20
Gas works	600,000	17
Chief industries	1,080,000	30
Households and small industries	1,200,000	33
Total	3,600,000	100

Germany furnished most of the coal before the war, exporting it by rail direct from the mining regions. A certain percentage of coal from the Ruhr district was shipped via the Rhine and discharged in transit in ports of the upper Rhine, to be transported from there on by railway. This was also the case with coal from Belgium, while coal from France was transported exclusively by rail.

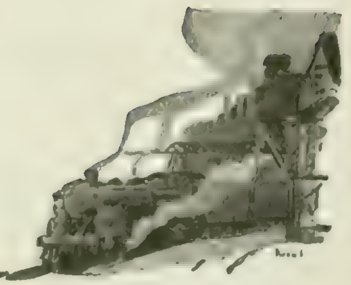
Up to the spring of 1919 a great many coal importers participated in the importation of coal. Since April 1, 1919, however, the importation has been centralized and is effected exclusively by the Swiss Coal Association at Basel, which is an organization of the former principal coal importers and is to be considered as of a semi-official nature.

Through the stipulations of the peace treaty, the former chief supplier to Switzerland — namely, Germany — is obliged to furnish the Allies with large quantities of coal, especially France, Belgium, and Italy. Owing to the fact that the German production of coal has considerably decreased and that Germany has had to cede to France its Saar district, which heretofore participated to no small extent in the Swiss coal supply, Germany will no longer be able to furnish Switzerland any great amount of coal.

The same thing is true of Belgium and France. For some time to come neither of those two countries will be in a position to export coal to Switzerland to a degree worth mentioning, although France is furnishing us (in an appreciable way) with a certain minimum of coal from the Saar district. However, the quantity which is actually being received here amounts to only about one-third as much as was furnished to Switzerland in peace times and during the war until the armistice.



Production and the Market



Weekly Review

Output Decreases, Cost of Production Mounts and Consumers Clamor for Coal the Mines Cannot Supply—Car Shortage and Labor Troubles on Roads Precipitate the Crisis—Bituminous Prices Raised—Anthracite in Good Demand—Coke Scarce and High

DESPAIR rules the coal situation today. Production is again on the decrease, labor is dissatisfied with the short running time and lowered earnings, costs of production have mounted and consumers are calling for coal that the mines cannot ship. The cause of the trouble at the mines is car shortage, and the cause of the car shortage is labor trouble on the railroads.

The long-continued condition of lack of transportation has so increased costs that prices of bituminous coal have generally been raised from 25 to 50 cents per ton, but problems of price are of secondary consideration. It is reported that none of the large Eastern companies has been able to keep up contract shipments, with the result that buyers have offered as high as $7.50 per ton for mine-run coal.

One of the very great difficulties now is the constant placing and raising of freight embargoes. Shippers can never offer any assurance to their customers regarding a single car of coal. Many large industries in New England have reported a suspension of operation because of lack of coal and those that have stocks see them becoming rapidly depleted, with but little source for future supply.

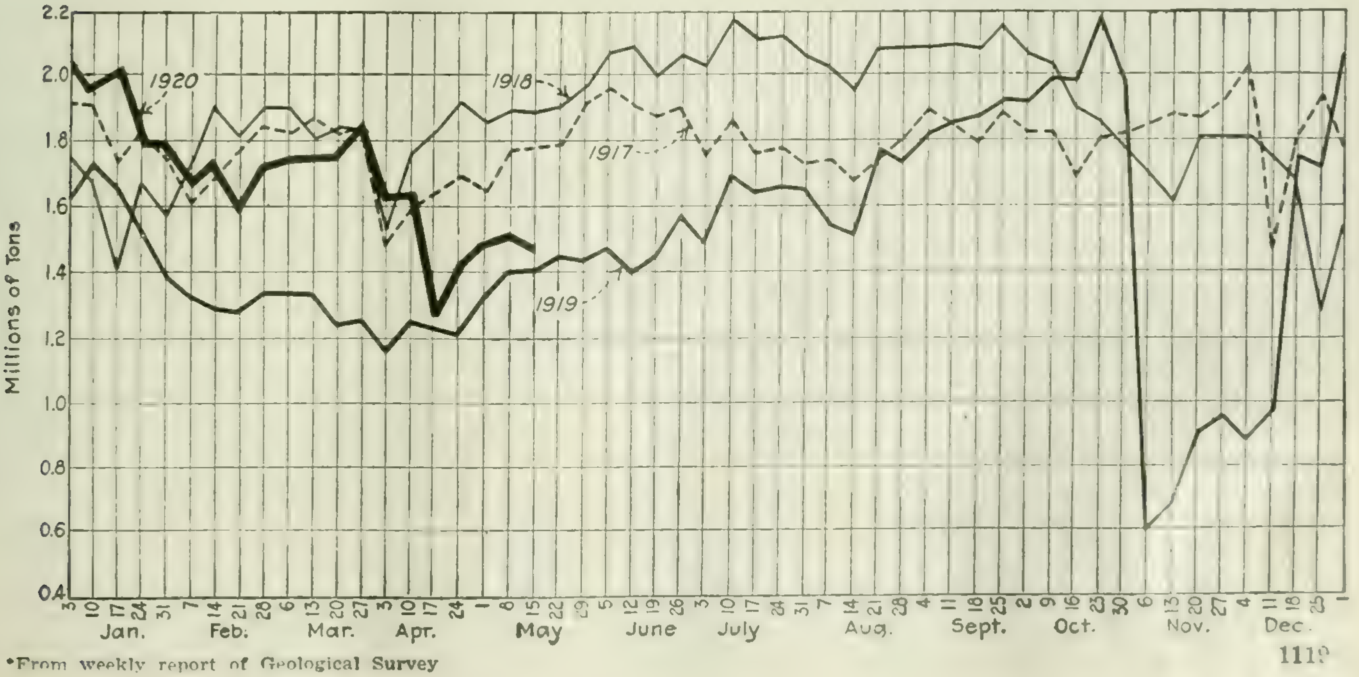
There is little the coal man can do today except ship his little coal and wait for the railroads to get straightened out. The pressure on the Interstate Commerce Commission during the last ten days has been terrific and that body has been able to give to the shipping public that has been doing most of the complaining very little assurance of improvement in the near future.

Shipments to tide for export are limited even at Hampton Roads and Lake movement is very light. The railroads are getting or taking the larger share of present output of bituminous coal.

Anthracite continues in good demand. New prices have been announced, even though a wage scale has not been negotiated.

Fancy prices rule for coke, with very little free coke to be had. Production here also is limited by car supply.

Average Daily Production of Bituminous Coal*



*From weekly report of Geological Survey

Reports From the Market Centers

New England

BOSTON

Traffic Troubles Continue — Prices Show No Material Change — Canadian Demand Is a Factor—Federal Intervention—Hampton Roads Market Fairly Even—Anthracite Companies on a New Price Basis—Demand Strong for Domestic Sizes—Less Activity in Buckwheat.

Bituminous—As yet there is no let-up in the deplorable traffic situation that confronts New England. The congestion at the Boston & Maine gateways, that made the embargo of May 13 necessary, is being relieved only gradually. Probably it is only a question of time when still other gateways will be clogged.

The New Haven R.R. is able to make more deliveries of empties to the intervening lines, but the block on eastbound freight continues almost unabated. Current embargoes have naturally had their effect upon the spot market. Neither buyers nor factors in the trade can see their way clear to make arrangements for prompt coal, when they know that shipments all-rail are almost an impossibility. The result is a quiet market. New England is confining itself today to getting better movement on contract purchases, rather than to spot buying.

While prices might be expected to recede slightly, the volume of buying in other directions is sustaining the quotations of a week ago. $6.50@$7 is the ruling level on the better grades from Central Pennsylvania. The lower grades are still to be had at prices ranging from $5.50@$6.25. Consumers here have practically given up buying spot coal from sections more remote.

Active buying in Canada has given a buoyancy to the current market it might not otherwise have. Thus New England is likely to have competitive buying from Canada for several weeks to come. Prices will be bid up to $8.

The West Virginia coals are now being absorbed in the Middle West and off shore; Canadian purchasers are left with only the Pennsylvania districts to draw upon.

Anthracite—With the announcements on May 15 and May 17 of the old-line companies, that advances of 85c. to $1 would be effective from those dates, practically every anthracite shipper is now on a new price basis. The agreement with the mine-workers, although not formally announced, has been discounted by retailers in this territory.

Pressure continue strong for the domestic sizes. The new high price for broken indicates to the trade that this size may be restricted to special uses. This should mean an increased consumption of egg size which would help materially in distribution. Shipments by water continue to come forward with fair regularity, although the all-rail route is still under great disadvantage.

The steam sizes are only in moderate demand. Large buyers of bituminous are discriminating carefully between different grades of buckwheat and there is less active buying than prevailed 60 days ago.

NEW YORK

Local Deliveries Show Slight Improvement — Retail Dealers in Need of Coal — Big Producing Company Announces Increase in Prices — Harbor Troubles Interfere with Deliveries — Bituminous Shipments Slow — Vessels Leave for Other Ports for Coal — Car Supply Improves Slightly.

Anthracite—The local retail market situation has slightly improved, as more coal is being received, where railroads can make all-rail deliveries to yards.

The wholesale market is mixed. No wage agreement has been reached by the operators and miners. But the price situation has been clarified by the following announcement of new prices (f.o.b. mines) by the Philadelphia & Reading company retroactive from May 11; Broken, $7.50; egg, $7.20; stove, $7.45; chestnut, $7.50; pea, $5.75; buckwheat, $4.10; rice, $3.00; and barley, $2.25. The Delaware, Lackawanna & Western, Lehigh & Wilkes-Barre and the Lehigh Valley companies have not, as yet, made any changes in their schedule of prices. The variation in prices has caused much confusion among the retail dealers who have several sources of supply.

With the Federal Government taking a hand in the movement of coal and the local harbor trouble, it is thought that shipments to this harbor should show an improvement within a few days.

The companies sending their output to the upper ports in this harbor have been able to make quicker deliveries to customers than have those shipping to the lower ports.

Current quotations for company coal per gross ton at mine and f.o.b., tidewater, at the lower ports are as follows:

	Mine	Tidewater
Broken	$5 95@$7 50	$7.80@$9 35
Egg	6 35@ 7 35	$8 20@ 9 20
Stove	6 60@ 7 70	8 45@ 9 55
Chestnut	6 70@ 7 70	8 55@ 9 55
Pea	5 30@ 5 75	7 05@ 7 50
Buckwheat	3 40@ 4 10	5 15@ 5 85
Rice	2 75@ 3 25	4 50@ 5 00
Barley	2 25@ 2 50	4 00@ 4 25
Boiler	2 50	4 25

Bituminous—The greater movement of coal cars, as promised by the railroads, will go a long way towards improving market conditions, but is not likely to change local conditions to any great extent unless decisive action is taken to remedy harbor conditions here.

Quotations change over-night and deliveries are uncertain. The railroads are still taking coal in large quantities for their own use, much to the deteriment of shippers and their customers. Car supply is said to be better, some districts reporting a greater percentage of receipts than for several weeks back.

Local labor troubles have caused many steamers to go to the Southern ports for bunker supplies. Reserve supplies at the factories depending upon water deliveries are showing usage, while the inland plants have plenty of coal for immediate need.

Grades are little thought of by buyers these days unless it is absolutely necessary, and medium coals have been quoted at from $6.50 to $7 at the mines, while tidewater quotations have been firm around $10 to $10.50 with slight increases heard of in some instances.

PHILADELPHIA

All Anthracite Companies Announce Price Schedule—Dealers Receive Light Shipments and Stocks Are Depleted—One Big Company Contracting Certain Sizes — Bituminous Trade in Bad Shape — Small Tonnage Arriving — Active Vessel Chartering.

Anthracite—Despite the fact that the wage controversey has not yet been settled, all shippers have now announced a price schedule for the current month. The biggest stripper announced prices from May 11 as follows: Broken $7.50, egg $7.20, stove $7.45, nut $7.55 pea $5.75, buckwheat $4.10, allowing other sizes to remain unchanged. These are the lowest prices for any company, the nearest other big company being 15c higher on egg, 25c on stove, 15c on nut and 25c on pea. All prices quoted are f.o.b. mines per gross ton, and are subject to change without notice.

The dealers in this territory are most urgently in need of coal of all sizes. The desire of the consumer for stocking has been so strong that the supplies of all retailers have been depleted. The bulk of the production seems to be going into New England, although the West is also beginning to get a share.

The independent shippers are said to be getting quite a little advance over the circular prices announced by them in the outside markets, and there are reports of sales of egg, stove and nut around $9.50 to $9.75, at the mines.

The dealers received big shipments five weeks ago and they cannot expect any heavy consignments until next fall. The retail prices for stove and nut vary from $12.75 to $13.50. Pea is pretty generally held around $10.50 a ton.

Using the present prices of the largest shipping company as a basis, the prices per gross ton at mines for line delivery and f.o.b. Port Richmond for tide are as follows:

	Line	Tide
Broken	$7 50	$9 35
Egg	7 20	9 35
Stove	7 45	9 30
Nut	7 55	9.40
Pea	5 75	7 35
Buckwheat	4 10	5 15
Rice	3 00	3 90
Boiler	2.50	3.50
Barley	2 25	3 15
Culm	1.50	2 40

BALTIMORE

Great Export Demand Forces Soft-Coal Prices Up — Best Coal, $7 at Mines — Many Ships Await Export and Coastwise Cargoes—Anthracite Prices Moving Up and Receipts Light.

Bituminous—Soft coal prices have gone up and up under the great export demand at tide here, the steady call for coal to keep domestic plants running and the fact that the car supply is so poor.

The average range of prices here, mine basis the net ton, are as follows: Best coals, such as run to pools 9 and 71, $7.25 to $7.50; No. 10, $7 to $7.25; No. 11, $6.75 to $7, and No. 18, $6.50 to $6.75. The low level of prices is around $6.50 for the least desirable coals at the mines the net ton.

As high as $8.50 and $8.60 a gross ton is being paid at the mines for best coals, and around $7.80 a gross ton for only a fair run of coal at the mines. Gas coals are about on a par with the quotations on steam coals as above; any screened high-volatile fuel being worth around $7; and run-of-mine around $6.25 to $6.50.

The great export demand continues, but conditions have combined to cause a congestion of vessels. At present there are between 30 and 40 ships astream here waiting to take on a total of about 175,000 tons.

The Curtis Bay pier of the Baltimore & Ohio has set still another world's loading record. On Thursday last a steamer was loaded with 7,222 tons in one hour and 58 min., or at rate of 3,672 tons an hour.

Anthracite—Hard coal keeps moving up in the wholesale prospect. Some of the independents are talking of $8.50 per ton coal f.o.b. mines. Such a price would mean, with a $2.68 freight rate (as at present) and a gross margin of profit for retailers of between $2.50 and $3 per ton, a cost of around $14 or more to the consumer, with the prospect of a $15 ton of coal for next fall. Receipts here are light, and coal men are merely booking orders at a price to be set at time of delivery.

Lake

BUFFALO

No Improvement in Bituminous Situation—Mines North of Pittsburgh Furnish Coal — Pittsburgh Out of Local Market — Lake Loading of Anthracite Active—Coke Strong but Inactive.

Bituminous—The situation does not improve, some shippers declaring that it grows worse every day. Still the factories and public utilities keep going unless they are held up by strikes.

But for the activity of the mines this side of Pittsburgh, such as Allegheny Valley, Reynoldsville, Shawmut and Clearfield, the bituminous trade would be completely demoralized, for it is practically impossible to get Pittsburgh coal at Buffalo, the strike in the Pittsburgh district being much more general than it is further north.

No Pittsburgh coal is to be had, so it is not possible to obtain any figures of that trade; as to other coal, the prices are $6 up at the mines for mine-run, which is about all that is offered, Clearfield being always marketed in that form. The latter does not come here in any quantity, for the freight is too high, but it can be sold to cover the eastern market of the state and New England.

Anthracite—The fixing of the price of hard coal has added 85c. a ton to the wholesale prices of the leading sizes, with a ten-cent monthly addition besides. Not all of the companies have yet adopted this advance, but they probably will do so. The supply is so short that coal consumers cannot complain much.

The Lake loading of anthracite is active, considering that only two companies have gone into it as yet this season. For the week the loading amounted to 89,400 net tons of which 11,400 tons cleared for Chicago, 18,600 tons for Milwaukee, 8,500 tons for Sheboygan, 46,900 tons for Duluth-Superior, and 4,000 tons for Detroit.

Coal freights have been fixed at 50c. to Duluth and principal Lake Superior ports, 60c. to Milwaukee, 65 and 70c. to Chicago and 10c. more to minor ports.

Coke—All coke is strong, but not active at rather irregular prices, as the consumers will not buy in the open market if they can help it. Jobbers quote Connellsville foundry at $15.10, furnace at $13.60 and chestnut domestic at $9.90, all per net ton, f.o.b. Buffalo.

CLEVELAND

Bituminous Stocks Low—Interstate Commerce Commission Inaugurates Priorities—Price Tendency Upward—Lake Shippers Enter into Pooling Arrangement.

Bituminous.—Stocks at industrial plants are running dangerously low, while everyday additional plants are reported either shutdown or crippled. Inauguration of priorities for coal by the Interstate Commerce Commission, which may bring mine operations and coal receipts above the present 30 to 40 per cent of normal, constitutes the only present visible ray of hope in the situation. The price tendency for most grades of coal continues upward and dealers predict that regular monthly increases of at least 10c. a ton are probable throughout the summer.

Pocahontas and anthracite — The looked-for boost in anthracite prices has been made, egg being quoted at $13.20; grate from $13.20 to $13.50, and stove $13.50. Shoveled Pocahontas also has been advanced to $11.75 from $10.50. Supplies are scant, but the demand of domestic consumers, seeking to lay in next winter's supply, is growing.

Lake trade—Although the pooling arrangement entered into by Lake shippers has been undertaken in the hope of averting a famine in the Northwest, shippers say that its success depends wholly upon the car supply. Railroad men say that the best that can be hoped for is a 60 per cent car supply during the present season, and at present it is far below that figure. The pooling arrangement follows the war-time plan in effect in 1918.

Retail prices of coal per net ton delivered by dealers in Cleveland are:

Anthracite — egg, $13.20; grate, $13.20@$13.50; chestnut, $13.50, and stove, $13.50.

Pocahontas—shoveled lump, $11.75; and mine-run, $9.25.

Domestic bituminous—West Virginia splint, $9.50; No. 8 Pittsburgh, $7.75; Millfield lump, $9.10, and cannel lump, $11.50.

Steam coal—No. 6 and No. 8 slack, $8.50; No. 6 and No. 8 mine-run, $8.50, and No. 8 ¾-in. lump, $8.

MILWAUKEE

Soft-Coal Supply Uncertain—No Way Found to Relieve Situation—Domestic Anthracite Plentiful With Prices Steady.

Uncertainty of the soft coal supply is keeping Milwaukee manufacturers anxious. It is a "hand-to-mouth" game at present, with all industries and public utilities scraping their bins daily. Any prolonged interruption of the meager supply would lead to a shut down of numerous factories.

Many conferences of business men and city officials have been held, but no way has thus far been found to relieve the situation. The railway strike must be settled and more coal cars furnished before an improvement can be expected. Receipts by Lake and rail continue much below normal.

Domestic consumers of anthracite find little difficulty in procuring supplies and deliveries of this nature are quite brisk. Prices are held steady. Consumers of steam coal demur at present prices, but are forced to accept the situation. The summer schedule of rates on coal is due and will probably be formulated before the end of May.

Cargo receipts by Lake (up to this writing) aggregate 86,890 tons of anthracite and 102,920 tons of soft coal, against 150,839 tons of the former, and 438,661 tons of the latter up to the same date last year.

Inland West

COLUMBUS

Lake Priority Orders Desired — Reduced Output from Ohio Mines — Demand Strong and Prices Soaring — Railroads Taking Fair Tonnage — Hocking Valley and Pomeroy Bend Furnish Bulk of Coal.

Shippers are trying to get priority orders for Lake movement and the Ore & Coal Exchange, at Cleveland, under the management of H. M. Griggs has been revived. So far the amount of coal loaded amounts to practically 700,000 tons, as compared with about 4,000,000 tons in previous seasons. A crisis can only be avoided by quick action. The requirements of the Northwest are placed at approximately 28,000,000 tons.

Reduced car supply resulting from the Switchmen's strike and the attending congestion here reduced the output in Ohio mining districts to about 40 per cent of normal. Eastern Ohio is probably in the worst condition with only 25 per cent operation. In the Hocking Valley field the output is about 40 per cent and possibly higher. Cambridge and Crooksville report about the same percentage. Pomeroy Bend district is having about 50 per cent run which shows up slightly better than the previous week.

Demand is increasing from all sources In the steam field, manufacturing plants are actively bidding for free tonnage in competition with public service concerns and with state and county institutions. Quite a few manufacturing plants have been partly closed for want of fuel. Others are operating from hand to mouth without adequate reserves. Prices are consequently soaring. Railroads are taking a fair tonnage, part of which is being confiscated.

In the domestic trade retailers are out of stocks. Prices do not appear to be an object at this time but rather the ability to receive shipments promptly.

Pocahontas is practically out of the Columbus market. Some West Virginia splint is arriving but the main bulk of local supplies comes from the mines of the Hocking Valley and Pomeroy Bend. Retail prices are soaring in sympathy with quotations at mines.

Hocking lump is selling at $7.50 to $8 delivered, while mine-run is about 25c. lower. West Virginia splints are retailing at $8.50 to $8.75 for lump and practically the same for mine-run. Pomeroy lump is strong around $8 and Pocahontas is retailing at $10.50 to $11.

Prices at the mines of the principal coals used in this territory are:

Hocking lump	$4 50 to $5 00
Hocking mine-run	4 25 to 4 75
Hocking screenings	4 00 to 4 75
Pomeroy lump	4 [illegible] to 5 00
Pomeroy mine-run	4 25 to 4 75
Pomeroy screenings	4 25 to 4 75
West Virginia splints lump	5 25 to 6 00
West Virginia mine-run	5 00 to 6 00
West Virginia screenings	4 75 to 5 75
Pocahontas lump	6 50 to 7 25
Pocahontas mine-run	6 50 to 7 25
Pocahontas screenings	6 25 to 7 00

CINCINNATI

Little Improvement in Fuel Situation—River Transportation Increased—Operators Prepare to Store at Mines—Prices Firm and Demand Excellent from Householders.

There has been little, if any, improvement in the local fuel situation, the demand for all kinds of coal continuing intense. Every endeavor is being made to increase the volume coming down the Ohio River, as operators feel that this is about the only channel through which a somewhat like normal supply can reach Cincinnati and vicinity.

Kentucky mines are better supplied with cars than those of Ohio, West Virginia and Indiana, but on the whole, even the car supply in Kentucky is far below the adequate needs of the operators.

Practically all Cincinnati coal companies have prepared for shortage at the mines, hoping in that way to be ready, when rail conditions right themselves sufficiently, to get the coal to market. The larger companies are finding it a hard matter to stem the tide of higher prices and cannot safely take new orders. The conservative prices for smokeless coal are $5.25 for lump and egg, and $4.25 for run-of-mine, delivered, carrying in addition the wage increase of April.

Splint coal of the better grade is quoted by the conservatives at $4.50 for block (lump and egg); run-of-mine, $4.25; and nut-and-slack, $4. Other companies are quoting $4.50 to $6.50 for lump, egg (block, all sizes) and nut-and-slack; run-of-mine, $5 to 6, and in many cases $6.50.

In the retail market the demand from the householders continues excellent. Prices are firm. The retail prices delivered are: Bituminous—lump, $8 to $8.25; nut, $6.75 to $7.50; run-of-mine, $7.25. Smokeless—lump, $9.25; run-of-mine, $8.50. Anthracite sells at $14.

ST. LOUIS

Railroad Conditions Still Bad, with Few Empties to Mines—Demand Good for All Coal, at Top Prices, with Little Moving — Railroads Get Most of the Coal

There is not much improvement in the local railroad terminals. A little coal continues to move in to St. Louis in train lots of 10 to 30 cars to central unloading points; but the switching facilities are such that cars cannot be set in at different plants. Many plants are running on reduced time on account of the lack of fuel.

On account of car shortage the price of coal continues to go up. Chicago parties are bidding in the St. Louis market as much as $4.25 for mine-run, $4.50@$4.75 for lump, egg and nut, and $3.50 and upwards for screenings.

In the Standard field the mines are working from one to three days a week on railroad coal. In the Mt. Olive field a little better working time is given on commercial coal, perhaps two days a week. The railroad tonnage continues heavy. The prices here range from $3.25 to $3.50 for domestic sizes, and $2.75 for mine-run. Steam sizes are all contracted.

In the Carterville field of Williamson and Franklin counties the circular is not being maintained. Working time varies from one day a week on commercial coal to five days a week on railroad coal; the mine loading railroad coal gets all the cars.

The Missouri Pacific R.R. is trying to obtain a $2.60 price on mine-run coal for railroad use, while many other roads are paying higher. A somewhat similar condition exists on some of the trunk lines entering East St. Louis with regard to the operators on their roads. The Pennsylvania is reported to have purchased 1,000 cars of 2-in. lump at about $3. at the mine.

Retail prices have not changed and the demand is easy. No Arkansas is moving in and nothing from the eastern smokeless fields. A little anthracite is on the way. The supply of coke is exhausted.

DETROIT

No Improvement in Soft-Coal Situation—Utility Companies Appeal to Interstate Commerce Commission—Little Anthracite Coming In—Pooling System for Lakes.

Bituminous—Shipments of bituminous coal into Detroit and Michigan appear to show no substantial increase. Industrial establishments and many public utility plants throughout the state are maintaining operation on practically a day to day supply, with uncertainty as to being able to continue. Insufficient supply of railroad equipment is held to be the principal reason for deficiency in shipments.

Representatives of public utility companies of the state who visited Washington May 19, presenting their appeal for relief to the Interstate Commerce Commission, were unable to obtain any promise that coal would be supplied in more liberal amount. The suggestion that a priority order be made to apply to coal consigned to Michigan public utilities, was productive of no action along that line. The commission advised the delegation that it would be necessary for the people of Michigan to take the places of the striking railroad switchmen if the railroads were to deliver coal.

It was brought out in the hearing that a number of Michigan manufacturers have sent representatives to the mining regions, and, in the effort to get coal, prices have been bid up to as high as $6.75 a ton at the mines for mine-run.

Anthracite—Little anthracite is coming to Detroit and yards of retail dealers are in many instances without stock. The outlook is pronounced quite unfavorable and predictions are being made that many household consumers will be unable to get a supply for next winter.

Lake Trade—In the effort to facilitate shipments of coal by Lake routes, shippers and the transportation companies have agreed to renew the pooling system, which was in effect in 1918, during the remainder of this season.

MIDWEST REVIEW

Operators Have Filled Old Orders and Now Sell Spot Coal—Factories Run on Quite Short Stocks — Railroads Hold Coal on Sidings — Leading Roads Optimistic—Car Pooling Approved.

Coal can now be purchased at a price, whereas even a week ago, steam plants and wholesalers were having difficulty in making purchases at any price. Operators have been able to fill old orders and are now holding all of their coal for current shipments.

Spot coal is bringing a premium. The better grades of coal from Illinois are still being sold at circular prices, but other grades, both from Illinois and Indiana, are being sold to the highest bidder.

The congestion caused by the switchmen's strike, and the resulting embargoes, is still hurting traffic. Practically every factory in the Middle West is running on a hand-to-mouth basis. The average householder is quite nervous and is doing everything he can to buy his winter's supply of coal during the summer months.

It is said that the railroads are holding considerable coal on their lines, considering confiscation. This rumor has caused widespread dissatisfaction among coal men.

The railroads claim they are not holding coal, but are trying to ship fuel right through to destination as quickly as possible. However, there are a number of side tracks filled with loaded cars of coal.

The Chicago & Alton claims that the movement of fuel to industries is nearly normal. The Chicago, Burlington & Quincy states that it is now loading about five hundred cars daily against a normal seven hundred. Other roads report in a like manner.

The railroads applied to the Interstate Commerce Commission for assistance and the commission is considering the pooling of cars as was done during the war. It is generally thought that the pooling system will help matters a great deal.

It is hoped that when the car-pooling system is inaugurated, Illinois and Indiana mines will be able to run at least fifty per cent of the time, as then the situation will be quite rapidly relieved.

CHICAGO

Chicago Faces Fuel Famine—Critical Condition of Yards of Large Retail Dealers — All Look to Interstate Commerce Commission for Relief.

Chicago is now face to face with a fuel famine. This shortage, of course, is a direct result of the freight congestion and lack of coal cars at the mines. Luckily, earlier in the week, the weather suddenly became warmer.

Dealers are supplying their domestic trade in half-ton lots. Steam plants are so short of coal that they are depending entirely on the railroads for prompt deliveries. If there is any delay the factory shuts down awaiting the arrival of the coal.

There is a concern in Chicago that maintains 47 retail yards. In normal times this company has approximately 150,000 tons of coal on hand. Today there are 7,000 tons in its various yards. This concern says if it receives and unloads 225 cars per day from now until Nov. 1, the company will go into the winter months without any appreciable surplus on hand.

The coal trade and those interested in the trade, are earnestly hoping that the proposed plan of the Interstate Commerce Commission to pool all coal-carrying equipment, will result in a much better car supply at the various mines.

If all the Illinois and Indiana mines receive a 50 per cent supply and only that for the next 90 days, it is pretty generally conceded fancy prices will disappear from the market, coal will be selling at reasonable prices, and there will be enough for everybody.

South

LOUISVILLE

Buyers Force Up Prices by Strong Demand for All Grades—Production Continues Light—Priority Ruling Expected to Improve Conditions.

Prices have advanced sharply during May as a result of buyers from Chicago and other points entering the Kentucky fields and bidding up the markets; being badly in need of immediate shipments, and not caring much about the price apparently.

There is a strong demand for all grades of coal. Retailers' yards are empty and they are buying steadily. Steam consumers are also buying and there is also a Lake region demand.

Practically no contracts are being made. Present selling is on a spot basis for immediate use, as lower markets are predicted.

Production in some sections of the state is on a 33 per cent basis, others doing as well as 45. Car shortage continues bad, but the new regulations and priority rulings are expected to aid materially.

Movement of solid trains of empties back to the mines may mean a much better fuel supply at an early date. However, much mine labor has deserted and it is a question whether mines can use a full car supply.

Quotations at mines are as follows: Western Kentucky block, $3.50@$3.75; mine-run, $3.25@$3.50; nut and slack, $3@$3.25; pea and slack, $2.75@$3.

Eastern Kentucky coals are selling at $4.50@$6.75 a ton, good byproduct mine-run and block selling at around $6.50@$6.75 except among a few operators who have restricted prices on block to $5, having advanced from $4.50. There is no material difference between mine-run and block prices in most instances today on the Eastern Kentucky market. Nut and slack in some instances has been quoted at $4.50 but it would be hard to find much under $6 a ton.

One concern reports quotations of $3.60 a ton for 1¼-in. Western Kentucky nut; $3.75 for 2¼ in.; $4 for run-of-mine; and $5.25 for 4-in. lump, at mine.

Retailers have advanced prices fifty cents a ton on all grades. Eastern Kentucky block sells for $9.25; mine-run, $8.75; nut and slack, $8.25; steam mine-run, $7@$7.50; screenings, $6.50@$7; West Kentucky lump, $7.50; mine-run, $7; screenings, $6.50; steam mine-run, $6@$6.50; screenings, $5.50@$6.

BIRMINGHAM

Car Supply Irregular, with No Improvement Over Last Week—Stiff Demand for All Grades—No Spot Coal—Steam Coal Users Quite Short of Fuel — Mines Operate 80 Per Cent Normal.

Conditions in general affecting the coal trade in this district have shown little change during the past week. The car supply has improved little, if any. Production is badly demoralized by the irregular and uncertain car supply, at least one and two days per week being lost in many instances.

Although there is a stiff demand for all grades of coal, there is little to offer the spot trade and this comes mostly from the small mines. The larger companies are applying the restricted output they obtain to orders in hand in an endeavor to keep their customers going; they have no coal to offer and are, therefore, taking on no new business.

Industries, public utilities and railroads are all quite short on fuel and are operating on a practically hand-to-mouth basis. Premium figures of from 75c. to $1.50 per ton can be easily obtained for spot coal, but conservative interests are holding down quotations and not taking advantage of trade conditions to sky-rocket prices.

The Southern Ry. has placed some contracts the past week for fuel for the next 12 months, paying $2.85 to $3.20 per net ton mines for Big Seam mine-run coal. Its fuel contracts do not expire until June 30. Quotations for steam coal are as follows per net ton mines:

	Mine-Run	Prepared
Big Seam	$2.[illegible]5@$3.25	$3.45
Black Creek	4.00	4.45@$4.50
Cahaba	4.00@4.35	4.35
Carbon Hill	3.35@3.50	3.50
Nickel Plate	3.35@3.50	

Domestic schedules are as follows per net ton mines:

	Lump
Big Seam	$3.50@$3.60
Black Creek	5.00@5.75
Cahaba	4.[illegible]@[illegible].00
Carbon Hill	3.[illegible]@[illegible].85
Montevallo	7.[illegible]
Corona	5.65
Straven	6.75

The output of the Alabama field, for week ended May 8, was approximately 329,000 tons. Labor is working irregularly, averaging about 80 per cent full time. There is also a shortage in some sections.

News
From the Coal Fields

Northern Appalachian

FAIRMONT

Car Supply Uncertain and Much Idleness Results—Pennsylvania Moves Big Tonnage—P. & L. E. Badly Crippled—Tidewater Shipments Heavy — Railroads Take Half of Output.

The car supply in the Fairmont and other northern West Virginia regions, during the week ended May 15, was quite uncertain. Consequently much idleness resulted. For a time mines on the Monongahela R.R. were almost entirely without equipment. Throughout the northern part of the state transportation conditions were such that few if any mines were able to load to 50 per cent of potential capacity.

Monday's supply of empties on the Monongahela division of the Baltimore & Ohio amounting to 1,451 cars, enabled mines to load a fairly large tonnage but did not permit mines to load to capacity. Monongahela mines fared better with 314 cars than they did at any other time during the week, it being the largest supply vouchsafed the mines in some time.

Much congestion still existed at Brownsville, Pa., the northern gateway for all mines on the Monongahela R.R. While the Pennsylvania R.R., was moving a large volume of coal freight out of Brownsville, Pittsburgh & Lake Erie was still so badly crippled that it was unable to handle any coal, a strike on the part of additional switchmen and yardmen tending to further complicate matters.

The tonnage consigned to Lake docks during the week was extremely limited, due in part to the meager car supply and in part to the heavy tonnage going to tidewater.

While tidewater shipments continued to be unusually heavy, it was reported toward the end of the week that stocks of coal on hand at tidewater were growing low. Notwithstanding that fact, pool 18 (Curtis Bay) low-volatile coal, was under embargo. Shipments to Western markets in general were slim.

There were days, during second week of May, in northern West Virginia when only about half the cars furnished were being loaded with coal for commercial purposes, the other half of the output going for railroad fuel. The railroads obtained such fuel by assigning cars—a practice denounced by operators.

It was also reported that some of the coal from Fairmont region was being confiscated in transit. It was stated in some quarters that eastern railroads were closing contracts for railroad fuel at $3.50 a ton.

PITTSBURGH

No Improvement in Rail Coal Movement — Car Shortage Acute — River Mines Working Full — Shortage of Coal Everywhere — Fancy Prices for Gas Coal.

There has been no improvement in coal movement in the Pittsburgh district in the past week, or probably in the past fortnight. The river mines are working full. Rail shipments in the whole Pittsburgh district are not over about 25 per cent of normal.

The two main difficulties are, the car shortage in general and the fact that the Pittsburgh & Lake Erie is not functioning to any extent. The Pennsylvania and Baltimore & Ohio are operating moderately well, so far as the freedom of their rails is concerned, but they are quite short of cars.

The condition in this respect is different from that existing in the first two or three weeks of the rail strike, when there was fairly heavy loading, but many of the cars when loaded did not travel any distance. At the present time nearly all the coal loaded out gets through to destination.

The old congestion remains, and it will be one of the efforts of the railroads, under direction of the Interstate Commerce Commission, to clear this congestion. This in itself would give consumers a considerable tonnage of coal.

CONNELLSVILLE

Production Low, Regulated by Car Supply—Much Coke Going by Water—Demand Limited at High Prices.

Production in the past week has been about the same as in the previous period representing a slight decline from the maximum reached during the strike, and about two-thirds the rate prevailing before the strike. Production is regulated entirely by car supply, which is extremely poor.

The Pittsburgh & Lake Erie is scarcely functioning at all and it normally furnishes one-half the cars for the Monongahela R.R. The Pennsylvania and Baltimore & Ohio are operating fairly well so far as shipping is concerned, but are quite short of cars.

A quite considerable part of the output of the Connellsville region is going by water, and unusual efforts are being made to secure additional barges for this work. There is little stocking of coke now, and the "push ovens" cannot stock at all.

Nearly a week ago the spot furnace coke market advanced to $15, per net ton at ovens. Demand since then has been limited in point of tonnage, most of the furnaces that need coke refusing to pay such a price and preferring to slacken operations or bank entirely.

Foundry coke has sold in the open market at $15, but two or three important producers refuse to price their coke at above $12, and sell to regular customers what they can spare at not above this figure. There are no negotiations for contract coke, leaving the market quotable at $15 for furnace and $12@$15 for foundry, per net ton at ovens. The *Courier* reports production in the Connellsville and Lower Connellsville region in the week ended May 15 at 154,400 tons.

Estimates of Production

FROM THE WEEKLY REPORT OF THE GEOLOGICAL SURVEY

BITUMINOUS COAL

	1920		1919(*a*)	
	Week	Calendar Year to Date	Week	Calendar Year to Date
May 1*b*	8,899,000	175,152,000	8,022,000	141,541,000
Daily average	1,483,000	1,679,000	1,337,000	1,357,000
May 8*b*	9,092,000	184,244,000	8,438,000	149,979,000
Daily average	1,515,000	1,670,000	1,406,000	1,352,000
May 15*c*	8,773,000	193,017,000	8,436,000	158,415,000
Daily average	1,4[illegible]2,000	1,660,000	1,406,000	1,362,000

ANTHRACITE

	1920		1919(*a*)	
	Week	Calendar Year to Date	Week	Calendar Year to Date
May 1	1,792,000	27,692,000	1,717,000	25,118,000
May 8*b*	1,840,000	29,531,000	1,782,000	26,900,000
May 15*c*	1,726,000	31,257,000	1,760,000	28,660,000

BEEHIVE COKE

United States Total

Week Ended				
May 15 1920	May 8 1920*b*	May 17 1919	1920 to Date	1919 to Date *a*
348,000	370,000	211,000	8,093,000	7,875,000

(*a*) Less one day's production during New Year's week to equalize number of days covered for the two years. (*b*) Revised from last report. (*c*) Subject to revision. All figures in net tons.

Middle Appalachian

POCAHONTAS AND TUG RIVER

Mines Work 40 Per Cent—Heavy Eastern Demand and Uncertainty of Return of Cars from the West — Customary Coke Output.

During the second week of May the Norfolk & Western car supply was much curtailed due to lack of cars from the West. Under ordinary conditions, the Norfolk & Western supplies all the mines on its lines from Williamson to Wilcoe with empties obtained from the West, other parts of the system being supplied from eastern sources. The car shortage was so acute in certain fields during the last of the week that no mines except those producing railway fuel were able to operate. Even in the Tug River, Pocahontas and Clinch Valley regions cars were insufficient to keep the mines running for more than 40 per cent of the full working time.

Few producers, took advantage of the opportunity to consign coal to the Lakes, because of the heavy Eastern demand, higher prices in the East and the uncertainty as to when the cars used for Lake and Inland West shipments would be returned.

So long as conditions remain subnormal in the West, insofar as the movement of coal is concerned, there is apt to be a continuance of unusually heavy tidewater shipments, from the Tug River field.

Irregularity of operations followed in the wake of a continued shortage of cars in the Pocahontas district in the week ended May 15.

Production was still not over 40 per cent, with the car shortage still in excess of 250,000 tons. The usual amount of coal, however, was coked, amounting to about 13,000 tons. The long haul from tidewater complicated with other troubles made it difficult even to secure cars from the East.

NEW RIVER

Little Improvement in Output — Coal Goes to Tidewater and to Inland East—Small Lake Shipments — Gulf Works Under Half Time.

Though there was still a material shortage of cars in the New River field, during the second week of May, a slight increase in the output of that field was recorded. The production for the entire week was about 110,000 tons. Aside from the larger production on Monday, there was no real improvement in the transportation situation in the New River field.

Since few cars were being received from Western markets, shipments were limited to that part of the country. The bulk of New River production was finding its way to tidewater and to Inland East markets; tidewater points receiving the major portion of the coal which was intended for export and for bunkering purposes. Little coal was being consigned to Inland West markets so the tonnage for the lakes was also small.

The higher scale of prices prevailing at tidewater had something to do with the larger eastern consignments. The heavy movement of both smokeless and high-volatile coal to the East tended to slow up the movement owing to crowded side-tracks between the mines and tidewater. The movement of New River coke to Western markets had grown in volume somewhat and was slowly returning to normal.

Less coal was loaded in the Winding Gulf field during the week ended May 15 than during the previous week; mines on the Virginian Ry., having only a three-day car supply; on the Chesapeake & Ohio, mines operated only two days out of the six.

KANAWHA

Decreased Production Due to Acute Car Shortage—Tonnage Goes to Tide Rather Than West — Price and Movement of Cars Influence Shipments.

Less coal was produced in the Kanawha field, during the period ended May 15, than in the preceding weekly working period, production being limited to about 85,000 tons, or between 40 and 50 per cent of potential capacity.

A most acute shortage of cars was entirely responsible for the greatly curtailed output. The shortage in empties was directly traceable (in part) to the fact that not more than 300 or 350 cars a day from Western lines were being received for distribution by the Chesapeake & Ohio.

Tidewater tonnage preponderated over every other class of shipments from the Kanawha field, tending to cut down the tonnage available for Western shipment due to the difficulty in getting coal through to the West.

LOGAN AND THACKER

Long Eastern Haul and Few Cars from the West; Reduce Output — Logan Works One-Third Time — Logan and Thacker Coal Goes to Tide.

So acute was the car shortage in the Logan field, during the second week of May, that production was reduced to about the level of the last week of April when the full effect of the strike was being felt. The output reached 173,000 tons during the first week of the month, but it dropped to about 133,000 tons during the week ended May 15. For the final week of April, 155,000 tons were produced.

The long haul from Eastern terminals and the meager supply of empties from the West were chiefly responsible for a reduction in the output. Logan mines were only producing at the rate of about 35 per cent of capacity.

Of course with the car supply so greatly restricted, it was difficult to comply with contract requirements for Western consignment; hence sales and shipment of spot coal were almost insignificant, insofar as Western markets were concerned; that being equally true as to Lake shipments.. The greater proportion of the Logan output was finding its way to the seaboard.

While Thacker district mines had managed to speed their output up to 119,000 tons, or about 46 per cent of potential capacity, during the week ended May 8, production fell behind that mark to quite an appreciable extent during the second week of the month, due to a most pronounced shortage of cars. The only mines operating during the last of the week were those holding contracts to furnish railroad fuel.

Cars were scarce, because so little equipment was finding its way to this territory from the West. Virtually the entire output of the Thacker field was being sent to tidewater.

NORTHEAST KENTUCKY

Mines Operate Half Time — Output Largely Under Contract, with Little Spot Coal.

The output for the week ended May 15 slumped from 126,000 to 122,000 tons, car-shortage losses climbed from 143,000 tons to 165,000 tons, an increase of 22,000 tons. Mines were being operated only about half the week.

While there had been a recovery on lines operating in northeast Kentucky, connecting lines were still suffering from the effect of the switchmen's strike. Lake shipments were disappointingly small. There was a heavy demand for byproduct coal.

Fully 80 per cent of the output of the northeast Kentucky field is under contract at figures prevailing more than a month ago; the high prices now being offered for spot coal only applies to a limited portion of the output of the field.

Unless there is a material improvement in transportation conditions, operators in the field are not sanguine that mines generally will be able to work more than 50 per cent of potential capacity for some time to come.

VIRGINIA

Output Decreases as Car Supply Grows Worse—Men Leave for the Farms.

Production in the Virginia fields during the week ended May 15 reached only 101,700 tons, showing a decrease, as compared with the previous week, of nearly two thousand tons, which went to show that the car situation had grown somewhat worse. The poor car supply was responsible for a loss of 68,000 tons, while the loss from a labor shortage amounted to only 9,800 tons. The tidewater movement of coal, after being embargoed for a time, was renewed under permit. At the same time prices on spot coal climbed to $5 a ton with little free coal available to meet the open market demand.

Labor troubles were lacking but few mines, however, had a full complement of men owing to the desertions to the farm for the summer months. Producers found it impossible, owing to limited transportation facilities, to keep pace with the demand.

Middle Western

INDIANA

State Mine Inspector Submits Plan to Governor — Considerable Legislation Proposed.

That a commission be created to codify Indiana mining laws and to have other powers, is proposed in a letter Cairy Littlejohn, state mine inspector, has submitted to Governor Goodrich.

Indiana mining laws are in a disjointed condition, says Mr. Littlejohn, and they should be worked into a harmonious whole. He would have additional legislation covering the use of electricity in mines; providing for the revocation of mine and fire-boss licenses, now held for life; regulations regarding the troublesome washhouse problem and other new legislation to accomplish what many mine inspectors fruitlessly have recommended to legislatures.

Mr. Littlejohn believes the state mine-inspection force should be increased and have a more adequate fund. Also that strip and small mines should be placed under the jurisdiction of the state inspection department.

It is possible that considerable legislation may be proposed regarding coal mining in Indiana. Just now Mr. Littlejohn is said to be having considerable difficulty with some coal and mining companies that are paying little or no attention to providing the inspection department with information it wishes.

SOUTHWEST ILLINOIS

Merger of Standard Field Mines Proposed—About $10,000,000 of New York Capital Involved—Field Supplies Half of St. Louis Fuel.

An effort is being made, it is said, to consolidate under syndicate ownership the 40 coal-mining companies in the Standard field, adjacent to St. Louis (operating 70 mines), with the object of eliminating trade abuses, limiting production and stabilizing prices. The deal is said to be financed by New York interests, and is being promoted by the Stifel-Nicolaus Investment Co. of St. Louis. Options have been obtained on about 40 per cent of the plants in the Standard field, including some of the largest mines in the district, with an output in excess of 50 per cent of the total. Between $8,000,000 and $10,000,000 are involved in the deal. The total production represents between 60,000 and 75,000 tons a day, most of which is marketed in St. Louis.

Elimination of competition in the Standard field, resulting from the merger, would place the entire coal output in the St. Louis district in the hands of a few operators. The Carterville field in southern Illinois is controlled by an association and the Mount Olive field, adjoining the Standard field, is controlled by two or three operators.

The Standard field supplies about half the coal consumed in St. Louis. It is claimed that a consolidation of Standard plants will stabilize the price of coal.

Association Activities

Engineering Advertisers' Association

At the May 11 meeting of the Engineering Advertisers' Association, William Bethke, secretary and editorial director of the La Salle Extension University, and president of the Executives Club of Chicago, addressed the association on the subject, "What Makes Advertising Effective for the Engineering Advertiser?" Mr. Bethke emphasized the importance of making engineering advertising stand on its own merits by giving positive and dependable data regarding the product or service advertised. "Much advertising today," said Mr. Bethke, "has nine strong points and one weak point, and it fails on its weak point. Engineering advertising cannot afford to have a weak point." At this meeting also W. Frank McClure gave a brief history of the National Advertising Commission, of which he is chairman, and explained its functions.

Northern West Virginia Operators' Association

Claiming that northern West Virginia mines supplied by the Pennsylvania, Pittsburgh & Lake Erie, Monongahela and Morgantown & Wheeling railroads are short 16,338 cars for the period between July 1, 1919, and March 1, 1920, George T. Bell (executive vice-president of the Northern West Virginia Operators' Association) recently filed a petition with the Interstate Commerce Commission, praying that a preemptory order be issued by the commission requiring the roads named to furnish the mines on the Monongahela 100 per cent of the orders for cars until the shortage had been overcome. The Commission is also asked to make final award of reparation.

Central Pennsylvania Coal Producers' Association

The annual meeting of the Central Pennsylvania Coal Producers' Association was held in Altoona recently, officers for 1920-21 being elected as follows: President, James H. Allport, Barnesboro; vice president, M. J. Bracken, Gallitzin; secretary-treasurer, Charles O'Neil, Altoona; statistician, W. A. Jones, Altoona; counsel, J. E. Evans, Ebensburg. Announcement was made of the withdrawal of the Berwind-White and several companies in the Buffalo, Rochester & Pittsburgh R. R. district, following the Central Pennsylvania Association consolidating with the Association of Bituminous Operators. Harry Boulton, of Clearfield, is the retiring president. The mines of the association produced 45,970,156 tons of coal last year.

Report of Operating Conditions at Coal Mines in Indiana, April, 1920

PREPARED BY JONAS WAFFLE, SECRETARY INDIANA COAL TRADE BUREAU

Railroads on which Mines are Located	District	No. of Mines	Tons Produced	Full Time Capacity (Tons)	Tons Lost and Causes Therefor — Total all Causes	Car Shortage	Labor Trouble	Mine Disability
Big Four	Terre Haute	6	57,881	170,471	112,590	96,920	14,720	950
B. & O. S. W.	[illegible]	2	26,146	43,319	17,173	16,735	438	
	[illegible]	26	288,871	410,196	181,325	157,255	16,560	7,510
C. & E. I.	(1) [illegible]	17	137,619	289,882	152,263	138,418	10,332	3,513
	[illegible]	43	426,490	760,078	333,588	295,673	26,892	11,023
C. I. & W.	Dana	1	7,734	7,934	200	200		
Central Indiana	[illegible]	1	4,550	4,750	200		200	
	[illegible]	10	72,461	237,699	165,238	157,838	6,200	1,200
C. T. H. & S. E.	[illegible]	25	111,564	341,829	230,265	222,843	6,740	1,182
	[illegible]	35	184,025	579,528	395,503	380,181	12,940	2,382
E. & I.	[illegible]	10	75,239	185,531	110,292	97,171	7,599	5,522
I. & I.	[illegible]	2	7,087	9,899	2,812	1,430	498	884
I. S. & N.	[illegible]	4	17,181	29,759	12,578	7,694	4,683	201
Illinois Central	[illegible]	6	44,657	84,423	39,766	35,005	2,839	1,922
[illegible]	[illegible]	20	154,219	316,629	162,410	112,260	24,600	25,550
	(2) [illegible]	20	113,982	357,586	243,604	216,114	9,830	17,660
P. C. C. & St. L.	(3) [illegible]	21	282,672	732,617	449,945	388,990	28,800	32,155
	[illegible]	41	396,654	1,090,203	693,549	605,104	38,630	49,815
	[illegible]	9	31,222	110,078	78,856	68,339	6,581	3,936
Southern	[illegible]	9	33,112	127,824	94,712	85,389	5,642	3,681
	[illegible]	18	64,334	237,902	173,568	153,728	12,223	7,617
Total		189	1,466,197	3,520,426	2,054,229	1,802,101	146,262	105,866

(1) Includes all mines South of Terra Haute.
(2) Includes all [illegible] Michigan Division
(3) Includes all [illegible] Division and Dugger Branch

Mine and Company News

GEORGIA

Savannah—The Taggart Coal Co. is having plans prepared for the construction of a large new coaling dock on its river front property recently acquired under lease. The proposed new dock will have a frontage on the river of about 750 ft., a depth of 600 ft., and be 65 ft. in height, arranged to accommodate two steamers, and will have a bunkering capacity of about 1,200 tons per hour. Complete coal-handling machinery will be installed, to be electrically-operated.

ILLINOIS

West Frankfort—A fire, starting from an oil explosion, damaged mine No. 18, controlled by the Peabody Coal Co., of Chicago, to the extent of $150,000, on the night of May 12.

KENTUCKY

Lexington—The following Kentucky coal companies have increased their capital stock recently:

The Standard Elkhorn Coal Co., of Garrett, increased from $50,000 to $200,000; the Defiance Coal Mining Co., of Lexington, from $100,000 to $200,000; the High Splint Coal Co., of Williamsburg, from $400,000 to $600,000.

Louisville—A recent report from Jellico, Tenn., was to the effect that the Consolidated Fuel Co. had purchased the properties of the Smoot Creek Coal & Coke Co., Jellico (Charles P. Price, principal owner), at a cost running into seven figures. The same interests recently purchased the West Virginia & Kentucky Coal Co. properties. It is planned to improve the Smoot Creek properties, installing electrical equipment throughout.

MONTANA

Belt—An order has been placed by the Merkle Coal Co., of this place for machinery and equipment for the tipple of the Merkle mine from Chicago. Plans for the installation of the machinery were drawn up by R. R. Vaill, the company engineer, who recently made a survey of the ground. The shipment will include modern bar screens, crushers, and picking tables. A three-ton weighing pan will also be installed for convenience in coaling Great Northern locomotives.

When this equipment has been installed, the plant will probably be one of the best equipped coal mines in the state. The coal will be prepared more economically and the quality of the fuel will be much improved; it can be utilized for commercial and domestic trade.

NORTH DAKOTA

New Salem—Government aid having been given the development of the lignite coal industry in North Dakota, its promoters declare it will become the most important coal industry in the Northwest. A model briquetting plant is to be erected at New Salem by the Government, with an appropriation of $100,000 for the erection of the plant and experimental work. By the process of carbonizing the lignite perfected in the U. S. Bureau of Mines, a lignite briquet will be manufactured to compete with high-grade anthracite.

OHIO

Columbus—The Panhandle Collieries Co. has increased its capital from $125,000 to $250,000 in order to provide additional capital for the development of the property of the company on the Pennsylvania R. R. in Jefferson County. The company is a subsidiary of the Hisylvania Coal Co., of Columbus, and J. W. Blower is at the head.

PENNSYLVANIA

Johnstown—Two thousand acres of coal land along the Potomac, in West Virginia, have been purchased by the A. B. Crichton Coal Co., of Johnstown, for $500,000. The plant is on the Western Maryland R. R., near Vindex, Md., extending to the West Virginia border. The output is 700 tons daily. The new owners will operate the plant under the name of the Manor Coal Co., with the following officers: President, A. B. Crichton; treasurer, John M. Crichton; secretary and general manager, H. A. Crichton, all of Johnstown.

Wilkes-Barre—The Laflin breaker, one of the largest plants of the Hudson Coal Co., located at Laflin near Wilkes-Barre, was entirely destroyed by fire recently. The total loss will amount to approximately $300,000 and will cause more than 500 men to be temporarily out of work.

The fire had gained such headway near the top of the breaker that the fire fighting organizations from nearby towns accomplished little except saving other buildings. Traffic on the Delaware & Hudson and Central railroads was delayed for a time.

An investigation was started by officials of the company who declare there was no one in the plant after 6 o'clock at night. Charles Dorrance, general manager of the company, intimated that the breaker will not likely be rebuilt. Coal from this mine will be sent to the Baltimore colliery for preparation.

The breaker was of wood construction and built nearly 26 years ago. Recently it had been modernized by the installation of 12 new jigs and other repairs at a cost of more than $60,000. It had a daily capacity of 2,500 tons and was insured for about $100,000.

Washington—John A. Bell of Carnegie, Pa., owner and developer of extensive coal acreages in northwestern and western Washington County, recently purchased the interest of Cyrus Ferguson, in the Cedar Grove mine of the Verner Coal Co. in the Avella district, northwest of this place. The reported price in the transaction is $600,000. It is one of the largest workings in the Avella district, and the acreage to be developed through it totals close to 1,000.

An important development in connection with mining in the Avella district is the completion of a survey by the West Penn Power Co., for the purpose of installing a high-tension line through that section. It is understood that it will be run from the Beach Bottom power house and that current will be furnished to mines throughout northwestern Washington County.

Whitesburg—The Consolidated Fuel Co., of Pittsburg, Pa., which recently purchased the mines of the West Virginia & Kentucky Coal Co., has just purchased the property and mines of the Smoot Creek Coal & Coke Co., of Jellico, Tenn. The properties are owned by Charles P. Price and the consideration is said to have been $70,000,000.

The purchaser will install electric mining machinery and electrify the mines, including the installation of electric lights in all employees' homes. E. Stewart arrived here recently to arrange for the building of 100 homes for the employees.

Greensburg — The Humphrey Coke plant, in the old Connellsville basin, near here, has been purchased from the J. H. Hillman & Sons interests by the American Radiator Co. The Humphrey Coal & Coke Co. has been organized as a subsidiary by the American company, the president being A. A. Landon; the vice president, E. F. Fitch; the secretary, W. D. Freyburger; the treasurer, W. H. Hill, the first two being of Buffalo and the other two of Chicago. A. B. Kelley, of Greensburg, will be assistant treasurer and general manager.

Lynchburg—The Ivy White Ash Coal Co. has increased its capitalization from $150,000 to $300,000, to provide for general business expansion. F. E. Turner, Jr., is secretary.

WEST VIRGINIA

Williamson—It is understood that the Pond Creek Coal Co. and the Williamson Coal Co., in which Captain E. L. Bailey, of Bluefield, was largely interested, have been sold to Charleston people, though whom the purchaser or purchasers were has not so far been developed, but it is stated that the sum paid for Captain Bailey's holdings in the two concerns named was more than $1,000,000.

Morgantown—The sum of approximately $200,000 was involved in the purchase of about 750 acres of Pittsburgh and Sewickley coal on Indian Creek, Monongalia County, W. Va. (near Arnettsville), by the Whyel Coke Co.

Beckley—Operations on a large scale in Shady Spring district of Raleigh County, W. Va., are to be undertaken by the Welton Smokeless Coal Co., organized by men identified with the production of smokeless coal. The new company has a capital of $350,000. Prominently identified with the new company are: J. B. Clifton, C. H. Meador, F. L. Conway, and Ashton File, all of Beckley; J. W. Wilson, of Wyco, W. Va.

A majority interest in the Bacontown Coal Co. and in the High Knob Coal Co. has been acquired by John W. Wilson, of Wyco, W. Va., and J. B. Clifton, of Beckley, the interest of C. M. Lilly and others having been purchased. The two companies, adjoining each other, will be reorganized and operated under the name of the Welton Smokeless Coal Co. The purchase of the two concerns and their consolidation under one management, is regarded as one of the important events of the year in the Winding Gulf field, where the two properties are located.

John W. Wilson, of Wyco, and J. B. Clifton, of Beckley, recently acquired control of the coal properties of the Bacontown Coal Co., and the High Knob Coal Co., both in the Widing Gulf field, purchasing a majority of the stock from C. M. Lilly and associates. A more rapid development of the properties may be looked for.

Bluefield—At an estimated cost of $4,000,000, a branch line of the Norfolk & Western (18 miles in length) will be constructed from Lenore, W. Va., along Rockhouse Fork of Pigeon Creek, in Mingo County, opening up about 25,000 acres of coal land for development. While negotiations for the construction of the branch line have been pending for a month or more, it was not until the last of April that negotiations between the United Thacker Coal Co. and the Norfolk & Western were completed. The acreage to be made accessible carries the Thacker, Winifrede, Chilton and Coalburg seams of coal. It is hoped to have the new branch line in operation by July 1, 1921.

It is believed that development work on coal and timber properties on the new branch line will involve an expenditure of about $2,000,000. The United Thacker company has leased large acreages to A. B. Rown, general manager of the Solvay Collieries Co.; to Garner Fletcher, of the Elkhorn Piney Coal Mining Co.; to George S. Wallace, president of the Union Bank & Trust Co. and to H. H. Morris, president of the Standard West Virginia Coal Co.

CANADA

Montreal.—The consolidation of nine steel, coal and transportation companies of Canada into the British Steel Corporation, with a capital of $500,000,000, was announced recently by Colonel Grant Morden. He said it was the largest merger of its kind in the British empire and second only to the United States Steel Corporation.

Colonel Morden declared the consolidation will associate the iron and coal deposits of the Atlantic seaboard of the Dominion with the steel making experiences and financial resources of Great Britain.

Included in the consolidation are:

Dominion Steel Corporation and its subsidiaries; Nova Scotia Coal Co., Ltd., and its subsidiaries; Canada Steamship Lines, Ltd., and its subsidiaries; Canada Foundaries and Forgings, Ltd., and its subsidiaries; Maritime Nail Co. and its subsidiaries; Collingswood Shipbuilding Co., Ltd.; Port Arthur Shipbuilding Co., Ltd.; Halifax Ship Yards, Ltd., and Davie Shipbuilding and Repairing Co., Ltd. Negotiations are in progress with several other enterprises to enter the consolidation, according to Colonel Morden.

Industrial News

Cincinnati, Ohio—The owners of the J. M. Macdonald Coal Mining Co. who had leased their three mines at Rosebud, Harrison County, W. Va., took back these properties on April 1 and will operate these mines themselves. The properties are on the Baltimore & Ohio R.R.; the mine office is at Rosebud and the main office is in the Union Central Bldg., Cincinnati, Ohio.

Philadelphia, Pa.—Members of the Motive Power Battery Sales Department of The Electric Storage Battery Co. of Philadelphia, gathered recently in this place, for their first annual convention. Sixty men were present from points as far west as Denver, as far south as Atlanta and on the north from Canada. The sessions were given over to a close study and review of the storage battery possibilities in connection with the propulsion of electric street trucks, electric industrial trucks and electric mine locomotives. The convention was held in the Green Room of the Bellevue-Stratford Hotel, April 29, 30 May 1.

Personals

L. W. Fogg, general manager of the Tower Hill Connellsville Coke Co., has been retained temporarily by the new owners, the Hillman [illegible]. Mr. Fogg is essentially a builder of [illegible] plants and when the new owners of Tower Hill complete the reorganization, it is understood he will resume his chosen profession as construction engineer.

Mr. Fogg came to the Connellsville region in 1899 as an engineer for the American Steel & Wire Co. to report on the property now developed as the Leckrone, Footedale and Buffington plants of the H. C. Frick Coke Co.

Mr. Fogg was construction engineer for the American Steel & Wire Co., built the Edenborn, Gates and Lambert plants in 1900 and the following year was made general superintendent of operations. In 1903, after the absorption of those plants by the H. C. Frick Coke Co., he became division engineer for the mines south of Connellsville.

In 1904 he commenced the construction of the Brier Hill Coke Co. plant. He became general manager of the Tower Hill copany in 1907, building the present two plants.

Coming Meetings

West Virginia Coal Mining Institute will hold its annual meeting June 7 and 8, at White Sulphur Springs, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

American Wholesale Coal Association will hold its annual meeting June 1 and 2, at Pittsburgh, Pa. Secretary, G. H. Merryweather, Washington, D. C.

Tne Colorado Retail Coal Dealers' Association will hold its annual meeting June 8, at Colorado Springs, Col. Secretary, E. Hopper, Denver, Col.

Southwestern Interstate Coal Operators Association will hold its annual meeting June 8 at Kansas City, Mo. Secretary, A. L. Johnson, Kansas City, Mo.

National Conference of Business Paper Editors will hold its next meeting June 4 at the Congress Hotel, Chicago, Ill. Secretary, R. Dawson Hall, 36th St. and 10th Ave., New York City.

American Institute of Mining & Metallurgical Engineers will hold its fall meeting about Aug. 20. It is proposed to leave Buffalo by steamer and cruise through the Lakes, the first stop being at Houghton, Mich., after which the party will visit Duluth and the Iron Ranges of Minnesota. Secretary, Bradley Stoughton, 29 West 39th St., New York City.

Mine Inspectors' Institute of America will hold its annual meeting July 13, 14 and 15 at Cleveland, Ohio. Secretary, J. W. Paul, Pittsburgh, Pa.

Pennsylvania Retail Coal Merchants Association will hold its annual meeting June 23, 24 and 25 at Reading, Pa. Secretary W. M. Bertolet, Reading, Pa.

The Rocky Mountain Coal Mining Institute will hold its annual meeting in Denver, Col., in conjunction with the National First Aid Meet on Aug. 20 and 21. Secretary, F. W. Whiteside, Denver, Col.

M. O. I. Coal Association will hold its annual convention June 16, 17 and 18 at Cedar Point, Ohio. Secretary, B. F. Nigh, Columbus, Ohio.

National Retail Coal Merchants' Association will hold its annual meeting June 10-12, Detroit, Mich. Secretary-manager, Ellery Gordon, Philadelphia, Pa.

Kentucky Mining Institute will hold its annual meeting June 4 and 5 at Lexington, Ky. Secretary, C. W. Strickland, Huntington, W. Va.

Obituary

George A. Strebel, of Springfield, Ill., for many years superintendent for various mines in the Belleville district, Illinois and well known among Central Illinois coal leaders, died recently at his home as a result of a paralytic stroke. He was, at the time of his death, inspector for the Mine Operators' Indemnity Exchange of Illinois. He was sixty-six years of age and was born in Switzerland.

John Franklin Kiser, a well known coal man of central Ohio, died at a local hospital recently from a carbuncle. He has been connected with a number of operating concerns, the last being the western office of the Elk River Coal & Lumber Co. He leaves a brother and a sister. He was 60 years of age, most of which was spent in Columbus. The funeral and burial took place at West Liberty, Ohio, his former home.

Edward Devoy, age 73 years, one of the most prominent and best known retail coal men in the middle west, died suddenly of heart failure at his home in St. Louis on May 10. For over 40 years [illegible] gaged in the retailing and wh[illegible] coal in St. Louis—formerly wit[illegible] Kuhn Coal & Coke Co., and f[illegible] six or seven years as president [illegible] ward Devoy Fuel Co.

COAL AGE

The Weekly Journal of the Coal and Coke Industries

Volume 17 NEW YORK, THURSDAY, JUNE 3, 1920 Number 23

National Coal Association Meeting

WITH more than two years of accomplishment behind it, the National Coal Association has just held its third annual convention. We publish in this issue the report of the retiring president, Mr. H. N. Taylor, a record that everyone should read to realize the extent of the activities of the association. The National Association is shown to have played a very important part in shaping the destinies of the coal industry in the past year, for through this organization the government and the public as represented at Washington has been kept informed of the condition of the industry.

The testimony given by members of the association before the Senate committee investigating the high price of coal was such as to give the coal man a clean bill of health last year. The work of the section on railroad relations did much to keep up a spirit of active co-operation with the carriers, with attendant good results. The value of proper cost accounting has been preached and the use of the standard forms adopted by the association has been extended to cover many fields.

That the association is gaining in strength is shown by the fact that despite the resignation of several large producers because of the stand of the majority on the questions of assigned and privately-owned cars, the proportion of total production of the country represented in the membership of the national organization has increased in the last year.

Throughout the meeting there was an undoubted feeling that now, if ever, is the time for the coal men to stand together in a united organization. Good-natured contests over the elections of officers only serve to indicate the whole-hearted interest of the members and do not show a lack of solidarity. President Taylor's call for co-operation as a means to success and the evident desire of the members for even better teamwork than in the past in solving the problems facing the industry are plain evidence that the National Coal Association has a good year ahead.

Daniel B. Wentz

WITH a multitude of able men from whom to make a selection, the directors of the National Coal Association wisely chose D. B. Wentz, of Philadelphia, as president for the coming year. Not so widely and intimately known in the industry as his predecessors in this office, to his friends and associates, who regard Col. Wentz as a lovable and pleasing personality and as a coal producer and business executive of wide experience and broad ideas, his election is extremely fortunate for the association.

We recall him first as a national figure with the Committee on Coal Production in 1917, when he was one of the few appointees to that work who gave their whole time to the tasks and who really gave constructive help to the chairman, Mr. Peabody, in the days when the trial of the coal industry began. Cool, patient and courageous, his invariable courtesy never fails to win for him his point. His record with the American Expeditionary Force has never been told. It is sufficient to say that in the face of apparently insurmountable difficulties and official red tape he gave our forces coal as Atterbury gave them transportation.

He brings to the leadership of the coal industry an international as well as a national viewpoint. As an operator in union and non-union coal fields in the South, East and West he will appreciate the problems of all sections and from his wide experience will lead where others will be willing to follow. We congratulate the National Coal Association on its choice of Colonel Wentz for president.

Cheap Transportation with Cheap Coal

TRANSPORTATION cheaper than in any other country in the world is what the railroads of the United States are giving us, A. H. Smith, president of the New York Central R.R., told the coal operators at Atlantic City last week. The answer came from the audience that the railroads are getting their coal cheaper than in any other country in the world.

Coal operators are opposing assigned cars for fuel coal because the roads use the cars to pay in part for the coal; that is, they thereby lower the price of railroad fuel coal. Now, that might not in itself be a bad thing but for the fact that necessarily and inevitably the cost of producing coal at mines not accepting assigned cars is materially increased, and because these are the mines that supply the general public the price of coal for all users other than the railroads is raised. The public is required to pay more for coal in order that the railroads can pay less.

The people of the United States are willing to pay value received for what they get and we are sure that did they but understand this situation fully they would tell the roads to pay for coal what it is worth and put it on the transportation bill. The railroads can pay the same for coal as others and still give this country cheaper transportation than in any other country, because even then they will be getting cheap coal.

A Fit Place to Live

HOUSES for labor are a part of the plant of most coal mines. These houses should be homes, but one reading the description of company housing in the bituminous coal fields printed in *Coal Age* of May 20 will understand why they are seldom homes and why mine labor is prone to shift. In the past anything that kept out the rain and weather was good enough for a company house. Rows of frame shacks of a monotonous sameness, depressing to the eye, were the habitations offered mine labor and still are the only houses available in many camps today.

For years the rents charged for these houses have not changed from about $2 per room per month, but that is all they have been worth. Such dwellings rouse none of the home building instincts that lie in the breasts of all normal men. Under such conditions a man is more likely to keep on the move—to shift from one place to another—than to settle down.

This thought is not new—it has been preached for years. The new thought is that as new housing is built it shall conform to modern ideas of what constitute American homes. Despite the high cost of materials and labor, some very large bituminous coal mines are now being developed and houses planned and built. The answer to the extra cost of building the right kind of houses is that you can capitalize that extra cost in better-satisfied labor and more efficient, steady men.

Vindication of the Railroads

MINING interests have conflicting sentiments regarding the railroads. Indubitably, coal operators have suffered much from the abuses incident to the practice of assigning cars and from the evils of railroad competition with private concerns. They have been annoyed and even robbed by the confiscation of coal—a confiscation that has not been marked by any consideration of the needs of either the operator or his clients. Nevertheless the coal operator still realizes that the necessities of the railroads have accounted for many of their exactions. Not being allowed to live, the railroads have not been advocates of a "Live and let live" principle.

However, the unpleasing relationship with railroad companies has not entirely blunted the mind of the mine executive to the injustice to which railroad management has been subjected by the unfair judgment of the public. He knows that only by allowing the railroads to make money can they be efficient. Few are there that do not know that during the war the German machinations did the country less harm than had already been done by the overdrastic regulation of the railroads by the Interstate Commerce Commission. We went to war with a wrecked railroad system and there was nothing that more sadly held up our war preparations. The railroads continued operating with difficulty, their attempts being bolstered by the patriotism that the war evoked. When the war ended and business revived it was found that the railroads could not fill the nation's needs.

Seeing then that the railroads suffered by restriction, it is gratifying to learn that the policing we gave them was unfair. It is disclosed now that we have not a true bill against them. They are not vastly overcapitalized, as was said; instead their physical property is worth immensely more than their stock would suggest and far and away more than their stock and bonds could be purchased for in the open market.

In the early days most of the railroads failed to make dividends. They were bought in for a fraction of their value by syndicates or by larger railroads which enjoyed a better traffic. There was no watering of stock at that time but rather a frying out of fat. Furthermore the work on the earlier roads was done with cheap labor. Only as far back as 1893 common railroad labor could be obtained for 80c. to $1 per day, and it was often rendered by men anxious to give service and ready to work ten or more hours a day. Naturally, with wages and hours what they are now or even what they were before the war the roads could not be duplicated at the price of construction.

Again many railroads steadily made improvements out of capital earned. Some paid no dividends, it is said, because they wished to freeze out small stockholders; others desired to put their roadbeds in better condition and spent their earnings on that work, though they might well have borrowed the money. Watered stock there undoubtedly was, but many of the companies were developing their properties and they were fast becoming far more valuable than their books showed. Appreciation of property and ploughed-in capital was making the railroads more valuable year by year.

Thus it happened that on May 27 the Interstate Commerce Commission was informed that the railroads were physically worth over two billions of dollars more than their capitalization and that their bonds and stocks could be purchased in the open market at present prices for six billions of dollars less than money that would provide for the replacement of the roads at the wage and land rates now ruling.

Figures were given for 51,853 miles of roads in all parts of the country, the valuation being based on the lower wage scale obtaining in 1914. They cover one-sixth of the total investment in American railroads. Yet the older and stronger Western properties are not included, nor are the Pennsylvania and New York Central railroads in the East. The reports as summarized run as follows:

Roads	Cost for reconstruction and land	Investment on carriers' books	Difference
18 Eastern	$1,205,407,829	$1,014,807,254	$190,600,575
14 Southern	366,288,043	335,647,336	30,640,707
18 Western	1,632,086,671	1,807,820,506	—175,733,835
50 Roads...................	$3,203,782,543	$3,158,275,096	$45,507,447

Railroads that have been continually beset by public aspersions nevertheless show up well on valuation. Thus the New York, New Haven & Hartford inventory proves to be worth $124,000,000 in excess of the company's statement of its investment, the Boston & Maine has an excess of $80,000,000; the Rock Island, of $47,000,000; the Great Northern, of $34,000,000, and the Big Four, of $15,000,000.

Inquiry into railroad values proves that they are conservatively estimated by their owners and that the railroad companies are well justified in demanding that they receive a fair profit on the basis of those valuations until the Interstate Commerce Commission completes its own estimate. If the dividends paid railroads are to be limited by law they should be based on the actual value of the property involved and they should not be less than can be earned by other safe investments. Even mortgages today bring more than 5½ per cent, which is the railroads' limit.

In the case of the railroads muckraking is doing its perfect work, so that today we cannot run our industrial plants for want of raw material and inability to reach markets. It is busy on the electric railway systems. Soon we shall walk to work if we cannot afford to buy an automobile and pay for gasoline, tires and garage charges. It is destroying our electric power companies and before long we shall be in darkness if the dark influences of the muckrakers are not controlled. When the railroads were first criticized we had too many railroads; now after two decades of condemnation our railroads are inadequate. No state is so strong that it can weather successfully the powers of persistent lying.

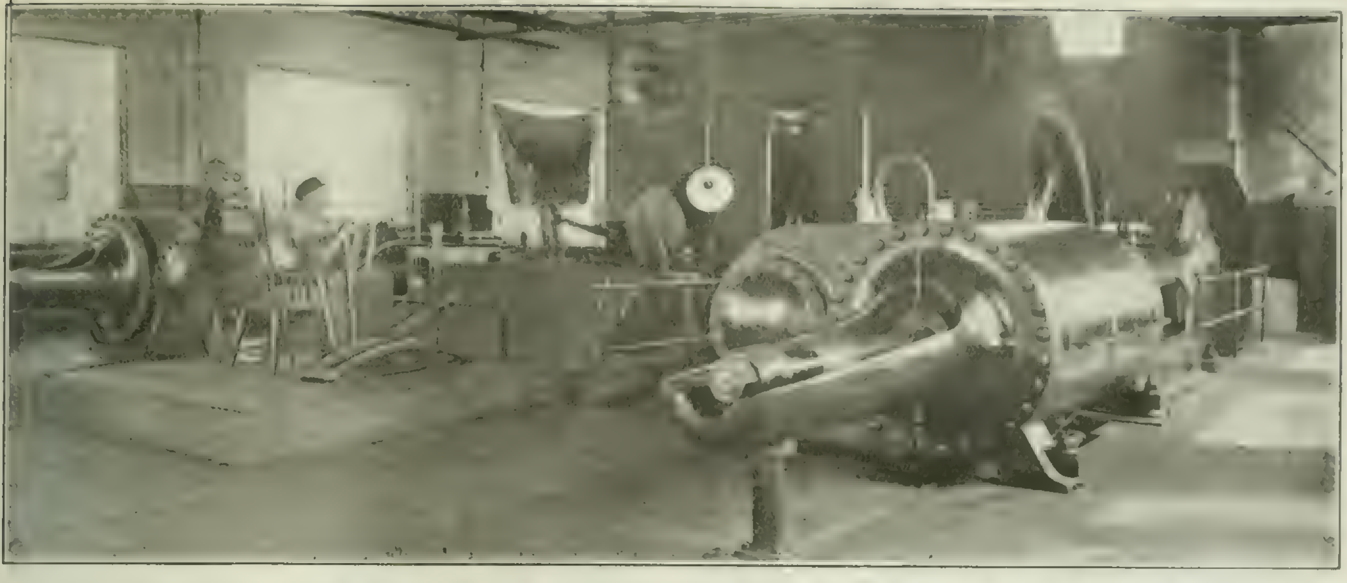


FIG. 1. HOIST ENGINE AT NO. 4 MINE AS IT APPEARS WHEN HOISTING BAILING BUCKETS

As may be seen, this is a heavy, substantial, high-duty machine such as is employed at many a mine plant for hoisting coal. This engine went wild when the buckets were overwound. It was repaired by the oxyacetylene torch

Oxyacetylene Promptly Clears Shaft and Repairs Engine Bed After an Overwind

As the Result of an Overwind the Bedplate of the Hoisting Engine Was Broken and Its Foundation Bolts Were Sheared—Two Bailing Buckets, Several Hundred Feet of Rope and an 8-In. Pipe Were Wedged Together at the Bottom of the Shaft — Repairs Were Made by Means of the Oxyacetylene Torch

By Charles C. Phelps
Montclair, N. J.

IT IS indeed a coincidence that the two most important factors in and about a mine—men and machinery—should be rescued, when necessity arises, by one and the same agency—oxygen. In one case the oxygen respirator performs the work of resuscitation; in the other the means employed is the oxyacetylene flame, by the aid of which metals are cut and welded. This article will deal with the use of the oxyacetylene process in the repair and clearing away of the wreckage after a remarkable accident at a large anthracite mine.

About three years ago the hoisting engine of this company was badly wrecked. This engine, Fig. 1, was employed for bailing water, two 3,000-gal. tanks being used as the bailing buckets. Fig. 2 shows in the foreground the top of a similar tank with guide shoes on

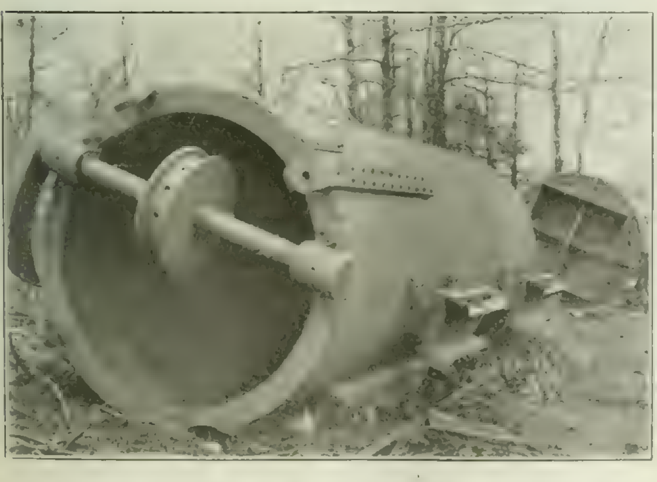


FIG. 2. PAIR OF BUCKETS FOR BAILING OUT SUMP

Each of these huge bailers is five feet in diameter and thirty feet long. It is discharged by the cam at the top acting on the valves in the bottom.

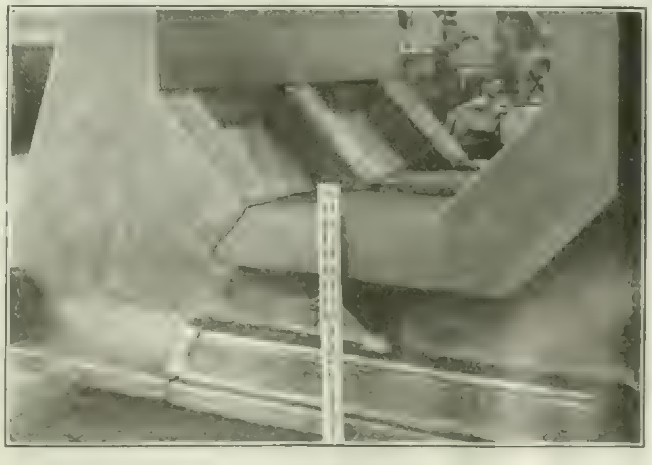


FIG. 3. BADLY FRACTURED BEARING PEDESTAL

The entire end of the engine frame has been cracked completely off by the violence of the racing engine. The gage is read in inches.

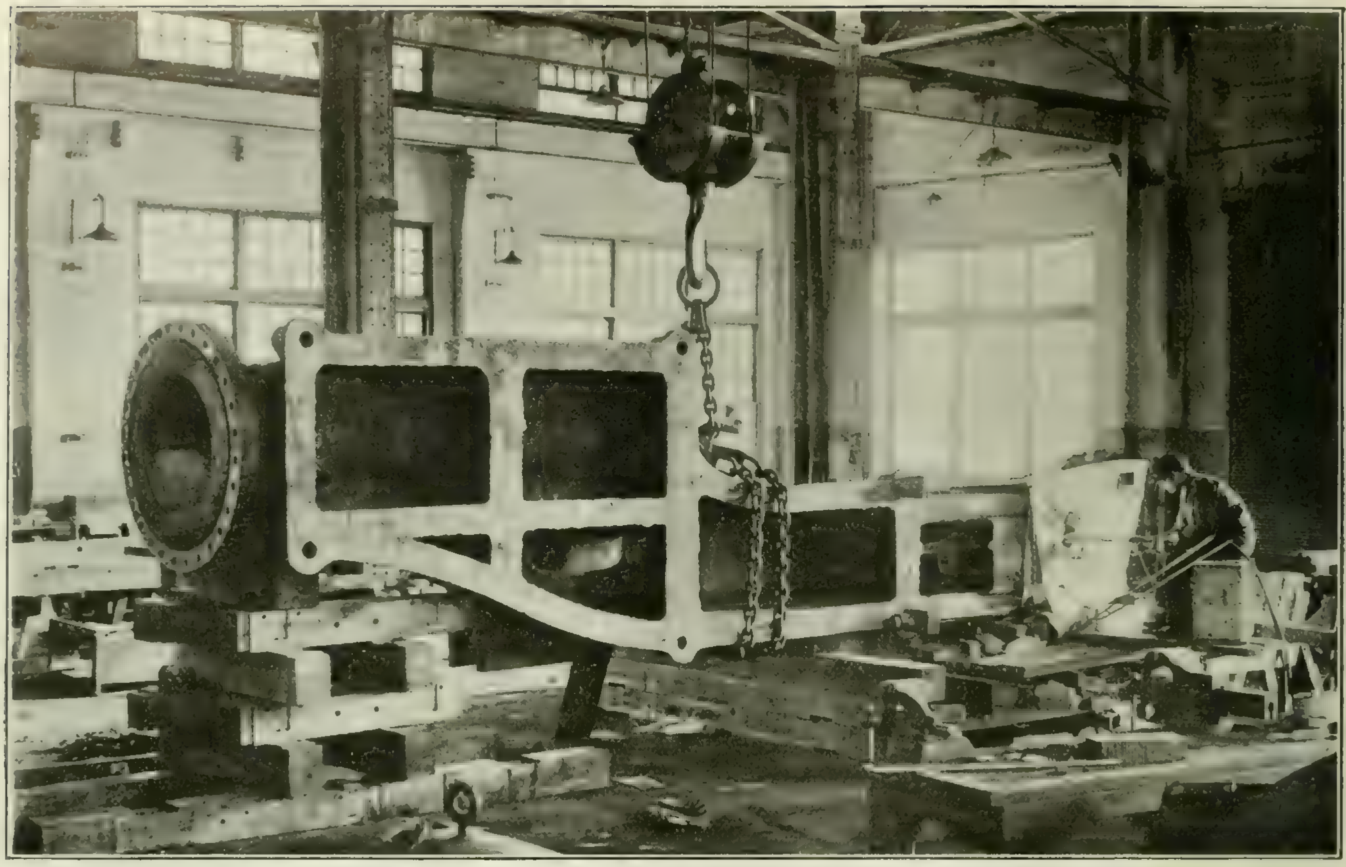


FIG. 4. WELDING THE ENGINE FRAME IN THE SHOP
This casting weighed approximately twenty tons. During the welding operation it was necessary to lift and turn the bedplate several times to make a perfect weld, yet the job was completed between Saturday and Monday mornings.

the side and valve-tripping mechanism on the left. In the background appears the lower end of a tank where the flap-valves for its prompt emptying are to be seen.

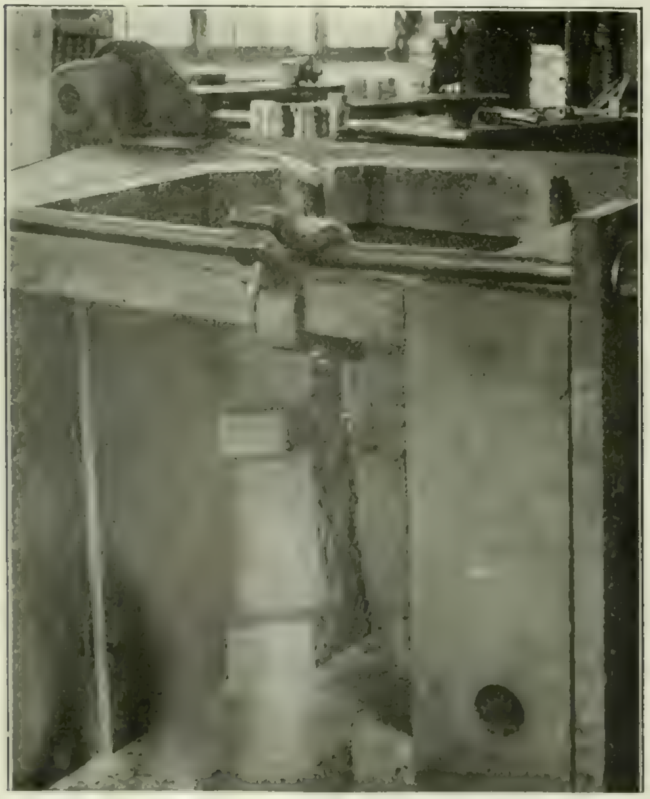


FIG. 5 HOLDING IN PLACE PARTS TO BE WELDED
It was necessary that the two pieces should be held firmly in place in order that the finished job would be suitable for use.

The accident in question began with an overwind. The ascending tank, filled with water, failed to stop at the end of its normal travel and continued its upward flight until it reached the sheave wheel. The cable then snapped and the tank went crashing to the bottom of the 1,000-ft. shaft. On its way it met its mate, breaking its cable, both falling in a common wreck to the sump below. The impact of the blow was so great that the sheave-wheel platform was thrown over at an angle of 45 deg.

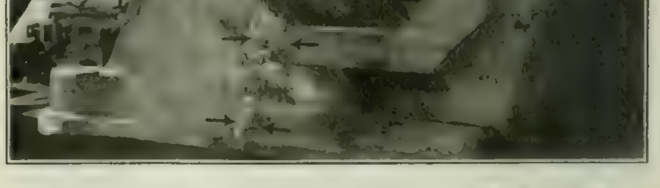


FIG. 6. WELD MADE BUT STILL IN THE ROUGH
This shows the two pieces of the frame welded together. The weld has not yet been finished by grinding

With its load released the hoist engine immediately started to race. The automatic control device naturally failed to arrest the rotation of the engine because it operated upon the throttle. The brake bands became

FIG. 7. ANOTHER VIEW OF THE SAME WELD
The pieces were so held during welding that the finished job was only $\frac{1}{32}$ in. smaller than the original casting

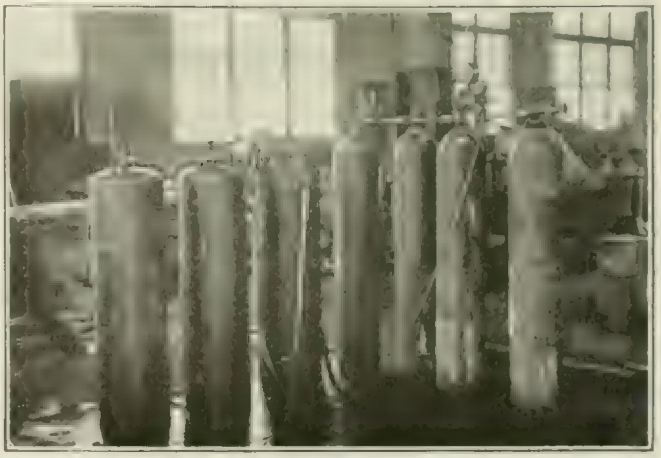


FIG. 8. CYLINDERS CONNECTED BY MANIFOLDS
As the welding job was a long one the cylinders were joined to obviate the need for changing cylinders when exhausted

red hot and tore apart. Finally the engine's mad career was ended when the right bed frame broke in two, directly under the main shaft. In the meantime, however, the cable on the right drum was whipped about the room, scattering débris right and left, while the cable on the left drum was wound up in the reverse direction.

TORCH CUTS ROPE AND STRUCTURAL IRON

The oxyacetylene cutting blowpipe was first brought into play to clear away the masses of rope. The concrete wall of the building nearest the drums was cut away to enable workmen to get at the cables and to provide an opening for removing the wreckage. Here the blowpipe was used to good advantage in cutting through the structural iron of the wall. In spite of the many strands in a rope the cutting blowpipe severed them all quickly and easily.

When the engine was examined the bed frame on either side was found to have shifted and sheared off the anchor bolts. These bolts were later welded together, which saved an immense amount of work that would otherwise have been required to embed new anchors in the concrete foundation. The right bed frame was cracked entirely across beneath the 22-in. shaft, as may be seen in Fig. 3. The main bearing cap was broken also.

To give an idea of the size of the job it may be said that the over-all dimensions of this engine are: Width, 35 ft.; length, 45 ft. The cylinder bore is 42 in. and the stroke 60 in. The broken bed plate was 22 ft. 6 in. in length and weighed approximately twenty tons. Figs. 3 and 4 give an excellent idea of the extent of the break, while Fig 5 shows how the fracture was opened up by chiseling out a V-groove preparatory to welding.

The latter view also shows how the two parts of the bed frame were clamped together to preserve the align-

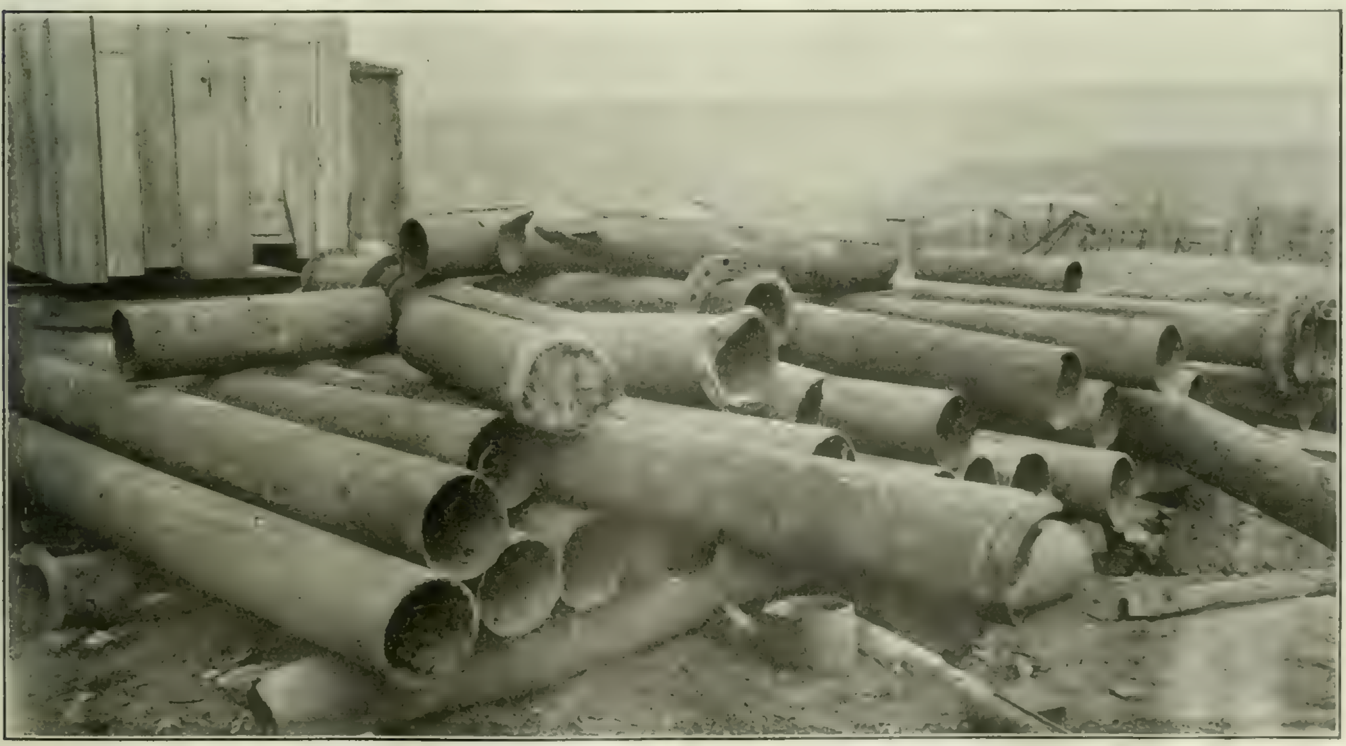


FIG. 9. SECTIONS OF THE 8-IN. AIR LINE THAT FELL DOWN THE SHAFT
The battered ends and flanges of some of these sections give evidence of the force with which this pipe was precipitated into the sump. Note how one of the tubes which fell on a timber sank deeply into it so that it closed the end of the tube as a cork closes a bottle. The air line was cut by the oxyacetylene torch, and the pieces were passed out and piled in the gangway.

ment while the welding was being performed. It became necessary to cast an entire new end piece for the bed frame. This was done in the mining company's foundry after making the pattern from the drawing of the engine.

ENGINE FRAME WELDED IN ABOUT TWO DAYS

Operators from the Newark welding department of the Oxweld Acetylene Co. were engaged to do the actual welding of the bed frame. In joining the new casting to the old frame it was highly important that the opening for the shaft be kept within the original dimensions so that the bearing wedges would fit securely. As a matter of fact the welding was done so expertly that the opening was just $\frac{1}{32}$ in. less than the distance calculated. Compensation for this discrepancy was easily made by planing off one of the wedges to fit.

The superintendent of the Oxweld Co.'s Newark welding shop and three of his operators performed the work, assisted by several of the coal company's helpers. The operation of welding started Saturday morning and was finished on the morning of Monday following, the men working in shifts each about four or five hours in duration. Fig. 4 shows how the bed frame was supported and handled. It had to be turned three times during the progress of the work. Several layers of asbestos paper retained the heat of the preheating fire and acetylene flame and also shielded the operator.

Fig. 6 is a view corresponding to Fig. 3, showing the completed weld, while Fig. 7 shows the reverse side. In each case they show the work as it appeared before it was finished by grinding away excess metal.

To insure an ample supply of oxygen and acetylene and thus avoid the delay and inconvenience of frequently changing cylinders, several of these containers were connected in battery by means of manifolds as illustrated by Fig. 8.

CLEARING AWAY WRECKAGE IN THE SHAFT

In falling down the shaft the water tank did much damage to the casing and to the 8-in. compressed-air pipe which, set snugly in one corner, extended down the full depth of the shaft. Here again the oxyacetylene process was put into operation.

About four hundred feet of the lower end of the pipe was ripped out by the impact of the falling tank and piled up in heaps at the bottom of the shaft. The difficulties of removing this tangled mass may be imagined when it is considered that a tank 30 ft. long and 5 ft. in diameter, part of its hoisting rope and chain, 400 ft. of 8-in. pipe and other miscellaneous débris had become wedged into the 7 x 11-ft. compartment of the shaft and into the sump, which extended about 70 ft. below the landing. All of this material had to be removed through the narrow gangway at the bottom of the shaft.

The first step was to make secure against falling the 600 ft. of pipe which still remained in the upper part of the shaft. This was done by lashing it to the shaft timbers, the men reaching the pipe from the adjoining compartment. Next a temporary roof was built over the wreckage to protect the emergency crew from water and falling objects. The sump was pumped dry and the tank was loosened by dynamite.

The tank was then pulled up to the level of the gangway and was cut by the oxyacetylene process into pieces of a size suitable for handling; likewise the steel cable was cut into short sections and the pipe was cut into pieces averaging 8 ft. in length. Three helpers removed all this wreckage through the gangway and piled it into cars in an adjoining mine passage. Fig. 9 shows a pile of this pipe, its distorted flanges and bent walls conveying some idea of the force that demolished the line. It will be noted that one piece of pipe was driven into a shaft timber, filling the end with a plug of wood.

The next step was the removal of the 600 ft. of pipe remaining in the upper part of the shaft. First a new tank was installed and lowered to place. A platform was built on the top of it as a stage from which men could work. Proceeding from the lower end upward, the pipe was cut into pieces as long as practicable. These pieces were lashed to the tank and lowered to the bottom of the shaft.

PIPE WAS CUT AT THE SHAFT BOTTOM

The lengths of pipe thus removed were cut into pieces about 8 ft. long at the bottom of the shaft. It is easy to understand that the work of cutting could be more conveniently performed there than suspended in midair between the surface and the landing. The men worked under many difficulties, not the least being the water which fell in torrents down the shaft. The operator and helpers each wore two oilskin suits, as a single outfit would have afforded little protection in the continuous downpour.

In spite of all the difficulties encountered, the entire job of cutting away the wreckage and pipe was completed in thirty-two working hours. It was estimated that at least three weeks would be required to accomplish the work by means of sledges and chisels. Furthermore, the oxyacetylene method was much safer, as the jarring necessarily arising from hammering might have introduced additional hazards, for it might have so loosened the pipe as to cause it to fall.

Although the oxyacetylene process is actually more economical than other means of accomplishing such work, as has been above described, an even greater advantage is often secured in times of emergency, because it enables the regular production to be resumed with minimum delay. Self-contained oxyacetylene units consisting of an oxygen and a dissolved-acetylene cylinder, blowpipes, hose, gages, etc., all mounted on a two-wheeled hand truck are found to be highly compact and convenient for use in an emergency.

Will the Government Acquire Coal Mines?

NOTING the diminishing oil supply, forcing the use by army transports, naval and merchant vessels of coal, with the possibility that available coal fields may be exhausted or advance in value, Senator Cummins, of Iowa, has introduced S. Res. 361 for an investigation by the Senate Naval Committee to cover the following points:

Is it probable that government vessels equipped for oil will be compelled to use coal?

Where are the coal fields from which coal of proper quality for ships can be mined situated?

What is the transportation cost of moving coal from fields to United States ports?

Would it be good policy for the government to acquire such of these coal fields as may be necessary to furnish supply that will be needed for government ships and merchant marine; and what would be the probable cost of acquiring them at this time, assuming that it is desirable that the country be assured of an adequate supply of coal for these purposes for a reasonable period?

What Barrier Coal Has Been and Should Be Left to Protect Anthracite Mines—II

Various Formulae Have Been Developed for Determining the Size of Barrier Pillars — While These Do Not Exactly Agree with Each Other They Give Vastly Better Results Than Mere Guesswork

By W. B. RICHARDS *
Hazleton, Pa.

As to the method to be employed in determining the width of barrier pillars, mining authorities differ considerably. An arbitrary rule for the width of these pillars adopted by a number of coal companies and the state mine inspectors of the anthracite districts of eastern Pennsylvania is as follows: Multiply the thickness of the bed in feet by 1 per cent of the depth below drainage level, and add to this five times the thickness of the bed. This rule applies chiefly to flat beds. Table I shows the size of barrier pillars required by this rule.

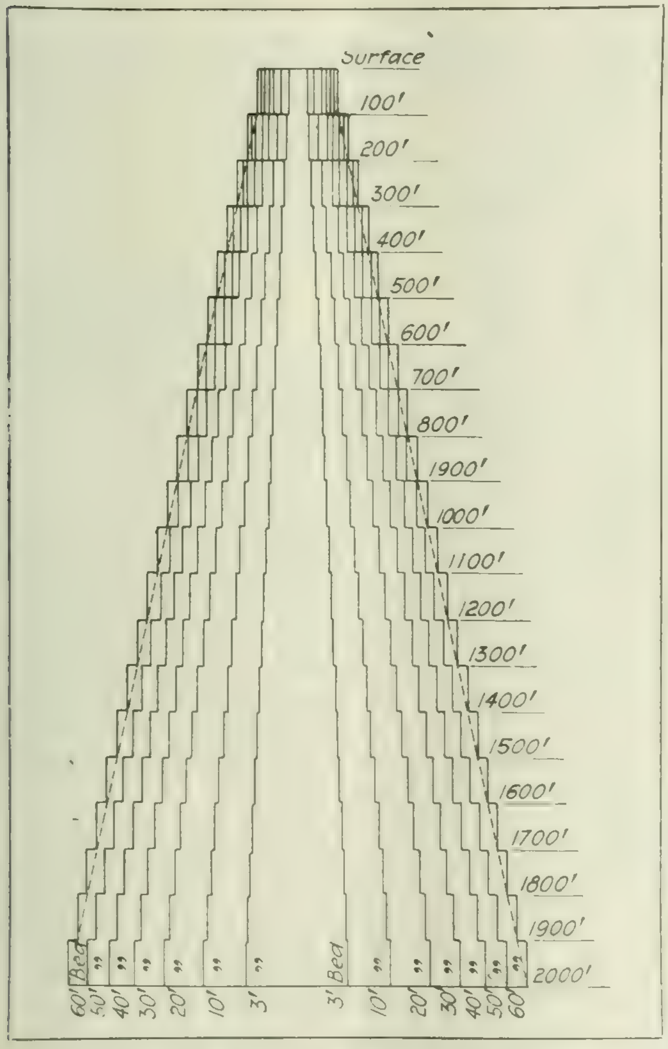


FIG. 8. VERTICAL SECTION OF IDEAL PILLAR

This illustrates the width of pillar necessary for various thicknesses of beds and for varying depths of cover as based on Table I. It is an arbitrary table adopted by a number of coal companies and state mine inspectors of eastern Pennsylvania.

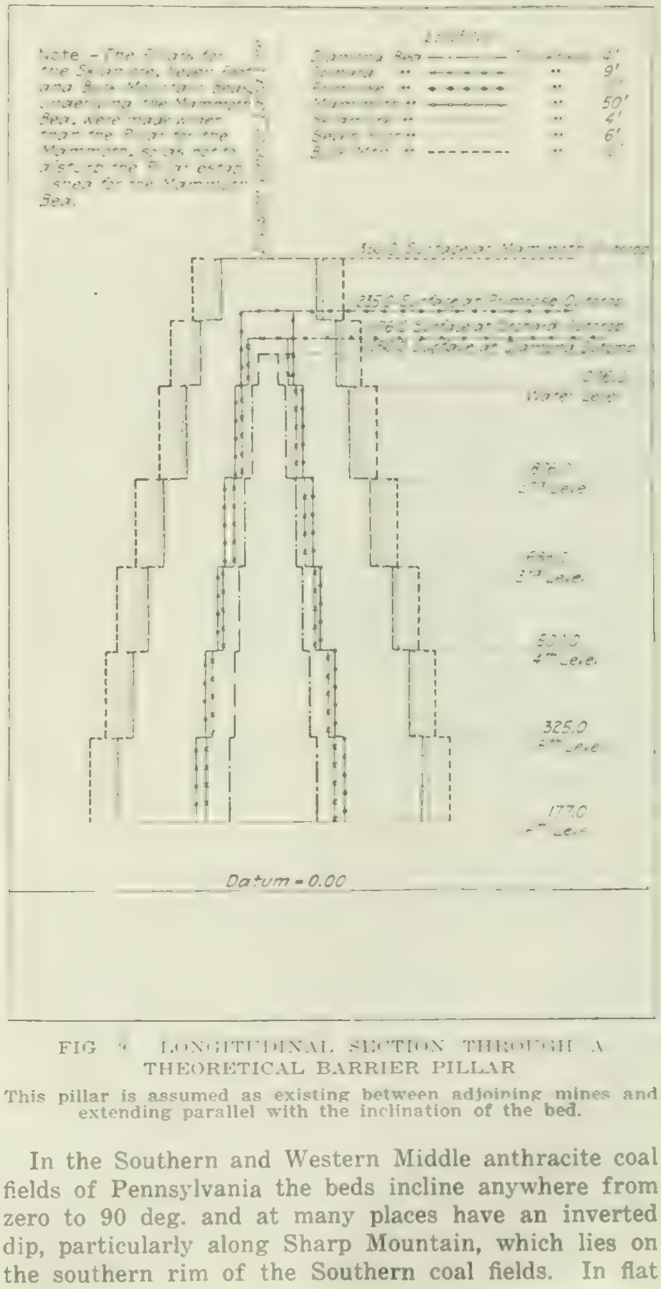


FIG. 9. LONGITUDINAL SECTION THROUGH A THEORETICAL BARRIER PILLAR

This pillar is assumed as existing between adjoining mines and extending parallel with the inclination of the bed.

In the Southern and Western Middle anthracite coal fields of Pennsylvania the beds incline anywhere from zero to 90 deg. and at many places have an inverted dip, particularly along Sharp Mountain, which lies on the southern rim of the Southern coal fields. In flat beds the size of the pillar required depends chiefly on its depth from the surface and to a less extent upon the thickness of the coal.

In such beds lateral draw does not complicate the situation as much as in tilted beds, where the inclination increases the uncertainty as to what will be the effect of that draw on the strata overlying the bed. Inclination also gives the roof a tendency to slide over

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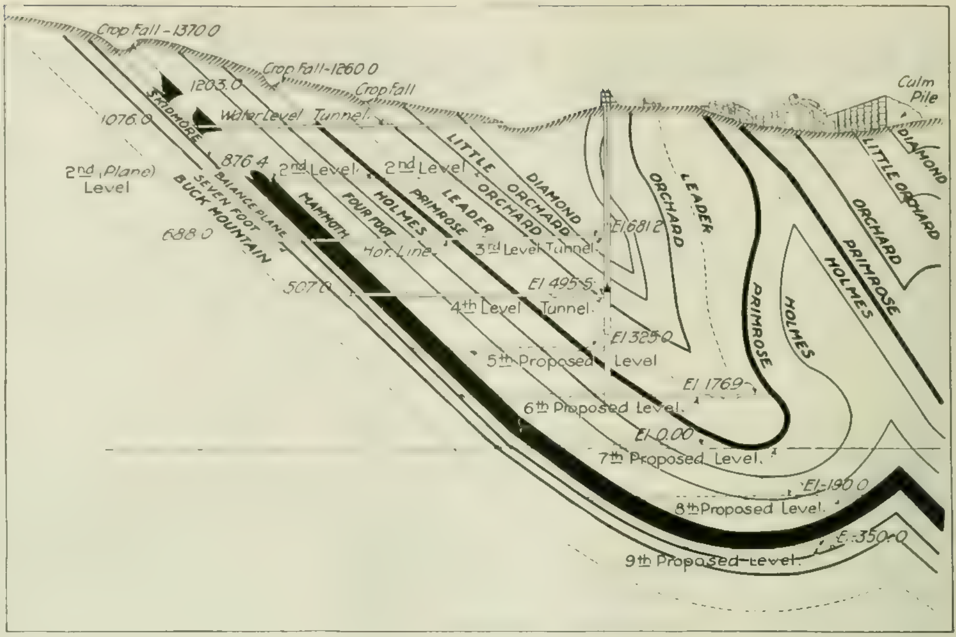
*Consulting Engineer, Cranberry Creek Coal Co.

FIG. 10

Cross Section Through the Shaft

This shows the relative position and sizes of the beds penetrated by the shaft and underlying the property shown in Fig. 17.



the pillar. On the other hand, it decreases the pressure perpendicular to the roof. The necessary width of pillar is largely determined by practical experience, due consideration being given to the local conditions in the district in which the sizes of the pillars are to be established. A formula has been devised for determining the width of barrier pillars in inclined beds in the Southern and Western Middle coal fields. The basis on which it was founded was as follows:

1. Tests of the squeezing strength of anthracite coal have been made and it has been found in general that in all cases where the height of the pillar is less than its width the squeezing strength varies inversely as the square root of the thickness of the bed.

2. The weight per cubic foot of the strata overlying the bed is known.

3. Various barrier pillars exist that have been tested by water. The sizes of these were established by the mine inspector and the engineers of adjoining properties.

After a study of the conditions and of the performance of these barriers the pillar that was 300 ft. thick in a 20-ft. bed of coal and had been tested by a head of water of 645 ft. (No. 6 in Table II) was taken as affording the best indication as to the size of the pillar needed, and the following formula was suggested as applicable to all pillars in seams from 3 ft. to 60 ft. thick and less than 2,000 ft. deep:

$$W = W' \frac{\sqrt{t}}{\sqrt{20}} = 0.2236\, W' \sqrt{t}$$

Where W = Required pillar width for a pillar t ft. high, W′ = Required pillar width for a pillar 20 ft. high based on the rule that the pillar should be 100 ft. wide for the first 100 ft. of depth and 25 ft. wider for every additional 100 ft. of depth, and t = Thickness of bed in the workings for which the barrier pillar is to be determined.

This formula gives the widths that barrier pillars

TABLE II. DATA AS TO WATERTIGHT ANTHRACITE BARRIER PILLARS

	Pillar Width, Feet	Depth from Surface, Feet	Head of Water, Feet	Thickness of Coal, Feet	Breast Pillars
(1)	180	425	323	10	In place
(2)	200	450	205	12	Robbed
(3)	300	570	455	23	Robbed on both sides
(4)	185	550	251	23	Robbed on one side
(5)	175	600	390	10	Robbed on one side
(6)	300	800	645	20	Robbed on both sides

TABLE III DATA AS TO ANTHRACITE PILLARS WHICH ALLOWED WATER TO PASS THROUGH THEM

	Pillar Width, Feet	Depth from Surface, Feet	Head of Water, Feet	Thickness of Coal, Feet	Breast Pillars
(1)	45[1]	300	45	30	
(2)	130[2]	600	235 and 415	16	Standing

[1] Water percolated through this pillar as also through one 80 ft. thick.

[2] Pillar was squeezing and cracking, and water passed through it in large quantities.

TABLE I. SIZE OF BARRIER PILLARS TO BE LEFT BETWEEN ADJOINING PROPERTIES

At Water Level, Ft	Thickness of Bed, Ft	Depth Below Water Level 100 Ft.	200 Ft.	300 Ft	400 Ft	500 Ft.	600 Ft.	700 Ft.	800 Ft.	900 Ft.	1,000 Ft.	1,100 Ft.	1,200 Ft.	1,300 Ft	1,400 Ft.	1,500 Ft.	1,600 Ft.	1,700 Ft.	1,800 Ft.	1,900 Ft.	2,000 Ft.
15	3	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72	75
25	5	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125
50	10	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250
75	15	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360	375
100	20	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500
125	25	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600	625
150	30	180	210	240	270	300	330	360	390	420	450	480	510	540	570	600	630	660	690	720	750
175	35	210	245	280	315	350	385	420	455	490	525	560	595	630	665	700	735	770	805	840	875
200	40	240	280	320	360	400	440	480	520	560	600	640	680	720	760	800	840	880	920	960	1000
225	45	270	315	360	405	450	495	540	585	630	675	720	765	810	855	900	945	990	1035	1080	1125
250	50	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250
275	55	330	385	440	495	550	605	660	715	770	825	800	935	990	1045	1100	1155	1210	1265	1320	1375
300	60	360	420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500

Each adjoining owner is to leave one-half of the pillar thickness required. The formula used in this case is (Thickness of workings × 1% of depth below drainage level) + thickness of workings [illegible] = Width of barrier pillars.

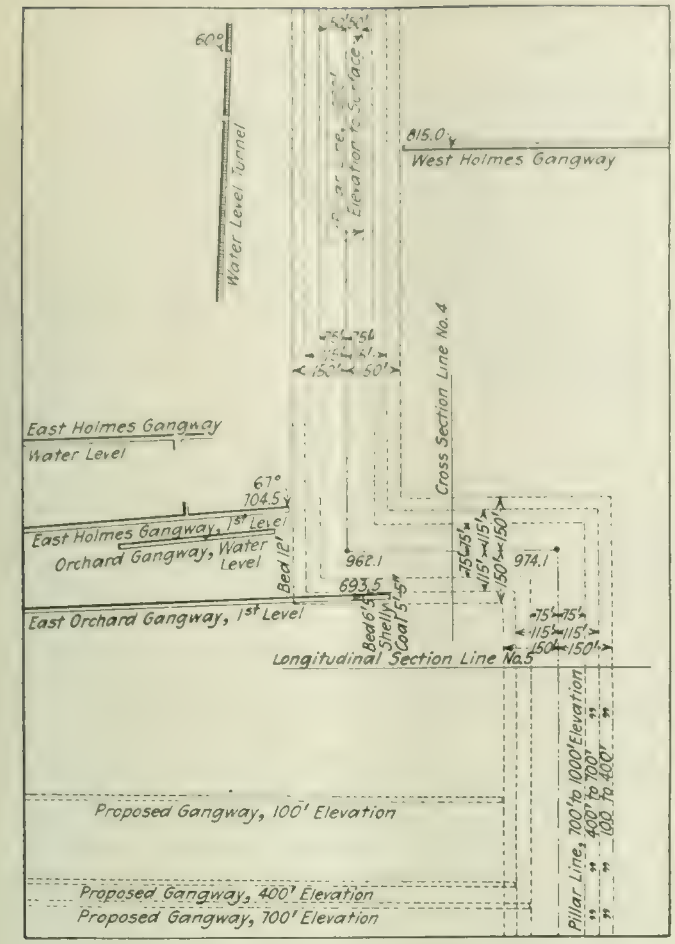

60°
Water Level Tunnel
815.0
West Holmes Gangway
Elevation to Surface
Cross Section Line No. 4
75' 75'
115' 115'
150' 150'
East Holmes Gangway
Water Level
67°
704.5
East Holmes Gangway, 1st Level
Orchard Gangway, Water Level
Bed 12'
962.1
693.5
974.1
East Orchard Gangway, 1st Level
Bed 6' Shelly Coal 5'
Longitudinal Section Line No. 5
Pillar Line, 700' to 1000' Elevation
400' to 700'
100' to 400'
Proposed Gangway, 100' Elevation
Proposed Gangway, 400' Elevation
Proposed Gangway, 700' Elevation

FIG. 11. A BARRIER PILLAR ESTABLISHED BETWEEN ADJOINING MINES

This shows clearly how the pillar width increases or should increase with the depth of cover. The pillar takes a turn to suit a twist in the land line.

should have as has been deduced from pillars that have been tested in mines that were filled with water. Some of the pillars tested, as noted above, were watertight, while the water percolated through the others in large quantities. It gives, as is to be expected, greater widths than were provided in those cases where the water percolated through the pillar.

The accompanying table (Table IV) shows the width of barrier pillars to be reserved between adjoining properties in anthracite mines. The widths shown in this table are to be used solely for determining the pillar thickness in flat or lightly inclined beds pitching from zero to 25 deg., and where the coal is hard and firm. Where the beds slope from 25 to 90 deg., or where they are dirty or shelly, or where the coal though hard contains slips or fractures and again where the coal tends to run across the pitch, and thus decrease the resistance of the established pillar, a 5- or 10-per cent allowance should be added to the width of the pillar specified in the table. Water under pressure will percolate for some distance through dirty, shelly, slippy or fractured coal or through coal running across the pitch.

Where the beds are in a heavy or inverted dip, as in Sharp Mountain, and where the coal also is dirty and shelly from 10 to 20 per cent should be added to the width shown in this table. By comparing the figure for pillar width in Table IV with the actual pillar in case No. 5 of Table II it is found that whereas the pillar is 175 ft. wide, Table IV calls for 160 ft. Likewise in case No. 4 of Table II the pillar was 185 ft. wide, whereas Table IV would call for a width of 250 ft. In case No. 3 of Table I the width of the pillar provided was 300 ft., whereas Table IV calls for a width of only 235 ft. These pillars were all watertight.

The pillar in case No. 2, Table II, was 130 ft. wide. Table IV would require the providing of a 200-ft. pillar. The water percolated through this pillar in large quantities, and it was doubtful if enough coal had been left for safety.

According to Eytelwein, the strengths of pillars vary as the cube of their breadth. By comparing the actual pillar which is 130 ft. wide with the tabulated pillar of 200 ft. width it will be seen that the latter would give a factor of safety of about 3. Taking the pillar No. 4 of Table II, which is 185 ft. wide, and comparing its width with the call of Table IV, which is 250 ft., and assuming that this width is safe, the factor of safety of the pillar as given in Table IV would be 2.

By checking the conclusions in Table IV with the pillars reserved under tunnels that have been tested and were not affected by the lateral draw, I found that the table agreed closely with these pillars, and that the widths shown in the table were safe as far as the lateral draw was concerned.

In determining the proper size of barrier pillars it is impossible to give exact rules or formulæ that would be universal in their application. Each mine is a special problem, and it is well to ascertain the successful practice in the field where the mine is located or in similar fields under the same conditions. Practice, however, even where conditions are similar, should not be followed blindly.

Since the width of pillars as shown in the table agrees closely with the general practice in the Southern anthracite field, I believe it can be used as a guide, with modifications, of course, to suit local conditions. Any modification, however, should be based on the experience and the judgment of the person in charge of the work. Great care should be exercised in determining the size of these pillars, and a large margin of safety allowed where experience has not already determined the best dimensions. A barrier pillar should be fixed

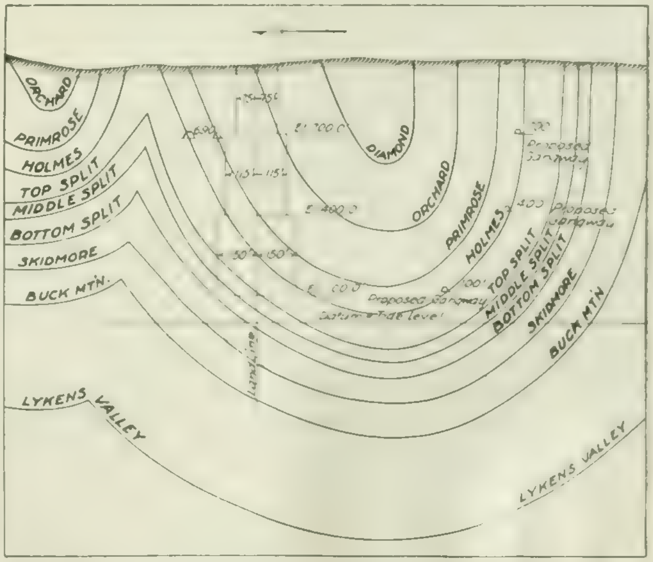


FIG. 12. CROSS-SECTION SHOWING PILLAR ESTABLISHED LENGTHWISE WITH THE STRIKE

This is the pillar shown in plan in Fig. 11. A depth of about 900 ft. has been attained.

TABLE IV. WIDTH OF BARRIER PILLARS TO BE RESERVED BETWEEN ADJOINING PROPERTIES

THICKNESS OF BED	VERTICAL DISTANCE FROM THE SURFACE TO THE LEVEL IN THE MINES WHERE PILLARS ARE TO BE ESTABLISHED																			
	100'	200'	300	400'	500'	600'	700'	800'	900'	1000'	1100'	1200'	1300	1400	1500'	1600'	1700'	1800	1900'	2000'
3'	39	48	58	68	77	87	97	106	116	126	135	145	155	164	174	184	193	203	213	222
5'	50	63	75	88	100	113	125	138	150	163	175	188	200	213	225	238	250	263	275	288
10	71	88	106	124	141	159	177	194	212	230	248	265	283	301	318	336	354	371	389	407
15'	87	108	130	152	173	195	217	238	260	281	303	325	346	368	390	411	433	455	476	498
20	100	125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575
25	112	140	168	196	224	252	280	307	335	363	391	419	447	475	503	531	559	587	615	643
30	122	153	184	214	245	275	306	337	367	398	428	459	490	520	551	581	612	643	673	704
35	132	165	198	231	264	297	331	364	397	430	463	496	529	562	595	628	661	694	727	760
40	141	177	212	247	283	318	354	389	424	460	495	530	566	601	636	672	707	742	778	813
45'	150	188	225	263	300	338	375	413	450	488	525	563	600	638	675	713	750	788	825	863
50	158	198	237	277	316	356	395	435	474	514	553	593	632	672	712	751	791	830	870	909
55'	166	207	249	290	332	373	415	456	497	539	580	622	663	705	746	788	829	870	912	953
60	173	217	260	303	346	390	433	476	520	563	606	650	693	736	779	823	866	909	953	996

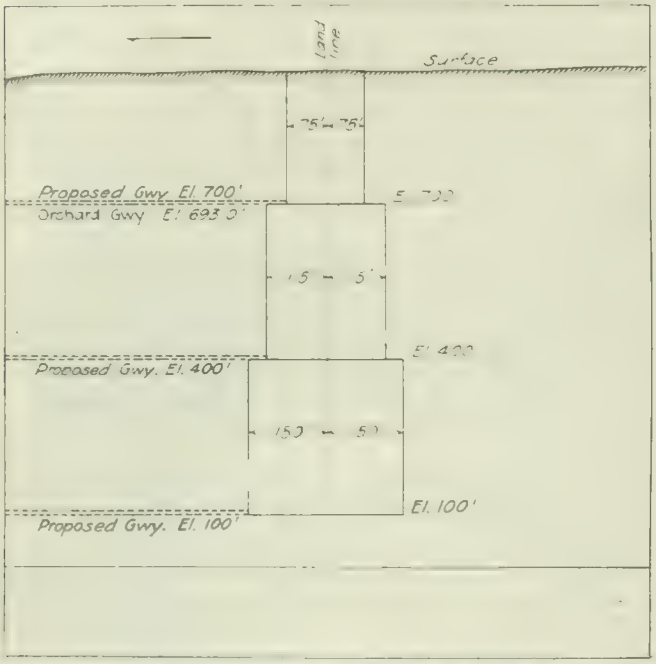


FIG. 13. LONGITUDINAL SECTION OF THE PILLAR SHOWN IN FIG. 11

from a safety standpoint, but care should be taken not to render unrecoverable any more coal than is necessary. Barrier pillars contain a large tonnage, varying from 100,000 to 2,000,000 tons.

Vertical section, Fig. 8, was constructed from Table I, and illustrates the increased width of pillar required for different thickness of beds from 3 to 60 ft. in thickness and for each 100 ft. of vertical depth from the surface to a limit of 2,000 ft.

Longitudinal section, Fig. 9, illustrates the theoretical barrier pillar required between adjoining mines that are divided by a line running parallel to the inclination of the bed. The pillar should gradually increase in width as the thickness of cover increases. This pillar was constructed from the cross-section shown in Fig. 15. The thicknesses of the beds were assumed to be as follows: Diamond, 4 ft.; Orchard, 9 ft.; Primrose, 12 ft.; Mammoth, 50 ft.; Skidmore, 4 ft.; Seven-Foot, 6 ft., and Buck Mountain bed, 13 ft.

The thicknesses of the strata at right angles to the dip are as follows: Between the Diamond and Orchard, 150 ft.; the Orchard and Primrose, 175 ft.; the Primrose and Mammoth, 260 ft.; the Mammoth and the Skidmore, 30 ft.; the Skidmore and the Seven-Foot, 50 ft., and the Seven-Foot and the Buck Mountain, 110 ft.

The pillar needed at each level was established by a consideration of the conditions. As the Skidmore, Seven-Foot and Buck Mountain beds are underneath the Mammoth, the pillar established in those beds for the protection of that upper bed has to be increased, and the increased thickness required was determined by using the thickness of the strata between the beds at right angles to the dip, and using Table No. I for the increased width required for the bed under the Mammoth.

Fig. 11 shows a barrier pillar that has been established between adjoining mines. It will be noted that, because of a change in the direction of the land line, part of this pillar runs lengthwise with the strike of the bed, but the pillar for the most part runs in the direction of the dip.

At the water level a width of 100 ft. was established, while at a vertical distance of 260 ft. below the surface the width was increased to 150 ft.; at 560 ft. the width

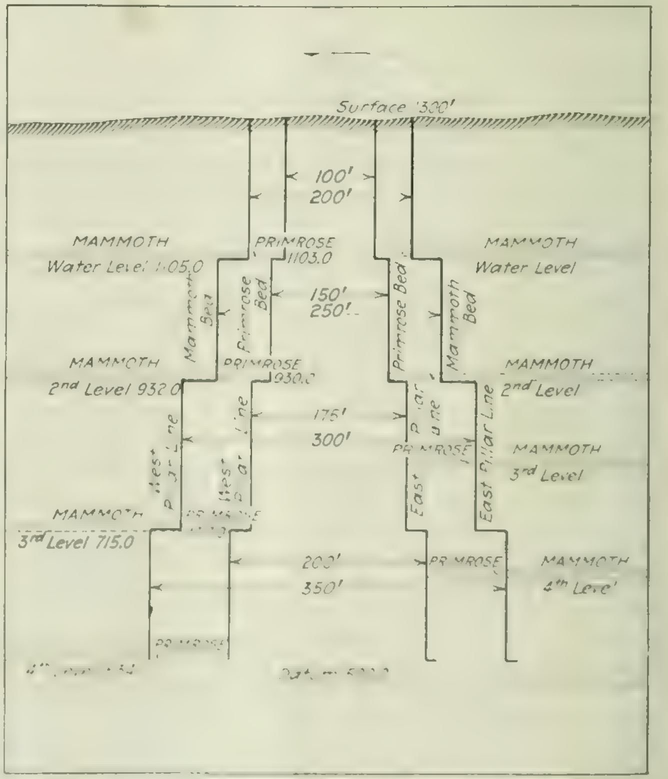


FIG. 11. LONGITUDINAL SECTION OF A BARRIER PILLAR OF VARYING WIDTH

Because of the greater thickness of the Mammoth bed the pillar is made from 100 to 150 ft. wider in this measure than it is in the Primrose bed.

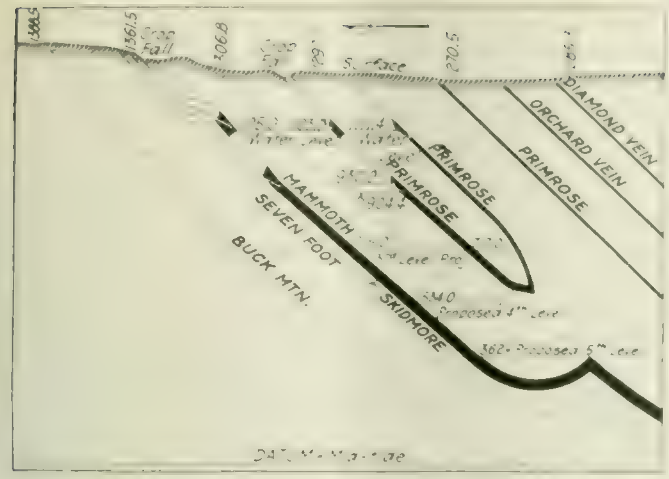


FIG. 15. CROSS-SECTION OF MEASURES WHERE PILLAR SHOWN IN FIG. 14 IS ESTABLISHED

The difference in thickness of the Mammoth and Primrose beds, so obvious in the illustration, has much to do with the pillar width provided. Wholly aside from the purport of the article the contorted position of some of the anthracite coal measures is well worthy of notice.

determined on was 230 ft., and at 840 ft. it was further increased to 300 ft. As shown in the section there are seven workable beds where this pillar is provided and in this case the widths of the pillars were determined to satisfy the needs of the thickest bed, which was 20 ft. thick. The cross-section shown in Fig. 12 is on the line of this pillar. The longitudinal section illustrated by Fig. 13 shows the established pillar.

The longitudinal section, Fig. 14, shows a barrier pillar that has been established between adjoining mines. Attention is called to the two widths of pillar shown; one is for the Primrose bed, which is 12 ft. thick, and the other for the Mammoth bed, which is 40 ft. thick; the inclination of the beds is 46 deg. As measured at right angles to the plane of inclination the Primrose bed is 250 ft. above the Mammoth, and it was not necessary, therefore, to maintain a pillar as wide in the Primrose measure as was required in the Mammoth bed. In the Primrose bed at the water or drainage level, which is 200 ft. from the surface, a pillar 100 ft. wide was reserved, while a width of pillar of 200 ft. was provided in the Mammoth bed. On the second level of the Primrose bed, which is 400 ft. from the surface, a pillar 150 ft. wide was reserved, the pillar in the Mammoth bed being planned at 250 ft. On the third level the Primrose bed, which is 575 ft. from the surface, was provided with a pillar 175 ft. in width, the pillar in the Mammoth bed being set at 300 ft. in width. On the fourth level the Primrose bed, which is 765 ft. from the surface, will have a pillar width of 200 ft., the pillar in the Mammoth being determined at 350 ft. The cross-section shown in Fig. 15 is on line with this pillar.

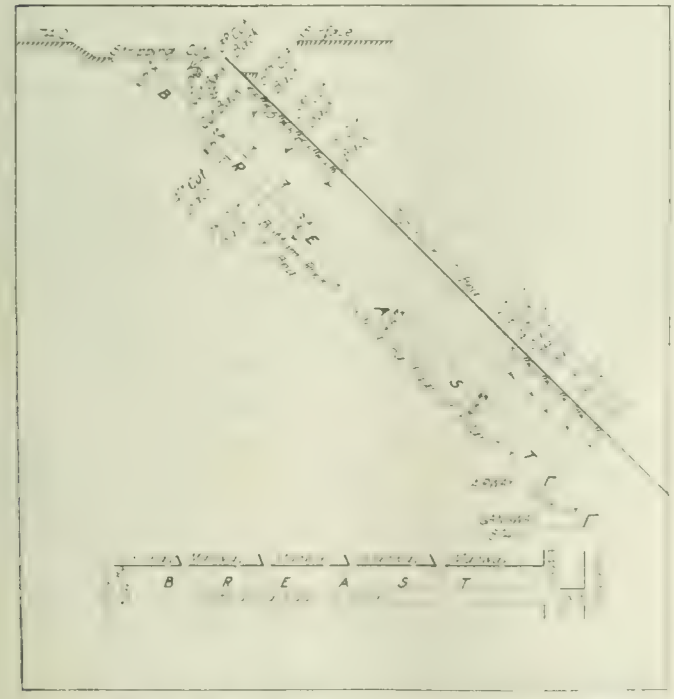


FIG. 16. PLAN OF MINING FOLLOWED NEAR THE EDGE OF A BARRIER PILLAR

This also shows the pitch of the bed and sequence of operations followed in coal removal near the pillar.

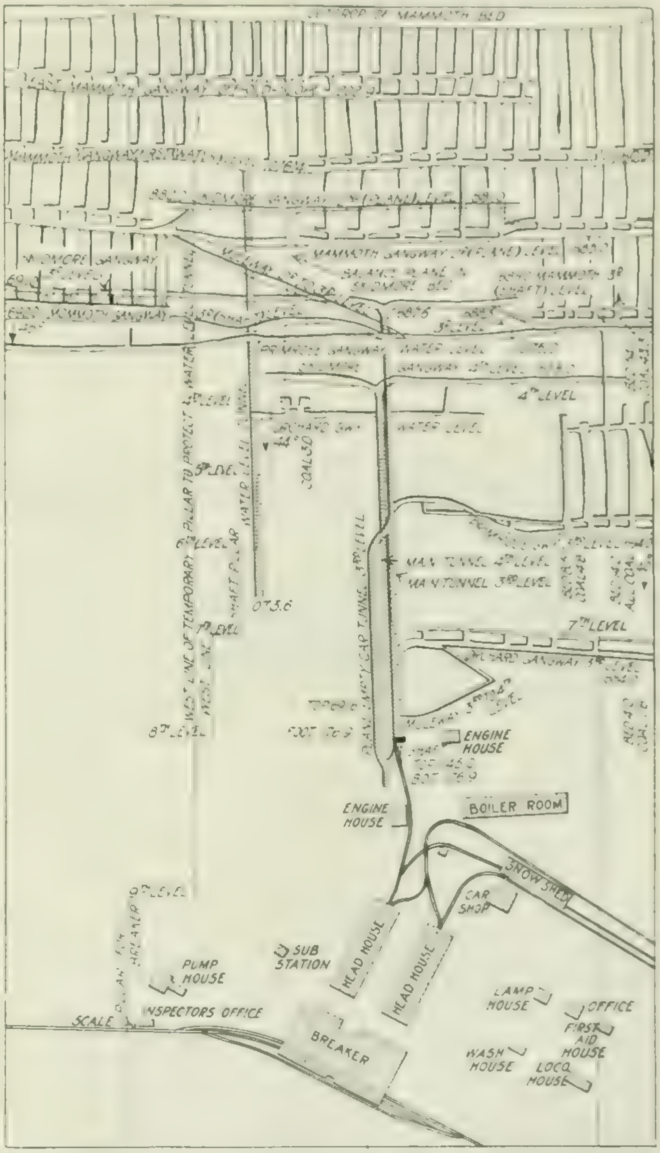


FIG. 17. PLAN OF A SHAFT PILLAR LEFT FOR SURFACE SUPPORT

As will be observed, all surface buildings and railroad tracks are amply protected from injury through subsidence.

The Bituminous Mine Law of Pennsylvania provides that when a mine contains a dangerous accumulation of water the barrier pillar shall be in the proportion of one foot of pillar thickness to each 1¼ ft. of water head, if in the judgment of the engineer of the property and

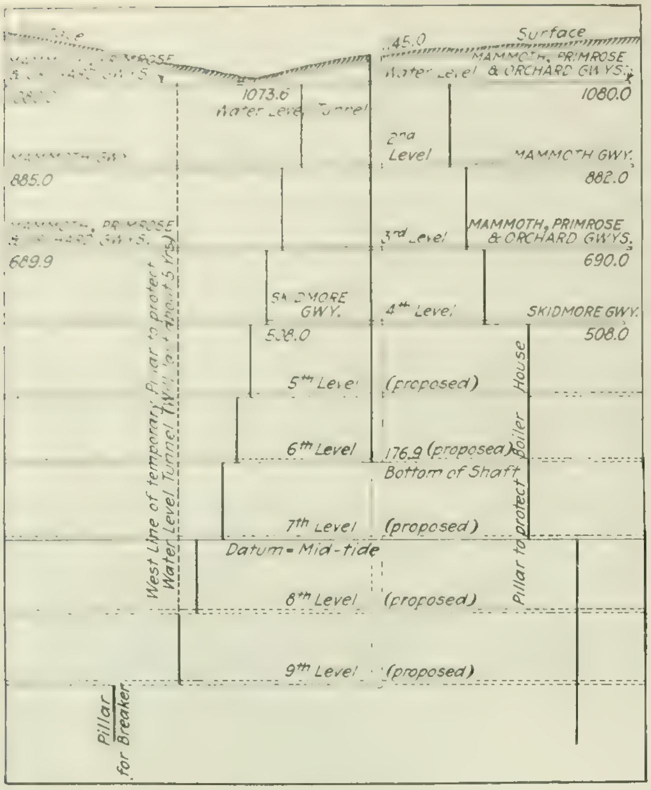


FIG. 18. LONGITUDINAL SECTION OF SHAFT PILLAR

In order to afford protection to the water-level tunnel this pillar will temporarily be kept wider on one side of the shaft than on the other.

of the district mine inspector this thickness is necessary for the safety of the persons working in the mine.

By this rule for various heads of water the following thicknesses of pillar will be required:

Head of Water in Feet	Thickness of Pillar Required in Feet
100	80
200	160
300	240
400	320
500	400
600	480
700	560
800	640
900	720
1,000	800

Fig. 16 shows the method of driving a chute along the pillar in thick beds on heavy dips where there is danger of the bed running and encroaching on the established pillar. This chute is driven through to within 75 ft. of the surface, where a battery is put in and a breast driven. After this breast is finished the breast pillar is extracted, and the work drops back 75 ft. down the chute. Then another battery is erected, another breast driven and the breast pillar extracted, and so on until the coal is mined to the airway. By this method the bed can be controlled and little damage will be done to the pillar by the coal sliding off.

A shaft pillar is the coal reserved on either side of a shaft. This should be of such a width that when the coal is extracted the lateral draw or subsidence will not extend to the shaft nor to the buildings on the surface around the shaft. This coal can be extracted only when the mine is worked out and robbed back to the shaft pillar. Thus it is the last coal to be extracted from the mine.

In determining the width of shaft pillar necessary to protect the main openings and buildings on the surface an engineer can ascertain the nature of the overlying strata by making columnar sections through the shaft and in the tunnels driven to develop the beds, and can establish a pillar to suit the conditions found.

When the location of a new shaft is decided upon, boundary lines should be established around the shaft, approximating to the proposed shaft pillar. The buildings required for the operation should be located within these lines. If the buildings are placed haphazard, their proper protection will make necessary the leaving of a larger pillar and this will tie up much coal, and later some of the surface structures may have to be removed at appreciable expense, in order to permit of reducing the unnecessarily large size of the pillar.

A shaft pillar is reserved to protect the shaft from the lateral draw, while a barrier pillar must not only be sufficiently wide that the lateral draw will not connect through the strata but must also be of sufficient width to withstand a considerable water pressure. A shaft pillar can therefore be 10 to 20 per cent less in thickness than that shown on the table for barrier pillars. This will depend on the thickness of the bed and the depth from the surface.

Fig. 17 shows a shaft pillar that has been established to protect a combined coal and water shaft, water-level tunnel and buildings on the surface. The pillar for the water level is only temporary, and will be required only until the water-level coal has been mined out, when the tunnel can be abandoned. The old slope, water level and second level appearing on the plan were mined years before the shaft was sunk. The present pillar line was established for all levels below the second down to the basin. The cross-section shown in Fig. 10 is on line with this pillar. The longitudinal section, Fig. 18, shows the pillar line in relation to the shaft, tunnel and buildings on the surface.

In the mines of the Lehigh Coal & Navigation Co. fire pillars are provided by leaving every eleventh breast unworked. Chutes are driven on 60-ft. centers, and breasts are made 24 ft. wide. This provides a solid fire pillar 96 ft. in width. A dam can be constructed at such a pillar and in case of a fire that portion of the mine can be sealed off or flooded without the balance of the mine being affected. Such pillars have been found valuable also in localizing squeezes, should they start in that section of the mine. The fire pillars are left standing until the gangway is being robbed back. When the robbing of the gangway approaches toward the fire pillar, a breast is driven in it, so that the breast can be driven up and the breast pillars extracted by the time the stumping of the gangway reaches that point.

Buyer's Default in Payment Authorizes Seller to Cancel Contract

ON FAILURE of the buyer, under a contract for sale of coal to be delivered in monthly installments, to pay for an installment previously delivered within the time agreed upon, the seller was entitled to cancel as to further deliveries.

And the fact that the seller afterward accepted payment of the amount due did not reinstate the contract, in the face of his continued refusal to make further deliveries, since the seller was entitled to recover for the fuel actually delivered whether the contract was cancelled or not. *(Illinois Supreme Court, Chicago Washed Coal Co. vs. Whitsett, 116 Northeastern Reporter, 115.)*

Duplex Water-Tube Boiler Adds Efficiency To Quick-Steaming Qualities

Boiler Has Water-Box Headers and so Omits Sectional Headers and Mud-Drums—Most of the Tubes Are Bent and Thus They Meet the Expansion Strains Which Arise Whenever the Boiler Is Heated

A BOILER recently put on the market seems suitably designed for the production of a maximum of steam with a minimum of trouble. It is a water-tube boiler with two water drums, one in the front and one in the rear. Water tubes pass from the rear drum downward to a water-box header, or water leg, in the front of the boiler, while other tubes criss-cross these, passing from the front drum down to a water-box header at the rear.

Short circulating pipes extend between the drums and the water legs, and these, as will be noted, are protected by insulating material from the heat of the fire. Their purpose is to provide for that circulation of the water in the boiler that is so desirable. The water in the drum is colder than in the water tubes and consequently passes down the circulating tubes to the water legs and replaces in the water tubes the hot water which tends naturally to rise toward the drums. A rapid circulation is thus started which might be impaired if the circulating pipes were allowed to share in the heat from the fire. It is for this reason that they are insulated.

This is known as a one-pass boiler, since the furnace gases pass the tubes once only, but as the criss-cross arrangement of tubes breaks up the gases and prevents them from following their natural course, deflecting them toward the water legs and drums, and as baffles are suitably placed on the water tubes, the boiler gases are well spread and do their work thoroughly, finally delivering their heat to the superheater which is placed immediately over the space left vacant by the criss-crossing tubes.

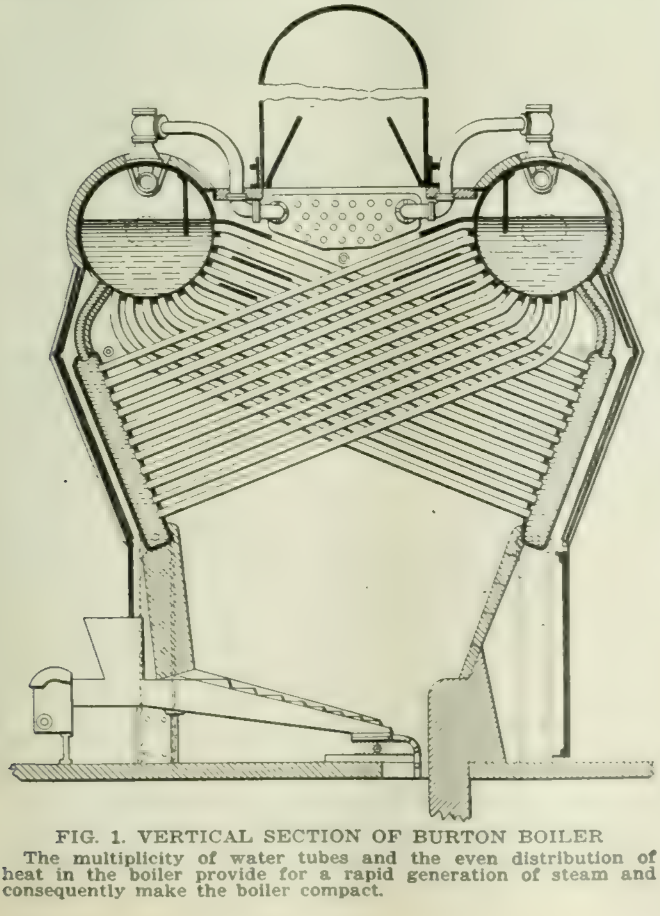


FIG. 1. VERTICAL SECTION OF BURTON BOILER
The multiplicity of water tubes and the even distribution of heat in the boiler provide for a rapid generation of steam and consequently make the boiler compact.

The designer of the boiler, T. Howard Burton, has for years been identified with the manufacture of a single-drum water-tube boiler of the old Worthington type. In this new boiler, although the criss-cross arrangement of the tubes of the older boiler has been retained, the sectional construction has been eliminated, and, as stated, instead of placing individual headers at either end of a tube section, the lower ends of the tubes enter a large water-box header extending the full width of the boiler. The tubes lead obliquely upward across the path of the gases and enter their respective drums. The header is thus eliminated at one end, and the arrangement gives maximum liberating surface for the steam generated, as each tube delivers its contents directly to the drum, thus eliminating the nipple connections between the heating elements and drum common to many types of water-tube boilers. The water legs, being arranged at right angles to the tubes, slope upward and outward at each end of the combustion chamber. An extension of the water leg with blowoff connections eliminates the necessity for a mud drum.

Water connection from the drum to the water leg on the same side and immediately beneath it is made by curved circulating tubes, one end leaving the drum radially and the other end entering the top of the water leg approximately in line with it. The curved tubes are easy to place and make a flexible connection, as they will bend slightly under the contraction and expansion of the boiler parts.

Fig. 1, a sectional elevation, shows how the tubes are arranged in vertical rows of eleven each, adjacent rows sloping in opposing directions. As most of the tubes are curved, they allow for expansion and contraction and tend to reduce the movement at the joints that often causes leakage. The tubes may be cleaned from within the drums and, instead of pulling them out through handholes in the header, they may be removed in the combustion chamber. Both features are big time savers and tend to reduce the time it is necessary to keep a boiler off the line for cleaning or tube removal. An outer shell is provided which may be varied considerably in construction and design.

This design of boiler can be installed in exceptionally low headroom, and the heating surface per square foot of floor space covered is unusually large. By leading the tubes into the drums one-half the header requirement is eliminated and maximum steam-liberating surface is provided. As a consequence the boiler steams rapidly. In the water legs key caps are provided opposite each tube, but the latter may be removed within the combustion space and may be cleaned from

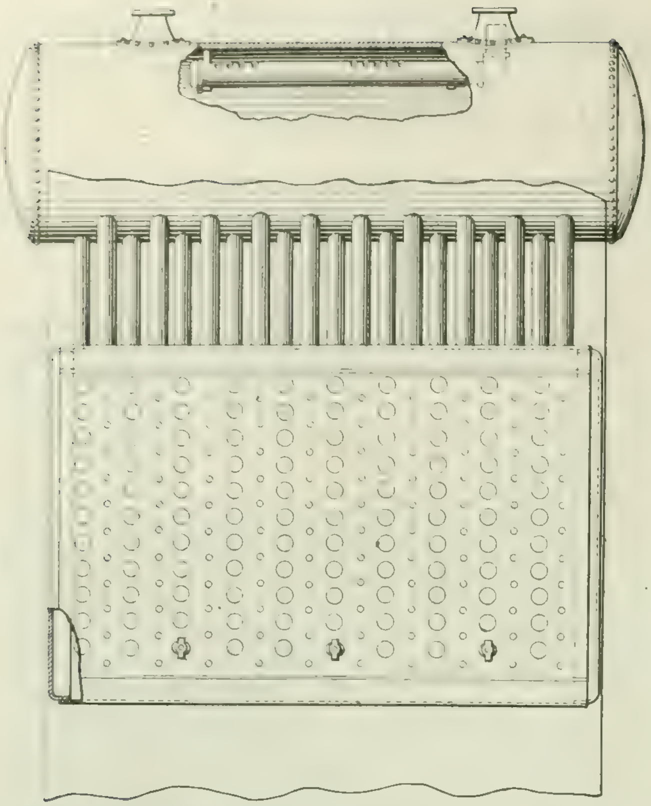


FIG. 2. ELEVATION OF ONE DRUM, THE TUBES AND WATER LEG

Showing the tubes, much foreshortened, passing from the front water leg to the rear drum and also the dry pipe in the drum, which is designed to collect steam free of entrained water.

the drum, so that the frequent removal of caps is avoided. The superheater is conveniently placed and, being in the path of the outgoing gas, tends to insure a low exit temperature. Being centrally located and extending the full width of the setting, the uptake induces an even distribution of the gases over the heating surface. Three soot-blowing elements are provided, and so placed that the soot removed by them falls directly on the grate and is automatically removed with the ashes. The boiler is manufactured by the De Pere-Burton Co., of De Pere, Wis.

Pros and Cons of Low-Temperature Distillation of Coal

Capacity of Retort Is Low—Coke Made Is Weak Oils Are Apt to Become Resinous—Gas Yield Low Though Gas Is Good

AMONG the many carbonizing processes the low-temperature process has for the past ten years been subjected to a strong searchlight of scientific investigation and public criticism. It has many merits but some of the claims made for it still need the confirmation that can only come by larger-scale operation under the actual working conditions of an established industry.

Its greatest impetus, as stated in *Coal Age*, April 29, was received in Germany during the war. That country, being shut off from all outside oil supplies, was constrained to seek and use coal-distillation methods that would give the maximum yield of liquid products, which requirements were met by the low-temperature process.

Under normal conditions, however, this process has been relatively slow in application and practical extension, because it is approached by most with considerable prejudice. It is highly improbable that it will ever supplant or rival the present high-temperature coke- and gas-making methods; first, because it does not produce a metallurgical coke, but a soft and friable material of poor structure and containing volatile matter from 8 per cent up. This coke would have to find its outlet in the domestic field and in water-gas plants. Secondly, the mechanical operations and speed of coking would militate against its use in competition with the modern byproduct coking plant.

Temperatures employed vary with the different systems. They range between 450 deg. and 650 deg. C., and to produce the best results it is essential that the distillation take place in an oxygen-free atmosphere. The retorts used are either inclined or vertical. Some provide for continuous feeding and others for distillation in a closed retort. Some are made of firebrick and others are of cast iron. The coal capacity of brick retorts for this process as developed to the present probably will not exceed twelve tons per twenty-four hours. Small cast-iron retorts will carbonize 1¼ tons of coal in 4½ hours.

The outstanding value of this entire process is found in the increased yields of byproducts, that is, motor benzol, ammonia and tar. These yields may be two or three times as great as those obtained in coke- and gas-making plants. The increased value of byproducts alone, however, will not pay for the process unless a good and steady market is found for the so-called smokeless fuel it produces. The cost of purification of the oils is considerable and unless the oils are so treated they are apt to become resinous in character and be of no value. Cracking of these oils also is a field for investigation.

As the coke produced by this process is a semi-coke, a good coking coal is necessary if a good coke is desired, consequently low-temperature carbonization of high-ash and non-coking coal probably would not be a commercial possibility.

The nature of the tar produced is pariffinoid in character and in many respects resembles petroleum. The free carbon is low, generally less than 2 per cent, with practically no naphthalene present, because that substance is not formed at low temperatures.

The yield of gas is only about half that obtained in gas works, averaging not in excess of 6,000 cu.ft. per net ton of coal. The calorific value and illuminating powers of the gas are, however, 60 per cent greater, making it possible to dilute the gas if it is to comply with the ordinary specifications for gas to be used for lighting purposes.

The low-temperature process has a future in that it tends to produce what the older and present carbonization processes were not designed to do. Future economic conditions may arise which will push this process to the front, and all possible encouragement and consideration should, therefore, be given to its continued development.

Inspects Tennessee Coal Deposits

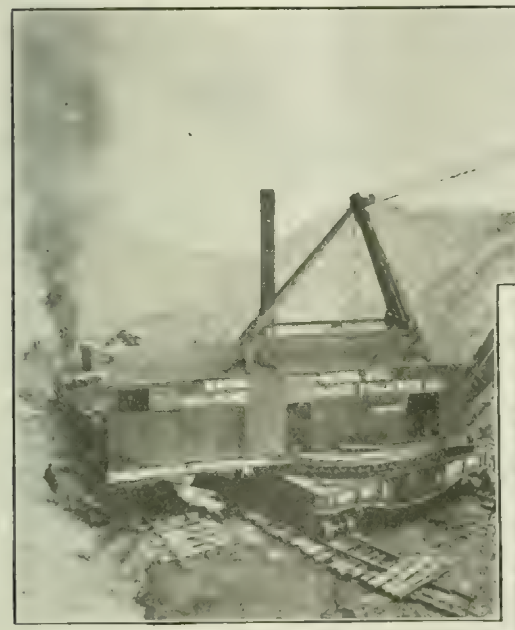
DAVID White, chief geologist of the U. S. Geological Survey, in company with L. C. Glenn and W. A. Nelson, is conducting an examination of coal deposits in Tennessee. Mr. Nelson is the state geologist of Tennessee.

Where Stripping Is Regarded as a Regular Adjunct to Underground Mining—I

Coal Is Stripped by Steam Shovel from the Outcrop to the Contour, Where the Depth of Overburden Makes Open Mining Prohibitive—From That Line, Which Is Set Where the Cover Is 45 Ft. Deep, to the Boundary Line of the Property Underground Mining Methods Are Employed

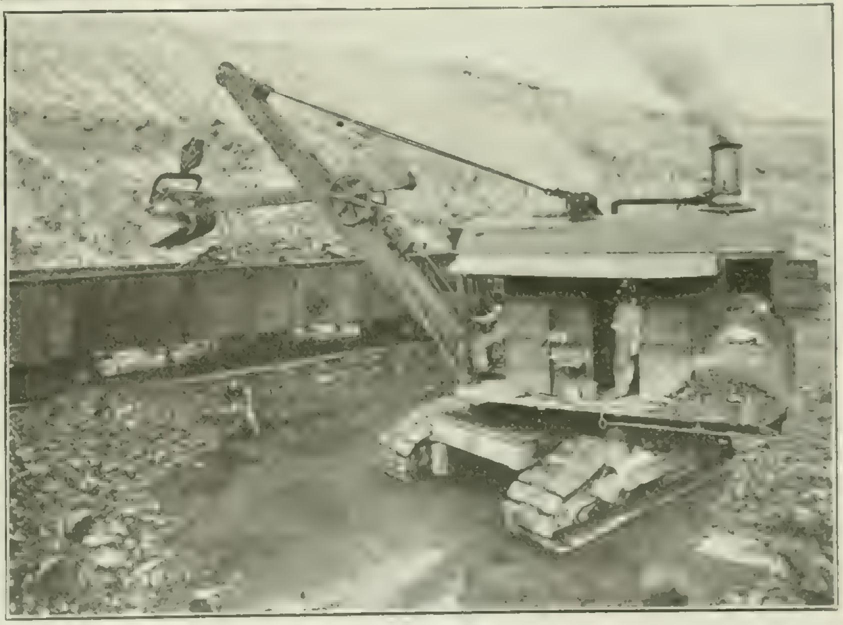
By Donald J. Baker
Pittsburgh, Pa.

ONE of the largest operators of combination strip and underground mines in the State of Indiana is the Rowland-Palmer Consolidated Collieries Co. It is fully abreast of the times, which have inexorably decreed that stripping operations shall continue to become larger. Market conditions during the past year have demanded greater economies in labor and a better preparation of coal, and only large and well equipped mines can successfully meet the competition. During our participation in the war and prior to that time the smaller operations, because of imperfect equipment for preparation and lack of care in the excavation of the coal, delivered to the market much poor fuel. It has been hard to overcome the unenviable reputation resulting from this lack of care. The larger pits were never accused of such inadequate preparation, yet to some extent the large amount of poorly prepared coal delivered by small strip pits affected even the reputation of the larger operations.



Stripping Cover at No. 9 Mine With a Big Steam Shovel

This shovel is full-revolving and has a veritable "boarding-house reach." Shovels such as this have made "double shoveling" unnecessary.

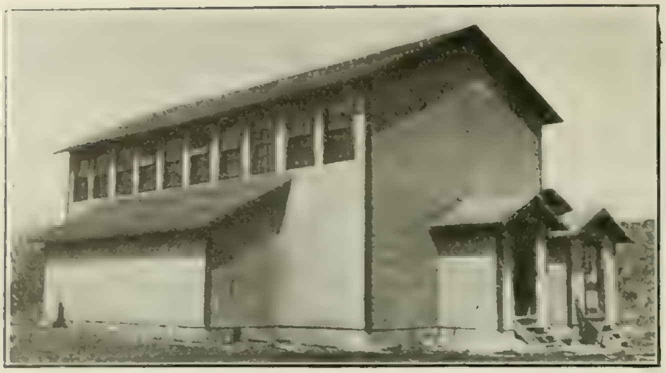


Loading Standard Steel Gondolas At No. 9 Strip Pit

The coal is hauled from the pit in standard cars. The locomotive, however, is a "dinkey." Note the caterpillar tractors that make it independent of railroad tracks.

Today a strip pit in Indiana must minimize its use of labor, for is not time work remunerated at the rate of $6 per day? The coal must be most scrupulously prepared, for the Indiana trade is insistent on clean coal and on coal of many sizes. In consequence the initial outlay must be large and to overcome prejudices the preparation must be such as to defy complaint, for the trade has not yet received stripped coal into its good graces. But preparation such as that given the coal from the pit of the Rowland-Power Co. will before long give to strip coal the good repute to which it has title.

At its mines the quality of the prepared strip-pit product so closely duplicates that of the coal from the underground workings that the difference is scarcely discernible except where the coal is taken near the outcrop, and in Indiana the difference even here is not as marked as in coals mined by stripping at points further east.

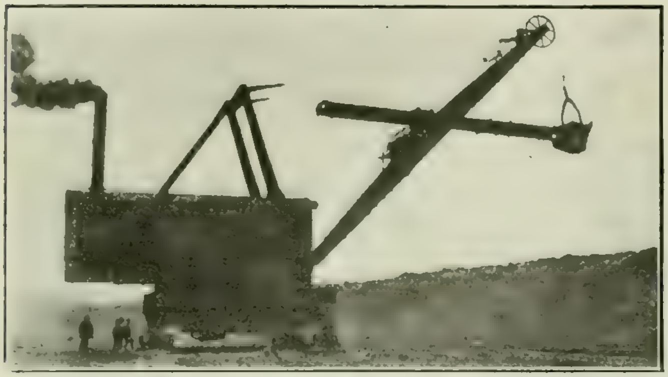


EXTERIOR VIEW OF MINERS' BATHHOUSE

Wings upon either side of the building house the showers while the main portion serves as a dressing and clothes room. The gable entrances make possible the double doors that shield the bathers from drafts.

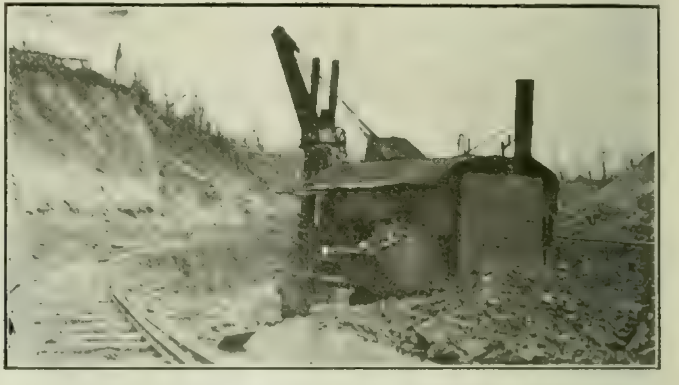
SUMP HOLDING WATER FROM STRIPPING

Water is voided from this reservoir by the periodic operation of the steam-driven pump on the left. Steam is provided from a locomotive temporarily detailed for that work, the unwatering taking not over two hours.



A 6-CU.YD. BUCYRUS STRIPPING SHOVEL

This machine is here shown working in shallow cover at the No. 3 operation. Note how it makes the men who operate it appear as mere pigmies. To misquote Shakespeare: "It doth bestride the narrow earth like a Colossus and we petty men walk under its huge legs," etc.



COAL-LOADING SHOVEL AT NO. 3 STRIPPING

As in No. 9 operation the smaller shovel is employed only for loading coal onto standard railroad cars that are operated only between the strip pit and the tipple. It will be noted that the material on the bank is such as the stripper seeks and the underground miner would wish to avoid.

One of the largest operations of this company, and incidentally one of the largest of its kind in the state, is located at Staunton, about twelve miles east of Terre Haute. Here 1,000 acres of the No. 3 bed of Indiana coal, averaging 8 ft. in thickness, is under development, partly by stripping and partly by underground mining methods. The bed outcrops along one side of the property and dips in a general southwesterly direction, the inclination averaging about 30 ft. to the mile, or a little less than 0.6 per cent. While the bed is thus relatively level and permits stripping on an extensive scale, yet it can be seen that a point will be reached where stripping will be impractical by reason of the ever-increasing overburden.

This region of Indiana is fairly level, and the cover over the coal increases uniformly with the dip of the bed. As a result, the coal is stripped from the outcrop line to a point where the overburden becomes approximately 45 ft. thick. When this stage is reached stripping methods are abandoned and the balance of the coal is removed through a shaft that has been sunk at the center to that part of the coal area that is so deep as to forbid stripping.

There are three separate operations at Staunton, two of which are strip pits. These lie on either side of the tract, but are approaching each other as they near the far end of the territory assigned to them. An output of somewhat over 4,000 tons daily is averaged by the three operations. Half of this is credited to the No. 6 mine, which is a shaft development, and the rest to the two strip pits known as Nos. 3 and 9.

The acreage, it will be noted, is a comparatively small one and the life of the property will not be long. Nevertheless great care has been taken in the selection of modern and complete equipment for preparing the output. All structures, it is true, are of wood, so that no large amount of capital is tied up in the surface buildings themselves. It would have been folly to construct buildings of a more or less permanent nature; that is, of either steel or brick. The type of construction chosen in no way interferes with the efficiency of the plant, and the equipment within belies the exterior aspect. Stripping operations are at the best only temporary and the adjoining underground mine at this plant also might be called temporary on account of the small size of the acreage available.

The three operations are situated almost in a line with each other and each is about a half mile from its nearest neighbor. The big shovels at both plants started at opposite ends of the outcrop and worked toward each other. Though the operations at the two strip pits are carried out in a similar manner, the equipment employed differs considerably.

At the No. 3 mine a 225B Bucyrus steam shovel with an 80-ft. boom and a 6-cu.yd. dipper is handling the overburden. A cut about 60 ft. wide is made by this shovel from one end of the territory to the other. The machine then works its way back in the opposite direction. Of the 60-ft. width of coal bed exposed by the stripping shovel only 45 ft. are lifted by the coal shovel, 8 ft. being left to accommodate the railroad tracks and another 7 ft. being provided between the tracks and the bank that is to be worked on the return journey. The leaving of this part of the bench

General View of No. 9 Pit

Both shovels are here seen in operation, the larger moving the overburden and the smaller loading coal. The size of the shovels can be judged when it is recalled that the seam of coal being lifted is eight feet thick.

makes it possible to lay the track for the return trip with minimum delay. The coal shovel is a 35B Bucyrus with a 1½-cu.yd. dipper.

After the larger shovel has removed the cover the top of the coal is cleaned by pick and shovel, brushed with a wire broom and finally washed clean, so that when the small machine reaches the coal it finds it quite clean on top. Throughout the tract a fireclay bed overlies the coal. This is the reason why great care must be taken to clean the top of the bed. The bottom is a firm sandstone and gives no trouble. Holes for shooting the coal loose are put down on 8-ft. centers. At both pits the drilling of these holes is accomplished by means of jackhamers.

COMPRESSOR ON SHOVEL SUPPLIES AIR DRILLS

In No. 3 mine compressed air for these drills is supplied through a 1-in. hose line from a Westinghouse compressor installed on the shovel. One stick of explosive suffices to bring down an 8-ft. block of coal. The shots are fired by a storage battery. In both strip pits standard-gage track is used and the small shovels load the coal directly into steel gondolas. Vulcan "dinkey" locomotives haul away the cars from the pit. Two of these are 20-ton while the third is a 30-ton locomotive. By reason of the firm floor on which fortunately the coal rests the product is clean when loaded into the car and but little of the bottom is ever disturbed.

In most strip-pit workings much surface water has to be removed, and this operation is no exception. Here, however, the dip of the bed aids in the solution of the problem. A large sump has been excavated and it serves to collect and hold all this water. At No. 3 pit the water is elevated by a Fairbanks-Morse centrifugal pump to a small stream running near the sump.

The pump is installed on the berm that has been left to sustain the railroad tracks which lead into the pit. This pump is equipped with an 8-in. suction line and a 6-in. discharge. It is operated by steam supplied by one of the locomotives, of which there are more than

One of the Big Shovel Cuts

Compressed air used in sinking shot holes in the coal is supplied by a compressor on the smaller shovel. The sandstone in the floor makes a good pavement for the caterpillars.

the haulage system demands. By use of the boiler of this locomotive is obviated the loss of steam that would be sustained if the pump were fed from the power plant at No. 6 mine.

Such pumps might be driven by electrical energy, but after all the work is intermittent and it leaves the locomotive free for other work when it is needed. If an electric motor were used for this purpose it would be subjected to all sorts of inclement weather and would be liable to frequent breakdowns because of the abnormally severe usage with which it would meet. It is necessary to operate this pump only one or two hours daily. Under these circumstances steam can be furnished with ease by the spare locomotive.

At No. 9 pit, on the other side of the tract, the operating methods are quite similar. The big, or stripping, shovel is of Marion make of the 300 type. It has a 90-ft. boom equipped with a 6-cu.yd. dipper. The coal shovel is a No. 36 Marion of the caterpillar-tractor type and has a bucket capacity of 1½ cu.yd.

IN NO. 9 COMPRESSOR IS ON LOCOMOTIVE

The coal is cleaned and the shot holes drilled in much the same manner as noted in preceding paragraphs. The compressor supplying the air for the drill, however, is not located on the shovel but has been installed on the locomotive assigned to this pit. By this arrangement the compressor is operated whenever the locomotive is waiting for the filling of a car and the coal is shot down during the time the locomotive is engaged in removing a loaded car from the pit.

The loaded gondolas from both strip pits are removed to a centrally-located tipple. Here the cars are placed, one at a time, over a hopper in the shed at the rear of the building. The bottom gates of the cars are opened and the coal passes into the hopper and is distributed evenly upon a housed-in flight conveyor that leads up an incline to the head of the tipple, that structure being built of wood. It was designed and erected by the Link-Belt Co., as was also all the equipment it contains. The exterior appearance of this tipple and its appointments on the inside are quite similar to the plant described in *Coal Age* April 8.

From the head of the flight conveyor on the tipple the coal drops into a second hopper, or conveyor discharge chute, from which point it is delivered to a second conveyor, or picking table, where dirt and refuse coal are removed, the extraneous material being thrown into wooden chutes that lead to one central point at which the rock and slate are loaded into dump cars for removal over one of the railroad tracks beneath the building.

The picking table is located on the upper of the two tipple floors. On the lower floor are mounted horizontal shaker screens, to which the coal from the picking table is delivered. Here the coal can be divided into three sizes or into a combination of any two or more of them. By the proper manipulation of a gate placed ahead of the screen plates the coal may be shunted to a crusher installed on the second floor of the tipple. It may thus be shipped as stoker fuel.

As a result of the careful preparation given in this building the coal loaded is of a high standard of excellence. From the appearance of the loaded cars it is hard to tell the stripped coal from that prepared at the tipple of the No. 6 mine. As a matter of fact some of the stripped product has at times commanded a higher figure than that produced by underground mining from the same bed. Some of the coal under light cover in certain sections of the tract has a higher calorific value. Few strip-pit plants could make a similar claim and one as well substantiated. The tracks under the tipple connect with a spur of the main line of the Pennsylvania R.R. which leads out of St. Louis.

(To be Continued)

Avoiding Inaccuracies in Moisture-Content Determination

Solvents Prevent Oxidation and Retain Volatile Matter and So May Aid in Determination of Moisture in Coal

A NEW method for the determination of moisture in coals is proposed by A. Renfred Myhill in the *Gas Journal*, Vol. CL, No. 2,969, page 21 (April 6, 1920). The method claims increased accuracy and rapidity.

Objection is made to the customary method of drying from one to five grams of coal for one hour at 100 deg. C. The statement is made that "most coals, particularly when in fine powder, evolve a fair amount of volatile matter (other than water) when heated for any length of time at 100 deg. C.," and that "certain oxidizing actions take place." It is admitted, however, that "this error in many cases is not serious." Bodies that will dissolve the volatile matters evolved have been proposed to meet these difficulties and the reviewer agrees that they would prevent oxidizing actions, but is of opinion they would not totally inhibit evolution of volatile matter from the mixture.

The new method offered consists in distilling a mixture of 100 grams of coal with 200 cc. of either benzol, toluol or xylol. The solvent selected must be free from water and must contain fractions boiling at not less than 110 deg. C. The distillation is carried on up to at least 110 deg. C. and the water collecting at the bottom of the receiving cylinder may be isolated and weighed or the volume may be determined and converted into grams by consulting a specific gravity table for water at the temperature of the resulting distillate.

One method employed by the U. S. Bureau of Mines for the determination of moisture in coal consists in drying a small coal sample in a weighing bottle for one hour at any temperature ranging from 104 deg. C. to 111 deg. C. This fact would seem to indicate that the inaccuracies due to the evolution of volatile hydrocarbons from coal at 100 deg. C. is regarded as negligible.

The author states that "the whole test can easily be carried out in from twenty to thirty minues." It should be pointed out that the apparatus would need constant attention during the entire distillation which is not now required in the generally accepted method.

The method proposed by Mr. Myhill would frequently be inapplicable because one hundred gram samples are not always available, and the action of the solvent employed might render the sample unfit for subsequent detailed analyses. It is known that organic solvents under some conditions will alter the structure of the original coal. The effect of this procedure on the constituent of coal requires investigation. Further, the greater amount of apparatus required, the more cumbersome manipulation and the added cost of water-free solvents are objectionable features of this method.

Urges Coal Operators to Meet Problems Through Organization

President Harry N. Taylor in His Address as Retiring President of National Coal Association Tells Coal Men That Their Body Is the Keystone of the Industry—Problems of the Year Reviewed

By H. N. Taylor

IN APPEARING before you for the last time as the president of the National Coal Association it is with a feeling of great pride that I look back over the accomplishments of the past year and the splendid record the National Coal Association has made.

Great as were the achievements of the association during the war period, the National has been called upon to face far greater questions, more vitally affecting the welfare of its members, during the past year of reconstruction than even the great questions which confronted it during the period of actual hostilities.

The war problem was largely one of increased production. During the past year we have been called upon time and again to defend ourselves against attacks which threatened the very life of the industry. Never has the need of oganization been so manifest, and never has the fact that we have so powerful an organization as the National so justified its being.

Local Coal Associations Strengthened

I desire to point out as briefly as possible some of the principal efforts and accomplishments of the association.

Shortly after the annual meeting of the association in Chicago Mr. Morrow, your vice-president, and myself made a trip into West Virginia and Alabama, meeting with the operators in that section for the purpose of strengthening their local association and their relationship with the National. These arganization trips were followed up by Mr. Morrow and myself, visiting the Iowa Coal Operators' Association, and, together with Mr. William Henderson, the chairman of the Membership Committee, we made an extended trip, meeting with the operators of Missouri, Kansas and Arkansas in Kansas City; with the operators of Oklahoma at Muskogee, the operators of Texas at Dallas, the operators of Colorado and New Mexico at Denver, and the operators of southern Wyoming and Utah at Salt Lake City. Mr. Morrow extended his trip to the State of Washington, returning by way of Montana, so that by personal contact we have reached the operators in almost every section of the country, and have added largely to our membership, and from reports received have aided the strengthening of the local associations which ultimately became members of the National.

Early in June of last year it became evident that there would be a serious shortage of coal in the fall and winter of 1919-1920. Advance information from the miners of their intent to strike in November caused the association to for ma committee to place these facts before the public, and this committee put on a campaign, laying these facts before the public through advertisements in the principal journals of the country, and for this purpose expended $94,447. This campaign yielded almost immediate results, and stimulated the placing of orders at the mines. The Geological Survey reports show an immediate increase in production—I believe largely due to this advertising campaign. It had the further effect of developing the fact that with the normal movement of coal there was an actual shortage of cars.

The association, through its railroad committees, put forth every effort to compel the U. S. Railroad Administration to give proper attention to the transportation of coal, and by co-operating with the Railroad Administration succeeded in obtaining a more effective use of the equipment for the hauling of coal.

Introduced Standard Accounting Method

I desire to call especial attention to the work of our Cost Accounting Committee, of which Mr. Thomas Brewster was chairman. It concluded its work, and a standard method of cost accounting for coal mining companies was adopted at the meeting in Kansas City on July 9, and this system has become generally recognized as the best accounting system yet developed for any of the mining industries in the United States. It has been adopted widely by individual companies and has been of the greatest value to the industry as a whole. Especially has it benefited by the approval of this system by the Treasury Department for taxing purposes.

On July 18, 1919, the U. S. Senate passed a resolution introduced by Senator Freylinghuysen, authorizing the investigation by a sub-committee of the conditions of the coal mining industry, alleging that prices had been advanced and production curtailed, against public interest. The National Association quickly compiled the facts, and showed conclusively through evidence of its witnesses before this committee that there had been a decline instead of an advance, and that the real trouble was lack of transportation and improper functioning on the part of the Railroad Administration. The result was that this investigation soon switched from an investigation of the coal industry to an investigation of the Railroad Administration, and through this investigation much publicity was obtained, which put the coal industry in a better light before the public.

Investigators Disclosed Strike Plans

This investigation developed the fact that the miners had intended using what they term "economic force" to bring about an increase in their wages, even though the public should be frozen out to enforce their demands. The fact that the coal operators had clearly pointed out this situation to the public through their advertisement in June relieved them of stigma when the strike actually occurred in November.

Through the efforts of the National Association in connection with the investigation of the governmental agencies, production, which had been running at about eight million tons a week prior to August 1, was increased to about thirteen million tons a week prior to the strike on November 1; and this increased production, much of which was in storage on November 1, tided over what would have otherwise been a national calamity due to the nationwide strike put into effect by the miners' union.

FUNDS SUPPLIED FOR PRODUCTION REPORTS

Because of the failure of Congress to provide sufficient funds for the continuation of the U. S. Geological Survey weekly coal production reports, this association quickly stepped into the breach, and from July 1, 1919, until the present time, has provided the funds to keep this all-important report alive. Your directors realized that a break in this report from July 1 to any subsequent date would throw the production information into a chaotic condition and prevent comparisons in the future for all time to come. Inasmuch as it was vital to the industry that these reports be kept continuous the effort of the association which made possible the continuation of this report for the general information of the industry has been one of its most important works.

The officers of the association have been constantly desirous that the public have a better understanding of conditions in the production and distribution of coal. The U. S. Bureau of Mines called upon the association for financial assistance in the preparation of a moving picture film portraying the operation of coal mines as an educational feature. Your Board of Directors appropriated $8,000 to cover a portion of this expense. This film has been prepared and arrangements have been completed by which it will be shown during this year in the moving picture theaters throughout the country, and it is estimated that 52,000,000 people will see the operation of a coal mine.

The average consumer of coal has at best a vague idea of the items which make up the total cost of production. What is paid the miner per ton is his idea of cost. The fact that there are over two hundred items of cost other than the amount paid the miner is overlooked. The National Association has given wide publicity to a chart showing these two hundred items of cost, and has obtained splendid results in an educational way.

STATISTICAL BUREAU A MEANS OF DEFENSE

On Dec. 11 of last year your Board of Directors established a statistical bureau for the assembling of information which should at all times be available for the defense of the industry whenever it might be attacked, as well as for the better information of coal operators and the general public. For this purpose your board made an appropriation of $50,000, and the services of C. E. Lesher, who has been with the Geological Survey, were obtained, and he was established as the head of this bureau. It was through the medium of this bureau that it was possible to assemble the enormous amount of statistical information necessary for the submission of the coal operators' case to the President's coal commission. Although Mr. Lesher has resigned to become editor of *Coal Age*, this bureau is still being maintained and is a vigorously helpful part of the association's organization.

The assembling of current information regarding market conditions, which has been obtained by the association from local associations, has been somewhat disturbed, and has been resumed only in part. Many local associations have not as yet re-established their daily market report, for one reason or another; but the importance of having authentic information properly compiled on hand at all times is vital, and I would urge that the local associations resume the compiling of this information and sending it to the headquarters of the National Association at Washington at the earliest date possible. This information can be compiled and published in the *Coal Review*, the official organ of the National Association, so that it can be in the hands of all coal operators as a barometer of trade conditions.

Figures compiled by the Bureau of Internal Revenue show that in 1918 something like 22 per cent of the companies mining bituminous coal had net losses, and almost a third of this class showed losses averaging 49 per cent on capital invested. At the same time 11 per cent had net income of less than 5 per cent on invested capital and averaged but 1.94 per cent after paying taxes. In fact, 40 per cent of the companies had net profits which, after payment of taxes, left less than 11 per cent on invested capital. Half of our bituminous coal was produced by the 62 per cent of companies that either had deficits or showed less than 11 per cent in profits after paying their taxes to the United States.

AUTHENTIC INFORMATION SUPPLIED TO THE PRESS

The daily press is prone to call attention to the high prices in spots here and there. Nothing is ever said of the millions of tons of coal that are sold at low prices. Correct and authentic information as to the average selling price should be obtainable at all times, and this can only be accomplished through the work of the statistical department of the National. The machinery for this great work has been established by the National Association, and it now is in the hands of the local associations to take the benefit of the organization provided for this purpose by the National. Correct and authentic information is a duty that we owe to the industry and to the public.

Your Board of Directors has set aside $75,000 for educational work. An educational or publicity committee, of which A. M. Ogle is chairman, which committee is working under the supervision of the Finance Committee of our association, of which Mr. J. J. Tierney is chairman, jointly agreed that the *Weekly Digest*, which has been a constant adviser of the coal industry, should be published under the name of *Coal Review*, and become the organ of the National Coal Association and the coal industry. The details of their endeavor will be put before you in the report of the committee.

On Feb. 16 the directors authorized the institution of test suits to ascertain the authority of the Federal Trade Commission to require coal operators to furnish reports of production, cost and income, which the commission had ordered them to submit. The first of a series of actions for this pupose has been brought in the Supreme Court of the District of Columbia, in the name of the Maynard Coal Co., and in the first instance the association has been successful in securing a temporary injunction restraining the commission from requiring the filing of these reports by the Maynard Coal Co. The case will be carried through to establish definitely the rights of the industry with respect to governmental regulation. This case has attracted wide attention, as the findings are vital to many other industries. Congress during the past year has given much thought to, and many resolutions and bills have been introduced, having for their purpose, the investigation of the industry. Construction, rather than reconstruction, is the great task confronting Congress. There is too much Government in business and not enough business in Government. Uncle Sam must be pried out of the coal business, the lumber business, the transportation business, and all other businesses which have been invaded. His right hand must be taken from the throat of private enterprise, while his left hand must be taken out of the pockets of the taxpayers. There is plenty of work for both hands if employed in the administration of legitimate business of governmental affairs.

Every effort toward government ownership must be discouraged and contested. Private capital uncovered and developed the resources of the United States. Private capital opened up to settlement, use and prosperity the places that had been wasted and idle. Private capital footed the payrolls of the laborers who built and ran the railroads. Private capital built and operated the factories. It was the private capital of the farmer that bought and tended the farms and made them productive. Private capital is the foundation and superstructure of all American business. Wages are the biggest bills that private capital pays. The prize for which private capital is competing is general prosperity. It cannot hope to win the race hampered by government control as a weight on one leg and with unreasonable domination of union labor as a weight on the other.

Organized labor seems to have adopted the theory that to work too hard will spoil the job. Their leaders say: "Why increase production when a shortage in supply is the very thing that keeps business alive?" They further assert: "If you allow an over-supply of commodities to develop, we will at once be thrown out of our jobs." This argument is a fallacy. The fallacy lies in confusing individual production with the production of the plant as a whole.

INCREASE OF MEN, BUT NO GREATER OUTPUT

To maintain output during the past four years coal operators and manufacturers have had to employ more men to do the same work. This means higher costs, first, in payrolls; second, in additional mining machines, clerk hire and overhead cost. The higher cost is generally passed on to the consumer in the form of higher living expenses. Still the shortage in production continues, so new companies are induced to start mining or manufacturing, sinking new mines, building new plants and creating what in normal times would be an excess of producing capacity. The effect is plainly seen in the distress of excessive living costs, overstrained credits and over-expanded business. Increasing individual production is quite another thing.

If each workman, by more effective work, adds 25 per cent to his daily output, he supplies the goods that are needed; but he does not add to the producing cost; in fact he cuts down the cost per unit, for he helps get a greater output from the same mine, the same machinery, the same equipment, without increasing the overhead charges. He benefits himself either through higher wages or by lowering the cost of living to consumers, of which he is one. He is able to buy more things, and consequently he increases the demand for goods at the same time that he increases the supply and cheapens the cost.

History does not record an instance where business depression was caused by labor increasing its output of goods per man. The unnatural condition forced by the false logic of shorter hours and less production creates a situation of higher cost, which, in turn, is responsible for the wave of labor unrest, which again in turn breeds Bolshevism. Bolshevism is merely a lazy man's envy of the prosperity of a hustler. The often repeated claim of the Socialist that labor creates the world's wealth is another utter fallacy. The wealth of the world has always been created primarily by intelligence. It is the brain of man that leads in production, and not the brawn.

Capital, after all, is only crystalized labor. Manual labor without the guidance and inspiration of brains has never accomplished anything for mankind beyond a bare existence. When the world gets down to work again we will cure our economic ills, and not until then.

COLLECTIVE BARGAINING PRODUCES HARD BARGAINS

The coal industry was the first basic industry to recognize the principle of collective bargaining. Since 1898 this method of dealing between the employer and the employee has been in force. Each wage period finds it more and more impossible to reach a settlement. The miners have fully recognized the importance of organization, and with the expanding of their efforts along these lines it becomes more and more difficult for the operators to meet and successfully maintain their position.

Organization is the keynote of industry; 100 per cent organization on one side must be met by an equally well organized body on the other if fair results are to be obtained.

The National Coal Association has made wonderful progress. It has achieved many things; but it must go forward in its effort. Not the least of the association's achievements during the year has been a further growth of mutual sympathy and understanding among coal operators in all parts of the United States, through their association in this organization. The association is not perfect by any means, but if it is to render the service that such a national organization should render it must continue to grow and we must give our serious thoughts to its improvement.

If some of us become dissatisfied because it has not accomplished all that we had hoped, the proper remedy is not to find fault and threaten to withdraw but to take off our coat and go to work and make the organization the powerful instrumentality that this industry ought to have in its national association.

To me it is unthinkable that the coal operators of the United States should ever consider leaving their industry without such an organization as this when the social and public problems which this business must face are so pressing and so serious as they are at the present time. Therefore, I look upon this association as an established institution. Through it the coal business has advanced beyond the dark ages of utter disorganization into the light of union for common purposes and achievement.

To Consider Advisability of Government Acquisition of Coal Fields

OWING to the oil situation and the possibility that Government vessels may be compelled to use coal, Senator Cummins, of Iowa, has introduced in the Senate a resolution directing the Naval Committee to consider the advisability of Government acquisition of coal fields.

Report of Railroad Administration Reveals Financing of Over Four Billions

Statement of Difficulty of Persuading Roads to Accept Allocated New Equipment Complicates Sentiment on the Present Car Shortage—Companies Unable to Pay Cash May Settle with Equipment Trust Notes

A COMPREHENSIVE account of the financing of the United States Railroad Administration, a task involving billions of dollars, is given in the report of Swagar Sherley, director of the Division of Finance, made public May 24 by the Director General of Railroads. Mr. Sherley sketches the history of the financing of the railroads from the beginning of Federal control on Jan. 1, 1918, to date.

One of the interesting features of the report, bearing upon the present situation of the railroads as to equipment shortage, deals with the efforts of the Railroad Administration to induce the railroads to accept the equipment that had been ordered for them. Because of the failure of the Railroad Administration appropriation in March, 1919, construction of equipment of all classes had to be delayed and expenditures kept to a minimum.

After money had been made available, and cars and locomotives had been constructed and allocated, many of the railroad corporations protested strongly, claiming that the cost was excessive and represented a war cost that the Government should bear and that they did not need the equipment. While it is now evident that this and more equipment is needed and that costs are as high or higher, it was not until late in 1919 that the Railroad Administration was able to persuade these roads to accept the equipment.

Government Was Obliged to Advance Money

The estimated balance sheet of the Railroad Administration at the conclusion of Federal control on Feb. 29, 1920, after twenty-six months of Government operation of the railroads, carried totals of $4,493,972,125. Because of the practical inability of the railroad corporations to float bonds or borrow money during and immediately after the war, the Government itself was obliged to advance nearly all money needed for capital expenditures and other purposes. At the end of Federal control, Mr. Sherley's report shows, there was due to the carriers in unpaid compensation and other large items, including all gross interest accruals, $1,476,928,805.60, while there was due from the carriers to the Railroad Administration, including similar interest accruals, $1,677,243,077. Of the amount due from the carriers it is estimated that $815,379,145 properly may be used under the terms of the Transportation Act, 1920, as an immediate offset against the amount due by the Government to the carriers.

Congress appropriated for the Federal control of transportation systems $1,250,000,000, and the Transportation Act of 1920, under which the properties were returned to private control, carried an additional $200,000,000. The following table from Mr. Sherley's report summarizes the loss sustained by the Government in operating the roads:

ESTIMATED EXCESS OF OPERATING EXPENSES AND RENTALS OVER OPERATING REVENUES

Class 1 railroads	$677,513,151.56
Other privately-owned properties (smaller railroads) sleeping and refrigerator car lines and steamship lines)	43,011,129.36
Inland waterways	2,419,738.69
Total	$722,974,019.61
Expense of central and regional organization	13,954,979.69
Deficit, American Railway Express Co.	38,111,741.60
Adjustment of materials and supplies in settlement with railroad companies on account of increased prices	85,204,618.26
Net interest accruals for deferred compensation, open accounts, and additions and betterments	37,558,162.01
Deductions from gross income	10,118,034.36
Miscellaneous profit and loss items	4,894,056.38
	$912,815,611.91
Less non-operating income	12,336,855.35
Total	$900,478,756.56

"The operation of the roads by the Government for the year 1918, together with expenses incident to the water-way operations of the Government, resulted in a deficit for the year of approximately $236,000," says Mr. Sherley's report. "On Jan. 1, 1919, there was to the credit of the Railroad Administration a total of $78,188,531.69, exclusive of the working funds with Federal treasurers. There had accrued as compensation due to railroads a total of approximately $945,017,848 and there had been paid to them either in the form of loans or direct payment on account of compensation the sum of $375,475,412.

"It became apparent that additional appropriations would have to be made by the Congress in order to enable the Railroad Administration properly to carry forward Federal control of the railroads and provide the additions and betterments needed if the roads were to perform their full duty to the public and be enabled to pay the sums necessary to enable the various carrier companies to meet their obligations to their bond and stockholders. Accordingly, there was submitted upon Jan. 24, 1919, by the Director General of Railroads to the Congress an estimate for an additional appropriation in the sum of $750,000,000. This appropriation was passed by the House, but failed to pass the Senate.

"During the pendency of the estimate the slender resources of the Administration were husbanded to the last degree, with the necessary result of the postponement of payment of many bills due, and with payment to the roads of only such sums as might be necessary to enable them to meet their necessary fixed charges, etc. Calls upon the Federal treasurers were made for surplus funds in their hands, and during the month of January nearly $14,000,000 was thus placed to the credit of the central treasury. Calls were made on various carrier companies to whom money had been loaned to repay such loans, and during the months loans were repaid by some of those corporations amounting to $57,000,000 in round figures of principal, and $393,000 of interest. The total of these various sums for that month amounted to $81,835,000, that was placed in the central treasury, and in February from various sources $31,300,000 additional was obtained.

"During the months of January and February, however, expenditures in the way of compensation and loans of carriers were made amounting to $89,930,000, and moneys were advanced to Federal treasurers to enable them to take care of vouchers and other pressing obligations amounting to some $36,139,000, while manufacturers of locomotives and cars were paid on account of indebtedness to them sums aggregating $48,125,000, and there were other payments amounting to $2,340,000. The result was that the balance in the central treasury amounting to $78,188,531 was reduced at the end of February to $14,795,894, and it was estimated that the Federal treasurers had on hand outstanding vouchers and payroll checks aggregating approximately $258,000,000, and they had cash on hand to pay them amounting to only about $129,500,000.

"The failure of the appropriation asked for presented, therefore, a very acute situation and required drastic steps to be taken. One of the first methods adopted was to get the War Department to pay to the Railroad Administration $100,000,000 on account of services performed by the Railroad Administration for the War Department, but which had not been vouchered. It was perfectly apparent that there was at least $100,000,000 of indebtedness from the War Department to the Railroad Administration, and in order to relieve the latter of the embarrassing situation which confronted it, without waiting for the vouchers to come in due course, the War Department paid on account the sum stated. Subsequently, as the vouchers came in and were audited, the War Department took and was given credit on account of the sum thus advanced; $10,000,000 was obtained from the Navy Department; $50,000,000 was borrowed from the War Finance Corporation.

CERTIFICATES OF INDEBTEDNESS ISSUED

"By these methods a total of $160,000,000 was added to the $14,500,000 that still remained in the central treasury. The money thus obtained in these various ways did not, however, provide anything like enough money to take care of the demands that were being made by the various railway companies for advances to them on account of compensation in order that they might in turn pay their corporate expenses, fixed charges, taxes and in certain instances their dividends. Conferences were had with them and it was agreed that as the Railroad Administration was unable to pay them on account of compensation due in cash, it would issue to them certificates of indebtedness in amount sufficient to enable them to obtain the money so needed and only in such amount.

"Conferences also were had with prominent bankers over the country and with the War Finance Corporation to the end that the banks and the War Finance Corporation might come to the help of the companies by loaning them money upon their obligations with these certificates as collateral.. Under this plan there was issued to the carrier companies in March $47,842,500 worth of such certificates; in April $79,517,300 worth; in May $57,831,500 worth, and in June $8,081,675, making a total of $192,272,975 worth of certificates of the Railroad Administration.

"During the summer and early fall the earnings of the roads sufficiently improved to warrant the hope that no further deficits would be incurred, but the situation that looked so very promising in August and September shortly thereafter was greatly affected by virtue of two chief factors, one of which had an indirect effect, and the other a very direct effect. The steel strike affected the earnings of the Railroad Administration by slackening business. The uncertainty that existed in the country as to what might be the developments growing out of it served to affect traffic which was immediately reflected in the earnings of the roads. The coal strike had a very direct effect in this regard, as well as increasing greatly the cost of operation during the remainder of Federal control.

"Earnings fell off very materially and the deficit in operation from month to month grew in volume. The estimate of $1,200,000,000 which was presented to Congress in May, 1919, though predicated upon the belief that there would be no further deficit incurred through operation of the railroads, as previously stated, was not allowed in its entirety, and the $750,000,000 that Congress voted, together with the reduced earnings from operations, resulted in the Railroad Administration's being at all times restricted in the amount of moneys available for capital expenditures, for the payment of its operating obligations and compensation to the carriers.

CONGRESS APPROPRIATES LESS THAN ESTIMATE

"Upon the convening of Congress in an extraordinary session, estimate was submitted for $1,200,000,000 in order to enable the Railroad Administration not only to redeem the certificates of indebtedness that it had issued, but to enable it to pay promptly all past due indebtedness on account of compensation, all outstanding vouchers and to have available sufficient working capital to enable it to efficiently and economically administer its affairs. Estimate was submitted upon May 24, 1919, and Congress promptly considered the same. but appropriated the sum of $750,000,000 in lieu of the $1,200,000,000 asked for. The bill was signed by the President upon June 30, and immediately steps were taken to call in and pay outstanding certificates of indebtedness. Through the generous and active co-operation of the Treasury Department and the Federal Reserve banks arrangements were made for presentation of these certificates at and payment by any Federal Reserve bank on July 15, and on that day out of a total of $285,308,172.26 face value of certificates outstanding there was paid $245,938,808 worth, and this without appreciable disturbance of money balances in any part of the country.

"The failure of the Congress to appropriate moneys requested in the latter part of January, 1919, prevented any large undertakings in the way of additions and betterments during the first quarter of the year and the reduction by $450,000,000 of the amount requested of the Congress at the special session, with the limited funds being received from operations, together with almost complete inability of the carriers to pay for any additions and betterments, made necessary the elimination of all projects for capital expenditures not of the most necessary and pressing character. The details of such expenditures are set out in his report. Exclusive of allocated equipment, such expenditures for the year 1919 and January and February, 1920, amounted to a total of approximately $419,821,000.

"In 1918 there was ordered 100,000 freight cars and

1,330 locomotives, and in the early part of 1919 there was an additional order of 600 locomotives, the estimated cost of all of the equipment being $402,000,000. This equipment was allocated from time to time to various railroads according to the estimate of their need for such equipment. While some of the roads early accepted the allocation of this equipment, many very strongly protested against the allocation. They based their objections on two grounds—one was that the cost was excessive and represented a war cost that the Government should bear, and the other was that they did not need the equipment that was being purchased; and some roads protested that they did not need the type that had been ordered.

"The Railroad Administration insisted that the cost was not excessive and that the quantities ordered were, if anything, inadequate to the need and that it was the duty of the railroads to supply themselves with the equipment necessary to perform their services as public carriers. Unfortunately, these views were accepted by only a limited number of the railroads in the first instance, and it was not until late in the year 1919, and after arrangements had been made for the carrying by the Government for the carriers of the cost of the equipment, that all of the equipment was accepted by the roads.

New Equipment Expected To Be Costly

"In view of the fact that it is now plainly patent that similar equipment will cost at least as much as this equipment has, and that the roads are badly in need of considerably more locomotives and cars, it may not be amiss to recite the conditions that confronted the Railroad Administration in connection with the acceptance of this equipment and which conditions, together with the limited funds at its disposal, prevented the Railroad Administration from undertaking the procurement of additional equipment although fully alive to the conditions that were confronting the railroads and the country as a result of the scarcity of locomotives and cars.

"On April 7, 1919, there had been accepted, 46,800 cars; there were allocated and not accepted 47,950, and there were unallocated 5,250; on May 9 there had been accepted 48,800; on June 11, 48,300; on July 14, 54,750; on August 7, 62,350; on September 9, 66,350; on October 8, 68,300; on November 12, 73,600; on December 10, 83,800. In January there were accepted 94,850; on February 9, 99,000, and by March 1 all of them had been accepted.

"Of the locomotives, it is the same story; accepted in April, 891; in May, 913; in June, 997; in July, 1,345; in August, 1,390; in September 1,564; in October, 1,709; in November, 1,740; in December, 1,869; and so on down to a final acceptance of all of them.

"The amount of compensation accruing monthly to the carriers for their properties under Federal control approximates $75,000,000. With the exception of four months—July, August, September and October—the net operating income from month to month was much less than this sum, and with the need to pay the cost of current additions and betterments as well as take care of those coming over from the previous year, it was necessary at all times to husband the moneys of the Railroad Administration. The carriers have been paid the sums necessary to enable them with their other resources to meet the corporate needs and fixed charges specified in the contract as above set out and dividends where the financial strength of the road warranted, but payments have practically been confined to such needs in the case of all carriers.

"As a result as to some few of the stronger roads whose standard compensation with other resources are considerably in excess of their fixed charges and dividends and for whom addition and betterment expenditures have been light the Director General is in debt over and beyond any indebtedness of such roads to him. As to the great majority of the roads, however, notwithstanding the conservation policy pursued as to compensation payments to them, they on a complete settling up of accounts, are indebted to the Government. From June 1, 1919, to the end of Federal control on March 1, 1920, there was paid, on account of compensation, to the carriers the sum of $776,825,760.71, the amount so paid being about equal to the compensation accruing for the same period."

Mr. Sherley describes in detail the arrangement made under which railroad corporations which are not in a position to pay cash for allocated equipment may meet such obligations with equipment trust notes. The total of such notes will amount to not more than $374,647,756 nor less than $345,875,352, according as the actual cost of the equipment may finally be determined.

The report outlines the reorganization of the Boston & Maine R.R., tells how the Government apparently has saved several millions of dollars by assuming its own fire risk, with the exception of marine property, and summarizes the provisions of the Transportation Act of 1920 under which funds are provided for liquidation of the Railroad Administration and winding up of questions growing out of Federal control.

Illinois Law-Makes Provision for Mine Surface Support

UNDER the law of Illinois, as by the general common law, where underlying minerals are conveyed, the grantor retaining the surface, he has a clear right to have the surface supported in the removal of the minerals. This right of support, being vital to the owner of the surface, is not presumed to have been given up by a conveyance of mining rights, in the absence of some express or strongly implied waiver on his part.

"The word 'surface' in mining controversies means that part of the earth or geologic section lying over the minerals in question, unless the contract or conveyance otherwise defines it. It is not merely the top of the glacial drift, soil, or the agricultural surface." A clause in a conveyance of coal mining rights excepting from the grant of underlying coal that lying beneath that portion of the surface occupied by buildings does not warrant an inference that it was mutually understood that the grantee of mining rights was under no obligation to support the remainder of the surface.

"A clause providing for removal of the underlying coal 'without entering upon or injuring the surface,'" etc., requires the mining to be so carried on as not to let down the surface. Injunction lies at the instance of the owner of a stratum of limestone which he is mining to restrain the owner of underlying coal mining rights from letting down the surface to the former's damage. *(United States District Court, Northern District of Illinois; Marquette Cement Mining Co. vs. Oglesby Coal Co.; 253 Federal Reporter, 107.)*

To Merge Forty Coal Mining Companies In Illinois Standard Field

ANOTHER attempt to merge the ownership of forty coal mining companies operating in the Standard Illinois fields, operating in the inner group of coal mines in Central Illinois, is being made by St. Louis and New York capitalists. The merger will involve a consideration of between $8,000,000 and $10,000,000.

The purpose of syndicating the ownership of the mines, according to those interested, is to increase, not limit, production; to eliminate trade abuses and to stabilize prices. By limiting production the purpose of the amalgamation would be defeated, those interested in the new organization say. It has been said that a number of large coal operators have been solicited to pool their interests, but those concerned said their plans were not complete and that information of the details of the merger would be announced later.

Louis J. Nicolaus, vice-president of the Straus-Nicolaus Investment Co., said that his company was interested in the deal in conjunction with New York interests. He said options had been obtained on about 40 per cent of the mines in the Standard field. These mines produce about 15 per cent of the total coal mined in that section. The daily production of the inner mine group is about 50,000 tons, most of which is sold through St. Louis. About half of the coal produced in the Standard field is sold to St. Louis.

The details of the merger are to be completed in July. The options which have been obtained will expire within thirty days. This is the fourth large merger of Illinois coal interests which has been proposed during the last twenty years. All three previous ones have failed.

Because of the conditions beyond the control of operators, the marketing of coal through the St. Louis gateway presents difficult problems to such an organization. The method used in selling the product of such a number of mines by a single organization is an extremely intricate one. It is because of these difficulties in adopting an efficient system of distribution that the failure of the other mergers resulted. The largest of these proposed mergers was launched just prior to the panic of 1907. It failed when it had been under way only a short time.

The new consolidation would give the purchasing syndicate control of most coal mines adjacent to the Illinois Central R. R., all Illinois mines on the Louisville and Nashville, the Baltimore and Ohio, East St. Louis and Suburban lines and mines on many other roads. The O'Fallon, Suburban, Troy and Eastern and Litchfield and Madison systems are the only roads on which mines in the Standard field would not be affected by the merger.

The Illinois Central mines, the output of many of which is consumed entirely by the road itself, extend forty miles east of East St. Louis. The elimination of competition in the Standard field, which will result from the merger, will place the entire coal output in the St. Louis district in the hands of a few operators. The other Illinois fields, which produce a better grade of coal than the inner group in the Standard field, also are controlled by a few operators. The Carterville field, in southern Illinois, is controlled by an association, and the Mount Olive field, adjoining the standard, is controlled by two or three operators.

The merger is expected to eliminate the selling of coal at lower rates in the summer months and to regulate the price of coal so as to have a uniform scale for both summer and winter. Consumers are now paying about 25 cents a ton below the normal price when they purchase in the summer and about 50 cents a ton higher than normal when they buy in the winter.

Text of Seasonal Rate Bill

THE text of the bill providing for seasonal coal freight rates which appears as an amendment to the Interstate Commerce Act, as reported by Senator Frelinghuysen on behalf of the sub-committee to the full committee of the Interstate Commerce Committee of the Senate, is as follows:

"That section 15 of the Interstate Commerce Act, as amended, is hereby further amended by inserting after paragraph (6) thereof a new paragraph to read as follows:

" '(6a) When used in this paragraph, the term "coal" includes anthracite and bituminous coal, lignite, coke, including petroleum coke, and briquets and boulets made from anthracite and bituminous coal and from coke. From and after thirty days immediately following the enactment of this amendment, no carrier by railroad subject to this act shall demand, collect, receive or enforce, for the carriage of coal, any individual, proportional or joint rate which is greater or less than—

" '(a) 5 cents per ton more than the schedule base rate then in effect therefor for shipments made during August,

" '(b) 15 cents per ton more than such rate for shipments made during September,

" '(c) 25 cents per ton more than such rate for shipments made during October, November and December, or

" '(d) 10 cents per ton more than such rate for shipments made during January, or which is greater or less than

" '(e) 10 cents per ton less than the schedule base rate then in effect therefor for shipments made during February,

" '(f) 25 cents per ton less than such rate for shipments made during March, April and May,

" '(g) 15 cents per ton less than such rate for shipments made during June, or

" '(h) 5 cents per ton less than such rate for shipments made during July.

" 'Whenever, after full hearing upon complaint or upon its own initiative, the commission is of the opinion that any such individual, proportional or joint rate as so reduced or increased is or will be unjust or unreasonable or unjustly discriminatory or unduly preferential or prejudical, the commission is hereby authorized and empowered to determine and prescribe what will be the just and reasonable individual, proportional or joint rate to be thereafter observed during the months to which the proceeding relates, and to make an order that each carrier affected shall cease and desist from demanding, collecting, receiving or enforcing a different rate than that so prescribed for the carriage in question.

" 'Whenever, after full hearing upon complaint or upon its own initiative, the commission is of the opinion that any of the increases or deductions in rates for the carriage of coal, as prescribed by this paragraph, or by order of the commission hereunder, cause or will cause shipments of coal to be made in such disproportionately large or small quantites during the months in question as to prevent the carriers affected from handling their traffic properly, from using their equipment and facilities most uniformly and efficiently, or from receiving just and reasonable revenue from such coal traffic as a whole, the commission is hereby authorized and empowered to determine and prescribe what increases or deductions in rates for the carriage of coal above and below the schedule base rates in effect therefor for the carriers affected and for the months in question will be just and proper, to be thereafter observed, and to make an order that each carrier affected shall cease and desist from demanding, collecting, receiving or enforcing a different rate than that fixed in conformity with the increases and deductions in schedule base rates so prescribed for the carriage of coal.

PROVISIONS TO PREVENT DISCRIMINATION

" 'Nothing contained in this paragraph shall be construed to authorize or require any carrier to demand, collect, receive or enforce (a) any rate which is less than its schedule base rate for the carriage of coal which has already been carried by it, or by any other carrier, under a rate as reduced under the provisions of this paragraph or by order of the commission hereunder, unless a carriage by water has immediately preceded such subsequent carriage by rail, or (b) any charge which is greater or less than that shown in its schedules for switching and other incidental services performed in connection with the carriage of coal, or (c) any rate which is greater or less than its schedule base rate for the carriage of coal, when such schedule base rate is 75c. or less per ton for the carriage in question. For the purposes of this act the schedule rate for the carriage of coal, except as otherwise provided herein, shall be considered to mean the schedule rate therefor as increased or reduced under the provisions of this paragraph or by order of the commission hereunder.' "

Amend the title so as to read: "A bill to further amend the Interstate Commerce Act, as amended, to provide for seasonal rates for the transportation of coal."

Cushing Attributes Traffic Congestion To Lack of Locomotives

IN connection with the efforts of the Interstate Commerce Commission to relieve traffic congestion, George H. Cushing has submitted a statement authorized by the American Wholesale Coal Association. In that statement he points out that there are three causes for the predicament in which the railroads find themselves. A portion of his statement is as follows:

"1. Unwillingness to work shown by the railroad employees.

"2. That the railways have fewer cars than necessary.

"3. That the railways have fewer locomotives than are needed to move trains, or have not properly distributed their locomotives.

"The railway employees will disclaim responsibility for the failure of transportation. Their statement is too hard to prove or disprove for the question to command serious consideration at this time.

"Whether or not we have enough cars cannot be proved until we have the maximum daily movement of cars in service, and that admittedly we are not getting today. In fact, the movement per day is decreasing rather than increasing.

"This analysis seems to put emphasis upon locomotives rather than upon cars and men. We believe that is where the emphasis should properly be placed.

"Our recommendation is that since the congestions which are killing cars and transportation capacity are in class 1 and 2 cities and since congestion always is an index of a shortage of motive power, it should be recommended to the railways that they subtract from engines employed in cross-country hauls to switch the terminals in class 1 and 2 cities. This means that we believe more emphasis should be placed upon engines in switching service than engines in cross-country hauls, because it only adds to confusion if you ship commodities to terminals but lack the motive power in terminals to do the switching.

"If by this simple change you avoid congestion, you will increase the mobility of cars and very soon determine whether you have enough engines on the railroads. If you have not, then the simple answer to the traffic question is to get more engines. At least a different distribution of motive power would serve to fix the responsibility and to localize the trouble."

House Committee Favors Byproduct Coke Ovens

MANUFACTURE of ammonium sulphate at the government plant at Muscle Shoals in relation to the byproduct coke industry is discussed in the majority report of a House committee which is investigating war expenditures. The committee says:

"During the war the War Department, through a large expenditure of public funds—amounting to many millions—by loans, contracts for the products and by building, caused the erection of approximately 1,500 byproduct coke ovens. There are now in operation in the United States about 11,000 of these byproduct coke ovens engaged primarily in the manufacture of coke and producing as one byproduct approximately 500,000 tons of ammonium sulphate during the present year. The ammonium sulphate produced by these byproduct coke ovens is largely in excess of any amount of ammonium sulphate ever used heretofore in the United States for agricultural purposes.

"The committee finds that no better single method of conservation of our national resources can be adopted than to encourage the supplanting of beehive coke ovens by coke ovens of byproduct type to that point where all coal carbonized for coke shall be so carbonized in ovens that will conserve the immensely valuable byproducts of the coal, now permitted in large degree to waste in the atmosphere. The building of such byproduct ovens is encouraged and stimulated by the prospect of a reasonable selling price for their byproducts, one of which is ammonium sulphate, an excellent nitrogen fertilizer material, and another toluol, a motor fuel of great excellence.

"If the War Department, or some agency of the Government acting under or through the War Department, should engage in the manufacture of ammonium sulphate for commercial purposes at Muscle Shoals in competition with private industry, it would have a decided tendency to retard the future conversion of cheap beehive coke ovens into the more expensive but vastly more efficient and conserving byproduct ovens."

Discussion by Readers

Edited by
James T. Beard

Co-operation of a Kind That Spells Success

REFERRING to the question of co-operation among mine officials, to my mind, John E. Ambrose has summed up, in a few words, the real object and purpose of such co-operation, when he says it is "to bring about greater efficiency in coal-mining operations, through more social relations whereby a better understanding will be established between employers and employees, on what may be termed a brotherhood in which men will have and take a deeper interest in each other's welfare." *Coal Age*, April 1, p. 662.

In my opinion, there can be no question but that a brotherhood of miners and operators, based on co-operative principles, would have a strong tendency to bring them close together. By this means, the operator would become more interested in the social, sanitary and financial welfare of his employee, and the latter would take a greater interest in the financial success of his employer. The successful operation of the mine would then be shared, in common, by both. The interest of one would become alike the interest of the other.

CO-OPERATION MEANS WORKING TOGETHER FOR THE COMMON INTERESTS OF ALL

Co-operation is the foundation principle on which labor and capital will be best able to adjust all their real differences. When capital and labor meet each other in a co-operative spirit and adopt the Golden Rule as a standard, all their differences will cease to exist. It is a regrettable fact that far too many employees take little or no interest in the success of their employer's business. Seemingly, many would rather see their employer fail than to see him prosper. I have known men to work for the same company for years and receive good wages, but never speak a favorable word for the company who employed them. Instead they were most always ready to say something against the company.

Co-operation of mine officials and mine workers may well be defined as a working together for the common interest and success of the undertaking, from the general manager down to the boss driver. They should all have the same object in view; namely, the successful operation of the plant. I am sorry to say, some high officials become selfish and autocratic in their official relation to their subordinates. By that means they hinder or destroy the spirit of co-operation, instead of fostering it as they should.

As has been stated, a mine official may be well prepared to fill the position he is holding, from the standpoint of his experience and knowledge; but, because of his selfish disposition and the lack of a spirit of co-operation with his brother officials, he may prove a complete failure. Again, there is a kind of selfish co-operation that is manifested only when greater benefits are to be received than those given. Co-operation, to be effective and beneficial, must be mutual.

In my opinion, instances are numerous where companies have suffered financial loss for want of better co-operation on the part of some of its officials. As an illustration of this fact, I will cite an instance that came under my own observation at a mine where I was employed. In some way the superintendent of the mine and the railroad officials handling the cars for that mine were at outs with each other.

It will cause no wonder that, as a result, the mines were frequently idle for an hour or so during the day, on account of the railway officials not shifting the cars when they knew that they were loaded. In this case, it was not the mine official who suffered the financial loss, but the company who owned both the mine and the railway. One official of the same company cannot work long against the interest of another official, without doing an injury to the interest of the company.

In conclusion, permit me to say that I do not much favor the plan or idea of a state and Federal board, suggested by J. A. Richards, on page 661 of the same issue, requiring the submission of plans of proposed mines before they are opened. In my opinion, such a system would involve much red tape, cause many needless delays and could not be applied to all coal seams. In uniform seams, prearranged plans might be feasible; but, owing to the geological formation of many irregular coal seams, such a plan would not be practical. An instance of this is the Nelson seam, located deep down under Walden's Ridge, in this state. This seam cannot well be operated on any prearranged plan or method, but the plan must await the development. The geological conditions will determine the method of operation in that case, as the development proceeds.

JOHN ROSE.
Dayton, Tenn. Former District Mine Inspector.

Can Coal Be Cleaned By Flotation?

REVIEWING the article presented under this caption, *Coal Age*, April 22, p. 795, prompts me to venture some personal views regarding this particular method of improving the quality of coal for shipment. In direct answer to the question, preliminary experiments made indicate that bituminous coal under this treatment will show favorable reductions of ash, sulphur and other impurities, but when the same treatment is applied to anthracite, more particularly to culm product, the results obtained are negative.

The procedure in floating coal, as compared with floating mineral substances, is a reversed one. For example, when treating 2,000 lb. of mineral, an average of 200 or 300 lb. of concentrates is raised by the froth, leaving, say 1,700 lb. of tailings to go to the bottom of the machine. But, in the case of the treatment of coal, 1,700 lb. has to be raised by the froth, and 300 lb. remains at the bottom as tailings or refuse.

It is therefore evident that, since the air bubbles in the flotation machine furnish the actual lifting medium and lift the material several feet high, it is necessary to supply a comparatively large volume of air. For this reason, it is plausible to assume that a pneumatic type of machine would be better suited for the treatment of coal than is the agitator type, considering the cheaper operating costs of the former machine.

Coal to be treated by the flotation principle would, necessarily, have to be finely ground, and it is doubtful if coal coarser than what will pass through a 30-mesh sieve can be raised by the ordinary frothing medium. As to the amounts of the reagents necessary for this treatment, much will depend on the re-use of circuit waters in the system. Then, there is the air consumption required, so much per ton of coal, which estimate is not available. Moreover, the dewatering of the treated product, of this fineness, would present no little problem, as all coal workers are familiar with the difficulties in handling coal of this state and fineness.

The use of proper frothing reagents and their presence in the finished product (even in small quantity) and their effect on the apparatus must also be studied and carefully considered. Experimental work, so far, with the flotation method, does not show a more efficient extraction of the impurities than the present perfected types of gravity separation. There are possibilities, however, in its application and the technicians in this particular field should give the matter its fair share of consideration and study. A time will come when portions of our coal will have to be treated by other methods than the straight, water-gravity type.

———, Ill. BYKEM.

Working Kanawha River Coal

HAVING read the request of Arthur L. Sheldon asking for suggestions in regard to the best plan for working three overlying seams of coal, and having had considerable experience in the working of contiguous seams, I venture to give an opinion on the matter.

First, regarding the relative advantages and disadvantages of shafts and slopes, in the operation of these seams, I am in favor of a slope opening.

A shaft, to give an output of one thousand tons a day, would require the installation of a fairly large and powerful first-motion hoisting engine and this in turn would require a correspondingly large boiler plant. Also, to use a hoisting tank having a capacity of from five to ten tons, would require an engine capable of handling this output in a comparatively small part of the working day, since the tank system is of advantage only when a tank of large capacity is used and the output is sufficiently large to justify a high-powered hoisting equipment.

The belt or conveyor system mentioned might suit for the top seam if that seam was to be worked alone but I would not advise depending on a conveyor to handle an output from a depth of 160 ft. As previously stated, I would prefer a slope opening and this should have a dip of from 15 to 20 deg. I would lay two tracks so that the descending empty trip would help to balance the ascending loaded trip. This would greatly reduce the power required for hoisting and call for an economical power plant.

Another important advantage of a slope opening is that the men will not require to be hoisted, which makes for greater safety and the saving of time. The weighing of the coal underground should be considered only in the event of arrangements being made to empty the cars on top without uncoupling them or detaching them from the haulage rope, as is being done at several mines where the whole trip is hauled onto a rotary dumper and dumped in one operation.

This property is mentioned as being below the level of the Kanawha River, and I would consider it unsafe to work the coal under the river, with but 50 ft. of cover; although the lower seam could be worked and sufficient pillars left to support the roof, under the river, and, say for 200 ft. on either side. But the top and center seams I certainly would not work beneath the river, except for the purpose of driving narrow roads through to connect with any property that may be on the other side.

WORKING FOR A MAXIMUM RECOVERY OF COAL

Assuming that the maximum recovery of coal from all three seams is an essential factor in this operation, my plan of proceeding would be as follows: The required output of one thousand tons can be obtained, with but a few months' development, from the lower seam, which is from 6 to 9 ft. thick. I would work this seam on the pillar-and-stall plan, but would not take out any of the pillars, until the boundary was reached. My reason is that to take out the pillars from a seam 9 ft. thick, the subsequent caving would damage the center seam, which is only 60 ft. above. The amount of damage will vary according to the nature of the strata separating the seams, and may be anything from a little inconvenience to absolute ruin.

While the required output is being secured from the operation of the lower seam, I would start work in the center seam. This seam, being from 3 to 5 ft. thick, it would be very suitable to use the longwall system. If the seam is worked before the pillars are taken out in the seam below, it should make an ideal seam in which to employ some type of longwall cutting machine.

However, I would not start longwall operations at first; but would drive a three- or five-entry system toward the boundary. When that was reached I would open out on the longwall system. The coal, being from 3 to 5 ft. thick, would require the roof to be ripped on the roadways and this rock, together with the débris from the ordinary working of the seam, would serve to build packwalls for the support of the roof.

IMPORTANCE OF WELL BUILT PACKS

Well built packs will reduce the settlement of the strata so that the top seam, which is 50 ft. above, will not be damaged. The work in the center seam should be driven faster than that in the bottom seam, so that by the time the bottom seam reaches the boundary the coal will have been worked out from the center seam in that area.

The top seam can probably be worked from the haulage roads of the middle seam, by means of several rock drifts driven up from the center seam. This appeals to me as a more economical method of working the top seam than by driving a separate haulage system for the top seam alone, especially as the required aggregate output from all the seams is only one thousand tons.

I would work the top seam also by the longwall method, whether it is worked in conjunction with the center seam or by itself. The effect in the bottom seam would not be sufficient to do any damage to the top seam, as they are 160 ft. apart and, in addition, the working of the center seam will act to distribute these effects.

In working the center seam it may not be necessary to reach the boundary before starting the longwall work; but that should not hinder the progress toward the boundary. The pillars in the bottom seam, under those areas where the coal has been worked in the center seam, will be available for any emergency; but, unless such conditions arose, I would go right to the boundary, before pulling the pillars.

No mention is made of the extent of this property. If it is extensive the operations should be carried forward in several directions, at the same time; and if the boundaries are a great distance from the outlet it will be best to arrange for a main haulage system that will concentrate the output of all three seams. The best seam in which to carry this main haulage can only be determined by local conditions, such as the position of the face line in the different seams, and the nature of the roof strata. These have an important bearing on the expense of maintaining permanent haulage roads. The lower seam, having 30 ft. of sandrock for a roof, should give an opportunity to drive haulage roads that would last during the life of the mine, providing sufficiently large pillars are left to support the roof and prevent the occurrence of a squeeze.

The question of drainage has an important bearing, especially on the top seam. If there is any probability of this seam letting surface water into the mine, it may be best to leave it, until the other two seams are worked out. However, no mention is made of this factor. **James Dickson.**

Victoria, B. C., Canada.

Barometer re Depth of Shaft

SOMETIME ago I remember seeing a question answered in *Coal Age*, regarding the increase in barometric pressure, in a shaft 1,100 ft. deep, with an initial pressure of 30.2 in. of mercury, at the top of the shaft, and temperatures of 64 and 75 deg. F. at the top and bottom, respectively. Being busy at the time, I merely noticed that the answer given, namely, 2.8 in. seemed somewhat higher than I had ever observed in practice. A further mention of it, in a recent issue of *Coal Age*, again brought it to my attention and I started to calculate what change of pressure would result by reason of the depth of the shaft and the increase in temperature.

As a rough check on the given figure, I think no one will deny that the densest air will be found at the bottom. Then, if the estimated increase (2.8 in.) is correct, the barometric reading at the shaft bottom would be 30.2 + 2.8 = 33 in.; and the weight of a column of air a foot high and 1 sq.in. in section would be (bar. 33 in., temp. 75 deg.)

$$\frac{1.3273 \times 33}{144\ (460 + 75)} = 0.00056855\ lb.$$

Now, even assuming this maximum density held all the way up the shaft, which we know is not the case, the increase in barometric pressure due to a depth of 1,100 ft. would only be

$$\frac{1{,}100 \times 0.00056855}{0.491} = 1.27\ in.$$

Having gone this far, I proceeded to work out the following solution, and would appreciate the opinion of *Coal Age* as to its being correct:

Let p = Pressure (lb. per sq.in.);

x = Distance from top of shaft (ft.).

Then, since the temperature increases 1 deg. each 100 ft. of depth; or 0.01 deg. per foot of depth, we have for the increment of pressure,

$$\delta p = \frac{2.7\ p}{144\ (524 + 0.001x)}\ \delta x\text{; or}$$

$$\frac{\delta p}{p} = 2.7\ \frac{\delta x}{75{,}456 + 1.44x}$$

Integrating the last expression, we have,

$$\log Cp = \frac{2.7}{1.44} \log.\ (75{,}456 + 1.44\,x)$$

Knowing the value of p when $x = 0$, we can determine the value of C, the constant of integration, in this case; thus,

$$p_0 = \frac{30.2}{29.921}\ 14.697 = 14.834\ lbs.\ per\ sq.\ in.$$

Then,

$$\log C = \frac{2.7}{1.44} \log 75{,}456 - \log 14.834$$

$$= 9.1456759 - 1.1712583 = 7.9744176$$

To determine the value of p_{1100}, at the bottom of the shaft, make x = 1,100, and 1.44 x = 1.44 × 1,100 = 1,584, which gives,

$$\log p = \frac{2.7}{1.44} \log\ (75{,}456 + 1{,}584) - 7.9744176$$

$$= 9.1625931 - 7.9744176$$

$$= 1.1881755$$

Hence,

$$p = 15.423\ lb.\ per\ sq.in.$$

The increase in pressure is therefore 15.423 — 14.834 = 0.589 lb. per sq.in., which is equivalent to 0.589 ÷ 0.49 = 1.20 in. of mercury. **James A. Block.**

Welch, W. Va.

[We are glad this correspondent has drawn attention to the error that occurred, inadvertently, in our reply to the question to which he refers. The method by integration he presents is correct, showing an increase in barometric reading of 1.2 in. for a depth of 1,100 ft., under the given conditions.—**Editor.**]

Reasons Why Shotfirers Should be Employed in Mines

READING the suggestion of a recent writer, in *Coal Age*, who seems to think that the employment of shotfirers in a mine might be considered as harmful or dangerous surprised me greatly. For myself, I would not care to even consider any attempt that had for its object the elimination of shotfirers, whom I regard as important factors in making and keeping mines safe for work. There are several important reasons why shotfirers should be employed in mines where the coal is blasted, and I will mention a few of them.

First, the employment of shotfirers makes it necessary to have always in the mine one experienced and reliable man who is charged with the oversight of from 40 to 50 miners, a comparatively few of whom can be said to be safe workmen if left to follow their own habits and inclinations.

Now, suppose for a moment that there was no shotfirer employed, in order to secure the same degree of safety each of these 40 or 50 men would need to have an equal amount of experience and be equally reliable as the one shotfirer. Even then, the foreman would be obliged to take many chances on the experience and reliability of these men, while the shotfirer's capabilities are well known to him.

Our records show that, among miners, about one man in five is killed by a premature explosion or a misfire, or the careless handling of powder in making up a charge, or other similar cause growing out of his lack of knowledge or skill in the handling of explosives and the shooting of coal. On the other hand, a comparatively few shotfirers are killed; and the most of these are caught by a fall of roof or coal, or die from some similar cause not directly connected with the work of blasting. This fact results not only from their knowledge and experience in the firing of shots, but is due to their constant vigilance and care to detect unsafe conditions, in firing, especially where gas is present.

A Mine Employing Shotfirers Requires to Be Well Ventilated

Second, generally speaking, the employment of shotfirers in a mine insures good ventilation. No trustworthy and reliable shotfirer will fire a shot where conditions would make it unsafe; and the ventilation of places where shots are to be fired is an important factor in respect to safety. I have seen shotfirers refuse to shoot coal, and the miner thought he was being discriminated against until the shotfirer pointed out the danger, after which the miner would apologize for his lack of foresight in placing the hole. It was made clear to him that the firing of the shot would not only have killed the miner and the shotfirer, but have caused the death of others in the mine.

Another feature to be considered is the economy effected by the employment of shotfirers. If I was an operator, I would rather spend $6,000 in the payment of wages to three shotfirers, than to have one miner killed in charging and firing his own holes. My reason is that the payment of wages to live healthy men is better than the payment of compensation to widows and orphans. I am thankful that there are operators who are progressive enough to view the question of employing shotfirers from this standpoint.

Blasting Coal or Rock by the Use of Fuse and Caps Is Unsafe

While we are speaking of blasting coal, there is one practice in particular that should be entirely stopped. In my opinion it is the cause of the death of more miners than any other agency employed in the shooting of coal or rock. I refer to the old fashioned cap and fuse. My preference is to employ nothing but electric caps and a firing battery, for this work, and to use permissible powder. The employment of experienced shotfirers will practically eliminate most or all of the dangerous practices of miners.

As long as we have all classes of miners, speaking different languages, and understanding little regarding the requirements of the mining laws, it would seem that the employment of shotfirers is an absolute necessity. The presence of reliable shotfirers in the mine will give to every mine foreman an added assurance of safety, since he knows it is a common trick of miners to attempt to pull one over on the foreman whenever the miner has the chance. It goes with out saying that any miner will keep his place in better shape, owing to the more frequent inspection by the foreman, assistant foreman and shotfirer, than when there is no shotfirer making his rounds.

It is my conviction that there should be shotfirers employed in more mines than is the case today. To my mind, they are as important to the safe operation of a mine as the mine foreman himself. As well might the latter be eliminated, as to throw out the shotfirer. The work of the latter concerns the most dangerous conditions that exist in coal mining. F. W. S.

Johnstown, Pa.

What the Employment of Shotfirers Has Accomplished

SOMEONE has been asked the question, "Are shotfirers harmful?" This seems an idle question in view of all the shotfirer has accomplished in reducing the number of accidents and making the mining of coal safer and more efficient. My answer to such a question is that, if crime could be legalized, then might we be able to consider the work of the shotfirer as harmful; because then his employment would interfere with practices that are now crimes and make the perpetrators punishable by law.

In my opinion, where a shotfirer complies with the requirements of the mining law, I can see no grounds for thinking that his work can be harmful in any respect. To my mind, such a suggestion appears to be the height of folly and must have come from someone having no practical experience.

Let us look, for a moment, at what the efficient shotfirer has accomplished and what dangerous practices his employment in a mine has eliminated. Even a madman, it cannot be assumed, would be willing to take the chances of again reverting to the custom of a few years ago, when miners fired their own shots when and where they pleased. Such a practice would be far more dangerous today than formerly, because a large majority of the men now employed are not experienced miners.

For this reason alone, the employment of shotfirers is a means of greatly reducing the chances of mine fires and gas and dust explosions. It can be truthfully said that the work of the shotfirer has preserved the lives of a large number of miners and there is but one answer to the question, Is the shotfirer harmful? The only way in which a shotfirer can be harmful concerns himself. In his haste or disregard of necessary precautions, he may make his work dangerous; whereas, with good judgment and skill, he can render his vocation reasonably safe. His own safety rests largely with himself.

Another thing that has increased the safety of mining coal where blasting must be performed is the advent of permissible explosives. One has only to look back to the time when black powder was universally used for blasting coal in mines. The miner would drill a hole, often on the solid, and charge and fire it with squib or fuse taking many chances with an overcharge of powder, a tight shot, short fuse and other practices that endangered not only his own life but the lives of all in the mine. The rules regulating the use of permissible powders have greatly reduced accidents by eliminating many of these chances, but the shotfirer has accomplished even more. Surely, no man with common intelligence would say that his work is harmful.

Perryoplis, Pa. R. W. Lightburn.

Inquiries of General Interest

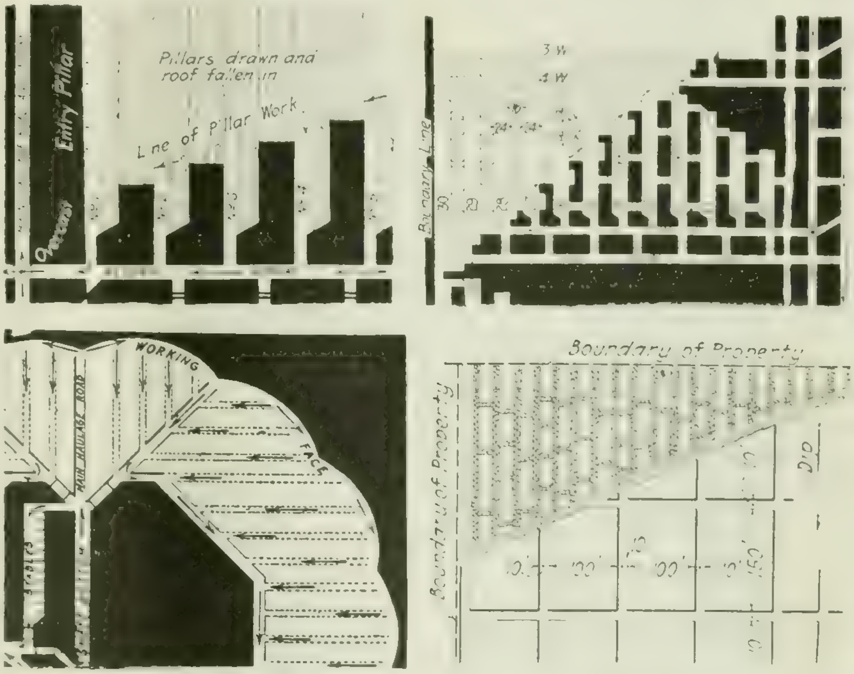
Answered by

James T. Beard

Room and Pillar Vs. Longwall Advancing and Retreating

KINDLY explain, in *Coal Age*, the advancing and retreating methods of working coal by both the room-and-pillar and the longwall systems, showing their comparative advantages. THOMAS ANDERSON.
Barnesboro, Pa.

In the accompanying figure, are illustrated both the advancing and retreating methods of working, in the room-and-pillar and the longwall systems of mining coal. The two upper sections show the room-and-pillar system and the two lower sections, the longwall system of mining. In each case, the left-hand figure is the advancing method, while the right-hand figure represents the retreating method, in the same system of mining. It will be observed that the general features of the room-and-pillar system of mining consist in driving rooms off the butt heading. The rooms are turned narrow for a short distance, from say 3 to 5 yd., and then widened out to a width of 6 or 8 yd., depending on conditions in the roof and floor of the seam, depth of cover, etc. The narrow portion is called the "neck" of the room.



(Advancing) (Retreating)

ILLUSTRATING THE ROOM-AND-PILLAR AND THE LONGWALL METHODS OF MINING

In the advancing method of room-and-pillar work, the rooms are driven up in regular order, starting from the entry pillar, which is left for the protection of the main haulage road and air-course. The illustration shows the first five rooms as having been driven up, and the work of drawing back the pillars between the rooms as now in progress.

In the retreating method shown on the right, it will be observed that the butt headings have been driven to the boundary line, a distance of about 1,300 ft. from the main heading, which provides for the turning of 30 rooms on 40-ft. centers, and allows for the necessary barrier pillars protecting the main heading. The illustration shows the work of drawing back the pillars between the rooms in progress in rooms 23 to 30, inclusive. Room 22 has reached the limit and the chain pillar at the head of this room has been attacked. The illustration shows rooms 19 to 21 as not yet having reached the limit. There is a break in the figure at this point, the rooms outby from No. 19 not being shown.

In the lower figure on the left is shown a section of a mine worked on the longwall advancing system. As there shown, a solid pillar of coal is left for the protection of the shaft, the main roads being driven through this pillar and the longwall face started by encircling the pillar with an entry. The longwall face is then opened up by extracting the coal forming the outby rib of this entry. As this coal is taken out, packwalls are built and gateroads are maintained by building solid roadside packs. As shown in the figure, diagonal roads are extended at an angle of 45 deg. in each direction from the main road. The gates or gateroads are opened off the diagonal roads, and these gates are cut off from time to time by other diagonals. By means of this system the coal is hauled from every part of the working face to the shaft bottom by the easiest direct route.

In the longwall advancing system, it has been found an advantage in many mining districts to maintain the working face in a series of arcs of circles, as indicated in the figure. By so doing it is frequently the case that the coal breaks better, while the roof pressure is under better control than where the working face is kept in a regular or uniform line. However, where the coal breaks freely, care is required to avoid crushing at exposed points.

To the right of the section just described is shown an outline of the longwall retreating system, the extraction of the coal in this case being made in panels. The work is started at the boundary line and is carried back from the boundary line toward the main heading, the coal in each panel being extracted in turn. As the coal is taken out the roof settles on the waste.

Examination Questions

Answered by

James T. Beard

Mine Managers' Examination Held at Springfield, Ill., Feb. 17, 18, 1920

(*Selected Questions*)

Ques.—What pressure would be required to produce and maintain an air volume of 150,000 cu. ft. per min., in an airway 8 x 10 ft. and 3,000 ft. long?

Ans.—The rubbing surface of this airway is $2(8 + 10)3,000 = 108,000$ sq.ft., and the sectional area $8 \times 10 = 80$ sq.ft. The unit pressure producing the circulation of 150,000 cu.ft. per min. is, therefore,

$$p = \frac{k\,s\,q^2}{a^3} = \frac{0.00000002 \times 108,000 \times 150,000^2}{80^3} = 95\ \textit{lb. per sq.ft.}$$

This pressure is far greater than what is used in mining practice, and the circulation should be divided into two equal splits, which would reduce the required pressure to one-eighth of the amount calculated or $95 \div 8 = 12$ lb. per sq.ft., nearly; or, say a 2¼-in. water gage.

Ques.—In the last question, what would be the total power exerted by the fan engine, if 70 per cent of the power was expended on the air?

Ans.—The circulation of 150,000 cu.ft. of air per minute, under a pressure of 95 lb. per sq.ft., allowing an efficiency of 70 per cent, would be

$$H. = \frac{Q\,p}{K\,33,000} = \frac{150,000 \times 95}{0.70 \times 33,000} = 619\ \textit{hp., nearly.}$$

Circulating this air in two splits, would require but one-eighth of this power, or say 77 hp.

Ques.—With a fan 8 ft. in diameter, making 250 r.p.m. and passing 62,000 cu.ft. of air per minute, under a water gage of 1 in., what is the equivalent orifice?

Ans.—The "equivalent orifice" is a term sometimes used in mine ventilation to indicate the ratio that the quantity of air in circulation (cu.ft. per min.) bears to the square root of the water gage expressed in inches. In this case, the equivalent orifice of the mine is

$$A = \frac{0.0004\,Q}{\sqrt{w.g.}} = \frac{0.0004 \times 62,000}{\sqrt{1}} = 24.8\ \textit{sq.ft.}$$

The diameter and speed of the fan does not enter the solution.

Ques.—On going to the mine Tuesday morning, you find the fan making 80 r.p.m., the steam gage shows a pressure of 75 lb., and an air current of 45,000 cu.ft. per min. is passing down the shaft, the water gage showing a reading of 0.4 in. On Wednesday morning, you find the steam gage is 80 lb. the water gage 0.5 in. and the quantity of air passing only 40,000 cu.ft. per min. What would you think was wrong?

Ans.—Both the steam and water gages show an increase, in this case, while the quantity of air in circulation is considerably decreased. It is natural, therefore, to assume that the cause is some obstruction in the mine airways, which increases the mine resistance, thereby reducing the quantity of air in circulation but increasing the water gage, while the power on the air remains unchanged. Under these conditions the speed of the fan will be slightly increased, owing to the fact that less air is flowing through the fan and the power absorbed within the ventilator is less than before, which makes a larger proportion of power available for driving the fan.

Ques.—What gases enter into the composition of firedamp, and in what proportion?

Ans.—The term "firedamp," in American practice, refers to any mixture of gas and air, in inflammable or explosive proportions. It is generally understood as referring to an inflammable or explosive mixture of methane or marsh gas and air. The lower inflammable limit of pure methane and air is reached when the proportion of gas to air is about 1:40, while the mixture becomes explosive when the proportion is 1:13; and the maximum explosive point is reached when there is just sufficient air present to completely burn the methane. The proportion of gas to air is then 1:9.57. The higher explosive limit of this gas is reached when the proportion of gas to air is 1:5; and the higher inflammable limit is attained when the proportion is 1:2.4, assuming normal air and pure methane in each case.

These proportions of gas to air vary somewhat with the character of the gas, the purity of the air and the method of inflammation or the source of ignition, which last concerns the volume and intensity of the flame producing ignition. When a firedamp mixture is ignited by the passage of an electric spark through it the intensity of the initial impulse is much greater than when the ignition is caused by contact with the flame of an open light.

Ques.—We have, in a mine, a sump 62 ft. long, 8 ft. wide and 7 ft. deep; it is full of water. How long will it take a 6-in. pump to empty this sump, the piston speed being 100 ft. per min., the resistance and leakage of valves being 10 per cent? There are 9 two-inch pipes running full of water into the sump, at a velocity of 100 ft. per min.

Ans.—The capacity of this sump is $62 \times 8 \times 7 = 3,472$ cu.ft. The piston displacement of a 6-in. pump running at a piston speed of 100 ft. per min. is $100(0.7854 \times 6^2) \div 144 = 19.635$ cu.ft. per min. Assuming a velocity of 100 ft., per min., the water flowing into the sump through 9 two-inch pipes is $9 \times 100(0.7854 \times 2^2) \div 144 = 19.635$ cu.ft. per min. In this case, therefore, since the quantity of water flowing into the sump is equal to the piston displacement of the pump, the pump cannot empty the sump, which will overflow when account is taken of the loss by leakage in the pump.

National Coal Association Holds Convention

Organization at Its Third Annual Meeting at Atlantic City Recounts Progress of the Year and Adopts Helpful Resolutions Advocates Increased Rates for Railroads and Separate Action on Coal

CONVENED on the playgrounds of Atlantic City, the bituminous coal operators met on May 25, 26 and 27 for serious discussion and frolic. The subjects of serious discussion were relations with the railroads and with the Government, and as the meetings were held only in the mornings, the afternoons and evenings were largely available for pleasure. The size and enthusiasm of the gathering were reduced by the absence of the Indiana delegation, to which Judge Anderson had refused passports for the trip. The first day was devoted to the address of the retiring president, H. N. Taylor, which is printed in full in this issue of *Coal Age*, and to preliminary consideration of reports of various officers and committees. The report of the Railroad Relations Committee on the assigned car question met with full approval, but a resolution to the Interstate Commerce Commission putting the association on record as favoring the rate advance asked by the roads was not so easily passed. Some contended that as the coal producers are not the ones who pay the freight on coal they are not the ones to endorse an advance in freight charges. The broader view, that the coal industry needs the railroads and should give this measure of support, prevailed, however, and on the last day of the convention the resolution was passed.

Daniel B. Wentz
President of the National Coal Association, 1920-1921.

Tuesday afternoon found many of the visitors on the golf links at Sea View, the country club having extended the courtesy of the course to the delegates. In the evening a meeting was held, at which the topic again was assigned cars. It is now clearly understood that the only hope for a release from this practice lies in legal action, the railroads standing on their rights as defined by Commissioner Clark of the Interstate Commerce Commission. Notwithstanding the pressure that is being brought to bear on the commission by interests opposed to the assigned car practice, those in touch with the situation are not hopeful for a change of attitude by that body.

Election of directors at large, which was held by secret ballot, occupied the early part of the morning on Wednesday. A spirited contest had been in progress from the previous day to gain these positions, of which four were to be filled. Interest in the outcome of the ballot did not interfere with the attention given to the speaker of the morning, Eugene Meyer, Jr., managing director of the War Finance Corporation. Mr. Meyer told in simple language the story of how and why the world has been financed since the war began in 1914, and made it plain that conditions cannot remain as they now are and crops be moved next fall. Throughout the country, Mr. Meyer said, there is a manifest disposition on the part of those engaged in industries and great business enterprises to bring about an adjustment of the economic situation. He pointed out that economy in these enterprises is as immediately essential as is economy with the individual. Not alone must the United States make sure that it produces enough for its own market, Mr. Meyer went on to say, but it must endeavor to create a surplus to meet foreign demands. All of Europe, he said, is looking to the United States for products, and if financial relations between this country and Europe are to be improved America must sell commodities in great quantities abroad. The whole world, he said, will need products from the United States for some time to come.

It has become more apparent than ever in the last few months, Mr. Meyer said, that the Government must take a greater interest in industry, and he urged at the same time that industry "must have a greater interest in the Government."

Wednesday evening the new officers for the coming year were announced, having been earlier selected by the newly-elected board of directors. Moving pictures of the new mining machine that cuts, picks down and loads coal all in one operation were exhibited by the Jeffery Machine Co.

The last morning was the best of all. To begin, A. H. Smith, president of the New York Central, told the assembled operators of the tasks that confronted the transportation system of the country when we entered the war and how the roads, though lacking equipment and facilities for which they had been refused the revenue, met the demands of the war period.

President Taylor, in his closing address, said: "There is too much Government in business, and not enough business in Government." Eugene Meyer, Jr., managing director of the War Finance Corporation, however, thought that the Government should take a greater interest in industry, urging at the same time that industry "must have a greater interest in the Government."

In his speech Mr. Smith told the convention that the railroads of the country, in order to build the car equipment urgently needed, must spend approximately $700,000,000 at once. The New York Central lines in the last month, he said, had authorized the expenditure of $50,000,000 to buy coal cars and locomotives.

"We have a tremendous problem ahead of us in furnishing the transportation needed by the country's industries," said Mr. Smith. "Unless we can get the money with which to do it, the critical situation confronting the industry today will become worse. The people do not realize how acute the situation is today. Industries are in deep distress, all for the want of transportation. The coal industry is in distress; the steel mills are in distress. This country is in more trouble, I think, than it ever has been in, even in time of war, because of the need of this vital necessity, transportation.

"I know we are going to have a great deal of trouble during the coming winter because of this transportation problem. You can be pretty sure of it. We need coöperation everywhere if this country is to find the way out. The whole transportation system of the country is 'stymied,' but I am optimist enough to believe we will be able to work out the difficulty. To do it we must raise the money we need—we have simply got to do it."

TRANSPORTATION TROUBLES TO CONTINUE IN 1921

Dr. Charles A. Eaton, editor of *Leslie's Weekly* and famed as a student of men and a speaker to men, spoke last. It is putting it mildly to say that he brought the house to its feet—he did that and more, for he left impressions for good with every one that heard him. The next best thing to hearing Dr. Eaton is to read what he said, and we will publish his address in full in *Coal Age* in a coming issue. Some of his remarks should be noted at once.

"The one supreme thing that we are up against in industry is to get production," said Dr. Eaton. "The outstanding difficulty right now in industry is the lack of disposition of a great number of individuals to do the work that is ahead of them. The country is under a frightful nervous distraction as a result of the war. Mountebanks and demagogues are leading unthinking workmen astray. Antagonism to organized industry, hatred and suspicion have developed under a false leadership. What we must have is a better understanding all around.

"We must have a leadership that will educate. We must have leaders in industry as well as in governmental life who will show the people the evils of the existing trend and who will help the country pass out of the age of chaos and into a period of success. We must develop the human element among our working people. We must develop an appreciation of the responsibilities that confront those who govern our great industries. The leaders of industry themselves must get closer to their own men. If they do not, the men will go elsewhere for leadership.

"We can no longer leave this nation in the hands of the demagogue, the self-seeker and the ignoramus. Need of production today is so appaling that I fail to see how any one can sleep over it, and yet agitators are constantly demanding more wages, more wages and putting into the heads of the workers the idea of less work. Next year will see food prices higher than ever, and unless there is advanced production in other commodities, there can be no lowering of prices for anything.

"Unless all of us get down to the idea of increased production and abstaining from buying things that we don't actually need this country within the next twelve months will find itself worse off than it has been at any time since the war began.

"Conservative leadership all along the line is needed. Moral cowards who are spreading discontent must be put down. People must quit theorizing and get to work. We will win this fight for the readjustment of our economic life if we gird ourselves for the great fight ahead of us. It will take courage and strength to do it."

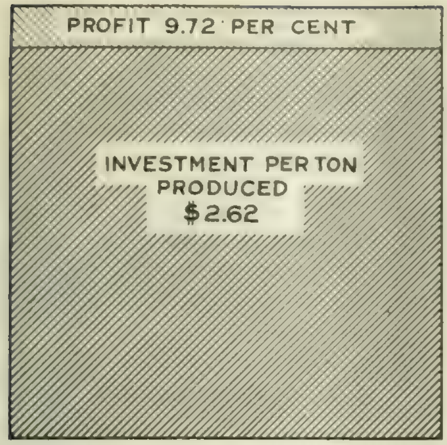
In the effort to end the freight tie-up and to help the railroads out of their difficulties the following resolution was adopted:

"Whereas, The present insufficient production of coal is directly due to the lack of adequate transportation facilities, and

"Whereas, The quickest way to rehabilitate the railroads and enable them to secure the needed equipment and give the service which will tend to reduce the cost of production of all commodities, including coal, is to re-establish railroad financial credit,

"Therefore be it Resolved, That the coal industry recognizes the need for an immediate increase in the revenues of the railroads, sufficient to insure their solvency and prosperity, by means of an increase in freight and passenger rates. However, the coal industry desires assurance from the Interstate Commerce Commission that this endorsement of an immediate increase in all freight rates will not prejudice the right of any parties interested to obtain redress hereafter, first if the differentials are inequitable as between different mines or different producing districts, and second, if rates themselves are excessive, unreasonable or discriminatory.

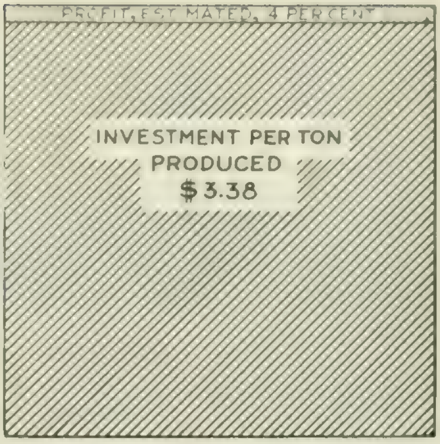
"The coal industry desires to call attention to the fact that coal consumers have already borne more than their share of increased cost of transportation and that the public welfare might be conserved by adopting a higher percentage of increases on freight of greater



Profits in the Coal Industry

With an average investment in developed coal lands and working plant of $2.62 per ton of output in 1918, the best year the industry ever had, the total investment in the bituminous coal industry is indicated to be more than $1,500,000,000, on which, according to the Bureau of Internal Revenue, earnings were made of 9.72 per cent.

The total investment in the bituminous industry was but slightly greater in 1919 than in 1918, but the output was 21 per cent less.



value and a lower percentage of increase than proposed on coal, which is the basis of industry."

In reference to the nationwide shortage of coal the association went on record as follows:

"The National Coal Association deplores the existing shortage in coal production and declares that present conditions are due solely to the lack of empty railroad cars in which to load coal at the mines, and to delays in transporting coal to destination."

The operators also expressed themselves as in favor of publicity in regard to the affairs of the coal industry, as shown in the following:

"The National Coal Association welcomed the opportunity afforded by the Frelinghuysen Committee of the United States Senate to present the facts before a fair and impartial tribunal in such a way as to better advise the people of the country as to the problems of the industry, because it recognizes the fact that many of the difficulties of the industry arise from lack of information on the part of the public."

To bring about the more general adoption of the standardized accounting system of the association this resolution was adopted:

"It is the sense of the members of the National Coal Association that the officers thereof use their influence for the general acceptance by the Government of the principles adopted by this organization for cost accounting so that there can be no disputes as to returns made to the Government or duplications thereof, thereby eliminating confusion and expense to the coal industry as well as to the Government."

In the matter of government regulation of industry the sentiment of the organization is clearly expressed in this resolution:

"The coal industry of the United States, represented by the National Coal Association, is unalterably opposed to the enactment of any legislation imposing additional regulation upon commerce and industry and is especially opposed to legislation which singles out any one industry for regulation by special commission."

Officers of the association elected to serve for the year 1920-1921 were as follows:

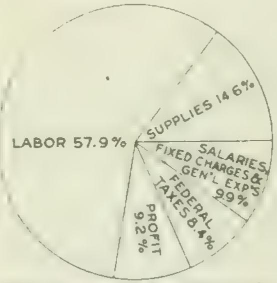
President, D. B. Wentz, Philadelphia, Pa.; Vice-Presidents, A. M. Ogle, Terre Haute, Ind.; Erskine Ramsay, Birmingham, Ala.; J. G. Bradley, Dundon, W. Va.; J. D. A. Morrow, Washington, D. C.; Treasurer, J. J. Tierney, Philadelphia, Pa.; Secretary, W. B. Reed, Washington, D. C.

Directors at large, Philip Penna, Terre Haute, Ind.; Michael Gallagher, Cleveland, Ohio; J. P. Walsh, Pittsburgh, Pa.; D. B. Wentz, Philadelphia, Pa. Directors by fields, G. H. Barker, Ohio; C. E. Bockus, Virginia; W. D. Barnum, Washington; T. T. Brewster, Illinois; W. J. Carney, Montana and So. Wyoming; Ira Clemens, Kansas; E. M. Gray, Iowa; T. W. Guthrie, Pennsylvania; T. H. Watkins, Pennsylvania; W. H. Huff, Colorado and New Mexico; A. M. Ogle, Indiana; Erskine Ramsay, Alabama; C. W. Taylor, West Kentucky; R. T. Price, Arkansas, Oklahoma and Texas, and J. J. Tierney, West Virginia.

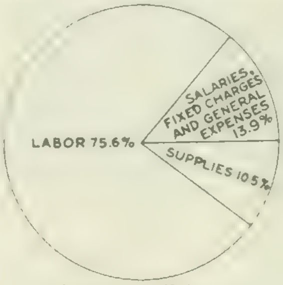
Geo. W. Reed succeeds F. S. Peabody (resigned), and C. W. Watson succeeds J. H. Wheelwright (deceased).

BUREAU OF COAL ECONOMICS

Work of the Bureau of Coal Economics of the National Coal Association was endorsed by the convention and a resolution was adopted promising the continued support of individual members and local associations in this work. It was pointed out that the need for accurate, comprehensive data on coal is greater today than ever before and that the key to success is the co-operation of the men in the field. The bureau can do nothing unless the figures are sent in to Washington. Vice-President Morrow said that the statement recently made by Commissioner Wooley of the Interstate Commerce Commission that with the 27-per cent increase in wages the operators had added $2 to the mine price of coal could not be refuted because the local associations had not furnished the National with the figures on realization, though they had repeatedly been called for.



What became of the Operator's Dollar in 1918



Distribution of Mining Cost

Large scale charts showing the investment and profits of the coal industry, time worked and lost because of car shortage and for other reasons, the division of cost as between labor, supplies and other items and of receipts between various items of cost and profit, and one showing the relation of the increase of cost of production and short running time, were exhibited on the wall of the convention room. Some of these are reproduced herewith. The bureau has in preparation numerous other diagrams of distinct educational value and will have a permanent exhibit at the headquarters in Washington.

Last year the National Coal Association had approximately 2,150 member companies. This year, 1919-1920, there are under 2,100 member companies. The decrease is primarly due to the number of small companies that went out of business in the past eighteen months. In 1918 the paid membership of the National represented 60 per cent of the total production of the country, whereas in 1919 it was 61.5 per cent, showing that there has been no decrease in the strength of the organization.

A measure of the work done by the Washington office of the association is found in the record of correspondence for last year. Mr. Morrow reported that more than 1,300 letters asking for information and advice were received from coal operators. In answer more than 1,400 letters were sent out, in addition to which some 12,000 circular letters were mailed to the membership and a vast amount of other material was furnished. It is estimated that about 40,000 letters of all sorts were mailed out by the Washington office in the year just closed. More than 5,000 telegrams were received asking for immediate service from the Washington staff. In reply 6,334 telegrams were sent out. The Washington office answered more than 800 long distance telephone calls on important matters and called 981 times.

Having completed its third and most successful year, the association expressed its appreciation and thanks to its officers and directors for their contribution to the accomplishment of such splendid results.

Reserve Board Lays Low Coal Supply to Inadequate Car Supply

IN reviewing the general business situation for May, the Federal Reserve Board comments on the coal situation as follows:

"Coal conditions have been particularly important in connection with iron and steel, as with other industries. The state of things in regard to coal is now very acute in some districts. In district No. 2 (New York) the supply is far below the demand and consumers are bidding against one another. Railroads 'are more or less the victims of systematic sabotage at their terminals.' Car supply at the mines is only 30 per cent of normal, while the labor situation there also is unsettled. The situation as a whole 'is such as to cause considerable concern among conservative coal men' and transportation is regarded as a fundamental factor requiring improvement.

"In the Middle West (district No. 4—Cleveland) coal shipments have fallen off. At Lake ports during April they were about one-third of what they were in April, 1919. Lake shippers will pool their coal in order to increase the movement, but this is only a partial remedy. Fuel prices are the highest on record in the Lake trade. Not only does a general shortage of coal exist now but a shortage is foreseen for next winter which may curtail production of iron and steel at interior furnaces.

"In district No. 6 (Atlanta) coal production is being held down, mines being able to get an insufficient number of cars. Labor, however, shows no discontent and there is small movement of coal in foreign trade. Railroads throughout the district have placed orders for fuel for the next twelve months, 'the amount in every instance being larger and the price higher than ever before.'

"Production of bituminous coal for the country at large during April amounted to 32,006,000 tons, as compared with 46,792,000 tons during March and 32,164,000 tons during March, 1919, the respective index numbers being 86, 126 and 87. Labor difficulties, although sporadically existing, appear to be a relatively minor factor in coal production as compared with the influence of car shortage. No reduction of prices is in sight."

Ten Million Barrels of Oil a Year Required by the Navy

NAVY requirements for fuel oil for the next fiscal year will be in excess of 8,000,000 barrels. This is in addition to 2,621,000 gallons of lubricating oil needed. This is the estimate of Admiral R. S. Griffin, chief of the Bureau of Steam Engineering. In connection with a statement as to the navy's oil requirements Admiral Griffin said:

"The demand for oil for the navy alone looks very formidable in comparison with the requirements of two or three years ago. When it is considered that a large number of merchant ships completed during the last three years also burn oil, and that many industrial establishments recently have converted their power equipment to oil burning, the question of an adequate supply of fuel oil for the navy becomes one of great concern.

"I share the view of many regarding the national importance of conserving our oil. Without an assured supply our navy would be practically useless, and I shudder to think what the result would be if anything should occur that even remotely would threaten this supply.

"We now have in commission seven battleships of a combined horsepower of 204,000 which burn oil only. In addition to these we have building twelve other battleships of 533,000 hp.; six battle cruisers of 1,080,000 hp.; and ten scout cruisers of 900,000 hp.; making a total under construction of these three classes of ships aggregating 2,513,000 hp.

"In oil burning destroyers we have actually completed 234 with an aggregate horsepower of 5,626,000, and have under construction eighty-seven others which will be completed during the next fiscal year and will bring the total horsepower of destroyers up to 7,975,000.

"Our submarines already completed aggregate about 80,000 hp. in Diesel engines, and those under construction will more than double this figure.

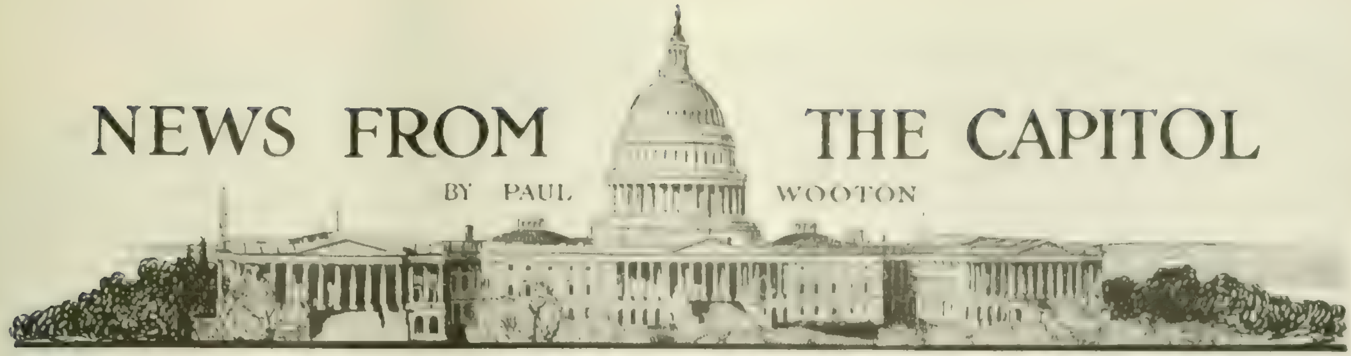
"Besides these vessels of a purely military character, we have others such as mine sweepers, tugs, destroyer and submarine tenders, and fuel ships in which oil is used as fuel, whose horsepower aggregates 173,400.

"To sum up, we actually have completed and ready for service vessels aggregating more than 6,000,000 hp. in which oil alone is used for fuel, and have under construction other vessels which will bring this total up to nearly 9,000,000 hp."

H. Mortimer Lamb, secretary of the Canadian Mining Institute, owing to ill-health has been obliged to resign his position as secretary of the Canadian Mining Institute. His resignation, on being conveyed to the Council, was regretfully accepted.

NEWS FROM THE CAPITOL

BY PAUL WOOTON



Senate Passes Bill to Sell Government-Owned Ships to Private Buyers

On May 21 the Senate—no record of the vote being given—passed the House Merchant Marine bill providing for a permanent merchant marine policy. The measure provides for the sale of Government-owned ships to American citizens or corporations as soon as advisable and, pending such sale, for their operation either by the Government or under lease.

Trade Commission Reports Producing Costs in Alabama, Tennessee and Kentucky

Coal producing costs in Alabama, Tennessee and Kentucky have just been made public in the Federal Trade Commission's latest report. It is the fourth report of its kind. The first report covered the production of bituminous coal in Pennsylvania; the second report covered the production of anthracite in the same state, while report No. 3 covered the production of bituminous coal in Illinois.

The tabulation of costs in Alabama refute most decidedly the sensational charges of profiteering made last year by Representative Huddleston. The compilation shows that for district No. 1 sixty-three cents of each dollar paid for coal at the mine went to labor, fourteen cents for supplies, thirteen cents for general expenses, and ten cents went to the operator, from which ten cents sales expense, interest and Federal taxes must be deducted. The remainder is the operator's profit. Similar divisions of costs for the other Alabama districts are shown.

One point in the report, the unreliability of averages, is brought out with particular clearness. One of the tables covering operations in Tennessee district No. 1 shows a drop of forty cents in the sales realization for September as compared with August. It happened that a strike closed down the mines in the district which had been receiving the higher average sales realization. Those which continued in operation happened to have comparatively low sales realization. As a result the average sales realization was in no way typical for the field.

Among the new features brought out in the No. 4 report are figures having a bearing on the coking of coal by producers. One of the tabulations compares costs, sales realizations and margins between operators who coked different proportions of their output.

The report points out that diverse conditions exist in the districts covered and that there is danger in applying widely some of the generalization drawn. In that connection the commission says:

"It is desirable to point out the diverse conditions which have existed during the past three years between the different coal-producing districts in Alabama, Tennessee and Kentucky. There were districts where a period showing a lower margin than the preceding period had an increase of output. There also were districts where a period showing a higher margin than its preceding period had decreased production.

"The explanation of such different results must be sought in the particular conditions which have existed in each producing district. There is great danger in applying widely some of the generalizations drawn from the experience of particular districts or states. The collecting of definite up-to-date information covering the whole industry and making it readily available for use is, therefore, highly desirable."

Walter Durand Takes Charge of Coal Cost Compilation

With the Federal Trade Commission's coal activities in the limelight there is particular interest at this time in the man who actually handles the cost figures and who directs the compilation of the reports on costs of production. Since June 1 Walter Durand has been in charge of this work. He succeeded David L. Wing, who has opened an office as a consulting economist. Mr. Durand is well known among anthracite operators, as it was he who had charge of the anthracite investigation conducted by the Federal Trade Commission shortly before the war. Mr. Durand was born in Romeo, Mich. His early education was obtained in the public schools of South Dakota and Ohio. He was graduated from Oberlin College in 1896, and did his post-graduate work at Harvard. He devoted several years to teaching and was a member of the faculty at Phillips Andover Academy at Andover, Mass., and at Oberlin College. He entered the Government service in 1908 as an economist in the Bureau of Corporations, which was absorbed later by the Federal Trade Commission. He was in charge of the foreign trade investigation from which the Webb-Pomerene Act was an outgrowth. For several years he has occupied the position of assistant chief economist of the Federal Trade Commission.

WALTER DURAND

Miners' and Operators' Trial Set for November 8

Judge Anderson Overrules Hughes Demurrer and Motion to Quash Indictment, Declaring Section 9 of Lever Act Constitutional

WITH the decision May 26 of Judge A. B. Anderson, of the Indiana District Federal Court, that section 9 of the Lever Act is constitutional and the overruling of a demurrer presented by Judge Charles Evans Hughes on behalf of the indicted mine workers' officials, the case of fifty-seven bituminous operators and miners was set for trial Nov. 8. All those indicted pleaded not guilty. The judge's decision was made on a motion by Judge Hughes to quash the indictments.

The decision as to the constitutionality of the Lever Act overruled the motion to quash in so far as the five counts of the indictment based on Section 9 were concerned. Section 4 and Section 26 of the original Lever Act and Section 4 of the amendment of Oct. 22, 1919, upon which thirteen other counts of the indictment were based, were held unconstitutional and void by the Court in his ruling.

Argument on the demurrer to the indictment was begun by Mr. Hughes immediately after the ruling on the motion to quash. Passing the question of the validity of the section upon which the remaining counts were based, Mr. Hughes contended that Section 9 of the act did not apply, but was superseded by the action of the President in regulating the fuel industry under the powers granted him by Section 25 of the same act.

He held that during the time regulation of the coal industry was effective under section 25, the general statute, section 9, did not apply, but was overridden by section 25, which was specific in regard to the coal industry.

Mr. Hughes' second line of attack upon the indictmen was the contention that the counts of the indictment were defective and insufficient in that they were couched in such vague, indefinite and general terms as to not inform the defendants of the charges against them. He said the Government had no right to come into court with a general "omnibus" statement that the defendants had limited facilities. He cited a parallel case under the Espionage Act in which a demurrer had been sustained because of the vagueness of the averments, which he asserted were no more indefinite than those in the present case.

In a supplemental argument Samuel D. Miller, in defense of the operators, stressed the contention that Congress had not meant section 9 to be applicable during the period in which section 25 was in effect.

"Why didn't Congress say so?" queried the Court.

"I was not a member of Congress at that time, your Honor," Mr. Miller replied.

"Well you haven't got that to answer for," rejoined the Court.

Pleas of not guilty were entered by the following Indiana operators: H. M. Ferguson, David Terhune, Robert J. Smith, Henry Smith, Archibald Spears, George A. Anthony, William J. Hamilton, John A. Templeton, William Epperson, Banus E. Neal, Valentine Martin, Alfred M. Ogle, Jabez Wooley, William P. Zimmerman, Thomas Byers, M. E. Mogg, David Ingle, W. H. Tobin, William Zeller, Edward Shirkie, Edward Hackett, George A. Van Dyke, William J. Freeman, Edwin D. Logsden, Phil H. Penna, G. H. Richards, Hugh Shirkie, Homer B. Talley, Walter D. Talley, Warren F. Smith, Frank Thorpe and John Kelly.

The following Indiana mine worker officials entered similar pleas: John L. Lewis, president of the United Mine Workers of America; Philip Murray, vice-president of the United Mine Workers; William Green, secretary-treasurer of the United Mine Workers; William Raney, William Mitch, John Hessler, James A. McKinney, Harry Such, Charles Fettlinger, Harry Lentz, U. G. Hall, John Little, Jack McQuade, John Chesterfield, Robert Perry and Ed Haverkamp.

Pennsylvania miners who entered pleas of not guilty are: William C. Cavanaugh, P. T. Fagan, Robert R. Gibbons, William Hargest, Thomas Hughes, Frank Leithold, John McWee and John O'Leary.

Those indicted from Illinois and Ohio were not in court pending a settlement of their suits to prevent prosecution in the Indiana court.

The ruling by Judge Anderson is expected to have a material effect on the prosecution of alleged profiteers in the Indiana district. Section 4 of the act as amended was one of the sections held unconstitutional and it was under this section that Charles P. Tighe, special agent in charge of the Bureau of Investigation, made affidavit against an Indiana company recently.

Indiana Strip Mine Operators Grant Most of Workers' Demands

AFTER granting most of the mine workers' demands the joint convention of the strip miners and the strip mine operators of district No. 11 adjourned May 25. All matters not decided were taken under advisement by a joint committee. First of the miners' requests, that which gave the mine committee jurisdiction over the mine engineers, was granted with little discussion. The fourth demand, making the time and one-half pay for over-time work apply to pumpers, night watchmen and boiler cleaners, also was granted. The fifth, which had to do with an increase in the death benefits, was granted and it was agreed to rewrite section 19 regarding the promotion of men according to seniority.

The sixth demand, however, which asked that steam shovel men be increased to $225 a month and that all other monthly men be brought up to the 20 per cent increase awarded by the national commission, was denied in part by the operators. They refuse to give any increase except that awarded by the commission.

Regarding a recent rumor to the effect that the organization was about to be dissolved Phil H. Penna, secretary of the Indiana Bituminous Coal Operators' Association stated emphatically that there was nothing to the rumor. "When the scale committee, composed of representatives from every sub-district in the state, made the wage scale," said Mr. Penna, "there were some who did not agree with the scale. In an organization of one hundred members it is always impossible to please every member on every point. In this connection there were four operators, Ed Shirkie, Grant Coal Co., Stewart Shirkie and the W. S. Bogle Co., who paid the increase asked by the shotfirers. But they paid it from the start and have never closed down their mines because of any controversy with the shotfirers. The report that they have resigned from the organization or that the organization is going to be abandoned is ridiculous."

Public Utility Power Efficiency Shown in Geological Survey Reports

REPORTS of the U. S. Geological Survey show a very interesting relationship between the power production and the efficiency with which the fuels are used in the various public utility central stations throughout the country. The following tabulation shows the total power output and the efficiency expressed in kilowatts per ton of coal used for each of the seven months for which reports have been made. Some of the variation is undoubtedly due to seasonal factors, but the principal factor probably is the greater percentage load factor during recent months as compared with the period about a year ago. These figures, of course, cannot be taken as absolute in their significance, but are a good indication of the general practice.

Month	Millions of Kilowatt Hours	Efficiency Kw.-Hrs. per Ton of Coal
1919:		
February	1,834	586
March	1,842	580
April	1,718	594
July	1,929	636
October	2,240	645
1920:		
January	2,575	643
February	2,327	632

Another interesting point shown by the figures is the relatively greater average efficiency of central stations in states where most of the power is generated at large plants. For example, in Pennsylvania, Illinois, Ohio and other states where large cities predominate the efficiency is about 600 kilowatt hours per ton of coal or even higher, being nearly 800 in the case of New York and Michigan.

On the other hand, in more sparsely settled states, such as North Dakota and Montana, the average is only 150 to 200 kilowatt hours per ton. This is a striking illustration of the great advantage which the proposed super-power plants will have if installed to substitute for existing central stations. When we see the average for whole states five times that for other states we can readily believe that the estimated saving of 50 per cent of the coal now used in all central stations would be feasible if all were replaced by a super-power system.

Record Petroleum Output in March

IN SPITE of constantly increasing domestic production of petroleum, consumption is increasing at an even faster rate, and stocks continue to be correspondingly depleted. The March production of petroleum, amounting to 36,491,000 barrels, a daily average of 1,177,129 barrels, is the greatest on record for any one month. These figures compare with a daily average of 975,290 barrels in March, 1919, and of 956,903 barrels in March, 1918. If production continues for the rest of the year at the rate established in the first quarter the total for 1920 will be in excess of 410,000,000 barrels, according to the Geological Survey.

Stocks of domestic petroleum held by pipe-line and other marketing companies at the end of March amounted to 125,291,000 barrels, marking the continued withdrawal of stocks which has been in progress since September, 1919. The greatest decrease (1,132,000 barrels) occurred in California, where the large drafts on stocks which have been reported in recent months continues. Gulf Coast stocks also were depleted 445,000 barrels during March.

It should be observed, however, that these large withdrawals of stocks of heavy oil were in part counterbalanced by small gains in stocks in other fields, the most notable being a gain of 323,000 barrels in the Appalachian field. Stocks of Mexican petroleum held by importers have not been collected for a long enough period to show significant results, but a reduction of stocks of imported oil is also reported.

Imports for March established a record, the total amounting to more than 6,500,000 barrels, exceeding the imports for March, 1919, by more than 3,000,000 barrels. Exports of crude oil, amounting to 861,486 barrels, were almost four times the quantity exported in March, 1919.

Total consumption of petroleum in March, 1920, exceeded total consumption in March, 1919, by more than 12 million barrels. If consumption continues for the rest of the year at the rate established in the first three months the total will be in excess of 495 million barrels. The March daily rate of consumption exceeded the daily rate of domestic production by more than 240,000 barrels.

Manning Opposes Transfer of Fuel Yard to Non-Technical Bureau

IN connection with a bill which has been introduced by Representative Wood of Iowa, Director Manning of the Bureau of Mines has written the author of the bill explaining why in his opinion the Government Fuel Yard should not be transferred to the proposed Bureau of Supplies. Extracts from his letter follow:

"I am especially interested in the provision in the bill to transfer the Government Fuel Yard work to the new Bureau of Supply. During the period of nearly two years since the establishment of the Government Fuel Yards no Federal or District government heating or power plant has been obliged to let its fires go out, or curtail its coal consumption because of the failure of its coal supply.

"I think you will agree with me, in view of the coal situation and different strike conditions during that period, that this is a particularly good record. The point I wish to make is that I do not think this record could have been established, and I do not believe it can be maintained, upon a basis of simply earnest, hard, overtime work by the Government Fuel Yards as a separate, purely business organization.

"There are certain of the established duties of the Bureau of Mines that tie into the Government Fuel Yard work to spell, in my opinion, the difference between only a fair or perhaps poor handling and an efficient and successful handling of that work. The bureau is the Government authority on the subject of the selection of coal for different fuel-burning equipment and the adaptation of fuel-burning equipment to different kinds of coal. The engineers engaged in this work as the general supply committee, a purely business organization, did not see several years ago the advantage and economy to the Government in arranging for the selection, purchase and distribution to the Government establishments in the District of Columbia of the coal needed by such establishments.

"The services of these engineers in the regular coal work of the bureau have been of the very greatest value in the guidance and handling of the Government Fuel Yard work. The handling of that work has been, and will continue to be, not a purely business matter of purchasing and distributing coal, but also a matter of applying engineering knowledge and technical skill to the reduction of the Government coal bill.

"At the present time, when the Navy Department is able to fill its coal requirements outside of Washington only by commandeering coal, the Bureau of Mines is obtaining, through the assistance coal mine operators are rendering upon the basis of the co-operation developed in mine safety and other work during the past ten years, sufficient coal for the needs of the Government Fuel Yards.

"I strongly favor the main purpose of your bill. I think that a central purchasing agency can purchase and deliver desks, file cases and other office supplies more economically than individual departments and government establishments can; but the purchase of this one commodity, coal, is already centralized in a single agency in the Government Fuel Yards, and I have endeavored to indicate my firm conviction that the selection of coal for the Federal and District governments in Washington, the purchase of this coal, its storage and its distribution, can all be handled to the best advantage by the retention of this work in the Bureau of Mines."

Commission Grants Coal Association Request On Coal Freight Charges to Canada

The Interstate Commerce Commission has granted in its entirety the request of the American Wholesale Coal Association with regard to payment for coal transportation between the United States and Canada, dissatisfaction having arisen because of unsettled rate of exchange. To the existing ruling in regard to payment for transportation the commission has ordered that the following be added:

"The existing difference in exchange value between the moneys of the United States and the Dominion of Canada, while continuing to bear the same denomination, has been productive of confusion and uncertainty as to the construction to be placed upon tariff schedules, division sheets and accounts in respect of traffic crossing the international boundary.

"We are of opinion that where transportation of persons or property or transmission of intelligence by wire or wireless takes place partly within the United States and partly within the Dominion of Canada, the tariff charges or divisions thereof accruing for the part which takes place within the United States are payable only in lawful money of the United States, irrespective of the money in which tariff charges or divisions thereof accruing for the part which takes place in the Dominion of Canada may be payable under the laws there in force.

RATE SCHEDULES MAY INCLUDE REGULATIONS

"Adjustment should be made in accordance herewith by carriers subject to the act in settling their accounts with connecting carriers. Appropriate rules or regulations to give effect to this ruling may also be included by such carriers in their tariff schedules, if they so desire.

The practice, which has grown up since development of said difference in exchange values, of requiring prepayment of charges in cases where not customarily required theretofore tends to embarrass shippers and impede foreign commerce. Carriers subject to the act will be expected to refrain from such unusual requirements in cases where they are not justified by other considerations."

The regulation to which the foregoing was added reads as follows:

"Nothing but money can be lawfully received or accepted in payment for transportation subject to the act, whether of passengers or property, or for any service in connection therewith, it being the opinion of the commission that the prohibition against charging or collecting a greater or less or different compensation than the established rates or fares in effect at the time precludes the acceptance of service, property or other payment in lieu of the amount of money specified in the published schedules."

New York Lighting Companies Use 3,453,408 Tons of Coal a Year

Gas Companies Also Consumed 88,785,797 Gallons of Gas Tar and 218,018,831 Gallons of Gas Oil—Made 378,438 Tons of Coke

More than three million tons of coal and coke was used in the manufacture of gas and electricity by the various gas and electric lighting companies in New York City in 1919, according to reports filed with the Public Service Commission. Of this tonnage the gas companies used 1,645,619 short tons of coal and coke, and the electric lighting companies used 1,806,789 short tons of anthracite and bituminous, a total of 3,453,408 tons.

COAL AND COKE CONSUMPTION BY GAS COMPANIES

	Boiler Fuel		Gas Coal Carbonized	Under Retorts	Generator Fuel	
	Coal	Coke		Coke	Coal	Coke
Consolidated Gas Co.....	10,603	9,519	406	513	80,998	39,398
Astoria Light, Heat & Power Co............	27,302	....	468,268 (Bit.)	48,612	120,200	C.&C.
New Amsterdam Gas Co.	17,477	C.&C.			103,320	C.&C.
N. Y. Mutual Gas Co....	9,440				54,515	C.&C.
Standard Gas Light Co...	4,695	C.&C.			40,816	C.&C.
Central Union Gas Co	9,139	C.&C.	80,421	10,637	45,165	C.&C.
New York & Queens Gas Co..................	2,478	....				...
	562 gas coal				6,573	...
Brooklyn Borough Gas Co.	3,185	....			11,031	
Kings County Lighting Co.	14,698	...			25,304	
Brooklyn Union Gas Co..	55,179	..			299,852	C.&C.
Bronx Gas & Electric Co..	10,416	....			3,343	....
	130 gas coal					
Queens Borough Gas & Electric Co	4,323				8,835	
New York & Richmond Gas Co	6,414	....			11,852	
Totals	176,041	9,519	549,095	59,762	811,804	39,398

In addition to the consumption of coal and coke the gas companies in Manhattan and The Bronx used 14,254,558 gallons of water-gas tar and 129,233,034 gallons of gas oil in the making of gas, while the companies in the other boroughs of the city used 12,305,157 gallons of water-gas tar and 88,785,797 gallons of gas oil, a total of 26,559,715 gallons of water-gas tar and 218,018,831 gallons of gas oil.

Three of the gas companies made 378,438 tons of coke during the year, of which they sold 119,479 tons for $669,660.03, an average of $5.59 per ton.

The reports show that the various electric lighting companies consumed the following tonnages:

	Anthracite	Coal	Bituminous
New York & Queens Electric Light & Power Co	6,441		1,770
New York Edison Co		948,651	...
United Electric Light & Power Co		334,553	.
Flatbush Gas Co	21,242		1,657
Brooklyn Edison Co	16,428	..	427,618
Queens Borough Gas & Electric Co		...	15,154
Richmond Light & Railroad Co	33,275	..	
Totals	77,386	1,283,204	446,199

The Labor Situation

Edited by

R. Dawson Hall

Railroad-Shop Strike Makes Coal Mine on Virginian Line Lie Idle

A STRIKE of shopmen and car inspectors on the Virginian R.R. at Princeton, W. Va., an important divisional point of the road, during the third week of May not only interfered with transportation but also played havoc with coal production on the road. In many instances production was brought to a standstill owing to the road's inability to supply cars and move coal trains, the railroad company being short of motive power. Twelve hundred men were involved in the strike, which grew out of the fact that the company had discharged a boilermaker. Shop employees demanded his reinstatement. When the company refused the shop employees went on strike.

Claimed Right to Load Pyrite as Coal

A STRIKE at the plant of the Consumers' Coal Co., located at Downs, in the Marion County (W. Va.) field, was declared by miners employed at the plant on Wednesday, May 19, following the discharge of three men. Fully 250 miners failed to report for duty on the date named, taking such action following a meeting the night before at which it was decided to strike unless the three men discharged were reinstated.

The company claims that they were discharged for persisting in the loading of dirty coal though they had been cautioned time and again to abstain from doing so. It is even said that one of the three men discharged loaded sulphur balls weighing as much as 250 lb. each in his cars. The miners assert that the company had issued no warnings against loading "dirty coal" but fined men when they loaded it and added that it was easier to pay the fines than to separate the impurity.

The strike was finally settled during the latter part of the week in which it began, officials of district 17 conferring with the miners and the latter as a result agreeing to go back to work provided the men discharged were reinstated. That was agreed to and the striking miners returned to the mines.

Star Chamber Proceedings Against Peters

MUCH mystery surrounds the bringing of charges by C. F. Keeney and the District Board of district 17 against H. E. Peters, president of sub-district 4, an area covering a part of northern West Virginia. Peters is charged with having circulated false statements about the president of district 17. So far Peters has authorized no statement for publication, declaring that any statement to be made public should come from the district board which is trying the case.

Keeney, the district president, has declined to give any publicity to the charges against Peters, stating that the matter is purely an internal affair and therefore what transpires should be kept within the organization and not given to the public. He has heretofore stated that nothing will be given out in connection with Peters' trial.

There has been more or less friction between Peters and Keeney for some time and the charges against Peters, whatever they may be, are not therefore regarded as surprising. As Keeney will act as judge and appoint the jury, the verdict, it is predicted, will hardly be favorable to Peters.

Employees Strike at Raymond City, W. Va.

OPERATIONS at one of the large coal plants in Raymond City, Putnam County, West Virginia, were almost totally suspended on Tuesday, May 18, when about five hundred miners went on strike. They objected to an order of the superintendent of the plant governing the mining and loading of coal and promptly proceeded to register their dissatisfaction by quitting work. It was believed, however, that the strike would be of short duration.

Wage Agreement Concluded in Wyoming

AFTER several days of joint session at the Plains Hotel, Cheyenne, Wyo., a wage agreement was reached on May 22 between mine operators and mine workers of district No. 22, which covers the State of Wyoming. The minimum wage for men underground is $6.28 and for workers on the surface is $5.44. An increase of 24c. per ton is granted on all coal produced and of $1 per day for all daymen. An advance of 20 per cent is given all hands for deadwork and yardage.

Mingo Operators Have Not Closed Mines

ALTHOUGH it was stated that all mines in Mingo County, W. Va., would be shut down pending a settlement of the labor trouble in that county it is learned that only about half a dozen companies have shut down entirely. Other companies, of course, have been operating with curtailed forces and production in the field naturally has been materially reduced as a result of the labor difficulties in the Williamson field.

Labor Department Has 28 Strikes to Settle

H. L. KERWIN, Director of Conciliation, in issuing a report of labor disputes for the week ended May 8, states that on that date there were twenty-eight strikes before the Labor Department for settlement, and in addition fifty-seven controversies which had not reached strike stage.

Anthracite Wage Dispute Will Be Submitted to Arbitration

Operators Offered Increase of 65 Per Cent. on 1916 Wages and 17.8 Per Cent on Wage Scale Existing Prior to April 1

After declaring that they would not submit the anthracite wage dispute to arbitration the mine workers at their tri-district convention in Wilkes-Barre on May 27 finally decided that it was the only way to secure a better settlement than their leaders had been able to obtain. Waging a successful strike, the representatives of the mine workers say, has been made "almost humanly impossible" because of "class legislation." Therefore they accepted President Wilson's offer to appoint an arbitration committee for the adjudication of the matter.

Meantime they will remain at work "under the retroactive understanding agreed to between the operators and miners and reiterated by the President, which will protect the mine workers in wage increases as from April 1." The contract that Secretary of Labor Wilson submitted, which was the maximum offer of the operators, was rejected without an opposing voice. Yet this offer had received the approval of the international officers of the United Mine Workers of America. This agreement would have provided for a 17.8-per cent advance above the wages now being paid and would have given the mine workers at least a part of that recognition for which they have long craved.

James Gorman, secretary of the Board of Conciliation and secretary also of the wage conference, was informed of the decision of the tri-district convention and was also requested to arrange for a meeting of the scale sub-committee of mine workers and operators on Monday or Tuesday of the present week.

It was announced by Thomas Kennedy, now and for many years president of district No. 7, that the President would be informed that Neil J. Ferry, of McAdoo, Pa., would be a satisfactory member of the commission to represent the interests of the mine workers. The President has expressed himself open to a suggestion of this kind.

The convention recommended that the President "take such action as will permit the United States Government to take possession of four anthracite coal mines and one coal washery." The delegates desire that an investigation be made by the light of the operation of these mines so as "to protect the consumer against excessive charges," while paying the mine worker, if possible, a scale that will be uniform throughout the anthracite field and compensating the miners on the legal-ton basis such as is used by the operators in the sale of their coal.

The terms of the agreement submitted to the convention and rejected by it were as follows:

1. Agreement to be made with the United Mine Workers of America of the first part.
2. Agreement to run for a period of two years.
3. Contract rates at each colliery to be increased 65 per cent over the 1916 basis. This means an increase of 17.8 per cent over the present gross earnings, or an increase of 19.5 on net earnings.
4. Increase for outside and inside day men who receive from $1.54 up to be 65 per cent on the 1916 basis, plus an increase of $1.20 per day, with a minimum rate of $4 per day and a maximum of $6 per day. This means an increase of from 66c. to 75c. per day over present wages.
5. Employees receiving less than $1.54 per day to be increased 30c. per day over present wages. (This provision refers solely to boys.)
6. Contract miners' laborers to receive the same increase as company laborers, and the companies to bear their share of the increase, as is now the case.
7. Monthly men to receive an increase of 65 per cent on their 1916 basis plus $30 per month, it being understood that the increase over present rates shall not be less than $20 nor more than $30 per month.
8. Employees of stripping contractors to receive the same increase as received by those in similar occupations at the collieries.
9. Increases to be applied on the work day established in 1918, whether eight hours or more.
10. Inside pumpmen and outside and inside hosting engineers working twelve hours to be put on an eight-hour basis, the conciliation board to work out the new eight-hour rates. Until this rate is fixed by the board the men affected to continue on present basis of increase and hours.
11. Board of conciliation to act as a commission to study and report to the next conference on uniform day rates.
12. Tools lost by contract miners through squeezes, caves, etc., to be replaced by company.
13. Contract miners when reporting for duty and shut out of work shall be given opportunity for other places of work at the established rates for such work, provided such work or places are available.
14. Permitting contract miners to report deficient or abnormal conditions to the foreman and if they disagree the case to be taken up as other grievances are handled.
15. Agreement to be signed by the officers of the United Mine Workers of America and the coal operators.

Arrest Mine Worker for Matewan Massacre

The first arrests in connection with the death of seven Baldwin-Felts detectives and three others were made on Monday, May 24, when Sidney Hatfield, chief of police of Matewan, and nine others were taken into custody and removed to Williamson, where they were arraigned before Judge James Damron in the Mingo Circuit Court, being charged with the murder of L. C. Felts and other Baldwin-Felts detectives. All those arrested waived examination and were released on bond in the sum of $5,000 each. In addition to Hatfield the following were arrested: Reese Chambers, Clare Overstreet, Charley Kiser, Douglas Mounts, a man named Chambers, Ezra Fry, Billy Bowman and two others.

The arrested men were taken to Williamson in the custody of Colonel Jackson Arnold and other members of the state police force. In addition to those already arrested warrants have been issued for fifteen miners and for the four surviving members of the party alleged to have been at Williamson during the shooting.

Would Keep One-Armed Man on the Job

Miners employed by the Deaker Coal Co. near Kingwood, W. Va., were on strike for several days during the third week of May, objecting to the discharge of a one-armed engineer who had been relieved of his work as engineer and given work more suitable to his physical capacity. The striking miners, however, after being on strike for several days finally agreed to return to work pending a permanent settlement of the trouble.

Owing to lack of space it will be impossible to publish the scale of subdistrict No. 5 of the Ohio district in this issue. It will appear next week.

Foreign Markets and Export News

Montreal Loses Line of Coal-Carrying Vessels

The Black Diamond line of freighters, which before the war brought to Montreal 2,000,000 tons of coal annually from Nova Scotia, will not run on that route this season. The reason assigned is the greatly increased consumption of coal by the steel companies of Nova Scotia, combined with a falling off of coal production at the mines. Another important factor is the high cost of bunkering in Britain, which compels British vessels to fill their bunkers at Sydney, thus further reducing the supply for Canadian consumption.

Spain's Coal Mines Urgently Need Tariff Protection

Chester Lloyd Jones, commercial attaché at Madrid, Spain, reports that the great natural resources of industrial energy possessed by the Kingdom are neglected. The coal mines are inefficiently exploited. There is only a rudimentary development of water power. There is no system by which the two are used in co-operation for supplying energy for national industry. Without some method of utilizing these resources industry cannot prosper, for they are the sources of its life under modern conditions. In turn they will be the consumers of the products of many other lines of industry. This indicates that once they are developed they will not only make other industries possible but create a demand for their products.

The coal industry should be given greater tariff protection. It has had assistance supplemental to the tariff rates, such as exemption from taxes on exploitation and the grant of special bounties in certain cases. All these were suspended during the war. Although the exceptional circumstances created by the war cut down foreign competition and brought Spanish coal mines to a state of abnormal prosperity, a ruinous foreign competition is now faced, which demands not only the re-establishment of all the assistance formerly granted, but its increase.

It is to be noted that during 1919 the coal industry was, in August and September, anxious to secure authority to export coal. This condition, it is alleged, was transitory, and the exhaustion of the surplus produced during the abnormal conditions just passed would make it impossible for the local mines to compete with foreign trade.

In spite of the fact that mining is one of the oldest and best-developed branches of industry in Spain, the country profits little from the exporting of its resources. Even those branches the fostering of which is demanded for national defense, are unworked. They are favored by special legislation in the law of July 22, 1918, and the royal order of July 25 of the same year, but as yet no real advance has been made. It has also been sought to stimulate all branches of the mining and metal industries through the provisions of the tariff, but thus far without success.

Germany Exploits Synthetic Fuel Oil

Bergbau (mining) reports, according to an announcement from the European Division of the U. S. Bureau of Foreign and Domestic Commerce, state war-time experiments in Germany showed that the distillation of lignite at a high temperature gave a liquid coal tar which contained certain ingredients suitable as a substitute for gasoline, kerosene and lubricating oils.

Through a new process benzine and kerosene can be obtained from liquid coal tar, which has been distilled from lignite at a lower temperature, and all industries using lignite are urged to set up facilities for generating this liquid coal tar and thus secure synthetic products to supply the lack of the natural products.

It is interesting to remark that, at this time when there is a shortage of fats in central Europe, German newspapers are advertising a liquid tar soap containing a percentage of alcohol, for shaving purposes. This is undoubtedly a byproduct.

Plan to Increase Coal Output in Ireland

Industrial expansion in Ireland, *The Statist* (London, England) states, is undoubtedly very seriously retarded by the relative insignificance of its coal-mining output. Dependence on Great Britain is practically universal in this connection, as the import figures eloquently testify. In 1918 imported coal totaled 4,301,083 tons, while the output of the home mines was 92,001 tons.

That the latter figure can be increased is the confident expectation of Irish colliery managers. Now that the Leinster and Arigna fields are fairly well served by railway communications and additional mining plant and pumping machinery have been installed, there is every hope that this expectation will be justified. Well over 90 per cent of the Irish coal raised is anthracite, and engineers, from practical experience, find that for gas production it answers all their purposes admirably.

France Faces a Coal Deficit of 40,000,000 Tons

Consul Ernest L. Ives, Paris, reports that the coal resources of France contained in deposits lying at a depth of not more than 3.937 feet are estimated at 13,143,000,000 tons, and at a depth of 5,905 feet, at 17,600,000,000 tons.

France's coal production in 1913 was 40,844.000 tons (including 793,000 tons of lignite), and consumption, including coke expressed as coal, 63,904,000 tons; the additional 23.060,000 tons being imported from England, Belgium and Germany. The future estimated French deficit of coal, due to the return of Alsace-Lorraine and the increased industrial activities, is estimated at 40,000,000 tons.

Relatively, France is in the same position as before the war in regard to iron and coal, having a superabundance of iron and insufficiency of coal; Germany, on the other hand, has a superabundance of coal and only a limited supply of iron ore. This shortage of coal on the part of France will necessitate the importation of large quantities of fuel and the exportation of iron ore.

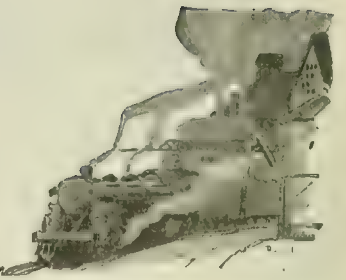
Despite High Costs, Electrification of Swiss Railways Proceeds

In spite of the present high cost of materials and labor, Trade Commissioner H. Lawrence Groves, Zurich, reports, the program for the electrification of the Swiss national railways is being pushed along as rapidly as possible, and Swiss firms are now holding contracts for the delivery of forty-odd electric locomotives within the next year. It is stated that the cost of one locomotive is about three times pre-war figures.

Poland's Coal Production Lags Behind That of 1913

Coal production in Poland in 1919, Trade Commissioner Louis E. Van Norman, Warsaw, reports amounted to 6,145,027 metric tons, as compared with 8,988,580 tons in 1913. Of the 1919 production, 4,614,710 tons came from the Dombrowa Basin, 1,408.983 tons from the Krakow region, and 121,334 tons from Silesia. Lignite was produced in the Zawiercie region to the amount of 173,798 tons in 1919, an increase of 18,716 tons over the 1913 figures.

Production and the Market



Weekly Review

Production of Bituminous and Anthracite Is Far Below Requirements, with No Relief in Sight Orders Lacking in the West—Canada and New England in Severe Straits—Northwest Awaits Lake Shipments—Traffic Conditions Improve at Pittsburgh

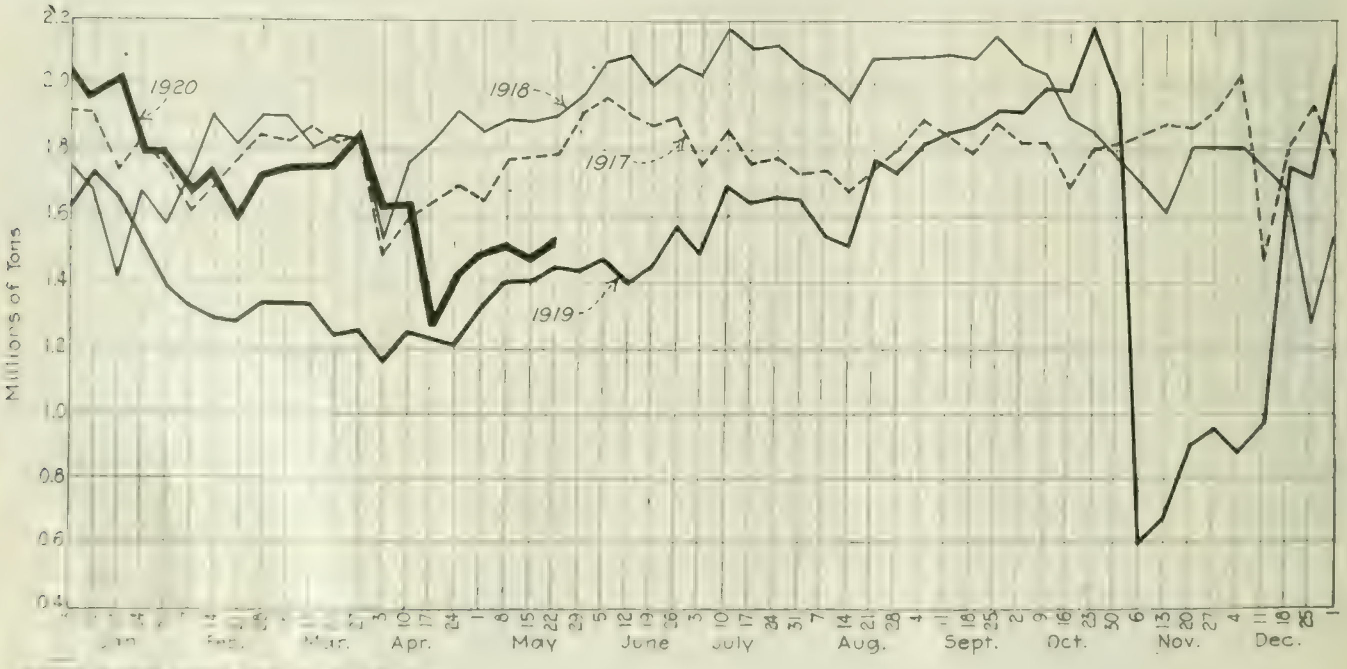
NO RELIEF in sight is the report from all quarters. Production hovers around the 9,000,000-ton mark for bituminous and has not varied greatly from a 1,700,000-net ton figure per week for anthracite. This output is entirely too low for the needs of the country and demand continues to press and prices to remain high and indeed to mount in some fields. West of the Mississippi the summer buying movement has not begun and the mines are losing some time each week because of a lack of orders for coal. The loss is noteworthy only by comparison with the situation in the East. Compared with last year and with normal years, business is good even in the Far West.

Canada and New England are in severe straits for lack of coal and the Northwest is marking time waiting for Lake shipments to get under way. Senators from New England have introduced measures in Congress to prohibit foreign exports of coal in order to insure a larger supply from the southern West Virginia fields.

Improvement in traffic conditions is reported from Pittsburgh, Connellsville, Cleveland and Chicago, but the measure of the improvement is not yet seen in more coal. Milwaukee has a fair supply of anthracite, but the lack of soft coal is described as little less than critical. From the smokeless fields the movement west has increased and thereby relieved a serious congestion at tide. Southwestern Virginia, where during the two years of war little or no trouble with car shortage was experienced, now is as hard hit as any other field.

Rising prices and labor dissatisfaction with the short running time are in evidence in the Middle West, and are noted particularly in the news from Cincinnati, St. Louis and Columbus. At Chicago so erratic is the steam market that poor grade coals are bringing higher prices than the best coal from the Southern field.

Anthracite is holding the interest of the trade, principally because of the wage controversy and the lack of certainty of prices for the season. The supply appears to be adequate for the demand, when it is realized that the demand this summer is unusually good for domestic coal. Shipments of anthracite on the Lakes are in better shape than are those of bituminous and New England is carrying on a brisk trade in hard coal, with no complaint of shortage in supplies.



Average Daily Production of Bituminous Coal*

From weekly report of Geological Survey

Reports From the Market Centers

New England

BOSTON

Trade Apprehensive of Outcome — Traffic Situation Shows Only Slight Improvement — Hampton Roads Situation Unchanged — Panic Prices Prevail Among Speculators—Anthracite Trade Brisk — Price Discussion Gives New Note of Anxiety — Demand for Steam Sizes Uneven.

Bituminous—Several weeks ago it was felt that spot prices were on an unduly high level. For a time the export market was almost a controlling feature but that is no longer the case with the steam grades from Pennsylvania. It is active and insistent buying that has forced spot prices to their present high range.

Remedial measures by the railroad authorities so far seem only to reduce car-supply and to be generally restrictive. After a blue week of tight embargoes, effective for several days against all five New England gateways, the embargo against the Boston & Albany was cancelled on May 27. The New Haven embargo was lifted a day or two earlier, and it is now announced unofficially that the Boston & Maine embargo will probably be raised by June 1.

A great difficulty in New England is the lack of locomotives and the generally run down condition of equipment on most of the roads. Embargoes are certain to be intermittent during the summer.

The railroads are still seizing heavy tonnages. Buyers are getting restive over losing so much low-priced coal and being obliged to replace it at spot prices, with no good prospect of collecting the difference from the commandeering roads.

Movement to the Philadelphia and New York piers has decidedly improved. There are occasional sales at high prices, but the bulk of coal available is moving on contract, whether for foreign bottoms or for local use.

At Hampton Roads there seems no material change. Despatch is about normal for those who have the coal available; agencies that are short of prompt coal find it extremely difficult to make up cargoes. Sales of spot coal at prices around $13.50 have been reliably reported.

Current prices on bituminous at wholesale range about as follows:

	Cambrias and Somersets	Clearfields
F.o.b. mines, net tons......	$7.00@$8.40	$6.25@$7.35
F.o.b. Philadelphia, gross tons..	9.70@11.25	8.85@10.10
F.o.b. New York, gross tons	10.10@11.75	9.20@10.50

On cars Providence and Boston Pocahontas and New River are quoted from $11.00 @ $15 per gross ton.

Anthracite—The situation here continues to be a sellers' market. There is steady pressure to get all sizes down to pea. Even egg is in strong demand at this season, and retail dealers are not at all disposed to grumble over the assortments they receive. Movement by water is still in fair volume.

Tidewater

NEW YORK

Anthracite Situation Shows Slight Improvement—Demand for Domestic Coal Easier—Buckwheat in Heavy Call—Bituminous Moving Easier, but Prices Remain Strong.

Anthracite—A slight improvement is noticeable. Receipts are larger and the general situation shows a better feeling. One more announcement has been made showing additional increases in wholesale prices. The demand continues strong with no hesitancy in the market absorbing all the coal available.

Shipments from this market to New England by water continue slow because of harbor difficulties. Shippers report a strong demand from the north and west, but as the railroad difficulties continue, coal movements are slow.

The demand for the steam sizes goes on. weather conditions making no apparent change in the situation. Dealers are finding a ready market for all the buckwheat they can obtain. Rice and barley are also in good demand. Quotations for independent buckwheat ranged from $4 to $5 at the mine, rice $2.75 to $3 and barley $2 to $2.50.

Current quotations for company coal per gross ton at mine and f.o.b., tidewater, at lower ports, are as follows:

	Mine.	Tidewater.
Broken	$5.95@$7.00	[illegible]
Egg	6.35@ [illegible]	8.20@ [illegible]
Stove	6.60@ 7.70	[illegible]
Chestnut	6.70@ 7.70	[illegible]
Pea	[illegible]	7.05@ 7.50
Buckwheat No. 1	3.40@ 4.10	5.15@ 5.85
Rice	2.75@ 3.25	4.50@ 5.00
Barley	[illegible]	4.00@ [illegible]
Boiler	[illegible]	[illegible]

Bituminous—With many factories in the Metropolitan district and throughout the territory covered by New York houses closing down, because of the lack of demand for their wares, conditions here are not to the entire liking of the trade. Demand is not as urgent as it has been and holders of coal contracts, while willing to take their requirements, are not as anxious to receive their tonnage as they were.

Due to the heavier receipts of contract coal at the piers and the delay in moving it because of labor difficulties, most of the piers here are affected by embargoes. So far the efforts of the Interstate Commerce Commission to relieve the jam have been of no avail, probably because the time has been too short.

Empty cars have been started for the mines, but the car supply remains at a low level at the works. Mines along the New York Central report a 46 per cent car supply, with about the same or slightly lower percentages reported along the Baltimore & Ohio and Pennsylvania lines.

Buyers continue to bid against each other and prices are higher than they were last week. Quotations on loaded boats at the piers range from $13.50 to $14. Quotations for the various pools ranged from $7 to $8 at the mines.

PHILADELPHIA

Anthracite Demand Strong for All Sizes—Stove and Nut in Heaviest Call — Strength in Steam Coals, Especially Buckwheat—Rice in Good Demand, but Barley Off — Bituminous Shows Slight Improvement—Strike at Tide Releases Coal for Domestic Trade.

Anthracite—With the weather approaching normal conditions, the retail dealers are devoting their entire energies to their summer deliveries. The dealers seem to be receiving fairly good shipments. But all producing companies are being urged daily for increased consignments.

The consumer demand is held close to stove and nut. The demand for egg, which has been increasing during the past few years, continues to be strong.

Pea coal is in stronger than the usual summer filling demand. Heavy shipments of pea are being received and most dealers are receiving more of this size than they are delivering.

As to prices now prevailing some of the independent shippers quote from $9.50 to $10 on egg, stove and nut. Usually the higher price is asked when the buyer refuses to take any pea coal; quotations on this size have run from $6.25 right up to $7.

There is a strong demand from the West to take coal at heavy premiums, as due to the slow delivery of coal to that region the people there are displaying considerable anxiety as to their ability to get sufficient fuel.

The steam sizes are in a strong position and no trouble whatever is experienced in getting $4.25 for buckwheat and plenty of sales are made at figures 25c. higher than that. Rice clings close to $3.25, but barley is occasionally shaded down to $2 and less and is the one size hard to move.

Bituminous—There seems to be some improvement in the bituminous situation. A number of producers report more cars received, but no one is getting anything in the way of cars to keep them going full time; most of the working time is around 50 per cent.

BALTIMORE

Soft-Coal Prices Moving Upward—But Drop in the Market Is Predicted—Hard-Coal Men Restive Under Price Uncertainty.

Bituminous—The price of soft coal keeps moving up in this section under active selling. Best coals sold at times readily as high as $8.25 and $8.50 f.o.b. mines the net ton, this price being recorded on sales of both steam and high-volatile gas coals.

The eight-dollar figure was quite frequent for almost any kind of coal under emergency purchasing. Probably the lowest prices recorded in this active market, for even the least desirable coals, was $7.25 f.o.b. mines the net ton.

It is predicted that the market is about due for a drop. The effect will not be immediate, as a number of consumers still need coal, but the accumulation, along with a betterment in the car run generally is expected to have the effect of breaking down prices somewhat from the exceptionally high standard.

At this writing there is a large number of ships here, there being 37 at the Curtis Bay piers or astream off the piers, for a total of about 205,000 tons of coal; and five or six at Canton or off the Pennsylvania pier for some 35,000 tons. At Curtis Bay to meet this there are 1,800 cars of coal and at Canton about 750 cars; the daily dumpings at the Baltimore & Ohio showing a healthy increase lately, running between 400 and 500 cars, while the Pennsylvania is dumping about 125 cars a day.

Anthracite—Hard-coal men here are growing restive under the delay in settling the wholesale prices because of the slow work of the Washington wage conference. Many of them report that the prices now charged at wholesale are far in excess of the retail advance of one dollar, which was set above the old October schedule as a temporary stopgap. Consumers too are restive under the fact that they cannot get a definite word on what their coal will cost them when delivered.

Lake

BUFFALO

Car Supply Controls Coal Situation—Bituminous Prices Chaotic—Shortage of Steamboat Fuel—Anthracite More Plentiful—Lake Shipments Good—Coke Quotations Irregular.

If a fairly good car supply could be obtained the situation would improve at once. Many Eastern coal cars have been observed on the Pacific Coast and Federal relocation orders have been issued for their return.

Bituminous prices are in a chaotic state, shippers as a rule refusing to make any quotations. If there is no contract the consumer is likely to pay from $6 to $8 at the mines, but with a good car movement these prices would disappear in short order.

The worst feature here is the shortage of steamboat fuel. It seems to be difficult to get any and yet one coal-shipping line has fuel enough and sells it at $6.50.

Anthracite.—There is complaint of scarcity in the city still, but the supply is much more adequate than is the case with bituminous. Consumers all tried to get a supply before the prices advanced. It should be remembered that it was the summer buying that saved the situation last winter.

Lake shipments are good, though the late start will count against the totals. All the upper-lake ports of account have been covered but they still have little coal. It is not expected that the shipping companies can make much of a showing under present conditions.

It has been impossible so far to fix Lake-coal freight rates; some cargoes paid 50c. to leading Lake Superior ports; 65 to 70c. to Chicago; 60c. to Milwaukee and 55c. to Sheboygan. Shipments for the week were 75,000 net tons, of which 37,400 tons cleared for Duluth-Superior, 18,600 tons to Milwaukee, 13,000 tons to Chicago, 4,000 tons to Detroit and 2,000 tons to Sheboygan.

Coke—The coke trade is fast following bituminous coal and prices are most anything that the shippers demand. Jobbers are not quoting it regularly, merely saying that it costs them as high as $20 at the ovens for both foundry and furnace, with other sizes and grades not in the market. To this must be added the Buffalo freight rate of $2.60.

CLEVELAND

Bituminous Situation Improving, But There Is Little Spot Coal—Pocahontas and Anthracite Unchanged—Pooling Arrangement Planned for Lakes.

Bituminous—Receipts of coal are gradually improving, but the movement is still far below normal. Empty cars for the coal mines are beginning to arrive from the West, in response to the Interstate Commerce Commission's relocating order, and marked improvement is expected soon in mine operation and receipts of coal.

Operators with headquarters in this city report that they are bending all their energies to take care of the Lake needs and their regular contracts, with the result that spot coal is almost unobtainable. For the little available prices are wild, as high as $6 a ton having been the figure for some sales of small tonnages this week.

Labor troubles on the Baltimore & Ohio are retarding operations in the No. 8 district, but there has been some freight improvement on the Pennsylvania lines. Retail dealers remain short of stocks but most plants are being kept in operation. Prices are strong.

Pocahontas and Anthracite—Quotations for Pocahontas and anthracite, which increased last week, remain unchanged. Receipts continue abnormal and the demand from domestic consumers is heavy.

Lake Trade—There is an effort to effect a pooling arrangement to prevent a fuel famine in the Northwest. Last week the coal shippers agreed to the plan to be placed in operation under the 1918 regulations. A meeting with ore and vessel men disclosed opposition from those sources, however.

Large ore interests are especially opposed to the plan. Herman M. Griggs, chairman of the Ore & Coal Exchange, is preparing a statement of the facts to be presented to the Interstate Commerce Commission. The railroads have agreed to the plan. Receipts at Lake ports are better, and Lake freight business is now said to be about 75 per cent of normal.

Retail prices of coal per net ton delivered by dealers in Cleveland are:

Anthracite—egg, $13.20; grate, $13.20 @$13.50; chestnut $13.50; stove, $13.50.

Pocahontas—shoveled lump, $11.75; mine-run, $9.25.

Domestic bituminous — West Virginia splint, $9.50; No. 8 Pittsburgh, $7.75; Millfield lump, $9.10; and cannel lump, $11.50.

Steam coal—No. 6 and No. 8 slack, $8.60; No. 6 and No. 8 mine-run, $8.60; No. 8 ¾-in. lump, $8.60.

MILWAUKEE

Soft-Coal Situation Critical—Crisis If Receipts Fall Away—Fair Supply of Anthracite on Hand—No Change in Prices.

The soft-coal situation at Milwaukee continues critical. Receipts continue sufficient to keep all industries moving, but unless they are speeded up and maintained at a good volume the fuel supply of the city will be exhausted before winter sets in. Should receipts fall away the crisis will be reached during the summer.

Milwaukee needs to have fully 3,000,000 tons of coal on the docks at the close of navigation. This requires a steady flow of cargoes, and receipts by Lake thus far have been quite disappointing. There is a fair supply of anthracite for the season and deliveries are being steadily made. The demand could be improved upon, however. Consumers do not take kindly to present prices, with summer weather prevailing.

Gas coal seems particularly scarce, and several companies in interior cities face complete suspension of operations. Some are carbonizing ordinary grades of coal at the expense of an inferior quality of gas.

No change has been made in the schedule of prices on hard and soft coal, but an advance all around is expected before long. Receipts of coal thus far this season include 105,452 tons of anthracite and 131,458 tons of soft coal, against 158,538 tons of the former and 560,750 tons of the latter in 1919. Complaints of too high a price in some instances have been heard.

Inland West

DETROIT

Coal-Carrying Roads Embargo Michigan — Situation Most Serious — Anthracite Outlook Also Bad — Little Lake Improvement.

Bituminous—Bituminous coal is coming into Detroit in small amount only, and yet a further reduction of shipments into the state is threatened. It is stated that the Hocking Valley, Pennsylvania and Toledo & Ohio Central railroads have given orders that their coal cars be kept out of Michigan. This action is said to mean that fully half the coal handled over those roads will be held in Toledo.

Michigan used to get 75 per cent of its coal from West Virginia and Kentucky, according to a Detroit wholesaler, but since the war opened, that coal has been diverted to the sea coast and Detroit has to depend on Ohio to make up the deficit. If the railroads that carry most of this Ohio coal forbid the movement of their cars into Michigan, it will be most serious for Detroit.

Except for the coal from Ohio, Detroit's supply is limited quite closely to small shipments from Illinois and Indiana. Prices on Ohio coal are quoted as $5 to $5.25 at the mines for lump in short tons, $4.75 to $5 for mine-run and $4.75 for slack.

Anthracite—The situation in the anthracite trade is causing considerable apprehension to dealers as well as consumers. Little anthracite is being brought into the city and practically no supply remains in the yards. The dealers not only have no coal to deliver but are also without information as to prices.

Lake Trade—While coal is reported moving somewhat more freely to some of the Lake loading docks, there is little improvement at other points. Lake vessels are still having great difficulty in obtaining fuel in sufficient quantity to meet their needs and in many instances vessels have to be shifted from port to port to get coal.

ST. LOUIS

In General Conditions Grow Worse—Car Shortage Shows No Improvement — Prices Higher Than Ever Before at This Season—Miners Dissatisfied—Future Does Not Look Good.

In St. Louis proper steam coal seems to be the cause of much concern. Many plants are unable to get any. Coal is not available for shipment from the mines because outside markets are offering unheard-of prices.

In the past few days screenings have been going at from $5@$5.25. But the demand for railroad coal in mine-run form has taken a large tonnage of screenings off the market.

The domestic demand is good, in both city and country, with little coal to be had. The price of Standard coal makes it prohibitive. Mt. Olive is coming in for one-tenth of the demand, with little Carterville.

Standard lump, egg and nut, are bringing from $3 to $4; $4.25 in the city and as high as $5 outside. Screenings are bringing anywhere from $3 to $5. Mt. Olive prices on domestic sizes range from $2.75@$4, while Carterville domestic sizes are from $3.50@$4.25, with as high as $4.50 and $5 asked.

In the Standard district some mines are working one day a week. Others loading railroad coal get as many as four days. In the Mt. Olive field similar conditions exist and there is much dissatisfaction among the miners.

In the Carterville field the mines work about two days a week on commercial coal.

On the Missouri Pacific lines almost no commercial coal is being loaded, the railroad demanding everything for its own use and still trying to force operators to sell coal at the railroad's price or go without equipment.

The retail prices in St. Louis have advanced as follows: Carterville, $7.50; Mt. Olive, $6@$6.25; Standard, $5.50@$6. Anthracite, grate and egg, $14.20; stove and chestnut, $14.45. West Virginia smokeless, $11.50@$11.75. By-product coke, $12.50. No gas house coke is available.

COLUMBUS

Active Bidding Advances Prices — Reduced Car Supply Curtails Production — Steam Market Hard Hit — Domestic Trade Lively — Lake Business Still Slow.

The striking feature of the coal trade in Ohio is the active bidding which has caused higher prices in all producing fields. Michigan and northern Ohio consumers have buyers in the Hocking Valley and Pomeroy Bend fields bidding for available tonnage, and extra high prices are offered.

Mine-run and slack is sold between $5 and $6 per ton at the mines and in some instances prices are higher. Mine-run appears to be higher than lump. With the output still curtailed to about 40 or 45 per cent of normal, it would not be surprising to see still higher prices.

The steam market is by far the most important department of trade. Northern Ohio and Michigan points are hard hit, while those in central Ohio have been able to make out with what fuel they could obtain. Reserve stocks are entirely exhausted, and most of the plants and utilities are operating from hand to mouth.

The domestic trade is also lively, but the strength exhibited in steam circles is lacking here. Retailers are clamoring for shipments. Retail stocks are low. Some West Virginia splints are arriving, but Pocahontas is scarce and little is coming west. Hocking and Pomeroy grades constitute the larger part of the supply for domestic purposes.

The Lake trade is still slow. The reduced production and rail embargoes have worked against Lake shipments. Records show only about one-fifteenth of the tonnage moved to the Northwest, in comparison with a year ago.

Prices at the mines for coals used in central Ohio are:

Hocking lump	$5 00 to $5 75
Hocking mine-run	5 00 to 6 00
Hocking screenings	5 00 to 6 00
Pomeroy lump	5 25 to 6 25
Pomeroy mine-run	5 00 to 6 00
Pomeroy screenings	5 00 to 6 00
West Virginia splints lump	6 00 to 6 50
West Virginia mine-run	6 00 to 6 50
West Virginia screenings	6 00 to 6 50
Pocahontas lump	7 00 to 7 50
Pocahontas mine-run	6 50 to 7 00
Pocahontas screenings	6 50 to 7 00

CINCINNATI

Operators' Difficulties Righted Only by Better Transportation—Little Progress Made in Lake Situation — Embargoes Increase Coal Prices.

The big factor in the local coal situation is that of transportation. Labor can take care of the conditions as they are today, but there seems to be no relief in sight until the transportation difficulties begin to right themselves. The coal men say there is only a 30 per cent car supply.

In speaking of coal for Lake shipment, the operators say that already three good months of production and two good months of Lake delivery have passed, with little progress made in filling the current demand, to say nothing of piling up a reserve.

Prices in this district have taken a jump. Contract delivery is the only one desired. Auction sales of coal are always taken at prices that never before were dreamed of here.

The Louisville & Nashville has placed an embargo, refusing to accept shipments off its own lines, explaining that as soon as its cars return in fairly good supply, the embargo will be lifted.

The Norfolk & Western has placed an embargo, east and west, off its lines.

In view of the embargoes, Ohio coal is reaching the suburban industrial plants, but it has been increased in price at both mines and plants. It is hoped that orders given to rush cars to the L. & N. and N. & W. will cause the embargoes to be lifted.

The shipments down the Ohio River, as always, are aiding in relieving the local situation. Retailers report that demand from domestic consumers continues brisk.

Wholesale prices are as follows, f.o.b. mines: West Virginia, block, $4.50; run-of-mine, $4; slack, $3.75@$4.

Jobbers have jumped their prices up to $6.50, $7 and in some instances as high as $8. Gas and byproduct coal in the past week have been increased to $6.50 and $7.50 and steam mine-run to $6.50 to $7. These prices cover the Kentucky side of the question also, with 25c. to 50c. better for domestic.

Retail prices of soft coal, delivered, are as follows: Lump, $8 to $8.25; nut, $6.75 to $7.25; run-of-mine $6.50 to $7. Smokeless, lump, $9.25; run-of-mine, $8.50. Anthracite, $14.

CHICAGO

High Prices with Demand Strong — Poor-Grade Coal Sells at Fancy Prices—Little Relief from Car-Pooling Plan Yet—Expect Improvement Soon—Some Anthracite Arrives, but Little Bituminous Comes from W. Va.

The Chicago coal market is steadily going up and high prices may be obtained for all kinds of spot coal no matter how poor in quality or preparation. The coal buying impulse which siezed the public 60 or 90 days ago is showing no signs of abatement, but on the contrary the markets here are flooded with frenzied buyers, or would be buyers, of coal.

Paradoxical as it may seem, poor-grade coals are selling at from one to two dollars per ton more than the higher grade and better prepared coals from the Franklin, Williamson, or Saline counties. There is, however, a noticeable and growing tendency on the part of a great many operators to disregard the circular prices which were sent out to the trade April 1.

A restoration of the car-pooling plan by the Interstate Commerce Commission has to date brought no improvement, but whether or not the car supply at mines in Illinois and Indiana will improve, is a question which will have to be decided by developments during the next three or four weeks.

The freight embargoes and delays which were the direct result of the switchmen's strike are now not as unsettled as they were a few weeks ago, although conditions are far from normal at the present time.

The various holding yards in and about Chicago are now in fairly good shape and it is hoped that from now on there will be a decided improvement. It is said that coal-carrying equipment is being returned to originating lines in larger numbers and at a greater speed than at any time during the past four or five weeks.

With the exception of anthracite, little eastern coal is coming into Chicago and anthracite shipments are nowhere near normal. There is a divergence of $1.25 per ton between quotations made by the various operating companies who produce and sell hard coal in this city. All of these people are not taking on new business but are concentrating their efforts in taking care of the demands of their established trade.

Relative to bituminous coal from the east, it is generally believed that Chicago cannot compete with tidewater on West Virginia splint and smokeless coals. Consequently but little soft coal is coming in from the east.

A careful investigation into the retail situation shows that a great many Chicago coal yards now have a fairly adequate supply of soft coal on hand and are therefore able to take care of their trade to some extent.

The householder is still quite panicky about his coal and is buying his winter's supply to be delivered into his cellar during the summer months. Even if the operating districts of Indiana and Illinois receive an excellent car supply, it will take at least from 30 to 60 days for the market to reach an easy state.

South

BIRMINGHAM

Steam-Fuel Supply Low and Demand Strong — Domestic Coal Also Scarce — Transportation but Slightly Improved.

There is practically none of the higher grade steam coals to be had in this district at the present time, and only quite a limited tonnage of Big Seam and other low and medium grades available for the spot market and there is strong competition for every ton offered, Big Seam mine-run being good for $4.25 to $5 per net ton mines.

However, a run-away market will not likely develop, since the amount of surplus coal is so negligible, the principal operators having sold ahead a much larger tonnage than they are able to produce under existing conditions and their entire output is being applied against orders in hand, at a reasonable margin of profit.

Domestic coal is also scarce but is not featured by as strong a demand as steam, though there is not sufficient tonnage to meet the needs of the trade. Deliveries on contracts are being made rather slowly but retailers are making some progress in stocking.

The car supply on the Southern Ry. has been slightly better for the past few days, and there has been less coal confiscated by this line than during the first part of the week. Piper, Marvel, Garnsey, Coleaner and other mines in the Cahaba field continue on strike and this has increased somewhat the number of cars apportioned to the mines in operation.

The car supply on the Louisville & Nashville is reported as poor while the Frisco road has furnished a fair quota, but materially short of the number needed. Mine labor is working in a rather lax and indifferent manner, though there is no labor unrest except at a few small operations.

LOUISVILLE

Prices Climbing Steadily Due to Heavy Steam Demand—Few Mines Screening Coal — Local Supplies Light — Higher Prices Predicted.

A runaway market barely expresses the way in which all bituminous fuels are climbing upward in the Kentucky fields today. The demand for steam grades is so keen that few operators are screening coal, preferring to ship mine-run. This results in a big shortage of screenings for plants equipped with mechanical stokers, and small deliveries of block coal to retailers.

Local supplies are quite light and very little coal is being bought by retailers under existing conditions, and many retailers are advising consumers to wait.

Coals of the Harlan grade are selling at a premium for gas and steel mill use, the fair price being from $6 to $7 a ton, while run-of-mine, on a premium basis, is selling at $7.25@$7.50 a ton at mine.

Hazard and some other coals are selling at $6 a ton and up for mine-run, and meeting with a steady demand. Prices of Alabama and Southern coals are well in line with Kentucky and East Tennessee fuels, and such coals are selling freely in the South.

Price advances have been more severe in the Western Kentucky field than elsewhere, due to the heavy buying forcing up the market.

Western Kentucky mine-run is today quoted at prices around $4.50@4.75 a ton, and block is quoted at as high as $5.50 a ton. It is believed that Western Kentucky will shortly be selling mine-run at $6@$6.50 a ton if conditions continue.

There has been some slight improvement in car supply, and mines in some districts are operating at 40 per cent capacity or better.

Retail prices in Louisville have again advanced 40c. a ton. River coal is retailing at around $9 a ton; and Eastern Kentucky rail coal is selling at $9.25@$9.50 for block in most retail offices. Western Kentucky block is selling at $7.50 a ton retail.

The following are quotations for Eastern Kentucky: Block, $6.50 to $7.50 a ton at mine; mine-run, $6; nut and slack, $6 and up. Western Kentucky prices are: Block, $5.50 and up; mine-run, $4.50 and up; nut and slack, $3.50 and up.

Canada

TORONTO

Great Shortage of Coal, Owing to Freight Charges — Matter Reported Settled.

The coal situation has been practically unchanged for the last two weeks, importations by rail having almost completely ceased, owing to the difficulty over the payment of freight to Canadian destination in New York funds.

Many carloads of coal originally billed for Toronto have been re-consigned to American points, owing to the refusal of local dealers to pay the increased freight charge. It is stated that a settlement of the difficulty has been arrived at and that coal will be coming forward freely in a day or two.

Some small supplies of anthracite are being received by water. Bituminous is quite scarce, and many industrial plants have reduced their force or are running on short time.

Quotations for short tons are as follows: Retail—anthracite egg, stove, nut and grate, $14; pea, $12.50; bituminous steam (nominal), $11; domestic lump (nominal), $12.50; cannel (nominal), $14.

News
From the Coal Fields

Northern Appalachian

FAIRMONT

Pronounced Car Shortage in Northern W. Va. — Congestion at Brownsville, Pa., Somewhat Reduced — Operators Incensed at Assigned-Car Practice.

There was a pronounced shortage of cars throughout northern West Virginia during the third week of May as a result of which in the Fairmont region, for instance, there were not less than 60 mines idle on any one day, the shortage in cars continuing to average more than 50 per cent.

Operations along the Monongahela R.R., in both Marion and Monongalia counties, were as short of empties as in all other parts of northern West Virginia.

The congestion at Brownsville, Pa., was reduced to some extent by efforts of the Pennsylvania railroad, but the Pittsburgh & Lake Erie found it impossible to move a single car of coal from Brownsville, as had been the case for several weeks. The Interstate Commerce Commission has not afforded any practical relief as yet.

Neither Lorain (a Lake point) nor Curtis Bay, at tidewater were under embargo during the third week of May. But both Lake and Inland West shipments were extremely light in volume considering the demand.

The assigned-car privilege has been so greatly abused in northern West Virginia that the Northern West Virginia Association has decided to take the matter into the Federal Courts and to the Interstate Commerce Commission unless action is taken by the National Coal Association at Atlantic City.

PITTSBURGH

Traffic Conditions Slowly Improving— Bessemer Road Operating Again — Fancy Prices Offered for the Small Spot Tonnage.

In the past week there has been a distinct, though slight, increase in the movement of Pittsburgh district coal. Almost the best that can be said of the situation is that the trend is in the right direction, but hopes are entertained that a really measurable improvement will soon occur. Operations may still be estimated at about 25 per cent of normal for the mines depending entirely on rail shipments, while those with river connections are working to the limit of the shipping facilities.

The improvement in movement noted thus far is chiefly in connection with private cars, the supply of railroad-company cars not having increased materially. Coal operators believe the orders of the Interstate Commerce Commission as to diversion or return of empty coal cars, if complied with promptly, would bring about a great improvement, but have doubts whether the compliance will be very prompt. Operators assert that railroads have a way of discovering obstacles when it suits their convenience to do so.

The Bessemer & Lake Erie R.R. has been functioning normally since about May 20, and coal production on that line is now fairly heavy again. This has enabled the Republic Iron & Steel Co., at Youngstown, which has mines on the line, to resume nearly full operation.

CONNELLSVILLE

Transportation in the Region Improves — Production May Now Be 75 Per Cent—Fancy Spot Prices Continue.

Car supplies in the Connellsville region have been improving more or less steadily for nearly a fortnight. The Pennsylvania and Baltimore & Ohio are functioning still better, while the Pittsburgh & Lake Erie is now doing something, although not a great deal.

The Monongahela R.R. taps a large part of the productive capacity of the region, and is operated jointly by the P. & L. E. and the Pennsylvania—each road being supposed to contribute half the cars. On an average in normal times the P. & L. E. has supplied about two-thirds, while during the strike until quite recently it has supplied practically none.

For the first six weeks, during which the rail strike affected the Connellsville region, the coke production was at about 65 per cent of the rate obtaining before the strike; but with the recent improvement, this week should show 75 per cent or more of the former rate.

The movement of coke (once loaded) is improved, and as the amount of coke en route decreases, then the receipts at furnaces exceed the shipments from ovens. One large valley interest found that for some time it had en route to its furnaces just three times the normal quantity of coke.

There is practically no contract market, neither consumers nor producers caring to negotiate when conditions are so uncertain. The spot market is quite a narrow affair. The offerings are small, nearly all the coke made being by producers or by merchant ovens having regular contracts. The disposition of consumers to buy is also limited, many consumers simply refusing to pay the fancy prices now obtaining.

However, there is enough absorption to prevent a decline, and in open market transactions $15 per net ton at ovens is practically the market for both furnace and foundry coke. Some transactions in furnace coke between friends are probably put through at lower prices; while two or three important foundry-coke producers are holding their price down to $12 and making sales only to regular customers.

The *Courier* reports production in the Connellsville and Lower Connellsville region, in the week ended May 22, at 178,250 tons, an increase of 23,850 tons.

Estimates of Production

From the Weekly Report of the Geological Survey

BITUMINOUS COAL

	1920		1919(a)	
	Week	Calendar Year to Date	Week	Calendar Year to Date
May 8b	9,167,000	184,348,000	8,438,000	149,979,000
Daily average	1,528,000	1,671,000	1,406,000	1,352,000
May 15b	8,756,000	193,104,000	8,436,000	158,415,000
Daily average	1,459,000	1,660,000	1,406,000	1,362,000
May 22	9,174,000	202,277,000	8,724,000	167,139,000
Daily average	1,529,000	1,655,000	1,454,000	1,367,000

ANTHRACITE

	1920		1919(a)	
	Week	Calendar Year to Date	Week	Calendar Year to Date
May 8...	1,840,000	29,531,000	1,777,000	26,917,000
May 15..	1,726,000	31,256,000	1,761,000	28,678,000
May 22	1,788,000	33,044,000	1,673,000	30,351,000

BEEHIVE COKE

United States Total

Week Ended				
May 22 1920b	May 15 1920	May 24 1919	1920 to Date	1919 to Date a
378,000	349,000	251,000	8,471,000	8,126,000

(a) Less one day's production during New Year's week to equalize number of days covered for the two years. (b) Revised from last report. (c) Subject to revision. All figures in net tons.

CHESAPEAKE & OHIO

Operators Act to Secure Better Service from C. & O. — President Stevens Comments on Situation.

About 75 operators representing the Kanawha, New River, Coal River, Guyan and Big Sandy fields of West Virginia gathered in Huntington recently to take appropriate action to secure service commensurate with their needs. It was decided to go into the courts if necessary in order to compel the Chesapeake & Ohio R.R. to furnish enough equipment. The sum of $400,000 was pledged to back up the efforts of the coal people to secure better transportation service and a committee of five was selected to perfect arrangements for carrying the plans of the operators into effect. No representatives of the Chesapeake & Ohio were present at the meeting, but George W. Stevens, president of the road, while in Huntington, at a later date, said: "The Chesapeake & Ohio is doing all that it possibly can do to relieve the car shortage on its lines. Our road has ample equipment to care for the needs of all of its shippers if the cars were returned to us promptly. All control over our rolling stock is lost as soon as the cars leave our rails, and there are no means at our disposal to secure their return." Mr. Stevens also said negotiations were now under way for the purchase of 1,000 100-ton coal cars to be used exclusively in handling coal for tidewater.

NORTHERN PAN HANDLE

Majority of Mines Idle Here and in Eastern Ohio—No Cars—River Transportation Helps Out Industries—Railroad-Fuel Mines Work

Between May 10 and May 22 the car shortage in the Northern Pan Handle of West Virginia, or Wheeling district, was so acute that fully 60 or 70 per cent of the mines here were idle two-thirds of the time.

Instead of the situation showing improvement, at the beginning of the last week of the month it grew worse owing to the strike of switchmen and yardmen at the Holloway yards of the Baltimore & Ohio, near Bridgeport, Ohio, that being the road's northern gateway to the Lakes.

While through trains were moved, it became necessary to impose embargoes on all shipments requiring switching at the yard named. The only thing that prevented greater idleness to industry was the fact that river transportation of coal was possible.

The greater part of the supply of empties available was assigned to such mines as had contracts to furnish railroad fuel. In some instances mines were accepting railroad-fuel contracts to keep their mines in operation. The assigned-car system is said to be used as a club here as elsewhere to force coal companies to supply fuel to the railroads at prices fixed by the latter.

Mines in the eastern Ohio regions were loading only a small part of potential capacity owing to poor transportation conditions.

Middle Appalachian

POCAHONTAS AND TUG RIVER

Car Shortage Acute, Reducing Production Below 50 Per Cent — Western Shipments of Smokeless Increase and Relieve Tidewater Piers — Tug River Output Cut to the Quick.

While labor troubles affected production in the Thacker field during the weekly working period ended May 22, owing to the tragedy at Matewan, as well as to a political campaign of unusual bitterness, yet the lean production in other Norfolk & Western fields was due to a continued acute car shortage and to the derangement of the sources of car supply in the West. Reports from all smokeless fields supplied by the Norfolk & Western showed that car shortage and other causes reduced production to a point below 50 per cent of potential capacity.

The only new development in Norfolk & Western smokeless fields was an increase in Western shipments due to a desire to avoid overcrowding tidewater piers with more coal, the heavy movement to tide during previous weeks having brought about much congestion there. There was much talk of the prospects of having to utilize privately-owned cars in order to augment tidewater shipments. In the Pocahontas field the loss from a car shortage was in the neighborhood of 300,000 tons, as against which only about 240,000 tons were produced, other sources of loss being comparatively negligible. Heavier shipments were made to western points for the reasons previously noted.

Tug River production was still on a discouragingly low level. As most of the cars for this field had to be distributed from such a supply as was received from tidewater, the total number of cars available when pro-rated among the very mines cut the supply almost to the quick.

VIRGINIA

Shortage of Equipment Retards Output One-Third—Large Tidewater Tonnage at High Prices.

Inability to secure an adequate supply of cars was still materially holding back production in the Virginia fields for the week ended May 22, the output reaching only 119,000 tons, aside from the 43,000 tons coked in ovens.

There were no losses to speak of from any shortage of labor, which was considered equal to a large production, but a shortage of equipment, applying to the entire region, did retard the output to the extent of about one-third of the capacity of the mines.

The mines served by the Clinchfield R.R., however, sustained even heavier losses, leaving a shortage of cars running as high as 56 per cent.

The bulk of production was still being shipped from Virginia fields to tidewater, spot prices for such coal being on quite a high level, owing to the comparatively limited supply. Coke was bringing from $12 to $14, the former price being quoted for furnace and the latter for foundry coke. The price for mine-run at the mines was ranging from $5 a ton upward.

KANAWHA

Car Supply Better on K. & M. Than on C. & O.—Kanawha Coal Goes to Tide—Difficult to Obtain Empties from the West.

During the first half of the week ended May 22 in the Kanawha region, transportation conditions showed a slight improvement over the preceding week, but production during the last half did not average over 15,000 tons a day at mines on the Chesapeake & Ohio.

However there was a somewhat more marked improvement on Coal River. The Kanawha & Michigan at the same time kept its mines fairly well supplied with empties, the quota fluctuating from 38 to 82 per cent.

There was a steady pressure for coal for delivery at the Lakes, but buyers were unable to secure any tonnage to amount to anything for delivery at such points, Kanawha producers shipping the larger part of their product to tidewater, where somewhat higher prices prevailed.

The fact also that it was difficult to secure the return of empties from Western markets, seemed to deter producers to some extent in consigning coal to the West. Assigned cars continued of course to reduce the supply of empties available for the loading of commercial fuel.

NEW RIVER

Mines Operate Two Days in Third Week of May—Shipments to West and to Lakes Low—Strike on Virginian Ry. Stagnates Production in the Gulf.

Lack of cars reduced mines to a critical condition in the New River field in the week ended May 22, many mines operating only about 15 hours during the weekly period. The entire output for the field for the week was not over 100,000 tons, running approximately 25,000 tons behind the output for the period ended May 15.

As had been the case in earlier weeks, the tonnage moving westward was low in volume, coke alone being consigned to Western points to any extent. It was not attempted to ship much coal from the field westward, owing to the fact that so few cars were being received from Western points. For the same reason Lake shipments were virtually negligible.

A strike of shopmen and car inspectors at Princeton, in which 1,200 men were involved, had the effect of almost completely stagnating production at mines on the Virginian Ry. in the Winding Gulf field, the railroad being unable to furnish any considerable run of empties throughout the week. Another factor in holding down production on the Virginian, was the great accumulation of cars at Sewell's Point.

NORTHEAST KENTUCKY

Decrease in Output Fault of Louisville & Nashville—Heavier Tonnage to the Lakes, Inland West and North.

Ground was lost in the Northeast Kentucky field during the deek ended May 22, as compared with the previous week, only 118,960 tons being produced as against 122,000 tons for the previous week, full time capacity being 291,760 tons. The greater part of the loss of output was attributable to a shortage of cars chiefly on the Louisville & Nashville R.R., the supply on that line being nearly ten per cent under that of the previous week.

On the other hand mines on the Chesapeake & Ohio managed to secure about as many cars as they had during the previous week, or approximately 44 per cent of requirements. The mines on the Louisville & Nashville had a supply of only 32 per cent. There was little to warrant the belief that there would be any material improvement in transportation.

There was quite a perceptible increase in the movement of coal to the Lakes as compared with previous weeks. It was also believed that more coal was being shipped to Inland West points and to the North.

LOGAN

Production Losses Heavy, Due to Car Shortage—Much of Logan Output Goes to Tide—More Than Half of C. & O. Coal Cars on Other Lines.

As during the previous week, production losses were quite heavy in the Logan field during the week ended May 22, mounting well above 250,000 tons; while on the other hand the output remained at the same figure as that of the previous week. Logan district mines could not produce more coal on account of lack of cars. While for the first two weeks of the month there had been about a 45 per cent car supply, during the week ended May 22 the supply was on even a lower level.

The larger part of the output of the Logan field was being shipped to tidewater, still under special permit, however. Producers generally were not consigning a very large tonnage either to Lake points or to Western markets, one reason being the inability to secure the prompt return of empties.

While labor-shortage losses were on a somewhat larger scale than heretofore, owing to friction between miners and operators over the organization of the Williamson field, nevertheless not more than six mines in the entire field were shut down during the third week of May because of labor trouble, the mines chiefly affected being those in the vicinity of Matewan.

Car shortage losses far exceeded those from labor shortage, the former entailing a loss in production of about 100,000 tons, or approximately 45 per cent; labor shortage losses, on the other hand, equalled only about ten per cent of potential output.

Shipments to the Lakes this year are estimated to be about 1,500,000 tons short for the present lake season, insofar as the Chesapeake & Ohio R.R. is concerned. Officials of that system point out that the haul is short and the road is able to control the movement to the Lakes and back to the mines. However, less than 20,000 of the 42,000 coal cars belonging to this railroad are now on that company's lines.

Southern Appalachian

SOUTHEAST KENTUCKY

Activity in Coal-Land Sales — Big Deals Reported — Byproduct Concerns Interested.

Several transfers of coal properties have recently been made in this field. Owing to the suitability of the coal in this region for byproduct purposes, a number of large gas companies have been acquiring properities. Among these are the following: Coal lands owned by T. J. Asher, known as the Lick Branch property, leased and operated through the Harlan Coal Co. and Williams Bros., to the Koppers Coal Co. of Pittsburgh, Pa., for a consideration said to be around $1,500,000. It is reported these people will make extensive development of this property, putting in their own railroad equipment, and so on. The McComb Coal Co., near Harlan, sold its holdings to the Detroit Gas Co., at a figure understood to be $800,000. The Kentucky King mine, in the Harlan district, has been reported sold at $600,000.

Middle Western

INDIANA

Great Scarcity of Fuel—Car Shortage on Account of Embargoes—Domestic Demand Due to Cold Weather.

Demands for steam coal by industries, public utilities and railroads upon the operators of Indiana are only matched by the demands for domestic coal. Railroads are not getting a sufficient tonnage. Public utilities and industries all over the state are shutting down entirely because of lack of coal.

The principal cause is the car shortage. Indiana operators looked for embargoes to be lifted, but conditions appear to be no more favorable than they were a week ago. It is practically impossible for an Indiana operator to get a car of coal out of the state or to get an empty in.

Cold weather during April and May caused a steady demand for coal for domestic use. In many of the smaller cities, which have never fully recovered from the strike of last November, suffering was reported.

The prevailing price per ton for screenings for steam coal is $2.75; mine-run, $3; lump, $3.50. Indiana egg and nut are sold at retail at $7.50 a ton and mine-run from $6.75 to $7 a ton.

SOUTHERN ILLINOIS

Office Building for Coal and Railroad Interests—Byproducts Coal Co. Fire Development of Extensive Coal Lands by New Railroad.

Jesse Dimond, of Chicago, president of the Southern Gem Coal Corporation, which operates several mines in Franklin County, Ill., is said to be contemplating the erection of a five-story building to cover an entire block in Mount Vernon, Jefferson County, Ill. The building will contain the offices and headquarters of the Wabash, Chester & Western R. R., recently purchased by this company, together with the offices of the Dimond coal interests.

An explosion of oil in a transformer in the engine room of mine No. 18 of the Byproducts Coal Co., near Benton, in Franklin County, caused a fire which damaged the surface plant to the extent of $150,000. The mine has been idle about ten days, but work will be resumed shortly, as equipment has been received and a large force of workmen are now engaged in installing the new machinery and repairing the buildings.

According to an announcement by General Manager Barbour, arrangements have been made for financing the extension of the Marion & Eastern R. R., which runs from Marion, in Williamson County, to Fulton, in Saline County, and from the latter place to Carrier Mills in the same county. This road traverses one of the richest coal fields in Southen Illinois.

INDIANAPOLIS

Without Priority Order for Coal, Utilities Must Close—Acute Car Shortage—Coal Sold at Contract Prices—Preferential Distribution of Cars Asked.

Public service corporations from all over Indiana are besieging the Public Service Commission for assistance in securing a priority order for coal. They declare that unless something is done quickly, scores of gas, water and electric utilities will be forced to close.

John W. McCardle, vice chairman of the Public Service Commission, is directing the fuel investigation at the request of the Interstate Commerce Commission and recently appealed to that body to re-establish the wartime priority orders at once.

Recently the car shortage at the mines was 60 per cent, whereas the greatest car shortage at any previous time in the history of Indiana mining was only 38 per cent.

Operators much prefer to sell contract coal at the agreed prices, if cars can be obtained, and deplore the soaring of "free coal" prices resulting from competition.

The American Coal Mining Co. has asked various state public organizations to see that concerted action be taken to get preferential distribution of cars to the coal industry, stating that the mines of the country can produce all the coal required but for the restricting deficiency in transportation.

Canada

BRITISH COLUMBIA MINES' CHIEF

James McGregor Succeeds George Wilkinson, Resigned—Provincial Inspector Goes With Pacific Coast Coal Mines, Ltd.—Life Story of Mr. McGregor.

George Wilkinson, Chief Inspector of Mines for British Columbia since early in 1917, has resigned and the appointment to the vacancy of James McGregor, senior member of the Mine Inspectors' Staff of the Province, has been announced. His term of office has been marked by signal advances, especially in respect to the improvement of underground working conditions.

Mr. Wilkinson, who has accepted the position of general superintendent of the Pacific Coast Coal Mines, Ltd., succeeded Thomas Graham (now general superintendent of the Canadian Collieries, Ltd.), as chief inspector. At the time of his appointment he was the manager of the Reserve mine of the Canadian Western Fuel Co.

Mr. McGregor has been connected with the Department of Mines for 22 years. He is a native of British Columbia, his parents having come from Scotland in 1849; his father being one of a party of eight coal miners engaged by the Hudson's Bay Co. to open up coal mines at Prince Rupert, Vancouver Island.

The boy McGregor went to work in the Nanaimo mines. Ambitious to qualify himself technically for higher positions, he attended both day and night schools; later he received private tuition under C. C. McKenzie, then Superintendent of Education for British Columbia.

While overman at the South Field collieries of the New Vancouver Coal Co. in 1888, he qualified for a first-class mine manager's certificate. In the year 1894 Mr. McGregor represented Nanaimo in the Provincial Legislature.

Later he was appointed to the position of Inspector of Metalliferous and Coal Mines for the Kootenays, which position he held at the time of receiving his present well-earned preferment.

Association Activities

Northern West Virginia Coal Operators' Association

Severe condemnation of the assigned-car system represented the action taken by directors of the Northern West Virginia Coal Operators' Association at a meeting held in Fairmont during the second week of May. It was pointed out at the meeting that the assignment of cars has been used by the railroads to secure an undue supply of fuel, seriously curtailing the production of fuel for commercial purposes. Legal action will be resorted to by the association to secure relief from the present intolerable assigned-car evil if relief can be secured in no other way. Action of the scale committee of the Northern West Virginia operators in reaching a wage agreement at Baltimore in April was ratified by the directors of the association.

Elk River Coal Association

The Elk River Coal Association has perfected its organization by electing officers and establishing headquarters at Weston, W. Va. Although the membership of the association is confined to coal operators on Elk River and Dundon, yet Weston was selected as headquarters because it is also the headquarters of the Coal & Coke division of the Baltimore & Ohio R.R.

On the roster of officers are: C. L. Voglesang, of Clay, president; B. C. Barber, of Clay, vice-president; E. V. Shorr, secretary. The board of directors includes J. G. Bradley, Walter Wood and C. L. Voglesang. Mr. Shorr's appointment as secretary became effective on June 1, when he assumed charge of the offices of the association. He heretofore held an important position on the Kanawha & Michigan R.R.

Upper Potomac Mining Institute

The meeting of the Upper Potomac Mining Institute held early in May at Thomas, W. Va., largely attended by members, was featured by a paper prepared by William H. Noone, on the subject, "Timbering and the Prevention of Accidents."

The Upper Potomac institute has adopted the plan of having all papers read to the institute printed in pamphlet form, and distributed to members before the meeting at which they are to be read. The next following meeting of the institute was held at Piedmont, in the lower end of the Upper Potomac field, on May 29, when in addition to two papers read there was a musical entertainment.

Mine Foremen's and Fire Bosses' Institute

At the second meeting of the Mine Foremen's and Fire Bosses' Institute, held in Belington, a constitution was adopted and new members were admitted. A paper was read by Thomas Davis of Mabie, W. Va., on "Safety and the Mining Law"; this paper was well received by the members and was followed by an interesting discussion. The next meeting of the institute will be held at Junior, W. Va.

Smokeless Coal Operators' Association of West Virginia

In order to avoid the commandeering of coal by the Navy, as became necessary last year, the Smokeless Coal Operators' Association of West Virginia made arrangements in the course of a meeting at Washington, D. C., during the second week of May, to take care of the requirements of the Navy.

As the first step, a committee of members was selected to take this matter in charge and to work out a plan with Navy officials and with the coal operators of the various smokeless fields. The Navy tonnage may be obtained by allocating the amount of fuel to be supplied among the various smokeless companies.

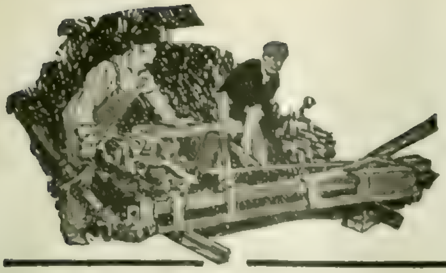
After studying pending legislation proposing further regulation of the coal industry, members of the association considered that it was useless to hope for any relief from shortage of production until the railroads secured the necessary equipment. A special committee of operators was selected to co-operate with the railroads in securing certain changes in the law.

Wholesale Coal Trade Association of New York

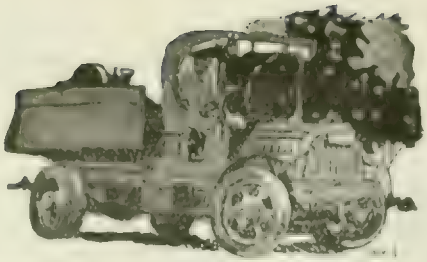
Shippers to the tidewater piers at New York are facing heavy demurrage charges owing to the strike of the marine and railroad workers, and the facts in the case will be presented to the Interstate Commerce Commission in an effort to effect a cancellation, or at least a suspension until an investigation can be made. The Wholesale Coal Trade Association of New York has called the attention of the Interstate Commerce Commission to the accrual of demurrage charges on tidewater shipments in the month of April, brought about by various strikes. The Interstate Commerce Commission has ruled that a strike is not an adequate reason for the cancellation of demurrage charges, yet conditions in this regard have materially changed since that ruling was made. The Wholesale Coal Trade Association states the facts surrounding the present situation are of so different a character and so widespread in their effect as to justify a modification of the commission's attitude. While the New York association makes this protest on behalf of shippers to the New York tidewater port, it is proposed to enlarge the scope of the application to cover the ports of Philadelphia, Baltimore and Hampton Roads if strikes have resulted in the accrual of demurrage charges at these ports.

Michigan-Ohio-Indiana Association

The program for the annual convention of the Michigan-Ohio-Indiana Coal Association, an organization of retailers of the three states, which will be held at Cedar Point, Ohio, June 16 to 18, inclusive, has been completed by Secretary B. F. Nigh, of the association. The attendance is expected to be about 1,200. Prominent among the topics to be discussed will be the car supply and costs of doing retail business. Homer C. Gill, of Columbus, president of the association, is preparing a lengthy statement of retail costs. Addresses will be made by Tom L. Lewis, formerly president of the United Mine Workers of America, now secretary of the New River Coal Operators' Association of West Virginia; H. G. Clabaugh, of the Peabody Coal Co., of Chicago, chairman of the Illinois Fair Price Commission; A. L. Allais, an executive of the Hazard Coal Operators' Association.



Mine and Company News



COLORADO

Craig—D. E. Evans, of this place, has completed preliminaries which will result in the opening of a coal mine at the southwest limits of Craig, in Moffat County, and cause the expenditure of a quarter million dollars to this district in the coming year. Mr. Evans obtained options on a total of 480 acres, for a coal company headed by George A. Levy, of Denver.

The company plans to sink a 500-ft. shaft on the property and begin development work at an early date in order to have the mine producing by the time the proposed Salt Lake & Denver R.R. is built to the west, thus giving an outlet for the coal.

IDAHO

Wallace—Three men were killed and one narrowly escaped death from gas in the Marsh mine near Burke, Idaho. The bodies of Fred L. Baron, superintendent of the mine; Charles Johnson and another miner yet unidentified were found beneath the water in the bottom of a shaft by a rescue crew.

ILLINOIS

Benton—It is said that the largest price given for coal land in Franklin County, Ill., was paid recently when the W. P. Rend Collieries Co., which operates a mine at Rend City in that county, purchased 600 acres, paying $75 per acre for same.

A big deal in coal lands is being negotiated between Bell & Zoller Mining Co., of Zeigler, and the W. P. Rend Coal & Coke Co., of Rend City. The deal involves ten sections of coal land in Franklin County, Ill., which the Rend company proposes to transfer to the Bell & Zoller Co. for nine sections in Williamson County, Ill.

Duquoin—A new mine is to be sunk near the old Lincoln operation, south of the town of Lincoln, which is expected to connect with the old workings of the mine, which has been closed down for years. The mine was abandoned after vain efforts had been made to smother a fire in the workings; later the tipple and other top works were torn down. It is intended that the new plant will enter the old mine's territory from another position and get the larger part of the coal which remains untouched. Lincoln (Ill.) men are backing up the scheme.

The united efforts of the various local unions around O'Fallon, northwest of here, have succeeded in purchasing the Taylor Opera House, which they will use for their meeting hall. The price paid for the structure amounted to $31,000.

The work at the Hallidayboro mine, five miles south of here, owned by the Jackson Coal Co., of Chicago, is progressing nicely and it is planned to hoist coal from the main shaft into the temporary tipple. This tipple is to be used during the time required to erect the big steel tipple which is now being shipped to the mine. The mine top works was recently totally destroyed by fire. The effect of this fire is especially felt in this district as the railroad, which uses much of the coal from this mine, finds it unusually hard to procure enough fuel to supply its many trains.

INDIANA

Evansville—A $150,000 plant will be erected by the Indiana Atomized Fuel Co. on its newly acquired property near the Crescent coal mine. The purchase of five acres of land near the mine has been completed. The company will manufacture a fuel product similar to powdered coal.

OHIO

Hocking—The Hocking Valley Mining Co., recently chartered at Columbus with a capital of $400,000, has started pumping out an abandoned mine on a 2,000-acre tract recently acquired by the company. It will require about six months to dewater the mine, after which a modern electrically-operated tipple will be constructed. It is expected that loading will start some time in September. The product will be sold through the Essex Coal Co., of Columbus.

Steubenville—Coroner T. H. Kirk of Jefferson County, who has been investigating the recent mine fire at Amsterdam in which 20 miners lost their lives, has rendered a decision that no one is guilty of negligence in the fire. He finds that the fire came from the fan room, and was caused by the explosion of a motor. In the inquiry the coroner called about 35 witnesses.

PENNSYLVANIA

Uniontown—The Hillman Coal & Coke Co. recently purchased a controlling interest in the Tower Hill Connellsville Coke Co. The Hillman interests now have 23 mines with an annual capacity of 6,000,000 tons.

Control in the company was formerly held by J. R. Nutt and associate capitalists of Cleveland. The company has approximately 1,500 acres of coal unmined and the two plants with 714 ovens are among the most modern in the region. L. W. Fogg, present general superintendent, who built the plants in 1907, will continue with the owners.

Connellsville — Connellsville and Uniontown men, organized as the Republic Coal & Coke Co., completed a deal with the Republic Iron & Steel Co., taking over the latter's plant at Atcheson, between Smithfield and Pt. Marion, in Fayette Co. The price is said to have been around $200,000, or about the same consideration the late John F. Atcheson, builder of the plant, received for it 22 years ago.

The officers of the new company are J. Fred Kurtz, president; Bruce F. Sterling, vice-president; W. D. McGinnis, treasurer, and Ross S. Matthews, secretary.

WEST VIRGINIA

Bluefield—Negotiations for the sale of the American Coal Co., operating in the Pocahontas field, were consummated during the first week of May, the sale price of the company being in excess of $3,000,000. The new owners of the American company are James A. McQuail, William McQuail, Edward J. Ennes, Wm. C. Atwater and others, of Bluefield, W. Va. The purchase of the American Coal Co. also covers 7,000 acres of coal land in the Pocahontas region. The American company operates at four different points, the mines so operated being known as the American, the Piedmont, the Crane Creek and the Pinnacle.

Morgantown—W. H. Warner & Co., of Cleveland, Ohio, operating mines in a number of bituminous regions, has entered the Marion County field, having acquired all the plants, acreage and assets of the Har-Mar Coal Co., the price paid, it is stated, being close to $500,000. The Har-Mar company owns Pittsburgh coal and a small acreage of Sewickley coal. The purchasers have already taken possession of the property.

VIRGINIA

Lynchburg—The Banner Fork Coal Corporation is understood to be planning general business expansion for increased operations. The company has increased its capital from $1,000,000 to $1,200,000.

CANADA

Fernie—A blowout in No. 1 East mine of the Coal Creek colliery of the Crow's Nest Pass Coal Co. occurred at noon May 14, forcing down 200 tons of coal and filling the mine with gas. All the workmen withdrew without injury.

Industrial News

New York, N. Y.—The Imperial Brass Manufacturing Co., with headquarters in Chicago, announces that on and after May 1, the New York office of the company will be located in the Longacre Bldg., 2nd St. and Broadway, New York City.

New York, N. Y.—Burns Brothers Coal Co.'s annual report for the year ended March 31, 1920, shows net profits after expenditures and Federal taxes of $1,027,-[illegible], equivalent to $11.44 a share on the $8,086,100 common stock outstanding, after allowances for dividends for the preferred issue. The Burns Brothers of New Jersey and the Burns Brothers of New York consolidated income account reported net sales of $24,053,980, against $21,286,870 in the year preceding.

New York, N. Y.—Goodin Reid & Co., of this place, announces the reorganization of its Cincinnati branch under the direction of Charles W. Taylor with offices in the Pickering Building. A full line of Goodin-Reid bratticing materials will be carried in stock for prompt shipment to the local and Western trade. Under present freight conditions, this should be a special convenience to users of the company's products.

New York, N. Y. — The Worthington Pump & Machinery Corporation announces that it has completed preparations to furnish improved water-power machinery of all capacities, for low, medium and high-head service, including oil pressure system, water governors and other auxiliaries. The company has supplemented its staff with competent designers in hydraulic problems with experience gained in years of service in such lines.

Chicago, Ill.—The Webster Manufacturing Co., with executive offices here and works at Chicago and Tiffin, Ohio, makes the following announcement: Since the purchase of the Skillin and Richards Manufacturing Co., in June, 1918, a new building has been erected, which will increase the capacity of that plant about 50 per cent. The receiving and shipping facilities have been improved, and the plant made thoroughly up-to-date in all respects.

The sales offices formerly in the McCormick Building, and the general offices and engineering staff, at Tiffin, Ohio, now occupy the new office building, at 4500 to 4560 Cortland St., Chicago, Ill., to which office all correspondence should be addressed.

Personals

John L. Kemmerer was recently elected chairman of the board of directors of the West Virginia Coal & Coke Co.; Everett Drennen was made president.

D. Gleisen, manager of the Industrial Bearings division of the Hyatt Roller Bearing Co., has appointed W. F. Myer to be directing transmission engineer. In his new position Mr. Myer will be responsible for the sale of Hyatt line-shaft roller bearings; he has been doing field work with the Hyatt agents throughout the country for over two years.

C. P. Broadhead, wholesale anthracite and bituminous coal, announces removal to new offices at 29 Broadway—room 1020.

W. R. Davis, brother of T. B. Davis, president of the Island Creek Coal Co., and three other men were killed recently at mine No. 3 of the Mallory Coal Co., on Huff Creek, Logan County, W. Va., when a rock roll[illegible] crushed them. Five others were injured. They had taken shelter from a rainstorm in a mine opening.

Charles H. Chase, [illegible] expert of the Council of National Defense, regrets that he has been [illegible] cancel his engagement [illegible] before the Kentucky M[illegible] on June 4 and 5.

William H. Sterling, [illegible]rintendent of the Docena [illegible] of the Tennessee Coal, Iron & Railroad Co., between Pratt City and [illegible]ville, Ala., [illegible] spending a few days in the Connellsville, Pa., coke region looking [illegible] matters connected with the mine and [illegible] of [illegible]

R. H. McGinley has been appointed manager of the F[illegible] of the Tidewater Coal Co. Mr. McGinley was connected with the brokerage office of the company and [illegible] to that was with the Anker [illegible] company.

H. C. Drum, formerly manager of the Fairmont office of the Tidewater Coal Co., has completed arrangements for engaging in the coal brokerage and export business, having opened offices in the Hutchinson Building, at Fairmont, W. Va. Among other companies he will represent the William R. Seaman Co., of Baltimore, and the Wiley Beyes Fuel Co., of Uniontown, Pa.

M. H. Tomb, of Charleston, has been appointed district manager of the Raleigh Smokeless Fuel Co., his district comprising Norfolk & Western territory. Mr. Tomb's headquarters will be at Bluefield. For the last two years he has been the secretary of the Kanawha Coal Shippers' Association. The Raleigh Smokeless Fuel Company has offices at New York, Norfolk, Huntington and Beckley.

C. M. Roehrig, formerly secretary of the Northeast Kentucky Coal Association, with headquarters at Ashland, Ky., on June 1 severed his connection with that association to accept an important post with a company now in process of organization by New York capitalists. This company is negotiating for the purchase of mines in Kentucky and West Virginia. Mr. Roehrig's headquarters will be in Huntington, for the present in the office of the Tuttle Coal Co., a concern also having a sales office in Cincinnati.

Carl G. Barth, who was a pioneer in the machine building industry and to whom many other industries owe modern principles of production and management, has been elected an honorary member of the Taylor Society, with headquarters at 29 W. 39th St., New York, N. Y. Only two other men have been thus honored by this society, which is the national organization for the promotion of science in management; these men being Frederick W. Taylor, himself, and Henri Le Chatelier, the prominent engineer who developed scientific management in France.

Phillip Konrad has been appointed general manager of all the properties of J. C. Sullivan in southern West Virginia. Mr. Konrad will have under his direction mines in Raleigh, Wyoming and McDowell counties in addition to a large amount of development work. He will establish headquarters at Tralee, Wyoming County, W. Va. Mr. Konrad has been a civil and mining engineer in Fayette County, W. Va., for the last 20 years.

L. W. Sydnor, assistant to the president of the Lake & Export Corporation, of Huntington, W. Va., and Miss Eva Dietz of Charleston, W. Va., were united in marriage in that city on Saturday, May 1. They will live for the time being at Beckley, W. Va.

E. W. McCullough, for nine years executive secretary of the National Implement & Vehicle Association, with headquarters at Chicago, has been named manager of the new Industrial Production Department of the U. S. Chamber of Comerce. In the departmentalization plan of the National Chamber, the Industrial Production Department occupies an important place.

George F. Germain, proprietor of the Corning Mining Co., has sold his oil interests in the mining property and will devote his entire attention in the future to developing the mining end of the business.

L. H. Keim has been appointed general sales manager of the R. D. Nuttall Co., gear manufacturers, of Pittsburgh, Pa. Mr. Keim came with the company in 1911 as engineer in charge of erection work and the installation of equipment. Later he was assistant chief engineer, designing and developing heavy-duty railway and steel mill gearing. In 1916 he developed a standard tractor transmission unit and was soon placed in complete charge of this new field with headquarters in Chicago, Ill. From this work Mr. Keim has been brought back to the main office at Pittsburgh, to take charge of his present duties.

George M. Rowland, architect, has become associated with the engineering and surveying firm of Blum, Weldin & Co., of Pittsburgh, Pa. Mr. Rowland has practiced his profession for over 20 years, the last 12 of which he has been in the employ of a prominent architect of Pittsburgh, and has had responsible charge of the design and supervision of construction of some important buildings. Blum, Weldin & Co. has recently moved its offices to the seventh floor of the Bakewell Building, Pittsburgh.

George E. Long recently resigned as senior vice president of the Joseph Dixon Crucible Co. Shortly before his resignation, he celebrated his seventieth birthday. Mr. Long thereby terminates 13 years of active service with this company, beginning in the capacity of stenographer and advancing to the offices of secretary, treasurer and vice president, respectively. Mr. Long will continue as a director of the Dixon company. He was prominently connected with the growth of this company and was widely recognized as the "father" of graphite lubrication and of silica-graphite paint for protective purposes.

Recent Patents

Electrical Connector. George A. Mead, Mansfield, Ohio, assignor to Ohio Brass Co., Mansfield, Ohio, 1,336,475. April 13, 1920. Filed Jan. 5, 1918. Serial No. 210,523.

Pipe Wrench. Wasyl Zadorozny, Meacham, Sask., Can., assignor of one-half to Tony Zygiel, Hamilton, Can., 1,336,710. April 13, 1920. Filed March 13, 1919. Serial No. 282,465.

Rail Bond. William C. Starkey, Mansfield, Ohio, assignor to Ohio Brass Co., (a corporation of New Jersey), Mansfield, Ohio, 1,336,932. April 13, 1920. Original application filed June 26, 1916. Serial No. 105,943. Divided and this application filed Sept. 21, 1917. Serial No. 192,456.

Motor Control System. Eugene R. Carichoff, Schenectady, N. Y., assignor to General Electric Co. (a corporation of New York), Schenectady, N. Y., 1,337,040. April 13, 1920. Filed May 6, 1918. Serial No. 232,726.

Mechanism for Operating Reels of Mine Locomotives. Frank B. Deans, Sharon Hill, and Benjamin K. Kirk, Philadelphia, Pa., assignors to the Baldwin Locomotive Works (a corporation of Pennsylvania), Philadelphia, Pa., 1,337,048. April 13, 1920. Filed Dec. 5, 1917. Serial No. 205,572.

Grease Cup. Leon N. Bourdeau, Rock Island, Ill., assignor of one-half to John G. Sorenson, Davenport, Iowa, 1,337,432. April 20, 1920. Filed Feb. 7, 1919. Serial No. 275,484.

Process for Treating Coal. John N. Wingett, Denver, Col., assignor to Warren A. Haggott, trustee, Denver, Col., 1,337,496. April 20, 1920. Filed May 2, 1915. Serial No. 25,636.

Coming Meetings

Mine Inspectors' Institute of America will hold its annual meeting July 13, 14 and 15 at Cleveland, Ohio. Secretary, J. W. Paul, Pittsburgh, Pa.

Pennsylvania Retail Coal Merchants Association will hold its annual meeting June 23, 24 and 25 at Reading, Pa. Secretary, W. M. Bertolet, Reading, Pa.

The Rocky Mountain Coal Mining Institute will hold its annual meeting in Denver, Col., in conjunction with the National First Aid Meet on Aug. 20 and 21. Secretary, F. W. Whiteside, Denver, Col.

M. O. I. Coal Association will hold its annual convention June 16, 17 and 18 at Cedar Point, Ohio. Secretary, B. F. Nigh, Columbus, Ohio.

National Retail Coal Merchants' Association will hold its annual meeting June 10-12, Detroit, Mich. Secretary-manager, Ellery Gordon, Philadelphia, Pa.

American Institute of Mining & Metallurgical Engineers will hold its fall meeting about Aug. 20. It is proposed to leave Buffalo by steamer and cruise through the Lakes, the first stop being at Houghton, Mich., after which the party will visit Duluth and the Iron Ranges of Minnesota, spending a day or two in Minneapolis on its return. Secretary, Bradley Stoughton, 29 West 39th St., New York City.

American Institute of Electrical Engineers holds annual convention at White Sulphur Springs, W. Va., June 29 to July 2. Secretary, F. L. Hutchinson, New York, N. Y.

The Colorado Retail Coal Dealers' Association will hold its annual meeting June 8, at Colorado Springs, Col. Secretary, E. Hopper, Denver, Col.

Illinois and Wisconsin Retail Coal Dealers' Association's annual meeting Aug. 4 and 5 at Milwaukee, Wis. Secretary, I. L. Runyan, Chicago, Ill.

Indiana State First Aid Meet at Clinton, Ind., July 5, under the auspices of the Indiana State First Aid Association, with the co-operation of the Clinton First Aid Association, Chamber of Commerce, Indiana Coal Operators' Association, United Mine Workers of America, Bureau of Mines, and State Mine Inspection Department.

COAL AGE

The Weekly Journal of the Coal and Coke Industries

Volume 17 NEW YORK, THURSDAY, JUNE 10, 1920 Number 24

Engineers Advance in Organization

AN epoch-making step in engineering organization was taken in the Washington conference of technical society representatives which decided upon the formation of a federation of these technical associations. This is the first all-embracing movement of the engineers to place their activities upon a full professional basis comparable with that of the other learned professions of law, medicine and the clergy; and as such is of the greatest importance.

For a number of years the several larger national engineering societies have been affiliated through the Engineering Council and other channels, but the work thus done is limited in many ways. It is a happy development, therefore, that gives us the larger agency which is now assured.

The element of public service and of greater participation in the constructive thought of the nation were stressed many times in the organization meetings and the application of these ideas will go far to inspire and support the effort that is now beginning. Indeed it was the clear recognition that these ideals must govern more fully the major professional activities that was most convincing as an argument for the comprehensive organization.

At the outset of the conference it was apparent that there would be considerable difference of opinion as to whether there should be an organization made up of representatives of the various societies now functioning or only an organization of individuals, such as the American Association of Engineers.

The latter scheme was at first advocated by a few of the delegates, but a full discussion soon developed a unanimous vote in favor of the former plan. Apparently the determining factor in this decision was the realization that two major activities confront the engineers as a group: First, advancement of the professional work to a proper plane both in action and in adequate recognition of the importance of the profession by the public; and second a service for the individual engineer in the matter of salaries, working arrangements, and other relations particularly with the employer. The latter group of needs is being covered most actively by the American Association of Engineers, and it seems to be the thought that this is the proper agency to continue in this work. The professional problems, on the other hand, have not had the broad attention that all technical men would wish, and it is for these responsibilities that the new body will no doubt most effectively function.

Thus far coal mining engineers have not been participants as a group in the plan of co-operative effort. But this does not by any means signify that they are either not needed or not welcome. They should through every available agency in which they are active give their support to the larger ideals that seem now within the possibilities of realization. It is a duty as well as a privilege to take this part in the advance of the profession.

Their civic consciousness and the sense that all parts of engineering are interdependent serve to bring the engineers into a common body. Specialization has done a good work, but engineers need to supplement it by association. Their interests, in many ways variant, are and should be in large degree united.

Let New England Face the Facts

OUR coal is now in the markets of the world. The present situation in which consumers in New England are forced to bid against the world at large for their coal, or that part of it that reaches them by water, is not of the making of the coal man. There is a tremendous shortage of coal in the world—a shortage created in some countries by depleted man power, in others by lack of transportation, in some by both causes. The situation was plainly forecast by many competent observers a year ago. Today coal is being carried from British colonies as far away as South Africa and India, to supply the demand in the Mediterranean market. The English coal trade has a clientele that is worldwide, and what is more natural or right than that British coal shippers, failing to get supplies in England for their trade, should turn to other producing countries to piece out their shortage?

A year ago we were seeking by every means to establish an export trade in coal. Today we have it. We intend to keep it, too. It happens that the sudden expansion in offshore shipments comes at a time when production is below normal because of the shortcomings of the railroads. Were we not thus handicapped, the export movement would cause hardly a ripple on the surface of the American trade.

Other parts of the country have just as much right to demand an export embargo on cotton and cotton goods, shoes and other products from New England, on the ground that the price to them is excessive through the bidding up of prices by needy foreigners as New England has to demand that coal be cut off from foreign shipment because unless that be done, the price to her will be too high. We have just as reasonable basis to ask that no more wheat be shipped to hungry Europe because that demand on top of our domestic need makes us pay too high a price for bread. And so with other food and manufactured products, including gasoline.

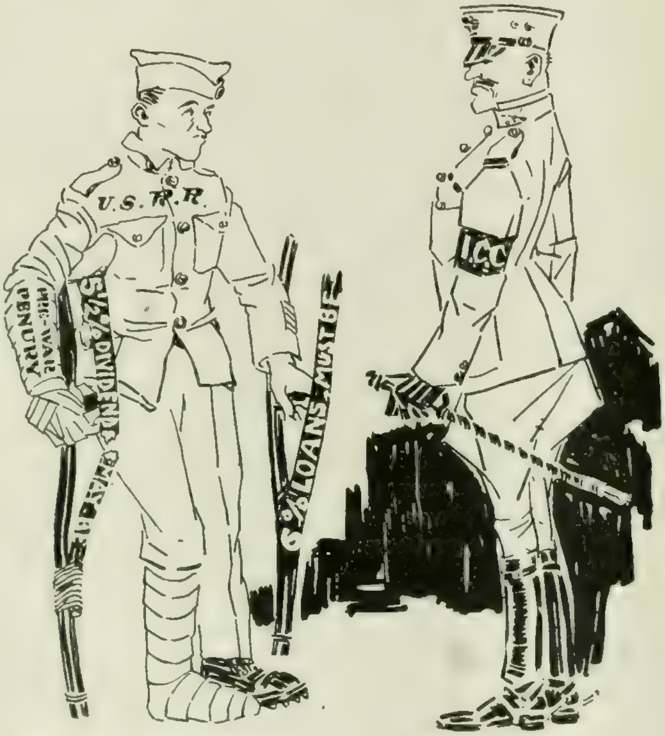
An export embargo on any commodity today would be but thinly-veiled price regulation, and the coal industry wants no more price regulation. We doubt if any section of the country, or any industry really favors further governmental regulation of business. The recent disclosure of profits in textiles in New England gives cause for scant sympathy on the price these same manufacturers are now required to pay for the coal which they use.

Embargoes on foreign shipments have been proposed before as remedies for high prices at home and have always been discarded as poor national policy. We have no wish to engage in sectional legislation.

Futility of Embargoing Exports of Coal

EMBARGOING coal for foreign export, as proposed by congressmen from New England, is another attempt to discriminate against coal. Had the scheme the slightest possibility of achieving the results that its sponsors hope for, it would deserve consideration. But let us examine into the merits of this latest move to pick out coal for such particular and drastic treatment. The basis for the proposal is that the coal that New England needs is being taken away from this country by foreign buyers. The figures for April show that an exceptionally large proportion of the coal dumped at the Atlantic tidewater ports has gone to export markets and that New England has received a correspondingly small share. About 2,000,000 net tons of bituminous coal were exported in bottoms in April and but 700,000 tons shipped coastwise to New England. This is at the rate of 24,000,000 net tons of offshore export, compared with from 4,000,000 to 6,000,000 in pre-war normal years, and less than 9,000,000 net tons by water to New England, compared with requirements of from 12,000,000 to 15,000,000 tons. Something has gone awry. The reason is well known. The buyer on foreign account has offered more money for the coal and it has gone abroad. Plainly New England is forced to bid in the world market for coal by water, to the extent of more than half of her requirements. There is nothing involved but the price. New England has coastwise freight rates that are fixed and, if anything, that are discriminatingly low in her favor. Boats are available. The Shipping Board will supply all the boats for this service for which there is call. It is unquestionably true that New England is against a hard situation, due to the congestion of the rail gateways through which come in normal times from one-third to one-half of her soft-coal supply from the all-rail suppliers located in the northern Appalachian coal fields.

Another War Cripple Who Needs National Rehabilitation



SECOND LIEUTENANT I. C. C. (*Loquitur*): Salute! Don't you see my shoulder straps?

The railroads, permitted to make dividends of only 5½ per cent and graciously allowed to borrow money from the revolving fund at 6 per cent, are truly the sorriest of war cripples. In fact the strongest of them that are now in the market to sell bonds are offering to pay 7 per cent for the accommodation and to get it have to give the best of security.—*News Item.*

But though she is in a hard case, would it be bettered if, to accord with her wish, exports were prohibited?

What might be expected to happen should export of coal be prohibited from tidewater ports? If the step is taken it will be solely for the relief of New England and cutting off exports to Canada would be of no assistance. An absolute embargo on foreign sales at tide would at once cause a drop in price. New England would get all exported. It is not required and if it were bought and the coal she desires, because aside from ship bunkers there would be left no other large buyer. But New England could not begin to take the coal that is now being shipped, the port facilities would limit its receipt. Furthermore, the conditions on the railroads in New England are no better than elsewhere and these roads could not carry such quantities of coal from tidewater ports inland to consumers. At the most, from 300,000 to 400,000 tons per month of the 2,000,000 that are going to foreign countries, added to what is already going coastwise, would break the New England demand. And what of the remaining 1,600,000 tons that would be cut off from the export market? Who would get that? No one. The railroads could take no more west from the southern West Virginia fields that are furnishing the bulk of this export tonnage. If exports are cut off, production of coal will be automatically curtailed. The same is in large measure true with respect to the railroads serving the port of Baltimore. Beyond question, Europe is in desperate straights for coal or the demand would not be so strong. To deprive foreign consumers of the fuel they need so badly in order to satisfy the desires of a small section of our domestic consumers would involve the United States in a breach of good faith. Italy is one of the heaviest foreign purchasers of our coal. It is somewhat difficult to conceive the administration acquiescing in a move to thus adversely affect that country with which our diplomatic relations are now proceeding so unpleasantly.

An attempt to stop exports was made during the coal miners' strike last November and December. Not a pound of coal was to be spared to foreign consumers in November and the lid was clamped on tight by the Central Coal Committee acting for the Fuel Administration. The emergency was great and the decision had the support of the country and was not opposed openly by foreign governments. Individual pressure, however, was so great that coal was exported in considerable volume. Permits were issued one at a time, for good reasons in each case. The total was over 700,000 tons in one month.

Gunite Forms an Excellent Material for Covering Mine Buildings

Frame Buildings with Gunite Covering Possess Many Advantages Over Similar Structures Covered with Sheathing and Clapboards They Are Cheaper in First Cost, Nearly Fireproof and Only the Trim Requires Repainting

MUCH has been written about the use of the cement gun around coal-mine plants, but most such articles have dealt with its utilization underground. One of the most important places where the gun can be employed to advantage is in the construction of the buildings comprising the surface plant.

The cement gun is a relatively new addition to coal-mine equipment, albeit a valuable one. There are so many reasons why a gunite-constructed building is well adapted to coal-mine plants that it is natural to inquire why this type of building has not been more frequently constructed. The answer is that the cement gun is a newcomer as a piece of mine equipment and the production problems that it has aided in solving have been located underground, where no other solution was feasible.

Let us cite a concrete case—this is not intended as a pun—where gunite has been used in the construction of buildings—the plant of the Valley Camp Coal Co. This concern is located at Parnassus, Pa., and is operating in the Thick-Freeport District that lies adjacent to the Allegheny River.

EXPERIMENT WITH GUNITE COATING SUCCESSFUL

While the steel tipple at the plant of the Valley Camp company was under construction it was realized that the time was not far off when some thought would have to be given to the construction of the remaining surface units. The officials of the company had practically determined to construct these buildings of cinder-concrete blocks and some of this material had already arrived on the ground. It was finally decided, however, to alter the plans and construct frame buildings with a gunite exterior, utilizing for that purpose a cement gun that had already been purchased.

As there was no mining town nearby that the company officials could visit in order to make inquiries as to the effectiveness of this type of construction, and learn what advantages, if any, it had over other types, it is apparent that the buildings were constructed more or less as an experiment. A recent conversation with the officials at Valley Camp proved that they are highly pleased with the result of their experiment.

Why are gunite buildings peculiarly adapted to coal-mine plants? In the first place, this is the only type of low-cost construction available today wherein an ideal dead space between the exterior and interior walls of a building can be assured. This dead space is desirable in any construction in order to prevent the entrance of cold air in the winter and assure the exclusion of heat in the summer.

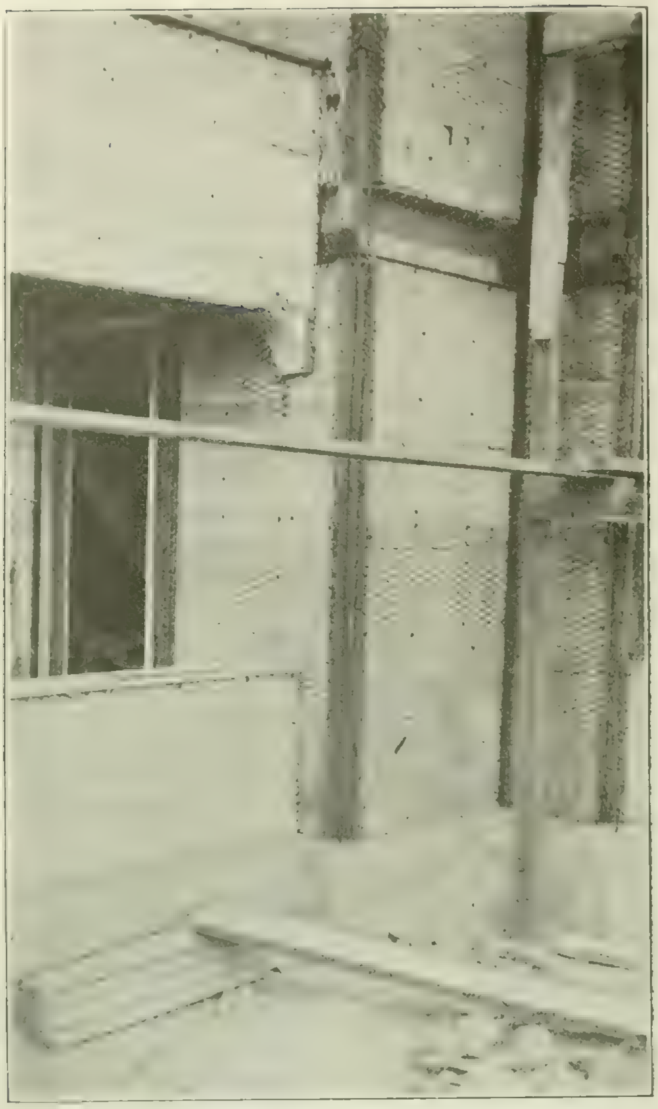
WALL SPACE MUST BE VOID OF AIR CURRENTS

The stagnant air acts as an efficient insulator, but to be most effective it is imperative that no contact be permitted between it and the outside atmosphere lest a current be set up, causing the dead air to fail to function properly. Furthermore, it is highly desirable that no means of entrance for the outside air be left open since in the summer months the moisture carried by warm air entering from the outside will condense on the cool interior surface of the walls, thereby making the building not only damp and unhealthy for habitation but simultaneously hastening decay of the timbers.

Effective dead-air space is a most important factor in the construction of buildings where the means of heating

Gunited Tenement

House comfortably shelters seventeen families. The walls are inexpensive, fireproof and attractive. They keep the house warm in winter and cool in summer, as neither the heat of the inside in winter nor the heat of the outside in summer can pass through them.



WALL PREPARED FOR RECEPTION OF GUNITE

Over the studding is spread two- or three-ply tar paper, applied by using ordinary carpet tacks. Over this again No. 15 gage galvanized poultry wire of a 2-in. mesh is stretched and lightly fastened with fence staples.

during the winter months is scant or inclining toward the inadequate. This type of construction is, therefore, particularly suited to those plants where power for operation of the mine is purchased and steam heat is not available or where it is necessary to conserve heat if the buildings are to be comfortable during the cooler months.

Another factor of considerable import is that the upkeep expense connected with a building of this type, such as the periodical application of some sort of protective paint, is small. This feature was recently made the subject of a special investigation by the authorities of the Nashville, Chattanooga & St. Louis Ry. This company constructed of gunite the side walls of a large number of section houses along its lines.

The report made in this investigation shows that the painting of such houses at present prices would cost $312 every six years on a house wood-wall with about 2,600 sq.ft. of surface, against a charge of $171 for painting the trim on the gunite-covered buildings. The original cost of the gunite houses was 22c. per square foot, or $253 for the gunite and $95 for painting the trim, making a total of $348, against a cost for a single shiplap will of $105 for the sheathing and $173 for the painting, or a total of $278. It will thus be seen that in six years this railroad will have saved $71 on the gunite building over the cost of a single-wall wood building. The latter type, incidentally, is ill adapted to a rigorous climate such as that of the Pennsylvania coal districts. Apart, however, from the economy of the gunited building is its attractive appearance.

APPLICATION OF GUNITE REDUCES FIRE RISK

Still another consideration favorable to gunite is the fact that a cheap insurance rate can be procured where this type of construction has been used. Most present building codes have not provided for the gunite structure, as it is relatively new. In comparison with other masonry walls the exterior coating of this type of building is thin. However, the same end has been achieved as that reached with the thicker walls, although the construction is entirely different. Permanence and strength are present, for a reinforcement of expanded metal or some other suitable mesh is always employed as a background for the cement. The advantage of this type of building around the mines lies in the fact that the gun is always available for quick construction, as the mine equipment and regular operators are employed on this outside work.

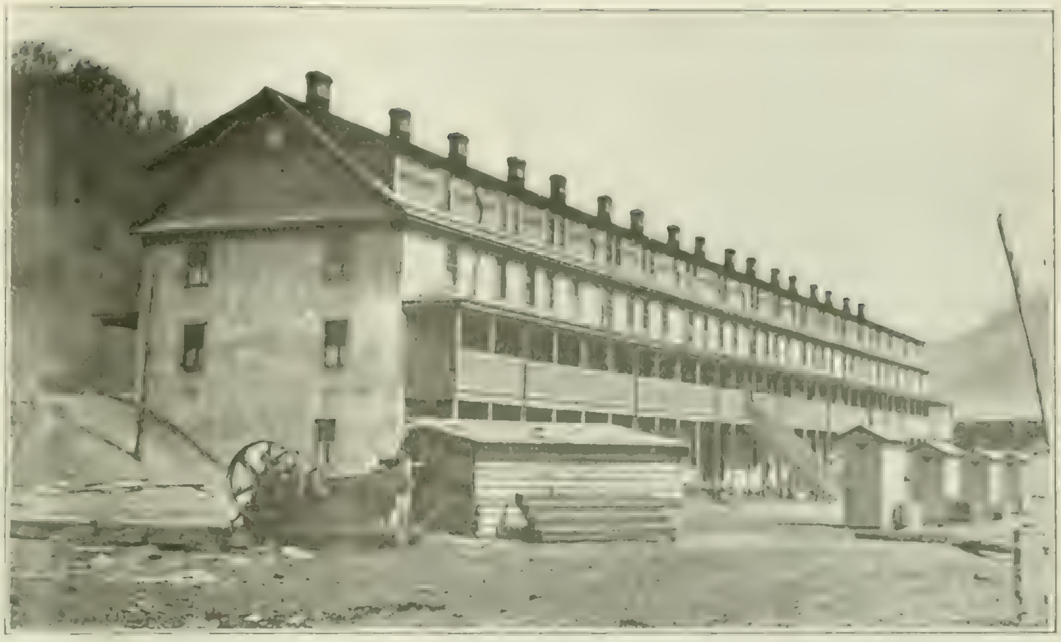
All the buildings at Valley Camp are of simple frame construction except the repair shop, which is built of cinder block. For such frame structures three-ply tar paper was fastened to the studding with ordinary carpet tacks. This paper was applied horizontally, beginning at the bottom of the wall and working upward. At the vertical joints of the paper the ends were overlapped 3 in., while at the horizontal joints a 2-in. overlap was employed. It is essential that the ends and sides of the paper courses overlap slightly in order to more fully guarantee the existence of an effective air space between the outer and inner walls. Care was taken to see that the paper was drawn taut so as to avoid sagging.

WIRE MESH COMPLETELY INCLOSED BY GUNITE

Over the paper No. 16 gage galvanized poultry wire with a 2-in. mesh was stretched. This was also drawn tight and fastened with 1¼-in. galvanized fence staples. The netting was overlapped about 4 in. at the vertical and horizontal joints, and the adjacent courses or sheets were securely fastened together. When the staples were applied they lacked about ¼-in. of being driven home. This was to allow the cement mortar to entirely inclose the wire.

In building the repair shop at this plant the cinder blocks were used which have already been referred to as having been purchased. These blocks were laid with rough-cut flush joints ½ to ⅝ in. thick. The surface was then covered with gunite until a thickness of ¾ in. had been attained. It was necessary to wet the walls before applying the cement in order to prevent a too rapid absorption of the water in the gunite such as would occur if the blocks were dry. This coating has assured an absolutely dry interior although the dead-air space is not as prominent a feature in this type of building as it is in one of frame construction.

The cement and sand were mixed dry, one part of cement being used to three of sand. After mixing the material was passed through a ¼-in. mesh screen before being placed in the gun. It was found that sand that contained a small amount of moisture gave better results than one that was perfectly dry, as it hydrated more easily and at the same time did not cause so much dust.

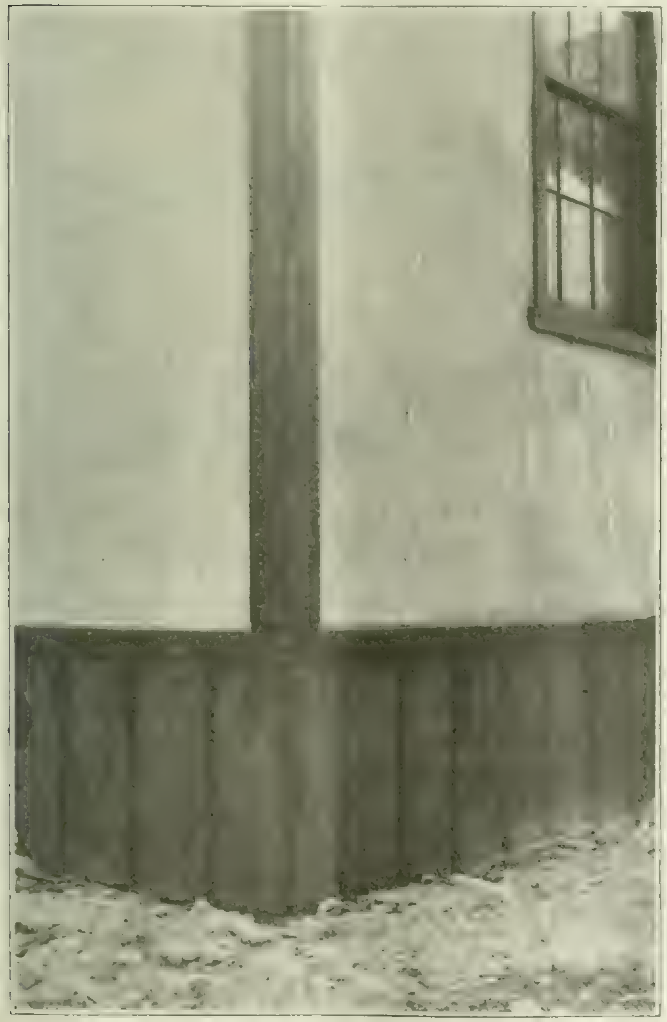


Rear of the Tenement

The building stands, as is characteristic of Pennsylvania, on a steep hill. Consequently entrance in the rear can be made to a ground floor which is beneath the level of the road in the front of the building.

This mixture also gave a more uniform flow through the gun. Where any of the dry mixture was allowed to stand over night it was rescreened the following day.

Many finishes can be given to a stuccoed surface, but perhaps the best and most practical one for mine buildings is that which is left by the gun itself or the so-called "stipple" finish. This was the type chosen at Valley Camp. A smoother finish, such as one left by a trowel or float following the gun, gives less surface for the ever-present dust and soot to settle upon, but on the other hand is a little more costly. As the finished wall can be easily cleaned with water, no matter what the character of the final surface, it is, of course, more practical to use the cheaper construction.



CLOSE-UP OF A CORNER OF THE BUILDING

As this type of building is not so subject to dust and soot as are the structures around the tipple the finish is made rougher. The natural or "stipple" finish is, from an artistic point of view, much preferable to one which is smoother. It is, needless to say, a trifle cheaper also.

Cost data on the Valley Camp construction would be interesting, but unfortunately no records were made by the officials. It is believed, however, that the completed buildings have not cost any more than similar structures having weatherboard sides. Estimates made for other building work show the comparative costs of gunite and wood-covered houses, respectively, are about as estimated in the accompanying table; the figures being computed in costs per square foot of wood-covered wall surface:

WOOD-COVERED HOUSE COSTS

	Cents
2 x 4-in. studding spaced on 16-in. centers at $70 per M....	4.2
Carpenter work placing studding at 60 per cent of lumber cost	2.5
Sheathing at $70 per M (making no allowance for waste)..	7.0
Placing the sheathing ($30 per M)......................	3.0
Building paper over sheathing..........................	0.5
Placing building paper.................................	0.5
Siding at $100 per M...................................	10.0
Allowance of 20 per cent for lapping and cutting.........	2.0
Placing siding ($40 per M).............................	4.0
Painting	7.0
Total cost per square foot for wood..................	40.7

The following figures are computed per square foot of wall surface covered with gunite 1 in. thick:

	Cents
Studs and carpenter work (same as for the wood-walled buildings)	6.7
Wire placed behind tar paper and over studs to prevent sag	0.5
Tar paper (2-ply Barrett specification).................	2.5
Placing tar paper	1.0
Reinforcing mesh	3.0
Cost of placing mesh....................................	2.5
Gunite material: One bag cement, 75c.; 3 cu.ft. sand, 25c... (This amount will cover 22 sq.ft. of surface 1 in. thick.)	4.5
Cost of placing gunite (labor, $40 per day)............. (An average of 1,300 sq.ft., 1 in. thick was covered daily)	3.0
Power and engineer......................................	1.0
Depreciation of equipment...............................	1.0
Total cost per square foot..........................	25.7

In addition to the saving in first cost, amounting to 15c. per square foot of wall surface, there is no comparison between the completed gunite buildings and those of a similar design but constructed entirely of wood.

The gunited structures at Parnassus are nearly fireproof. They are warm in the winter and cool in the summer. They present an attractive appearance, being decidedly neat, while there is practically no periodic upkeep expenditure.

One detail in the application of the cement that should not be overlooked is that of securing a uniform color over all of the building. On one of the buildings at Valley Camp the coloring is not uniform. This resulted from the moving of the operating scaffold to a lower level and the renewal of the guniting process without first using a brush wet with water to remove the dust that had settled upon the previously "shot" gunite.

MINE WATER SO CLEAN IT COULD BE USED

An N-O gun model, as manufactured by the Cement Gun Co., Inc., of Allentown, Pa., was used for the guniting. An ordinary type of mine compressor supplied the air, which was delivered to the gun at a pressure of about 30 lb. to the square inch. A pump situated in the fan house furnished the water, which was supplied at a pressure of 65 lb. to the square inch. Ordinary water from the mine was used as at this operation this is unusually clean. It is important that clean water be employed. At most mines it would be impractical to use mine water because of the sediment ordinarily carried, which might interfere with the operation of the gun and at the same time discolor the mortar.

Gunite construction compares even more favorably with buildings made of brick. The gunite structures are not as costly, have the same relative fireproof qualities, are warmer than the brick in winter, and present an appearance that is fully as attractive. They possess the added advantage that they may be cleaned at any time at practically no expense.

Carrying Out Burdensome Contracts

Release from Performance of Terms Agreed To Must Be Provided For in Contract—Damages May Be Recovered for Misrepresentation

By A. L. H. STREET
Minneapolis, Minn.

A FIRM holding a contract to mine coal lands for a lessee asks the legal department of *Coal Age* for information as to its legal rights under the following stated circumstances:

The land contained two coal veins—one containing "very good coal," and the other being very low, ranging from 2 ft. 4 in. to 2 ft. 6 in. When the better vein had been worked the firm was practically out of debt and owned a valuable plant. Then the firm asked the other party for a new contract or an advance on the price of coal, "as we were not able to work this low vein at the old price as there were faults to cut, and it naturally cost more for labor." But the other party insisted that the firm proceed to work the coal, which was done. This compliance with the other party's demand has entailed heavy indebtedness.

"They insisted upon our working this unworkable coal," adds our correspondent, "which is the direct cause of our indebtedness. We would like your advice on the matter, as to whether we are lawfully forced to stand all or part of debt, and as to what procedure we should take in the matter. Also we would like advice as to the position of our personal property in case of a foreclosure and as to how we could protect it."

No matter how burdensome performance of the contract may be, the correspondence discloses no legal ground on which the firm is entitled to release from the terms of the agreement or to reimbursement for any part of loss entailed in working the coal.

"The general rule is that, where a person by his contract charges himself with an obligation possible to be performed, he must perform it, unless its performance is rendered impossible by the act of God, by the law, or by the other party, it being the rule that in case the party desires to be excused from performance in the event of contingencies arising, it is his duty to provide therefor on his contract. Hence, performance is not excused by subsequent inability to perform, by unforeseen difficulties, by unusual or unexpected expense, by danger, by inevitable accident, by the breaking of machinery, by strikes, by sickness, by weather conditions, by financial stringency, or by stagnation of business. Nor is performance excused by the fact that the contract turns out to be hard and improvident, or even foolish, or less profitable, or unexpectedly burdensome." 13 Corpus Juris, 635-637.

One clause of the contract held by our correspondents provides that they shall "mine all of the coal that is practicable to mine," etc. Under this clause the operator is not permitted to work a bed of good coal and then avoid the obligation of the terms of the contract which provide so far as "practicable to mine" the poorer coal. If it was not "practicable" to mine the poorer vein, that would be good excuse for not doing so. But the firm could not work it and then hold the other party for any part of loss in doing so, in the absence of special agreement to that effect, which we do not find in the contract in question.

Apparently the only respect in which the firm has protected itself at all in the contract against increased cost of production is in the following quoted paragraph appearing after the schedule of prices to be paid the firm for mining coal:

"It is understood and agreed that the above prices are based on present mining scale and that in case of any changes in the future the price will be increased or decreased sufficiently to meet the changes in the cost of production made necessary by such change."

This will authorize an increase in the price of the coal to cover increasing labor costs commensurate with advancing mining scales. But it will not authorize recovery on account of cost of production merely entailed by unexpected difficulties encountered in carrying out the contract.

What has just been said, however, should be qualified to the extent of saying that if the other party to the contract misrepresented the character of the coal veins, the firm could recover damages based on a difference between the cost of working the veins had the land been as represented and the actual cost and the actual cost of working them.

Should the chattel mortgage referred to by our correspondents be foreclosed, title to the mortgaged property would be lost unless redeemed before sale of the property by payment of the debt, interest and costs of foreclosure. Should the partnership debts exceed the firm's assets, with no fair chance of putting the concern on sound footing again, voluntary bankruptcy proceedings would appear to afford the best means of "wiping the slate clean" before starting in upon a more promising venture.

Successful Methods of Working Two Coal Beds Separated by Six Feet of Slate

A Scheme of Mining Developed to Suit Conditions in One Part of a Mine Failed in Another—Methods Were Then Worked Out Suitable to Each Portion of the Operation

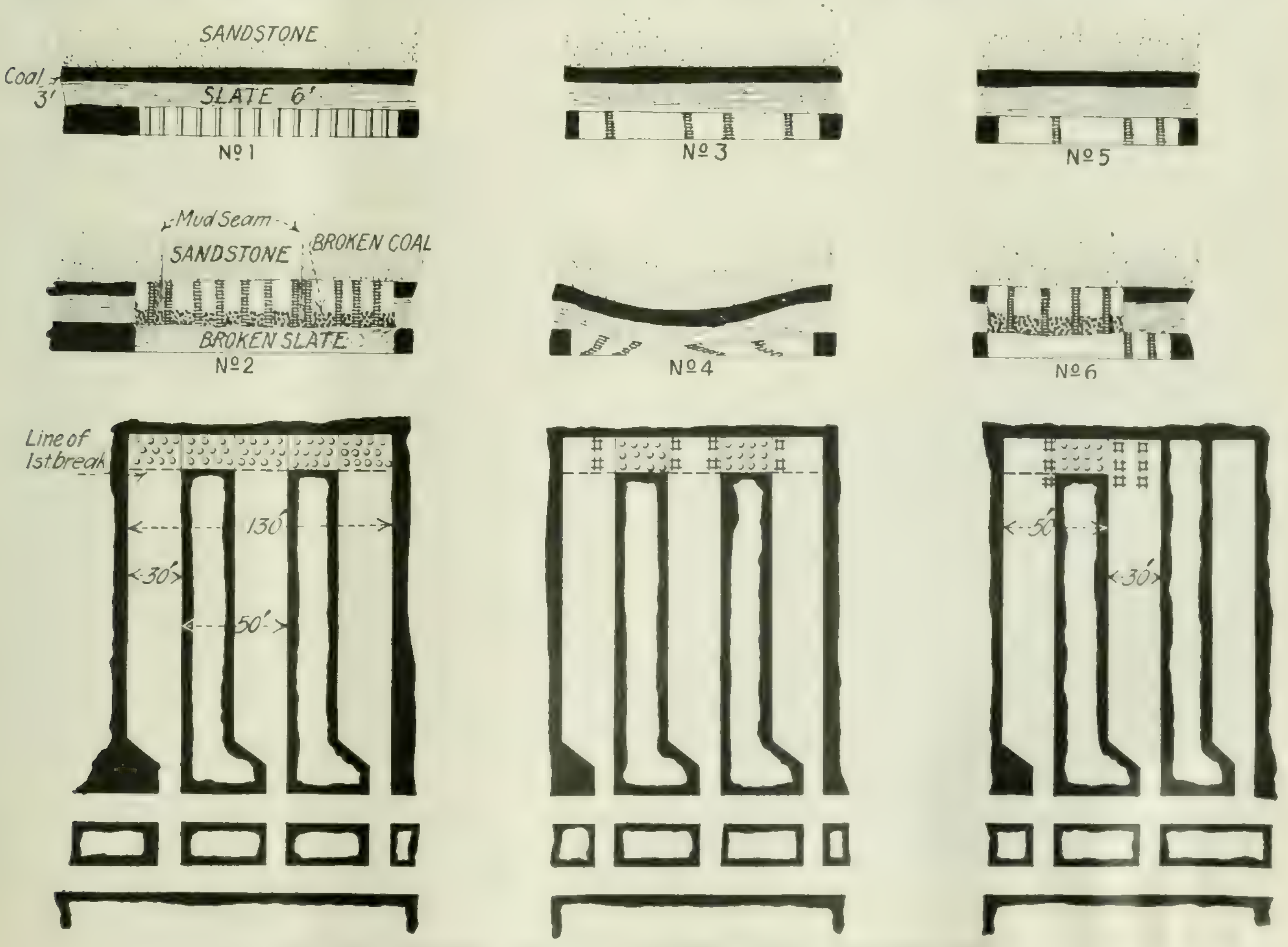
By Dever C. Ashmead
Tarrytown, N. Y.

AMONG difficult mining problems is that of working two coals separated by only a few feet of strata—adjacent or superincumbent beds, they are often called, but both the names are inaccurate and only excusable because of the inadequacy of our vocabulary. Such beds can be found both in the anthracite and bituminous regions, and the difficulties they present are variously met, or not met, by the companies which are confronted with them. The Connell Anthracite Mining Co. at its mine at Bernice, Pa., has solved this problem for its own operation, and a recital of its methods may be of assistance to the managers of other mines who are confronted with like difficulties.

The Connell company has at Bernice two beds of coal so close together that they cannot be mined separately, and yet they are too far apart to be worked profitably as one. The lower seam is seven feet in thickness and is overlaid with six feet of slate, on top of which is another bed of coal varying in thickness from two and one-half to three and one-half feet.

The thickness of the slate between the two beds of coal is too great to be handled profitably. Over the upper bed lies a sandstone roof forty to forty-five feet thick, above which is slate and surface soil. The minimum cover is sixty-five feet, but a maximum cover of about 165 ft. is at times reached. Other difficult features that have to be contended with are the numerous fissures filled with mud that are found in the sandstone.

Practically every method of mining that was suggested by anyone was given a fair trial, but without satisfactory results, until the idea was conceived that it might be possible after mining the lower bed to drop the upper one and load out the coal. The success of this scheme depended entirely on the sandstone roof



VARIOUS SCHEMES TRIED FOR WORKING TWO ADJACENT BEDS
Procedure successful in one part of the mine failed where heavier cover was encountered

remaining up until artificial support could be provided. The first experimental work was done where the coal had the lightest cover. At this point the method employed was an entire success, but considerable difficulty was encountered when the cover became heavier.

The procedure followed consisted in robbing two adjacent pillars for a distance of twenty-five to thirty feet from the end of the room and supporting the roof by numerous props. The robbing of two pillars made the total span of the roof equivalent to a distance of 130 feet on the first two pillars and on the second two and thereafter 100 feet, provided the rooms were thirty feet wide and driven on fifty-foot centers, thus making the pillars twenty feet wide. This procedure is shown in the accompanying illustration under section 1.

While the robbing is in progress it is necessary to support the roof with props. As soon as the two pillars are drawn back the proper distance the props are drilled and the holes in them loaded with dynamite and fired. This removes all support to the roof, which falls, and all the overlying strata, as far up as the sandstone, come down. This, of course, includes the slate and the small bed of coal.

The next step is to build a series of cogs on top of the fallen slate to support the new roof. These cogs are about five feet square, are placed on twelve and one-half feet centers and are filled with rock. Wherever it is necessary, because of mud seams in the roof, two cogs are placed, one on each side of the fissure, but ordinarily it is sufficient to build the cogs on twelve and one-half foot centers, as already stated.

After the coal has been dropped mine tracks are laid to the fall, and whenever possible these are carried on top of the fallen slate. This considerably lessens the distance that the coal must be moved. The coal is next loaded into mine cars and taken to the surface.

It would be a comparatively simple matter to carry on this method of working if the conditions of the roof remained the same in all parts of the mine. Unfortunately, however, the thickness of the overlying strata does not remain constant but, as has been previously stated, greatly varies, much augmenting the weight to be supported.

At first the coal company, in the extraction of coal where the overburden was heavier, attempted to employ the system that it had used successfully under light cover. The sandstone roof, however, would not stand up under the greater weight arising from the wide and comparatively lightly supported span. It broke and fell when the props were shot, making it impossible to remove the small bed of coal. As this scheme failed it was necessary to try another. The middle portion of the illustration shows what this method was.

A row of cogs was built on each side of the pillars to be robbed, the pillars were then removed and the coal dropped by removing the cogs one at a time. This did not work successfully. Because of the long span the roof rode the cogs and when one or two were removed the remainder could not withstand the load and failed, causing the roof to break.

It was therefore necessary to try another method. This time instead of robbing two pillars at a time it was decided to try robbing one. A row of cogs was built on each side of the pillar to be removed, to take care of the weight, and sufficient cogs were placed in the room the roof of which was to be supported. A total span of 50 ft. resulted instead of the 130 ft. span.

After removing the coal from the pillar the cogs on one side were removed, allowing the upper coal to drop, after which the sandstone was supported by another set of cogs in the manner previously described under the method used for light cover. In this case, as in the first instance, a set of cogs was placed on each side of any mud fissuer that might be discovered. So far this system has been successful but it has not been in use a sufficient length of time to determine definitely whether or not it will continue to be satisfactory. This method is well shown in the third section of the illustration.

Having made the first cut under light or heavy cover, a second cut is made on the same pillar or pillars. The third cut is then made on the adjoining pillars and thereafter the work is carried on in steps with the idea of keeping the retreating face across a number of pillars in a line of steps at about an angle of 45 deg. to the direction of the rooms. As soon as sufficient roof has been undermined so that it will break properly it is allowed to do so, relieving the pressure on the remaining supports.

In the past a great many mines have been abandoned as failures, properties have been condemned, and much coal has been lost because of the difficulty encountered in operating two closely adjacent beds of coal. Various systems have been tried and in a few cases have been successful.

The success of the system of mining just described, it is hoped, will lead other operators who are confronted with a similar problem to seek its solution. It is quite possible that an adaptation of this method may be found that will be as successful in their operations as it has been in those of the Connell Anthracite Mining Company.

Coal and Coke Lead Advance in Wholesale Prices During April

LARGE increases in the wholesale prices of many important commodities again took place during the month of April, according to information collected in representative markets by the U. S. Bureau of Labor Statistics. The bureau's weighted index number, which registered 253 in March, rose to 265 in April. This represents an advance of nearly 4¾ per cent.

The most notable examples of price increases were found in the group of fuel and lighting materials, the increase in this group as a whole being 11 per cent. Bituminous coal and coke were responsible in large measure for the resultshown. Food followed next, with an increase of 9¾ per cent, due largely to the recent sharp advance in sugar and potatoes. In the group of lumber and building materials prices continued steeply upward with an increase of 5¼ per cent over March. The groups of farm products and chemicals each showed an increase of over 3 per cent, while smaller increases were recorded for metals and metal products and for housefurnishing goods.

Experimental Mine Has Foreign Visitors

H. IKECHI, a mining engineer in the service of the Mitsubishi Mining Company of Tokio was a recent visitor at the experimental mine of the Bureau of Mines at Pittsburgh. Other foreign visitors were Kjell Lunde and Florin Wahl, of Christiania, Norway.

Where Stripping Is Regarded as a Regular Adjunct to Underground Mining—II

This Concluding Article Has Reference to the Underground Mine at the Rowland Power Co's. Plant While Much Money Has Been Spent at That Three-Unit Operation, No Capital Has Been Needlessly Wasted in Building Permanent Structures for an Impermanent Industry

By Donald J. Baker
Pittsburgh, Pa.

At No. 6 mine of the Rowland-Power Consolidated Collieries Power Plant near Terre Haute, Ind., which takes out the coal which is too deeply covered to be redeemed by strip pits Nos. 3 and 9, the surface equipment is of such odd nature as may be required to meet the exactions of the trade for which the Illinois and Indiana fields have to compete, a trade that is periodically most discriminating. In this trade region the usual sizes of cleaned coal are generally in greater demand than others, but there are many times when certain less usual sizes are desired.

In the matter of tipple design the Indiana operators must pay careful attention to their trade, as competition is keen and the product must be well-nigh perfect. Furthermore they must compete with western Pennsylvania and West Virginia coals in the open market. The going is therefore not of the easiest.

The tipple at No. 6 mine, like those of the stripping operations, is constructed of wood. A two-compartment shaft measuring 19 ft. 6 in. x 12 ft. has been sunk to the coal, which at this point is 60 ft. from the surface. Mine cars are hoisted up this shaft on Prox self-dumping cages. During odd hours of operation this shaft is used also for lowering materials to the mine. No great amount of water was encountered in sinking, and as a result the shaft is not concrete-lined but curbed for a distance of 22 ft. from the top with 6 x 8-in. timbers. The balance of the distance is lined with 4 x 12-in. planking. Thus at minimum expense a good type of temporary construction is provided.

The site of the tipple was determined by the proximity of No. 9 strip pit. In order that the railroad tracks which serve this operation might be used also for No. 6 mine a cut was made giving a suitable and easy grade between No. 9 mine and the tipple that prepares the stripped coal. This cut, which is shown in the illustration of No. 6 tipple, was made by the large Marion shovel on its way to its destined work at No. 9 pit.

The cars as they are brought up on the cage discharge their contents into a weigh basket. The coal

INTERIOR OF A ROOM IN NO. 6 MINE

Here the coal comes down in chunks so large that they must be broken up before they can be loaded and hauled to the surface. No need in this mine for a miner to bend his back when moving about the room.

GENERAL VIEW OF THE STRIPPING TIPPLE, UNLOADING TRACK AND LOADING YARDS

In this building the coal from the stripping operations is given careful preparation before it is loaded upon railroad cars for shipment to market. The coal comes and goes in standard railroad equipment.

after being weighed passes into a hopper that feeds a 10-ft. shaker screen. The screening equipment has a capacity of 5,000 tons in 8 hr. The tipple was designed by the Link-Belt Co., which also furnished the tipple equipment. The sizes usually loaded are 1½-in. egg, 4-in. lump and screenings. Arrangements have been made whereby, in the event of a breakdown, the tipple can still be operated, run-of-mine, however, then being the sole product. The screens are operated by engine.

Adjacent to the tipple and the wood head-frame is a building housing the boiler house and engine room. This building also is of wood construction. For the operation of the cages a 20 x 40-in. Crawford & McCrimmon hoist engine has been installed. This unit has a 6-ft. drum which winds a 1½-in. cable and is equipped with steam and foot brakes. The mine cars used are of 4-ton capacity.

The power-generating equipment, which is in the same room as the hoist, consists of one unit of 160 kw. capacity. This is a 250-volt direct-current generator of General Electric make and supplies energy for the operation of trolley-type locomotives. The needs of the mine foreshadow a larger installation and a second unit of 200 kw. capacity is now being installed. Both of these generators will be driven by Ball & Wood steam engines.

REMOVAL TO ANOTHER MINE IS KEPT IN MIND

In the adjacent boiler room a battery of two Brownell boilers has been erected. These deliver steam at a pressure of 110 lb. per square inch. At present additional installation is here being made to assure successful operation of the new direct-current generator. The new boilers are duplicates of the other two. All will be hand-fired with coal delivered to the boiler room

PROVING THAT "INDIANA LUMP" IS NO MISNOMER

Looking at the level ground it is easy to see that the topographical conditions are as favorable as the nature of the material to be stripped by mine cars taken off the cages at the surface landing.

The equipment at this plant cannot be considered as being of a permanent nature. The life of the mines is not a long one, yet an installation has been sought that will continue to be highly efficient until all the coal has been removed. The Rowland-Power Consolidated Collieries Co. plans to install such equipment as will be suitable for erection later at some other point. It is already operating ten mines located in five different sections of the state. Staunton Mines is the largest but not by any means the only operation of the company.

The airshaft for this operation is situated about 300 ft. from the main hoisting shaft. Here a 16-ft. reversible Crawford & McCrimmon fan is direct connected to an 8 x 16-in. steam engine of the same manufacture. This unit also is housed in a wood structure. Here is situated the manway, which is a vertical stairway from the foot of the airshaft.

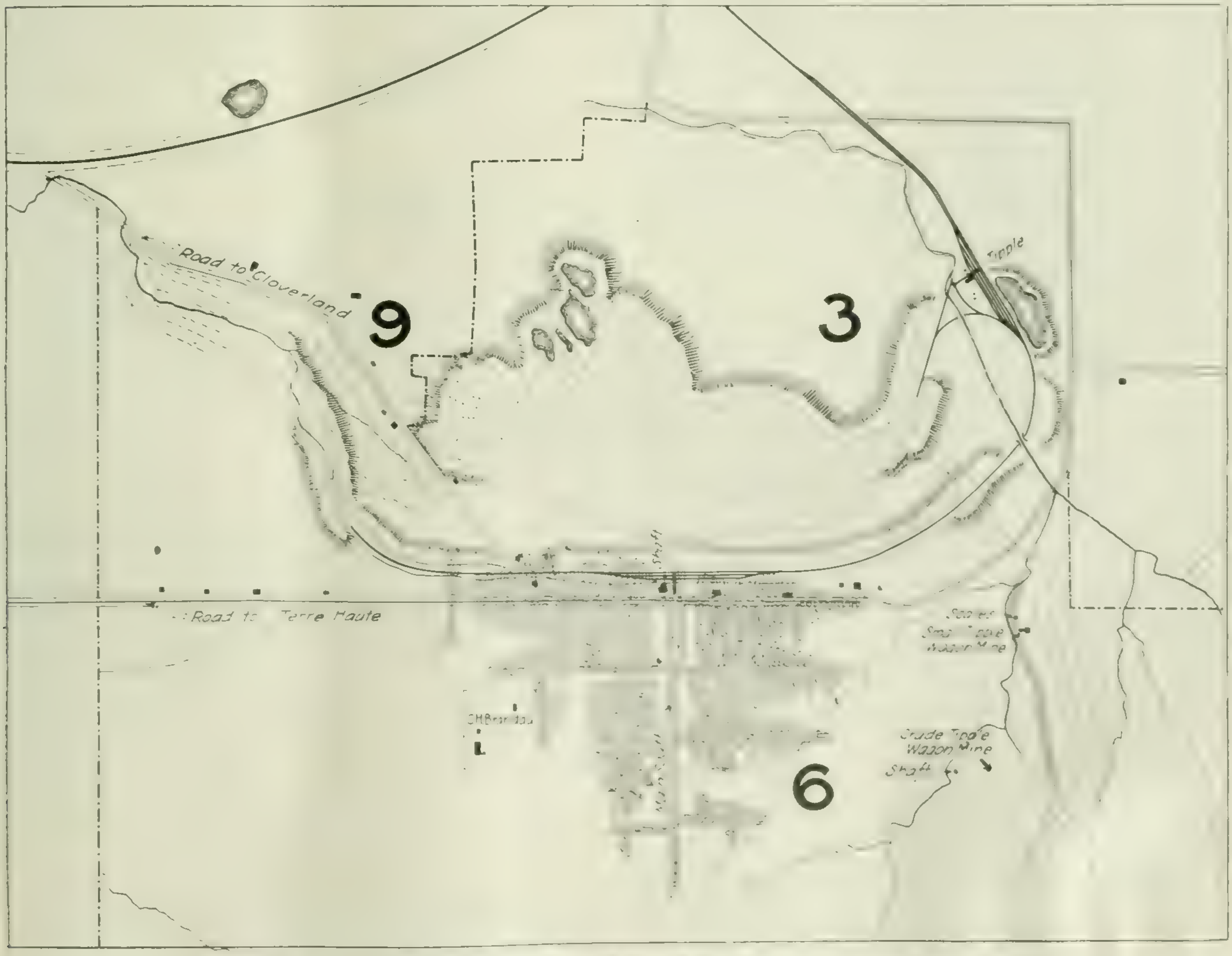
MINERS' BATHHOUSE SIMPLE BUT SUFFICIENT

The bathhouse—under the law every mine in Indiana must have one—is an exceedingly well-designed building, but had it been built of brick with concrete floors it would not have been in keeping with the other buildings of the plant. It is, in consequence, a simple frame structure. As can be noticed in the accompanying illustration, a bay abuts each long side of the building. Nine shower heads have been installed in each bay, and water is delivered through the feed lines at a uniform temperature. This is accomplished by simply regulating the temperature in a mixer that feeds each shower supply line. Both bays are concreted, the floor being about a foot lower than that in the main building.

The advantages of this design are apparent. It has materially reduced the cost of building, for by this arrangement the main floor can be constructed of wood. The showers are adjacent to the benches and these are arranged crosswise to the main diameter of the building. A partition incloses each set of shower heads and there is no possibility of the water splashing out onto the floor proper. Coils of steam piping keep the building heated. These are situated in each bay but above a level that would permit accidental contact with them by the men while bathing. Hooks in the ceiling are provided for the clothes of 175 men.

One room of the building is used for the storage of first-aid and mine-rescue supplies and apparatus. Indiana does not have state insurance and as a result dressing stations have not enjoyed the attention that they receive in certain other localities where these buildings are quite frequently veritable hospitals.

First-aid and welfare work in this district is not as far advanced as in regions farther east. The absence of the compensation schedule is in a large degree



GENERAL LAYOUT OF STRIP PITS NOS. 3 AND 9 AND UNDERGROUND MINE NO. 9

This shows the underground and surface plan, the dotted lines clearly indicating the movements that the steam shovels have so far made in excavating the overburden to blame for the slow progress of these activities. However, interest in these important phases of operation is spreading and it may not be long before Indiana operators appreciate to the same extent as their Eastern brethren the place psychology holds in the safe operation of a mine. Perhaps, too, the labor shortage has not been as keenly felt here as in other soft-coal districts.

This seems strange also, for throughout the Middle West the mining population is not such a cosmopolitan one as it is in the East, and the absence of foreigners is quite noticeable. It may be that the union is strong through the Central Field because community work in the Middle West is not on as firm a footing as elsewhere.

This will serve to describe the surface plant, but something should be said as to the underground workings. The floor of the coal underground is the same sandstone rock already mentioned, while the roof is fireclay. This formation is quite uniform throughout the tract. Despite the fact that the coal is not under a great amount of cover, especially in the acreage developed to date, the mine is dry. The general development scheme followed is the double-entry system with the rooms worked in panels.

WIDE PILLAR KEEPS WATER FROM STRIP PITS

Where the rooms approach the stripping operations they are driven to within 50 ft. of the open. This provides a pillar such as will amply protect the mine against the entrance of surface water from the strip pits. After the mine has been worked out this pillar will be removed by the steam shovels. The width of the pillar was made such as to be consistent with the amount of coal that can be removed by the small shovel in a simple bench. A smaller pillar might have been left but it was feared that if less were provided it might not be a sufficient barrier against the entrance of the surface water that collects in such abundance in the open pits.

The main haulageways were so laid out as to afford maximum ease of developing the tract. "Butt" and "face," two terms well known where Eastern coals are mined, do not hold great significance in Indiana. Here the coal to a considerable degree lacks cubical cleavage, breaking rather with a conchoidal fracture. As a result the direction of the rooms is regarded as of secondary importance to that of the main haulageways, since the coal is as easily cut and shot down in one plane as another, and no appreciably increased resistance to air currents is offered.

This type of coal allows the mine to be laid out with great regularity. The room entries are at right angles to the main haulageways and the rooms at right angles to the room entries. The dip of the coal is practically negligible and but little water is encountered. These conditions allow the rooms to be developed in both directions off the room entries. A scheme like this could not be followed in the Pittsburgh bed, where gas is encountered and more splits of air are needed to sustain the ventilation.

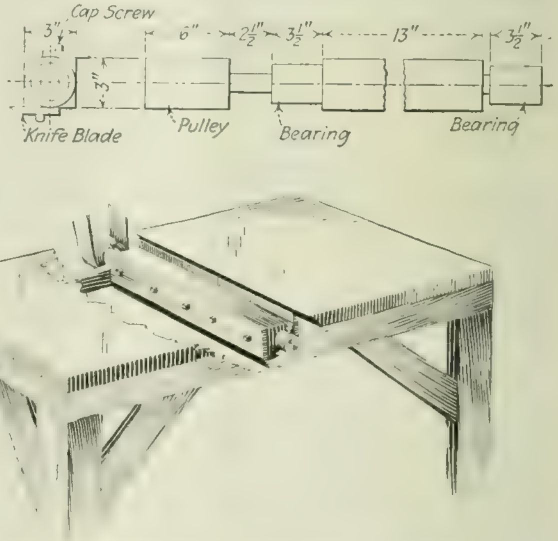
The panels between room entries are about twice as wide as in more eastern mines. The rooms are carried to a length of 200 ft. and have a width of from 20 to 25 ft. To provide a pillar 8 ft. of coal is left between rooms. Speed of production is the predominant consideration and maximum recovery suffers as a result. Sixty-five per cent recovery is considered fair in this district, the room pillars being abandoned at the same time as the panels. When the rooms have been carried to their full length and have broken through on each other the whole panel is abandoned. By this time the roof has started to squeeze the small room pillars and drawing them would be extremely dangerous.

If maximum recovery is to be attained, fewer rooms should be alloted to a panel and a larger pillar left to sustain the roof until such a time as it can be withdrawn safely. Indiana, however, has plenty of coal at present and is not worrying much over the future.

Planer Made from Material on Hand At Mine Blacksmith Shop

In many instances it is unnecessary for the coal operator to spend good money for tools and equipment of a simple nature if those needing these appliances have the proper inventive ability. The men in the carpenter shop at the Silver Creek Colliery of the Philadelphia & Reading Coal & Iron Co. wanted a small planer. When the planer was not forthcoming, the men "got busy" and built their own.

The accompanying illustration shows the arrangement and some of the details of the machine thus evolved.



PLANER WITH DETAILS OF MANDREL

The mandrel is a piece of steel three inches square and was finished in the machine shop. The cutting blades are thirteen inches long and are cap-screwed to the mandrel. The boxes are ordinary pillow blocks such as may be found in the scrap heap or around the works of many mines. The pulley is turned up integral with the shaft.

In operation this planer is run at 3,200 r.p.m. Two men, one at either end of the table, pass the work across the machine. Although the entire outfit is improvised, the results obtained are entirely satisfactory.

Secretary Payne Advises Coal Burners To Conserve Oil

Because of the acute oil situation, Secretary of the Interior Payne has requested the Navy Department and Shipping Board to provide coal-burning instead of oil-burning vessels, and the conversion of oil burners into coal burners.

Burning Eastern Coals Successfully on a Conveyor-Feed Type of Stoker[*]

Coking Coals Burn with Some Difficulty on Chain Grates By Alternating Chain and Tuyere Elements and Making Ignition Temperatures High These Fuels Have Been Successfully Burned

By Loyd R. Stowe
St. Louis, Mo.

FOR the past two years the Laclede-Christy Clay Products Co. has been experimenting on a new forced-draft stoker for use with any of the many kinds of fuel found in this country. The boiler house of this company's Christy plant at 4600 South Kingshighway, St. Louis, has been, and still is being, used for experimental, testing and development work. Fig. 1 shows the test boiler and stoker.

The stoker used employs the conveyor method of feeding, i.e., it uses progressively moving chain-grate conveying elements to feed the coal through the furnace and to discharge the refuse to the ashpit.

Declaring that coals in which the resins are oxidized (that is, weathered) are little disposed to cake, an attempt is made to rapidly weather the caking coals on the grate by exposing them to currents of air under high temperature. Over twice as much air is delivered to the fire at the feeding end as is provided near the point of ash discharge.

At the outset it is necessary that we realize the full import of the term "conveyor feed." When the conveyor-feed grate is used the fuel is continually moved forward with the grate. The fuel bed, being supported on these moving grates, is positively conveyed from the stoker hopper, where fresh coal is introduced, to the discharge end, where the refuse is rejected to the ashpit.

Conveyor-Feed Stoker Does Not Disturb Coal

The feature of the conveyor feed that particularly commends its use is its handling of the fuel bed in a positive, definite fashion. By striking off the fuel evenly under a feed gate and then literally carrying it on through the furnace and over the point of ash discharge, this mechanism prevents in a large measure the evils of less positive feeding devices, namely, uneven fires, balled-up spots, and immovable clinker formations. So important are these advantages which the conveyor-feed provides and so thoroughly have the underfeeds demonstrated the great advantages of mechanical draft, that there are many builders who are now experimenting on and developing forms for forced-draft conveyor-feed stokers.

It is well known that there have been many failures in attempting to burn Eastern coal on chain grates. In fact, some have gone so far as to maintain that the undisturbed fuel bed of the conveyor feed is so poorly adapted to Eastern coal that it is useless to proceed further along these lines. Others have in all sincerity advised manufacturers to stay with the Western coals, where the conveyor feed rightfully belongs.

Now, one of the characteristics of the conveyor feed, it will be observed, is that the fuel bed is undisturbed during the so-called coking period or, more properly speaking, the period of destructive distillation. It is largely because of this feature that I have elected to relate specifically what has been learned about Eastern coals with conveyor feed—coals high in heat value and low in ash and including those termed semi-bituminous and caking. And it may be as well to state at this point what may be considered as the conclusion of this paper, namely: that the results of the experiments undertaken indicate that conveyor feeding can be used successfully with Eastern bituminous fuels.

For many years it has been quite clearly established that nearly every requirement of a successful stoker is lacking when burning caking fuels on chain grates with natural draft. The coal cakes almost immediately upon entering the furnace, high rates of burning cannot be secured, the combustible content of the ash is high, the admission of the air is not properly graduated to the requirements of the various stages of combustion, and the expense incurred for the maintenance of links is excessive. This is indeed a complete indictment, and with the sole exception that the automatic features are always in evidence, it may be said that the performance of chain grates on Eastern bituminous coals violates every requirement of a successful stoker.

It is well known that the caking property of Eastern coal is the most serious obstacle in the way of the successful use of this fuel on chain grates. In endeavoring to burn Pocahontas and similar coals it is observed that tarry oils flow through the fuel bed as a result of the application of heat at moderate temperatures. It is further observed that the coal under the arch is caked or coalesced by these tarry oils, and forms a sticky blanket that prevents the entrance of air through the coal and hence checks combustion and heat generation under the arch.

Causes of Coke Formation on Stoker Grates

In attempting to remedy this situation the most natural thing to do is to employ mechanical means to break up the caked fuel bed, and this is the course which the inventor almost invariably takes. In fact, the idea is prevalent that "a mechanical agitation of the fuel bed, for the purpose of breaking up the coke, is necessary or advisable when burning Eastern coals." So many statements have appeared similar to the one just quoted that mechanical engineers have come to accept it as a basic fact. The results obtained at the experimental plant, however, have disproved this contention.

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[*] Paper presented before the spring meeting of the American Society of Mechanical Engineers, St. Louis, Mo., May, 1920.

All bituminous coals have a small quantity of resin that flows when heat is applied. In certain varieties this resinous material has marked adhesive or binding properties and hence when it flows under the application of heat it agglomerates the coal particles into a primary mass. This mass is the starting point of coke formation and out of it true coke may be formed by further actions that take place in the fuel bed. It must be noted here that while *all* bituminous coals have this resinous content its adhesive or binding property is lacking in the Western or free-burning coals.

It appears that the higher the oxygen content of the coal, the less pronounced will be the primary caking tendency. Analyses on a moisture-and-ash-free basis show that Eastern coals contain less than half as much oxygen as Western coals of non-caking characteristics. Furthermore it is well known that Eastern coking coals lose their caking properties by weathering, and it has been determined that weathering causes coal to absorb oxygen and to increase in weight by an amount equal to the weight of oxygen absorbed.

Coal Can Be Weathered on Stoker Grate

The absorption of oxygen can be accelerated and be made to take place in the boiler furnace by producing high coal temperatures and accompanying these with a plentiful supply of air. In other words, this feature of weathering can be artificially carried on in an exceedingly short time. The oxygen absorbed apparently destroys the adhesive qualities of the resinous material referred to above and hence the primary mass from which the coke structure is later formed is not produced.

Again, when heat is applied to *any* bituminous coal a chemical rearrangement or breaking down to certain of its compounds takes place. This action produces the greater part of what is termed "volatile matter," the remainder coming from the resinous content. The initial product of this chemical rearrangement is no doubt further decomposed into a fixed gas and a tarry residue. This tarry residue has not in itself the properties of a strong binder, but it does build up and materially strengthen any primary coke structure that may already be present by leaving a film of carbon behind when the final breaking down into this carbon and fixed gas has taken place.

Heat and Air Prevent Caking Tendency

The foregoing theory would account for the non-caking performance of Eastern coals in the experimental work referred to in the present paper, and in its essentials seems to be the theory most commonly accepted by coal and coke analysts.

In the experiments with the new stoker the ignition temperatures are extremely high and at these temperatures considerable amounts of air are forced through the fuel bed, thus providing for the absorption by the coal of sufficient oxygen in a short time to destroy the initial caking tendency. Moreover, it is reasonable to suppose that these unusually high temperatures at the same time cause a quite different procedure during destructive distillation than that which obtains with lower heat intensities. That is, these extremely high and unusual temperatures completely decompose both the resinous excretion and the remaining or major part of the volatile-forming matter before the former can set up an appreciable primary structure, and before the carbon of the latter can have time to impregnate any slight primary structure that may have formed.

The absence of coke formation changes completely the character of the fire under the arch and has almost as marked an influence on the rear half of the fuel bed. It is clear that if coke is not formed in the distillation zone the cemented coke lumps cannot be present in the final stages of combustion. The individual pieces of coal retain their identity exactly the same as when Illinois coal is used, with the result that the fuel bed has the soft, incandescent and fluffy appearance which every chain-grate fireman realizes means economy and high rates of burning. The absence of coke formation in the final stages of combusion will be mentioned again.

Description of the New Anti-Caking Stoker

A description of the final apparatus decided on is advisable at this point for the purpose of showing how the high initial temperatures are obtained. Fig. 2 is a view of the grate surface, its general inclination being 20 deg. The arrows indicated by *A* point to narrow chain-grate or conveying elements, which are about 4 in. wide and placed on 7-in. centers. In the intervening 3-in. spaces are placed stationary tuyères indicated by arrows at *B*. At the lower end of the grate surface the tuyères (*B*) terminate in short pivoted bars (*C*) which are made automatically to rise above, then drop below, the surface of the conveyor chains. This action takes place slowely. *E* is a feed grate, adjustable to give various thicknesses of fire exactly as on a chain grate. Partly overhanging the vibrating bars (*C*) is the bridge wall *F*, shown cut away in the center. An ignition arch is shown at *D*. This latter provision conforms to chain-grate practice except that with the greater incline of the grate the arch is farther away from the fire. Fig. 4 shows a cross section side elevation of the stoker and boiler.

Close study of chain-grate practice has revealed much in the art of building up high-ignition temperatures. A great expanse of bridge wall (see *A* in Fig. 4) extending from a point level with the arch down to or nearly down to the fuel bed is known to be of utmost value in directing heat onto the incoming fuel. The steep incline of the stoker in question permits this dimension (*A*) to be greatly extended over that possible with the ordinary chain grate. Moreover, it exposes the fuel bed more directly to the intense heat reflected from the bridge wall and the flame in front of it.

The form of arch also was taken from chain-grate practice, and its design and placement has, of course, contributed its part toward the building up of the high fuel-bed and ignition temperatures that play so important a part in preventing the caking and ultimate coking of the fuel.

Most of the Air Admitted on Bed Below Arch

As to the admission of a generous supply of air (the second requirement for coke prevention), the greatest percentage of the total air supply is furnished under moderate pressure through that part of the fuel bed which is under the arch. This air supply, coupled with the high fuel-bed temperatures obtaining, quite effectively destroys any inherent caking tendency of the fuels thus far tested, and makes it possible to burn Eastern coal with a considerable degree of satisfaction.

In view of the troubles arising from the burning of

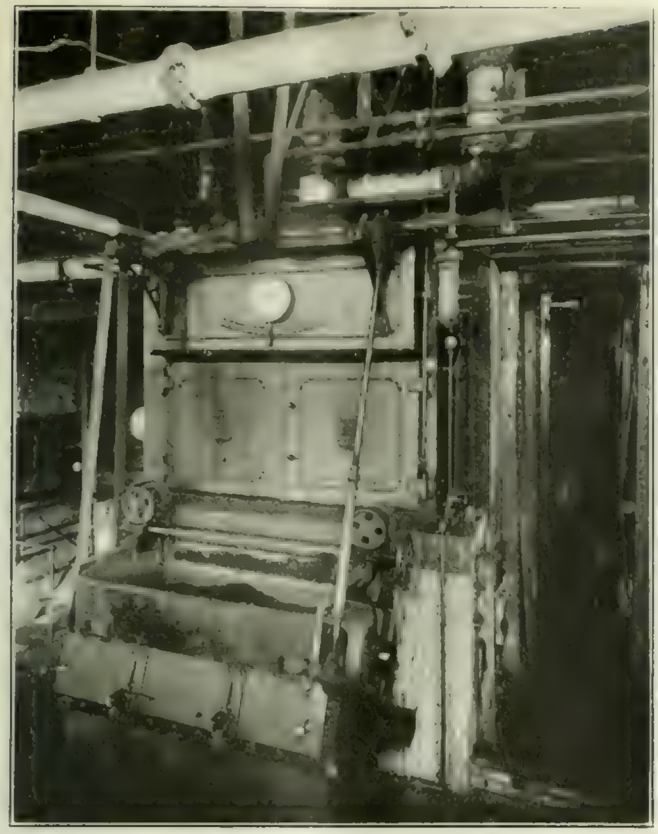


FIG. 1. TEST BOILER AND ANTI-CAKING STOKER

Boiler erected at St. Louis for the purpose of devising a conveyor-feed stoker that would burn successfully coals which cake as soon as they are heated and so admit air to the fuel bed at only a few points, thus causing imperfect ignition and a waste of fuel in the ashpit.

Eastern fuels with stokers that convey the fuel undisturbed into the furnace it is perhaps advisable to give a further description of the stoker in question. Table I presents the entire situation at a glance, and, farther on, each of the items therein is briefly considered.

Rather exhaustive surveys of the gas composition in various parts of the furnace were made frequently during the development work. These surveys showed that the fuel in the zone of destructive distillation yields far greater quantities of combustible particles than does that well-spent portion of the fuel bed near the bridge wall. It follows, then, that air distribution must be regulated to supply large quantities of air to the coal during the early stages of combustion and limited quantities as the fuel nears the place of ash discharge.

REFUSE HAS LOW PERCENTAGE OF COMBUSTIBLE

It will be generally admitted that in order to burn completely all the fuel with a minimum of air it is of prime importance to provide each particle of combustible just as it rises from the fuel bed with its own quota of oxygen-giving air. The tuyere construction is well suited to such a requirement and lends itself admirably to these experiments. The tuyeres are cast in interchangeable sections containing varing percentages of air openings. This feature permits the making of any desired gradation in air spaces between the two extremes noted in Table II.

It is important at this point to recognize that the wind-box pressure is uniform under the entire grate. This provides high draft intensity and high air-jet velocity for all parts of the fuel bed.

The reduction of the combustible in the refuse to a satisfactory figure was brought about by taking advantage of the four following factors that have a vital influence on the character of the refuse: (1) Ready ignition; (2) a free-burning fuel bed; (3) thickened fuel bed near the discharge end of the stoker; (4) high draft intensity through the nearly-spent fuel.

Reference has already been made to the high ignition temperatures. On the conveyor-feed type of stoker the coal burns from the top downward during the early stages, and from the bottom upward during the remainder of its travel. The higher the ignition temperature, the quicker this reversal is established. An early burning from the bottom upward is recognized even in chain-grate practice, as being most effective in providing for the attainment of a low-combustible content in the refuse.

AIR FILTERS EVENLY THROUGH FUEL BED

In a caked fuel bed of Eastern coal the air breaks through only at the fissures or cracks. Naturally the burning starts only at these fissures, and as it continues holes are formed in the fuel bed. As the holes increase in size the rate of burning decreases, due not only to the cooling effect of large columns of cold air but also to the lessening intensity of draft occasioned by the increase in the effective air openings. This action results in a fuel bed characterized in the final stages by isolated lumps of coke surrounded by patches of bare grate. To prevent exceedingly low carbon dioxide content in the furnace gases the operator must run these bare patches out of the furnace and consequently dump the intervening or accompanying coke lumps into the ashpit.

With coking prevented and with each individual par-

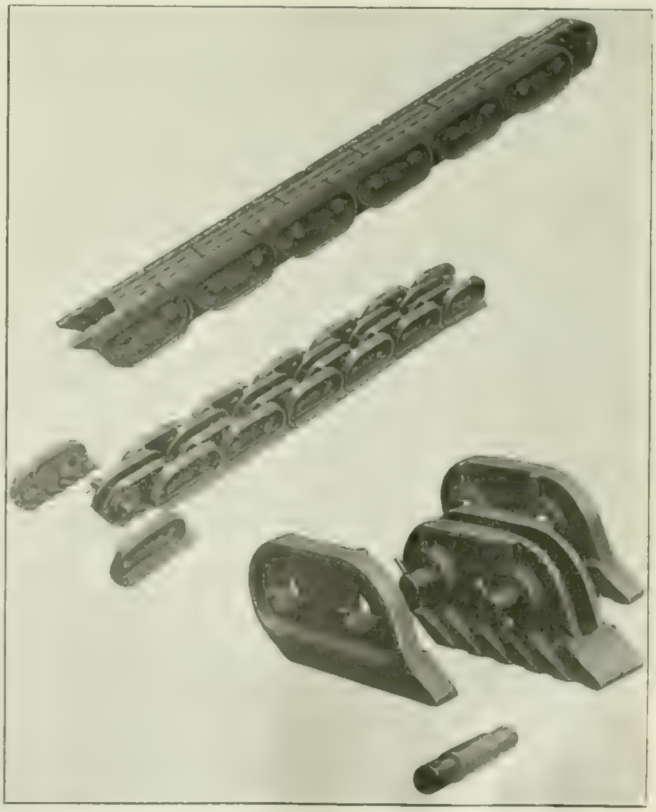


FIG. 2 DETAILS OF THE CONVEYING ELEMENTS

These elements are marked A in Fig. 3. They are about 4 in. wide and are set at 7 in. centers, the intervening spaces being taken up by stationary tuyeres. Most of the air comes through the tuyeres and but little through the conveying mechanism.

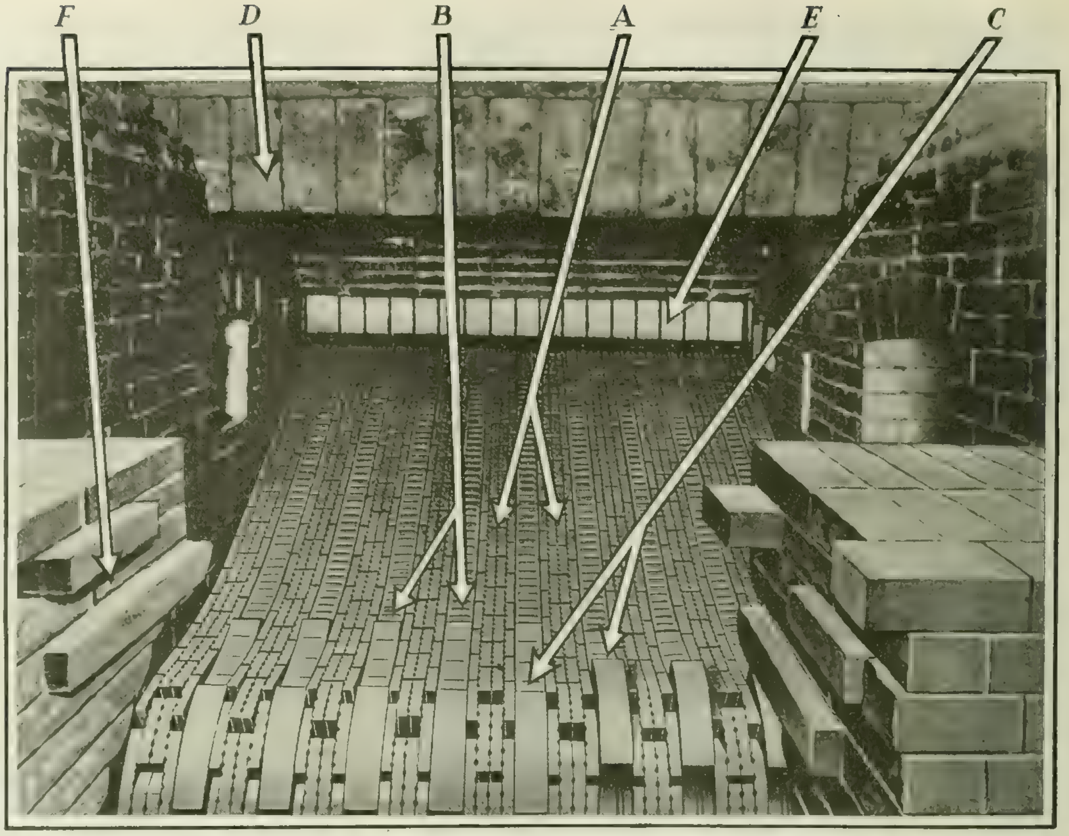


Fig. 3. Grate Surface and Furnace

As seen from the broken bridge wall in the rear, where the grate, in rolling downward, precipitates the ashes into the ashpit. On the right three deadplates are raised so as to hold back the nearly spent coal on the fire. Thus a deep bed is secured and the ash is rendered relatively free of combustible values.

ticle of coal preserving its identity, the air filters upward evenly throughout every part of the fuel bed. Freed from localized burning, the fire now appears soft, intense and hightly luminous.

TABLE I. PRESENT-DAY REQUIREMENTS OF AN AUTOMATIC STOKER COMPARED WITH THE PERFORMANCE OF CHAIN-GRATE AND CONVEYOR-FEED STOKERS, EACH USING EASTERN COALS

Requirements of the Present-Day Stoker	Results Obtained with Eastern Coals	
	With Chain Grates	With Conveyor-Feed Stoker Described
It should completely burn all combustible that arises from the grate, and perform this task under the great handicap of using no more air than is required.	Thin fires spotted with upstanding coke result in excess of air and low carbon dioxide due to the fact that the air supply is not graduated down to a minimum at the rear of the stoker and to influences attending the coking of the fuel bed.	Graduation of air supply and thickening of fire near point of ash discharge and the prevention of coke assure a consistent 10 to 12 per cent carbon dioxide content with positive assurance of an intimate mixture of air with combustible gas.
It should bring about low combustible in the ash	Combustible in the ash from 30 to 50 per cent.	Combustible in the ash from 16 to 24 per cent.
It should burn coal at high rates of combustion—not only to obtain high capacities but to widen the range of economical rates of burning as well, in order that great flexibility may be assured.	Rates of burning from 25 to 35 lb. of coal per sq. ft. of grate surface per hour.	Rates of burning up to 60 lb. of coal per sq. ft. of grate surface per hour.
It should be as nearly automatic in operation as possible.	Successful in the matter of automatic operation.	Successful in the matter of automatic operation.
It should not entail unreasonable expense in the upkeep of the grate surface or of the furnace brickwork.	No unusual maintenance cost for furnace brickwork, but a very high one for grate links.	Use of mechanical draft imposes a more severe condition for furnace brickwork, requiring a higher grade of refractories, but maintenance of ironwork is not excessive—in fact, may be considered quite satisfactory.

TABLE II. AIR-SPACE DISTRIBUTION ADOPTED FOR CONVEYOR-FEED STOKER

Air Space in Each Element at Feeding End	Per Cent	Air Space in Each Element at Discharge End	Per Cent
Conveying elements........	8.0	Conveying elements	8.0
Tuyere elements	22.0	Tuyere elements	2.0
8 per cent of 60 per cent =	4.8	8 per cent of 60 per cent	4.8
22 per cent of 40 per cent =	8.8	2 per cent of 40 per cent. =	0.8
Total air space =	13.6	Total air space =	5.6

Conveyor elements, about 60 per cent of total grate surface.
Tuyere elements, about 40 per cent of total grate surface.

The thickened fuel bed near the discharge end is brought about by the retarding mechanism described. (See Fig. 4.) When elevated the short pivoted bars

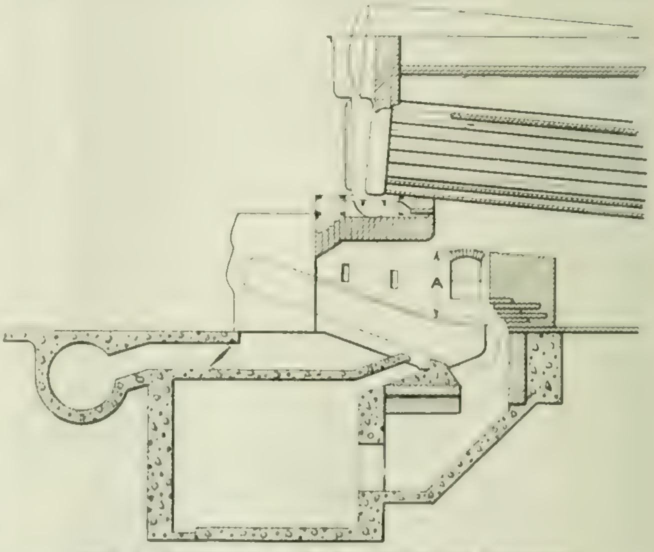


FIG. 4. SECTIONAL ELEVATION OF STOKER

Boiler has 2,500 sq.ft. of heating surface and the stoker 40 sq.ft. of grate surface, a ration of 62½ to 1. Note the elevation (A) of the top of the bridge wall above the grate, a height that is secured by the inclination of the stoker bed.

(*C*) raise the nearly spent fuel above the chains, thus holding it back, and when depressed permit the conveyor elements to carry the ash out of the furnace. The relative duration of these two influences can be controlled by the operator and the fuel bed near the discharge end of the furnace can be held back and thickened to any desired depth.

The high-draft intensity in connection with this thicker fuel bed has already been mentioned under the paragraph on air supply. Full wind-box pressure at this part of the grate forces high-velocity air jets into the thickened bed and hence is particularly advantageous in burning out the remaining particles of combustible.

HIGH RATES OF BURNING ARE SECURED

From the foregoing references to mechanical draft it is quite apparent that high rates of burning are attainable with this new type of stoker. The replacement of the typical plastic fuel bed with the free-burning, intensely-active bed obtained with the new equipment materially assists in securing higher rates of coal consumption. A high carbon-dioxide content results quite naturally from (*a*) the proper air distribution described; (*b*) the thicker fuel bed, particularly at the discharge end; (*c*) the higher fuel-bed temperatures that cause increased chemical activity; and (*d*) the impinging jet action on the fuel particles produced by small air spaces and forced draft.

In the matter of automatic operation it is only necessary to recall the basic principle of the conveyor-feed stoker—a positive feed from coal hopper to ashpit. The only action that interferes with this automatic and continuous performance and requires more than a minimum of attention from the operator is the formation of clinker on the side walls. This clinker accumulation is no more serious than with chain grates, but experiments are under way to still further minimize the evil.

Eastern coals require less side-wall slicing than do those from the Middle West, probably because of the lower ash content and the higher fusing point of the ash of the Eastern coals. Such coals likewise have higher heat value and hence greater firing stability than Illinois coals. Because of these two advantages, the firemen of the experimental plant prefer Eastern coals to those from the Central West when firing on the new stoker.

EVEN FUEL BED AND OPEN DAMPER SAVE REPAIRS

The thin uneven fuel bed at the discharge end of a chain grate combined with the low ash of Eastern coal exposes the grates to the heat of the furnace. Moreover, with caking coals and chain grates the procedure of partly closing the damper to raise the carbon dioxide content of the gases is too often resorted to, and such a practice invariably results in overheated grate links.

The stoker herein described, by employing a deeper fuel bed and a thick layer of refuse near the bridge wall, effectively protects the grate from the heat of the furnace. In addition, full advantage has been taken of the cooling action of the incoming air. The small air spaces and the employment of mechanical draft produce high air velocities, and this makes for cool links. An excellent idea of the very different character of the new link for Eastern coal and forced draft is obtained from Fig. 3.

High rates of burning and high furnace temperatures of course subject the furnace brickwork to severe service. However, the wind-box pressures are low (less than 2-in. water column), and this combined with the large number of uniformly distributed miniature air openings causes the impinging flame or blow-pipe action to disappear quite near the surface of the fuel bed, thus minimizing to some degree the brickwork deterioration.

The problem of more severe furnace conditions has thus far been met by employing refractories of a higher grade. The side and bridge walls have been made with standard 9-in. shapes and I am advised that the higher refractoriness of the brick used is in part due to its higher percentage of alumina and its low content of fluxes. Regarding the ignition arch, both the process and the mixture are new in stoker work. The material is highly refractory and porous and its performance under the harder usage bids fair to rival the ordinary arch maintenance in chain grates.

Priority Regulation of Coal Distribution Sought in Indiana

FOLLOWING a conference in May of the Indiana Public Service Commission, coal operators and railroad officials, members of the commission have received word from Washington that Indiana will receive some coal cars. Despite this assurance, little hope of immediate relief is expected.

Important developments at the conference were:

Disclosure that coal cars have not been ordered east from Indiana to take care of Lake port shipments, as reported.

Diversion of 39,000 coal cars to the East from Western territory will not materially relieve the situation in Indiana.

The Interstate Commerce Commission will take immediate steps to stop the use of coal cars for other products.

From two-thirds to three-fourths of all commercial coal now produced in Indiana is being commandeered by the railroads for their own use. Utilities and industries get the rest of the decreased production.

The railroad men promised to make every effort to keep utilities and state institutions provided with coal by giving them railroad coal in urgent cases.

The railroad representatives advised the commission to wait a week or two before requesting the Interstate Commerce Commission to re-establish wartime priority regulations and also declared that any attempt on the part of the state to establish priority regulations would prove futile.

During the conference John W. McCardle, vice-chairman of the commission, received a telegram from the Interstate Commerce Commission in reply to the suggestion that the practice of using coal cars for commodities normally shipped in box cars be stopped. The telegram read as follows:

"Action suggested by you concerning alleged misuse of coal cars being taken. Terminal committees at important terminal points are being organized. Among other things they will take action to prevent the misuse of cars."

The point was made by Carl J. Fletcher, secretary of the Knox County Coal Operators' Association, that more than a normal supply of coal is being shipped out of the state. Ordinarily, 6 per cent would represent these foreign shipments, he said, whereas now about 20 per cent, including railroad coal, is going out of the state.

He said this results from the fact that railroads operating outside the state are induced to send cars to Indiana to get coal. Railroad officials declared the operators were making more demands for cars this year than at any previous year at this particular season.

Coal Priority to Help Situation

Following the conference the commission decided that a coal priority order alone would help the situation. On May 26 the following telegram was sent to the Interstate Commerce Commission:

"Conference of representatives of coal carrying roads and representatives of coal operators held Monday. Conference developed three-fourths of coal mined is taken by railroads, leaving one-fourth for all other purposes, which does not meet demands and no opportunity for accumulation on account of winter.

"Indiana conditions large on account of Chicago congestion. It developed in two instances that 90 per cent of coal equipment is out of state. This commission has directed its railroad inspectors to investigate coal cars loaded, destination and all information so as to expedite movement.

"Commission recommends priority order. After railroads, coal should be given to state institutions and public utilities. Coal of state institutions exhausted and several utilities closed. Will co-operate with nearest interstate committee for movement to and from mines."

Erie Road Ordered to Repay Excessive Freight Charged on Coal

On May 3 the Interstate Commerce Commission ruled in favor of Henry E. Meeker, coal dealer, in his complaint against the Erie Railroad. The complainant charged that the road's freight rates on anthracite coal, pea size and smaller, in carloads, from Wayne washery, Clemo, Pa., to Undercliff, N. J., were unreasonable, discriminatory and prejudicial, and asked reparation.

The commission decided that the rates charged on pea coal were unreasonable, but disallowed the claims on sizes smaller than pea. The railroad company was ordered to make reparation, with interest.

Shafts Replace Trace Chains in Kingston Coal Co. Mines

At the mines of the Kingston Coal Co., Kingston, Pa., a large number of mules are employed underground. Instead of hitching them to the mine cars by the ordinary trace chain this comapny uses a pair of shafts which make a rigid connection between the mule and the car. The type of shaft thus employed can readily be seen in the accompanying illustration.

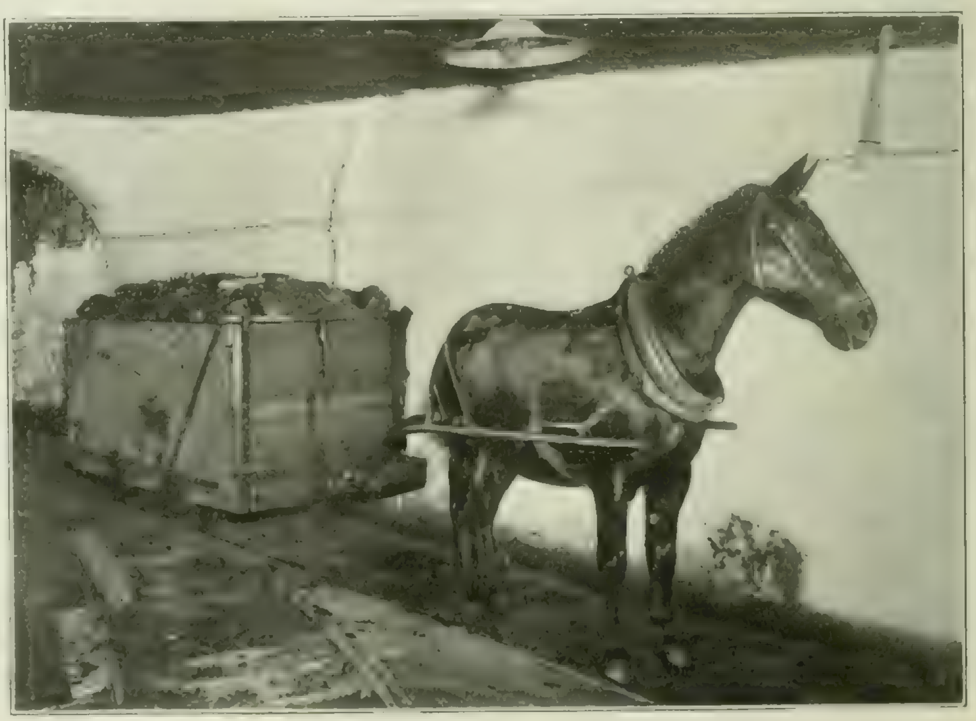
A number of advantages result from the use of shafts instead of the old type of hitching and the Kingston Coal Co. finds shafts best meet the needs of its haulage system. With the former type constant danger existed that the car, when coming down-grade, would run into the mule's heels and either cut his legs or break them if he could not get out of the way quickly enough. There are usually many places in a mine where there is insufficient room for mules to get out of the way of cars.

With shafts it is possible to use a breeching on the mule, and as a result he has a direct control over the speed of a car by holding back in the breeching. Furthermore with this device it is practically impossible for a mine car to run over a mule since there is a fixed distance maintained between the car and the mule because of the rigid shafts. More efficient effort can be exerted on the draw bar as the shaft can be so designed that the pull is horizontal rather than at an incline, as is the case with the old-fashioned type of hitching.

The Nova Scotia Steel & Coal Co., in its operations at Sydney Mines, N. S., employs a somewhat similar device. This latter firm, however, uses ponies instead of mules. The advantage the Canadian company seeks to attain is precisely that sought by the Kingston Coal Co., namely, the interposing of a hitching of fixed length between the animal and the load to which it is hitched.

Mine Mule Working Between a Pair of Shafts

This type of hitching enables the mule to hold back on cars on downgrades. It also gives the animal a better purchase upon the car he draws



Leadership and Education the Cures for Our Industrial Ills*

Employer of Workingmen Should Make Himself Their Actual Leader — Failure To Do So Makes Possible the Demagogue and Self-Seeker — Misrepresentative Government Due to Neglect of Working Constituency

By Dr. Charles E. Eaton

WHILE you are at work I do not want to talk to you in language that you cannot understand, but I will talk to you today simply as a brother American citizen, and I want to talk about the human element in your business and in all business that you are associated with.

The war was supposed to have been fought to make the world safe for democracy. Now that peace has come we find that we are in greater straits than we were even during the war. We have a democracy, but what we are going to do with it, or what it is going to do with us, remains to be seen. But two things are absolutely fixed—you cannot have a democratic system of life, including government, unless you have an intelligent and moral peace. Public opinion is the last court of appeal, and public opinion will go wrong unless it is created by men who know how to think and who have moral restraints to govern and guide their thinking. For that reason the human element in all our life is the chief element, and that is exactly what we have turned down. We have neglected the one element that in the last analysis is responsible for success in every calling in which we occupy our energies.

Country Ignorant of Industrial Matters

I suppose that no country in the world is more ignorant than our country at the present time of the great industrial processes that men are engaged in who are in business at all. Take, for instance, the railroads. For thirty years before the war every government in this country spent all its spare time hounding the railroads, passing restrictive legislation, confiscating property, and making it practically impossible for the railroads to equip themselves for the future, and that movement was backed by public opinion; otherwise it could not have been put across. When the Government took over the railroads the first thing it did, with one stroke of its pen, was to advocate the repudiation of the legislation of thirty years. In other words, the taking over of the railroads by our Government was a monument to the colossal hypocrisy and stupidity of the American people for a whole generation.

Now the one supreme thing that we are up against in industry is to get production. As to my interest in that, perhaps I had better tell you where I come in on it.

We went into the war as we go into everything—hindside first. We announced that we were going to lick the Germans, three thousand miles across the sea, and we did not have enough ships to carry coal across New York Harbor. We had no development in the shipbuilding industry. In 1917 practically every shipbuilding yard in this country was broke; many went out of business and those that remained were those that owed so much money that the bankers could not afford to bust them.

With that as a start we proceeded to organize the greatest shipbuilding campaign in the history of the civilized world. We got our shipyards and then got our men together, and then the men would not work. So the Government immediately solved the labor problem—a practice which it has followed up to this time—by paying the men three times as much as their work was worth; in other words, where a man used to get $25 for a week's work they found that they could get that much for two days' work and quit four days in the week. So the average work of the shipyards in this country at that time was about two days per man per week, and they did not work desperately hard at that. It got to be such a serious condition that a great meeting was called in New York of ship architects, marine engineers and shipbuilding associations on the different coasts. They asked me to come over and speak.

My theory was that the trouble with these men was one that you could not reach with money. I have spent my life dealing with what is inside of a man rather than what is outside. I have a firm faith in human nature. It is very seldom you can find the man who is normal at all who will not be amenable to reason if he is shown. Sometimes you have to show him in polysyllabic language and sometimes in words of one syllable. Sometimes you have to hit him once or twice gently to make him see the point. But if you go to work and show him reason the ordinary man will respond.

Plain Truth-Telling Gets Results

So I went to this meeting and told these men that if they would put in the shipyards somebody who had no axe to grind, no favors to ask and no interest to defend, but would simply represent Uncle Sam and tell these men the truth, I believed they would respond. Immediately the boss of the situation got up and commandeered me and I had my first and last government job. I reported to him the next morning at nine o'clock and was in for two years.

Before the war was ended I had about seven thousand industrial plants and two hundred shipyards under my care. I never used a single instrument except man-to-man talk—a moral intellectual appeal. I used to stand up and talk to those men in language that would forever put me out of the Church, but I believe they needed it. I was telling the truth.

Now today we confront terrific conditions and I want to place your business against this background which moves and molds all of us. In the first place, we come to a time of frightful nervous distraction as a result of

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*From an address by the editor of *Leslie's Weekly* before the third annual convention of the National Coal Association, Atlantic City, May 27, 1920.

war. Everybody is irritated; everybody is critical. Then we have an enormous suspicion everywhere. We have a cynicism that is intolerable.

Your welfare is the welfare of the nation, but nobody believes that. The whole nation looks upon you as a champion assortment of thieves and sharks. The whole nation, on the other hand, looks upon the railroads as another assortment of thieves and sharks. Our chief industry is calling each other thieves and sharks and rogues. The fact is we are not. Nobody is. There are infinitely more honest people in this country than dishonest people, and in your business, as in every other business, you cannot succeed in it unless you are men of character and intelligence. We all know that and that it is only the mountebanks and demagogues that are stirring up strife.

Diversity of Races Complicates Problems

In industry in this country we have a tremendous racial diversity that makes it difficult to allay the suspicion and hatred engendered by false teaching. We have to deal with that. Do you realize that 58 per cent of the workers in our American industry were born in other countries, and in many industries as high as 85 per cent? As high as 85 per cent of increase in this country today is either foreign-born or children of foreign-born parents, and they are segregated into racial groups because of our indifference and stupidity to their presence in our midst in the past generation, and in addition to that they take their fundamental ideas from the countries from which they have come. They take their leadership from their own races across the seas. They have their own leadership and their own thought circles and their own motives and impulses, and many of them are as far removed from America today as if they had never left the land of their birth. You have to deal with them in your business and it complicates your task enormously.

Then there is a vast misunderstanding between the employer and the employee, representing interests and groups, and that has been accentuated and developed by all sorts of teaching and leadership until it has become now a national calamity.

We have got to remember that the human element is more important than the financial or economic. If you do not handle the human element from now on in America, not matter how perfect your management may be, you will not be able to make a success. Now what I have to say to you as the nub of my address today is this: I have no theory to exploit. I do not believe in any method or system that is invariable or will cover all cases, but there are two ideas that I desire to impress upon you—one is leadership and the other is education. Those are the two things that we must have in American industry in all branches if we are to pass out of this age of chaos into a time of success.

Leadership Opportunities Are Neglected

First, leadership. My proposition is that the man who employs labor is a normal leader. That is the next great revolution that is going to come in American industry. The man who employs the workingman is the normal leader of the workingman. Now you, I suppose, in common with all other industrial operators, have neglected that side of your work. How many of you men here are leaders of the men in your employ? I judge very few. You have got to beat the professional deliverer to it and become your own deliverer.

If you do not lead your men someone else will, because they are divided into two classes, the led and the leader. They are both here. You have to accept it as a fact, and if you do not take the responsibility for leading your own men, the same as you handle your own machinery and your own financing, then they will go elsewhere for outside leadership, and when that leader arrives on the scene he can only retain his position by carrying on a campaign to deliver your working people from you, their oppressor, and every advance he makes he makes by depreciating your standing and helping his, as their deliverer, and the moment he gets out of that he gets out of a job.

The average workingman would rather be led by a big boss than by anybody else. The average workingman looks upon his employer a little like a boy looks upon his father, or a political follower looks at his leader, or a church member looks upon his pastor, or a student upon his teacher.

We have got to have leadership. We have got to have leadership not only of you employers in business, but have got to find time some way to come out into the public and help lead the masses of men. We cannot any longer leave the business in the hands of the demagogue and self-seeker and the ignoramus.

Ourselves to Blame for Poor Government

We talk about the low order of our representatives in Washington. If they are a low order of being they are that because they represent another low order of being, namely, you and me; and if we want better men in Washington we cannot ask George to do it; we have got to do it ourselves. But you say, "I could not be elected." No, you could not because you neglect a constituency that normally would elect you, but if you go to it with the same acumen and same honor and same intelligence and same determination with which you go to other tasks, in a short time you will have educated a constituency that will believe in you, and if they believe in you as they believe in other fellows they will elect you. Do not be discouraged, because after you see the kind of men who can get away with it in this country it seems to me that almost anybody could do it if he tried.

Now as to the matter of education. To begin with, the education is in your work with your people, and you as the chief educator. And in what will you educate these men? First, you have got to educate the workingman of today about your business. I do not know what your average employee thinks about that, but I would be willing to wager that he thinks you are just rolling in wealth.

Now you cannot meet a bad idea by calling it names. The only way to get rid of a bad idea is to put a good idea in its place. The only way to drive out a small idea is to put a big idea in its place, and that is a process of education, and of course that process will have to be determined by the individuals themselves in each individual plant in each individual district. These men have to know about your business—what it will cost you, what you are up against. Actually, gentlemen, the trouble is that they do not think of you as anything except a lot of parasites playing golf eight hours a day and trying to recover from your exercise with rest.

That is not an extravagant statement of the case. They think of every big man in business as just drifting along a stream of golden prosperity while the rest of them are starving and toiling for a mere pittance. You have got to educate the workers of your own industry and take them out from that and educate them upon the larger forces that are flowing around you.

Take two things—and I will just use these two as illustrations—take, for instance, the need of production, which is so appalling that I cannot understand how anybody can sleep over it; and yet the average appeal to a workingman to produce will be met with this answer, and met with it time and time again, "Why should I? Why should I work harder to make more money for the boss?" That is the answer one gets, and the argument with which that is met is usually feeble. Let me ask you if this argument would go across? I have spoken with hundreds of workers with the big boss beside me and the men from the machines around me and I have gotten the same result.

If you could see the production of the world's food and goods placed in a great heap, it is an absolute fact, easy of demonstration, that that complete mass of the food and goods of the world is never more than two years in advance of the world's needs—never in normal times. In spite of all of our machinery and of all our productive capacity, the world has never been more than two years ahead of its consumption in the mass of food and goods created by industry.

CUMULATIVE CAUSES FOR PRICE INCREASES

Now in the last five years the chief business of the civilized world was to destroy food and goods and men, with the result that the world's stock of food and goods is lower today in proportion to the world's population than it has been in one hundred years. The inflation of the currency has increased prices and profiteering has increased prices, whether done by the employer, the employee, or both. But after you have made due allowance for all these secondary causes of high prices, and consequently the high cost of living, the fact remains things are dear because they are scarce and they never will be cheap again and cannot be cheap until by work and thrift we increase the world's stock of goods to a larger relationship to the needs of the people. That is self-evident.

Now, when you go to the workingman and tell him that he must work and his employer must work and everybody must work and save until we get this heap of food and goods bigger than it is today, and for the reasons which I have named, he may make some response.

We have got in some way to co-ordinate the masses of the city with the production of the farms and get some help out on the farms or we never can bring down the high cost of living, Mr. Gompers to the contrary notwithstanding. He is a great and wise man, I have no doubt, but he says the way to bring down the cost of living is to put the profiteer in jail and increase the wages of the workers. Well, you can go on to some certain extent in those interesting directions, but arithmetic is still on the throne and you cannot get more meat out of an egg than there is in it. It cannot be done, gentlemen, and unless you and I, and your wife and my wife and your children and my children go to work and produce, or produce by abstaining from the consumption of things that are not necessary until we get in a normal condition again, we are going to have to have a condition in this nation in a way worse than anything we had to face during the war.

Something has gone out of the American people. They have quit work. Men tell me in the factories that their production has been reduced 50 per cent as compared with before the war, while wages have increased 200 to 300 per cent in many cases.

The day is coming soon when the man that can work and won't work cannot depend on some labor union to get him a big wage for the two or three days he does work. He will have to work or starve. You cannot bring that to your man by sprinkling him with rosewater or using a powder puff on him. You have got to tell him the truth and you have got to enlist with you the great conservative mass of workingmen in this country. I know the American workingman thoroughly. I worked myself with a pick and shovel for years and can do it again, and would be glad to do it if I had to.

AVERAGE WORKINGMAN LACKS COURAGE TO BE FREE

I believe every man ought to work, and it is God's blessing and not God's curse to mankind to work with his hands. And 90 per cent, certainly 75 per cent, of the average workingmen of this country normally are conservative, sane human beings. The trouble is that they are terrorized. They don't dare to do anything else than go with the crowd. They are just like you and me. We are just the same. We are moral cowards. We have got to have the backbone to say, "I won't be the slave to a labor union. I will starve first. I won't be a slave to a capitalist. I will starve first. I won't be a slave to a despotic government or anyone else. I am going to be free." And the only way to be free is to be able to make your own living at any cost of sweat and sacrifice.

The average high-class foreigner, if you could get him away from the maggots that have been put into his system by the breeders of maggots, you would find, is a fine fellow. He wants his children to have a better chance than he had; he wants a home; wants to be a human being, and if you act as his champion and say, "Yes, that is an American desire, but you will have to pay the American price of hard work and thrift, and if you will I will guide you and help you," you will find that he will follow.

As for the nationalization of the mines, a year ago, when I was in England, that was the great big thing with the laboring people, but they have found since that it was an empty dream; the British Government and the British people said, "No, you shall not nationalize the mines." And they will not do it, nor will they have nationalization of mines in this country, because it cannot be done and at the same time have any coal. We would be infinitely worse off than now, and we have a preference for coal.

STATE SOCIALISM NOW A DEAD ISSUE

Now, you hear an enormous argument about socialism, and with this I am to close. We have all gotten rid of this subject. Hardly anybody in this country but realizes that state socialism is absolutely dead. What is socialism? Socialism was an invention or discovery of a very brilliant German Jew, Karl Marx, eighty years ago. The thing he discovered was that all of the economic ills could be traced to a variety of economic causes. He gathered the whole thing into the realm of materialism and said that if you could get rid of the economic causes you would usher in the millennium. In tracing up the causes he discovered a trinity of evils —private capital, wages for work and corporate investment. He felt that if he could get rid of those three he would solve the problem. So he looked around for an instrument big enough to uproot this stump, and the only instrument he found big enough to do the job was the political state government, the oldest institution of civilization except the home.

GOVERNMENT CONTROL OF INDUSTRIES A FAILURE

For sixty years the argument went back and forth and up into the skies as to whether that could be done or not, but they never had a chance to try it out on what you are accustomed to call a commercial scale until the war. As soon as the war started they discovered that it was a struggle between industries and peoples instead of between governments, and in those free countries the governments had to introduce dictatorships and in this country we adopted the fundamental principles of state socialism. Our Government, for instance, took over the entire maritime industry of this country, and is still fooling with it. The Government took over the railroads and operated them and is still operating on them now. The Government took over the telegraph and the telephone, and now look at the poor things!

Our Government fixed prices of commodities, fixed wages of labor, fixed the profit on capital, and then, by a process of economic revolution, it took, through the rates of income tax, immense steam shovels of income and redistributed it among the poor by excessive wages for work that was not done.

What was the result? The result is that two years later we may have had some lingering tendencies to state socialism, but after two years of actual trial, with an absolute dictatorship at Washington, which could make it go if anything could, we are cured of socialism, and the socialists themselves, intelligent and intellectual men like John Spargo, realize that that is the situation. Spargo has recently written a book in which he tells us state-controlled industries are worse than private capital, because they are more expensive and tend to create a formidable bureaucracy.

RUSSIA'S EXPERIENCES IN GOVERNMENT

Russia is supposed to be the kingdom of God on earth in some circles. Russia had an economic revolution set up by Kerensky, a socialist. Kerensky was not equal to the task and out of that revolution there came two very keen but unscrupulous men, Lenine and Trotzky. Lenine is one of the ablest men in the world. He was able to see what we did not see—that state socialism was an absolute failure, that it could not be administered except by a perpetual dictatorship in the government, and no dictatorship could be successful in communities that had had a thousand years of free government, and when he saw that we were going to scrap state socialism as were also Italy, Belgium and France, he decided he would start something else, and he had the courage to take the political state of Russia and tear it up by the roots and scrap it.

Russia is the only great state in the world that has no political state government. He substituted for it the soviet. It begins in the individual factories by a group of the workers. They get together and take the owner by the scruff of his neck and kick him out and they organize an economic organization, and they join with their fellows in other industries into a town soviet, which heads up in a state soviet, which in turn heads up into a national soviet, and the whole thing rounds up in twelve commissariats in Moscow. Russia has been an economic government since Trotzky took charge. It is failing there like it is failing here, because it is contrary to the laws of human nature. After a thousand years of sacrifice, of experiment and struggle, in which we tried to learn how to govern ourselves, you cannot expect the English-speaking world, at least, to turn away from the results of those thousand years of effort and take some wild and theoretic scheme which destroys the very foundation of things, and so I say socialism is a dead one as a practical proposition. Of course we will hear from it, but it will not work and the strongest men in that movement know that it cannot work.

These are stormy times, and are going to be stormy, but if we will make our economic institutions at the same time agencies of education and educate by fearless and able thinking and get to the bottom of every proposition that is haunting the minds of the masses of men, workingmen will not go back to their situation in the world before the war. I do not want to see them go back. I want to see a wider distribution of wealth. I want to see every home in the land where a man works and the family works, with musical instruments and education for the children and a good nurse if they are sick, and a little laid by for a rainy day. The country that has that kind of distribution of wealth is going to weather the storm, and those countries that fail in that respect must go down.

EDUCATION NEEDED IN PLACE OF THEORIZING

But you will not reach that point unless people stop their theorizing and nonsense and rebellion and go to work, and they will not go to work until they are educated either by a touch of starvation or educated by your leadership, and so, gentlemen, gird yourself for the fight; gird yourselves for a great fight. Do not be afraid. You can put your money on this country without fear of losing it because we will not lose in the long run, but we have to have men like you, good citizens like you, as educators to help the rest of us, even though you lose money in the undertaking.

It will be a good thing if you do not lose yourselves and the country and the consciousness that you are free men regardless of what comes against you, and therefore go out to your task and gird yourselves for the struggle as brave and free Americans. Believe in yourselves and in our resources, our resources of brain and character; believe in your God and make it a sacrifice and worship; believe in your fellow man, in his reason and honor; believe in your country, in its greatness and glory and strike what you think is wrong a fair and square blow in the front and stand up for what you think is right. Although it will be a stormy day, at the sunset there will be a time of peace.

Seek Revocation of P. R. R. Prepayment Requirement on Coal

THE Tidewater Coal Exchange, Inc., and wholesale coal trade associations are seeking revocation of the requirement of the Pennsylvania R. R. for prepayment of freight on coal shipped to tidewater. This is the only road requiring payment of freight in advance, other tidewater carrying roads collecting from the dumper. As cars reaching tidewater lose their identity, being handled on a tonnage basis, it results in bills being rendered on cars forwarded for other shippers, causing in many cases over-payments by shippers.

Rise in Coal Prices Is Attributed to Government Regulation[*]

Federal Interference with the Industry, This Authority Asserts, Brought About Such Uncertainty of Supply That Uniformly High Prices Were Inevitable — Cost Figures Gathered to Justify Extravagant Prices, He Thinks, Rather Than to Reveal Where Cost Could Be Cut

By George H. Cushing

The U. S. Geological Survey has no record of any measurable production of coal in the United States prior to 1821, although some coal was produced in 1807 or even earlier. In 1821 our output was less than 1,500 tons. In the ninety-three years between 1821 and 1914 the annual increase in production was 5,630,000 tons. The annual production did not equal this annual increase until 1848.

For the fifty years ending in 1914 the annual increase in production was 9,799,507 tons. The annual production did not equal the annual rate of increase for this fifty years until 1852. For the twenty-five years ending in 1919 the annual rate of increase was 18,700,000 tons. The total production of the nation did not equal this annual rate of increase until 1863.

SURPLUS OF SUPPLY MADE PROFITS UNUSUAL

There is no record of consumption to match these production figures. The folklore of the trade is that from 1807 until the fall of 1916 the current production of coal was steadily in excess of current consumption. That is, production was almost invariably in anticipation of need rather than being timed nicely to meet demand. In consequence there was as a rule a comfortable visible supply of coal above ground. Indeed, this visible supply has as a rule been so large that only in rare instances did the sales prices on coal rise to the level where more than a third of the producing companies were making money. The only recorded period when prices were generally profitable for as much as nine months in any one year was during and immediately following the anthracite strike of 1902.

Prior to 1916 it was the rule that high prices for a few months brought such a quick increase in production that the prices dropped below even the normal low level. Hence the profits of one abnormal period were turned into losses in the depression which immediately followed the flooding of the market.

A practice persisted in through practically a century may properly be said to constitute the natural routine of the industry, so we may say that the normal state of coal is to have abundant production and prices which fluctuate freely, leaving an assured margin only to the few.

Coal prices rose in the fall of 1916, but have not declined since. They have been uniformly profitable for nearly four years. There was no opportunity to determine whether the rise in price which came in 1916 would be followed by the customary depression due to overproduction, because at the end of nine months the Government undertook to regulate coal. Therefore an artificial force was introduced into both production and distribution, serving to freeze prices at the high level they had reached. These four years therefore stand alone in a hundred years of coal history. It is the only period when the coal business was uniformly profitable without bringing quickly a great overproduction of coal.

INEFFICIENT RAILWAY CONTROL LIMITED SUPPLY

The only possible deduction to be drawn from these facts is that detailed governmental interference with the coal industry reverses its normal practice by bringing a period of uncertain supply and results in a sustained period during which uniformly profitable prices apply.

In passing it is significant that this abnormal period in coal was co-extensive with the period of detailed control of transportation by the same forces. It is undoubtedly true that the failure of coal to express itself naturally by overproduction in response to high prices was due to the failure of the Government-controlled railways to carry the easily possible output of the mines.

There never has been a dependable record of coal prices. There is none now. There are, however, two outstanding facts about coal prices:

First, American coal prices fix the cost of power to the American manufacturer. The mine-mouth price of coal in Great Britain fixes the cost of power for the rest of the world. The price of English coal has, as a rule, been two and one-half times the price of the American coal. That relationship to all practical purposes still exists. Therefore, the cost of power in the United States has been and is the low cost of power for the world. This is one big reason for the commercial supremacy of the United States.

Second, the increased cost of coal at the mine mouth is less on a percentage basis than the increased cost at the source of manufactured articles. Therefore the relation of cost of power to the value of manufactured product has not increased. Rather it has decreased. Thus the American manufacturer is not at a disadvantage in the world markets on account of his cost of power. Instead he maintains and increases his advantage.

PROFITS ESTIMATED ON INVESTED CAPITAL

This means that the American coal price in relation to coal prices elsewhere is and has been subnormal rather than abnormal. The same is true of the relation of coal prices to the cost of manufactured articles. If, however, you take the position that the cost of other things is abnormal, then the price of coal is abnormal. The fact is that when the coal man goes into the open market to buy other things with his ton of coal he gets less for his coal than he did in the pre-war period.

Nevertheless it is commonly said that the profits of the coal men have increased on a percentage basis. That is true only because the percentage is figured on the invested capital, rather than on the working capital. One has stood still; the other has increased. If the percentage were figured on the working capital, it would be found that this percentage had decreased rather than increased. Therefore, the profit of the coal company seems to have increased—but has not—merely because the capital of the company has not been expanded commensurately with the amount of money invested in the business.

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[*] An address by the managing director of the American Wholesale Coal Association before the Kentucky Mining Institute at Lexington, Ky., June 4, 1920.

No conscious effort was made prior to 1914 to collect statistics on coal consumption. Naturally there was no exact information as to the uses to which coal was put. The folklore of the trade was that prior to 1910—with the exception of the bituminous coal from Pennsylvania—the output went 60 per cent to the domestic trade and 40 per cent to the steam trade. There was a guess figure that 25 per cent of the coal went to the railroads. If this division was even approximately accurate it indicated that only 15 per cent of the coal in those days went to industry.

I mention these figures not because they are accurate but because they express what was then the belief of the industry. About 1910 there was a revision of figures. I heard it estimated that the steam trade was taking more of the coal and that—outside the bituminous district of Pennsylvania—it was moving 50 per cent to domestic trade and 50 per cent to the steam trade. This would indicate that industry was taking 25 per cent instead of the 15 per cent previously accredited to it.

PROFITS FROM PRICES FOR DOMESTIC COAL

These percentages had, naturally, their influence upon the price policy. So long as there was considered to be even an approximately equal division as between the three major users—the householders, the railroads and industry—it was considered possible that steam coal could be sold for cost or less and the profits, if any, of the industry could be made up by prices charged for domestic coal.

It was in those days common for coal men to stress the importance of car supply and cold weather upon the profitableness of the industry. Thus, we often heard at the beginning of the fall the remark: "From now on it is a weather market. If we have blizzards, we will have good prices and make money. If we have an open winter, there will be no chance to make money."

Such a conception of the market could rest only on the theory that the only profitable size in coal was the domestic size and that the only hope of making money was in the price charged to the householder through the retail dealer.

Beginning with September, 1915, the coal man began to feel that some new but rather mysterious force had entered the market. Bituminous coal prices began to rise in the East and then in the West. It was known that the East did not use bituminous coal for domestic purposes. So it was the steam demand that was boosting prices. By degrees, but slowly, the trade came to understand that coal for industry was assuming a dominant position.

For three years, however, the trade did not appreciate the tremendous change which had taken place. It had attributed this leadership of industrial coal to the war and believed it to be temporary. This belief persisted even during a greater portion of 1919. If, however, the trade had been closely and carefully analytical it would have been prepared for the assumption of that permanent leadership by the so-called steam sizes which has now come.

INDUSTRIAL DEMAND GROWS IMPORTANT

In fact, the trade had been placarded for years with many signs pointing to this change. For example, I remember when slack coal or screenings sold on contract for 30c. and 35c. a ton. We can all remember when, in off seasons, this same coal sold at 10c. or 15c. a ton. We saw, however, that by 1914 the average or contract price on "fine" coal was 80c. to a dollar a ton. Even in 1914 we were not prepared to accept the real truth, namely, that the industrial demand was growing in importance. Instead, in rummaging about for an explanation we found it to our satisfaction in the fact that industrial plants were installing automatic stokers and were therefore switching their demand from run of mine or steam lump to the smaller sizes of coal. We saw only a shift in demand when it was, in fact, a growth in demand.

It was not until the fall of 1919 that the coal man really realized the truth, namely, that the big increase in demand for the last twenty years has been for coal in industry. It amazed all of us to find that a reasonably accurate estimate of demand for bituminous coal in 1920 would result in a division of the total productions about as follows: Household coal, 65,000,000 tons; railroad coal, 135,000,000 tons; industrial coal, 325,000,000 tons.

In other words, we were not prepared to find that the old or imagined equal distribution among the principal users had disappeared, never to return; that the railroads were using twice as much bituminous coal as the householders, and that the industrial demand is taking nearly two and one-half times as much as the railroads and one and two-third times as much as the railroads and householders combined.

The growth of the demand for coal for industry has eclipsed the demand for railroad coal and domestic coal. Domestic coal has so shrunk in importance that instead of taking 30 to 50 per cent of the output of mines it is now taking only 12 per cent. Railroad demand has so shrunk in importance that it is now taking only 25 per cent. Coal for industry has grown from 15 per cent to the point where it takes 62½ per cent.

That automatically reverses our price policy. It is impossible to sell 88 per cent of the coal at cost or less and make all the profit on 12 per cent of the coal. It is impossible even to lose money on 62½ per cent of the coal and make up the profit on the 37½ per cent of all the coal which goes to railroads and householders.

RAILROADS WERE ONCE OVEREQUIPPED

Briefly industrial coal is going to occupy the dominant position in production and must be the dominant influence on prices. The profits, if any, in the industry must be figured on the price of the steam coal—as it has been for years in Pennsylvania—instead of on the railroad and household coal. We have an entirely new basis for coal prices. The monitor of the trade is the industrial demand. The others are side issues—by-products.

Prior to 1910 there was still left in the railroads a semblance of the competitive spirit. The railroads knew that to make money they must carry freight. To carry freight, they must have transportation facilities. Therefore, they overequipped rather than underequipped themselves. In those days the matter of getting transportation was not serious. On this account there was always plenty of coal at the market.

Because there was plenty of coal the price of coal was low and the trading margin on it was narrow. When the margin was narrow, a difference of a few cents in the freight rate determined the sale. Therefore, in those days the coal man was not interested in transportation problems of the railroads, but he was deeply interested in traffic problems. He needed to have rates nicely adjusted so that he would never be out of line with his competitor even a cent a ton. He knew that to be out of line by 3c. a ton meant to be out of that market.

FUTURE OF COAL BUSINESS UNCERTAIN

Today the competitive spirit of the railroads is gone. The railroads are stall-fed. If they do not get revenue from their own exertion the Government gives it to them. They do not earn money by carrying freight, necessarily. They are guaranteed that there will be a return on their capital regardless of any effort on their part. They have become a ward of the nation; a public charge; an incipient pauper; beggars before the appropriations committee of Congress. As a corollary they have less than enough equipment.

This is having a direct effect upon the point of view of the coal man. He is no longer interested much in the matter of freight rates. He has consented to one increase after another. When a new proposition comes to give a new increase in rates he gives it his instant approval. And he is not seriously disturbed now by a differential against him of 10c. or 15c. or even 20c. a ton. He knows that the distant competitor may have the advantage in rates, but that he can't get the cars. In a word, the coal man has lost his interest in traffic matters. He has gained an interest in transportation matters. He is no longer talking rates; he is talking cars, and engines, and service.

I have sketched the coal history. I have nodded to a few of the big problems of yesterday and today. What does this mean about tomorrow? I wish I knew. I wish I could put my finger as unerringly upon even the near future of the coal industry as it is possible to do upon what has happened and is happening. However, it is possible to speak only in generalities. Rather than giving the reasons for these conclusions I shall have to be content with merely the conclusions themselves:

1. The Government has been led to believe in the wisdom of the commission form of government for the railroads. It believes in rate control to assure morality of railroad practices. Having undertaken rate control, it must try to control the cost of operation and income. It is wedded to that idea. It has made the legislative experiment. It is not going to abandon it, short of a revolution.

CUTTING DOWN COMMERCE TO FIT RAILROADS

2. The Government recognizes that the railroads are no longer adequate. Despairing of building more roads and of improving the present systems under present conditions, it is setting out studiously to build auxiliary transportation systems by reviving abandoned waterways and by pioneering in ordinary road building that we may encourage auto-truck haulage.

3. The Government recognizes that these expedients are of doubtful value. Hence we are approaching a cataclysm arising from the fact that the stall-fed railroads cannot carry the commerce of the nation and we will have nothing to take their place. Therefore there is a studied effort today to put business under regulation to the end that the volume of commerce may be whittled down to the size of the carriers. One of the first steps in this interesting program is the return of detailed regulation of coal as outlined in the proposals of Senator Frelinghuysen.

It is the definite understanding in Washington that this is but the overture to the larger program, which is to put all business under similar control. I do not speak in any ill-advised fashion. I know what I am talking about. I have put this proposition squarely and plainly before those who are advocating control of coal. They admit frankly that the program which I outline is the one upon which they have entered deliberately. With unblushing audacity these advocates of governmental control admit that their proposal is for the commission form of Government for everything in order to protect the commission form of government upon the carriers.

COAL MEN ADVISED TO LEARN SELF-GOVERNMENT

4. The coal trade is going to be policed. Somehow the information which is demanded of coal is going to be reduced to a definite record. Somehow the distribution of coal is going to be adjusted to the new situation in which the carriers find themselves. So the coal trade must be policed. If coal men can do the job themselves they may avoid for a little while the exercise of that police power by the nation. The length of time elapsing between now and another Fuel Administrator will be directly proportional to the capacity of the coal man for self-government.

5. Washington believes that the coal trade is tricky. That is, it gathers production information for the purpose of deceiving students of coal rather than for the purpose of reforming itself. It gathers figures on the cost of production to justify extravagant prices rather than to serve as an index as to where to cut the cost of production. It gathers information about prices for the sole purpose of controlling them on a high level instead of using this information to reduce the coal trade to sanity. And, in the Washington opinion, it is adopting the labor union practice of trying to increase the profits of the efficient by justifying a profit to the inefficient.

If it is to evade for long detailed exercise of the police powers of the nation, it must, in my opinion, reverse its practices in all these particulars. In a word, seeing the situation by which we are faced, the coal trade must "come clean" or stand by to see the slate, so far as it is concerned, wiped clean of any coal influence upon the coal industry.

United States Said to Have 7,000 Years' Coal Supply

SUFFICIENT coal supplies to last about seven thousand years are still unmined in the United States, S. M. Darling, of the U. S. Bureau of Mines, told the twelfth annual convention of the International Railway Fuel Association in Chicago, May 25.

He estimated the supply of minable coal at 3,553,637,100,000 tons. Last year's consumption, he said, was 530,000,000 tons.

Discussion by Readers

Edited by
James T. Beard

Contract System of Mining Coal

Replying to the question of "Mine Superintendent," in *Coal Age*, May 6, p. 959, concerning the contract system of mining coal in Pennsylvania, I thought that probably some information from another field would not be amiss and might prove of value.

In many parts of Kentucky, the operator gives an entry or section of pillars to some capable experienced miner, at a fixed price for delivering the coal on the sidetrack, or in some cases to the tipple. In practically all cases, the operator supplies everything just as though he had charge of the work himself.

The contractor hires and plans the work for his men, and turns in their time just as though he was a boss, instead of a contractor. The only advantage, in a system of this kind, in these parts, is that the hope that more pep will be put into the production of coal in that section when a single individual is given charge, who is striving to make extra money through his own initiative, which is not usually the case in the average section boss.

The contractor puts into the work the necessary personal flavor that is necessary to get a good working spirit started among his men, who, as a rule, feel that to fail in their work is a personal blow to a man who is a friend.

The principal drawback to this manner of working is that an unscrupulous contractor will, in a short time, get a section of the mine in poor condition. So to overcome this, most operators hire a foreman, who holds the contractor closely to good mining practices and the articles of his contract; and sees that the mining law is strictly complied with, in general.

Pikeville, Ky. G. E. Daugherty.

An Amusing Incident in the Charging of Storage-Battery Locomotives

Recharging storage-battery locomotives, in mining practice, is an important subject. The reference made to it in the inquiry answered in *Coal Age*, Apr. 29, p. 874, recalls to my mind a curious experience that I had with the first storage-battery locomotive I designed for the Jeffrey Manufacturing Co.

The locomotive was designed in 1899 and built for a large operation in Pocahontas, W. Va. The machine was a five- or six-ton, gathering locomotive, the battery being charged from the trolley wire while hauling the trips out and in, on the main haulage entry. The battery was a Willard type. The machine being the first of its kind was regarded as an experiment and we were watching it with great interest, keeping a trouble man constantly on the ground, though he actually knew very little about storage batteries, being one of our own men.

The machine started out well enough and reports were satisfactory, until one day we got a telegram informing us that the battery had exploded. I at once got in touch with Mr. Willard, who expressed his desire to go down to the mine with me for the purpose of making a thorough examination, as this was a new experience to him.

Upon our arrival at the mine we were told that the battery had "blownup" while pulling the trip on the main entry, charging in the regular way off the trolley wire. The "blowup" had so scared the operator that he deserted the locomotive, taking to his heels for dear life, and sprinted for daylight.

In his excitement, the man overlooked turning the controller handle to the "off" position, with the result that he had a worthy competitor in his race to safety. He must have gone some, because he won the race, although with a very small margin. When that marathon runner got to the mouth of the mine and, all out of wind, rolled off to one side of the track, safe and happy, the locomotive came rolling along as though nothing had happened, wondering in its own way what possessed the operator to cause him to run away from a friend in distress.

Amusement at the Motorman's Expense

We all had a good laugh over the incident, as it struck us all as being very funny. But the sprinter could not see the funny part, and expressed himself freely about electric locomotives in general and this battery experiment in particular, in terms that were intended to put an effective stop to the merriment at his expense.

After the hilarity had worked off a bit, we examined the innocent cause of this prank played on the indignant operator. We found six or seven of the battery jars cracked and the acid flooding the wooden box that housed the 88 or 90 cells. The box being lead-lined no damage had been done to the locomotive. The box had a heavy wood cover over the cells to protect them from curious fingers and falling slate.

The cover had mysteriously disappeared and no one had given it a thought, until, on our asking for it, someone came forth with the information that a wood cover of some kind had been unloaded from one of the mine cars at the tipple on the day of the "blowup." We looked for it, later, and sure enough that was the battery cover all right.

Explosion Explained as Being Caused by the Ignition of Hydrogen in the Battery Box

Mr. Willard soon explained the cause of this "blowup" by saying that, the battery, being charged from the trolley wire at a very fluctuating voltage, must have generated more gas than the openings under the battery-box cover were capable of removing. A probable short-circuit, due to condensation on top of the cells, must have caused a spark and the explosion of the confined hydrogen resulted, blowing the cover off the box, which struck the roof. The sudden stop in its flight added to the noise of the explosion and it is no wonder that the combination put our friend to flight.

The result of this experience convinced us that charging from the trolley wire, while the locomotive was running, was not desirable; but it was some years later before motor-generator or even resistance-charging sets came into use. As a matter of fact, the experience became noised about and the battery locomotive got a set-back in the opinion of many mine managers and engineers.

Battery Compartment Must Be Well Ventilated

The experience also showed that there should be plenty of ventilation over the cells, when the battery was being recharged. To avoid the necessity of lifting off the cover every time this was done, I devised a plan of exhausting the gas generated, by installing a small fan driven by a motor. I also provided a rubber-sheet acid-catcher over all the cells, in such a manner that only the filler and the gas-escape openings projected above the sheet, while all electrical connections were below the sheet and out of danger. These improvements were later patented, in my name, and assigned to the Jeffrey company. Whether the scheme ever came into actual use or not, I am unable to say, since I was no longer connected with locomotive building when the storage battery finally became popular.

I thought this bit of history would be of interest as well as serving to answer, in a way, the question asked in the inquiry, in regard to whether an explosion had ever occurred in recharging batteries in the mine.

ALEX. PALMROS,
Consulting Engineer.
Syracuse, N. Y.

Concrete Example of Labor Turnover

HAVING read with deep interest the statistics compiled by Mr. Crews, for the Bituminous Coal Commission, and published in *Coal Age*, Feb. 12, p. 316, I beg to submit the following brief regarding the earnings of men in the mining of coal.

We hear much, in these days, about the increased cost of living; rising standards of living; decreased production, per man, per hour; etc. More and more, the daily papers and trade journals publish articles with concrete illustrations couched in percentage figures, rates and ratios. I often think how meaningless these articles must be to those who do not understand the intricacies of higher mathematics; and what an opportunity the writer of such an article has to phrase his statement with an inflection that entirely misconstrues the facts indicated by the figures.

Much of the Propoganda in the Daily Press Is Misinterpreted by the Public

In these days of scientific advertising and salesmanship, the reader is inclined to mistrust these articles as being creatures of the brain, employed to bolster up propaganda for one side or the other. How can we discern between the real and those distorted facts intended to misguide some particular group or class of readers.

I refer more particularly, now, to the many articles that were written during and since the recent strike of the bituminous coal miners. Articles written by both sides, supposedly representing the miners, or the operators, quoted all sorts of figures and percentages, apparently based on facts but given an inflection meant to turn the reader from the figures to the conclusion reached by the writer.

Mere propaganda cannot be trusted. The only figures that one can really trust are those compiled by himself, where all the influencing factors are thoroughly known and understood. Fortunately, I have since found time to do this and herewith present the results and my interpretations and conclusions to the readers of *Coal Age*. The work, to be comprehensive, is so tremendous a task that a small operation, employing an average daily working force of about a hundred men, was chosen.

Analysis of a Year's Payroll

To my surprise, I discovered that to maintain a force of 100 men, daily, no less than 598 names appeared on the payroll, during the course of the year 1919; and 239 of these worked less than a month while only 56 of them worked the entire twelve months. Of these 56, all but four made over $1,000. The average was $1,524.87, for the year, which showed a monthly rate of $127.07. The four who earned less than $1,000 worked only two or three days during several months, but their names appeared on every payroll throughout the year.

The following table shows how irregularly the men worked during the year and the earnings of each group:

Period Worked	Number of Men	Total Amount Earned	Amount Earned per Man	Per Man, per Month
Less than one month	239	$ 9,263.01	$ 38.76	$ 38.76
From 1 to 2 months	96	12,374.66	128.90	64.45
2 to 3 months	48	11,472.88	239.02	79.67
3 to 4 months	30	10,491.07	349.70	87.43
4 to 5 months	20	9,734.99	486.75	97.35
5 to 6 months	21	11,638.31	554.20	92.36
6 to 7 months	19	13,855.97	729.26	104.18
7 to 8 months	19	13,694.92	720.78	90.10
8 to 9 months	14	12,152.14	868.01	96.45
9 to 10 months	20	23,821.38	1,191.07	119.11
10 to 11 months	16	21,001.24	1,312.58	119.33
11 to 12 months	56	85,392.57	1,524.87	127.07
Totals	598	$234,893.14		

Following is a table showing the earnings of the 239 men who each worked less than one month. It will be observed that one of these men earned, in that time, $320.05. The table is of interest by way of comparison.

Number of Men	Amount Earned per Man
56 earned	Less than $10.00
48 earned	$10.00 to 20.00
33 earned	20.00 to 30.00
22 earned	30.00 to 40.00
17 earned	40.00 to 50.00
15 earned	50.00 to 60.00
12 earned	60.00 to 70.00
8 earned	70.00 to 80.00
5 earned	80.00 to 90.00
4 earned	90.00 to 100.00
13 earned	100.00 to 150.00
5 earned	150.00 to 200.00
1 earned	320.05
239 men	Total earnings, $9,263.01

Truly the question of labor turnover is one of vital interest to every operator, when out of 598 men employed only 56 remain at the end of a year. This was at an operation located just outside of a good-sized city. Of the 56 steady employees, two-thirds were married men.

During the same year, 85 men made a taxable income; two cutters made $2,925.92 and $2,896.62, respectively. The mine being nonunion was in operation all of November and December when so many coal mines were idle by reason of the strike.

It is one thing to compile figures but much more important to be able to read them intelligently. One might charge that the men who work in this mine average only $38.76 a month, and ask if that is a just wage. The answer would be, emphatically, No! It is true that 239 men, who worked there less than one month, averaged that low rate; but that includes all the men who worked from one hour to thirty days, many of them earning less than $10, and quit.

Some might divide the total payroll ($234,893.14) by the number of men employed (598) and say that the average monthly earnings for these men was $32.73. True; but what a gross misconception of the truth to interpret figures in that way. For an average is valuable only when the figures approach similarity. An average is of no account when the variation is large, as in this case where the total includes men working anywhere from one hour to one year.

It is easily seen how readily one falls into difficulties in interpreting statistics; and statistics are worse than worthless if wrongly interpreted. In determining the *true* monthly wage of these men, a *weighted* average must be used and the total accrued from month to month. Thus, by re-reading the figures, we find that:

Number of Men	Months Worked	Total Amount Earned	Average per Man, per Month
56	12	$ 85,392.57	$127.07
72	11	106,393.81	125.49
92	10	130,215.19	124.25
106	9	142,367.33	121.26
125	8	156,062.25	117.69
144	7	169,918.22	116.39
165	6	181,556.53	114.55
185	5	191,291.52	113.53
215	4	201,782.59	111.79
263	3	213,255.47	109.42
359	2	225,630.13	105.38
598	1	234,893.14	98.68

Thus we see that the true average monthly pay increases directly with the length of time the man worked; and that the steady miner earns a fair living wage, and one that compares favorably with the wages paid men in other occupations. These figures would indicate that the miners do not need an increase of the wage scale nearly as much as they need steadier work. The reduction of labor turnover would be a large factor in increasing their average pay and in decreasing costs to the operator. Anything which would tend toward this end should be welcomed by both the labor chiefs and the operators.

It is a common saying that figures do not lie, and they don't. They tell the truth, until some human brain uses them as illustrations to prove his theory, which is generally predetermined. If one formulates statistics with a foregone conclusion as to what they will show, any figures indicating the contrary will not change his preconceived notions. While figures do not lie, so many people lie about figures that it behooves us to take them all with a "grain of salt" and make our own interpretation, instead of allowing someone employed for the purpose to do the interpreting for us.

Philadelphia, Pa. William Russell Rorer.

Car Supply the Determining Price-Factor

COAL prices may be rightly gaged, today, by the car supply available at the mines; and there is little hope of seeing lower prices until that situation is remedied. The quickest and most effective way to stop the so-called "profiteering" in coal is to insure 100 per cent of car supply, at all mines. Rabid-price investigations and legislative regulations accomplish little and are mostly misleading.

Few persons, outside of the coal business, understand why price of coal fluctuates so widely, from week to week; the range even reaching two dollars a ton; but a study of the mine reports will furnish the answer. Since the month of October, the car supply at the mines has varied, weekly, from 20 to 60 per cent, and most of the time has shown a very low percentage of the normal requirement.

As a result of this condition, the cost of producing coal one week is, perhaps, double what the cost will be the week following. The reason is that a mine is something that cannot be locked up and again opened on a day's notice. There are certain costs that continue even though not a pound of coal is mined; and these costs cannot be overlooked when figuring the price of coal.

Increased Efficiency Counts for Little

It is indeed a problem how to pass on to the consuming public the results obtained by the increased efficiency in the mining of coal, today, when these results are more than counteracted by the inefficiency in railroad management. Since the destiny of the coal-mining industry is so closely linked with that of railroading, on which its success depends, the fact must be recognized that the troubles besetting the latter react most seriously on the former.

Coal operators are not only subject to their own industrial troubles; but are likewise affected by those of another and what is generally supposed to be an entirely separate industry. The handicap that such a condition imposes on the coal industry any man of business can readily understand, inasmuch as no intelligent or efficient plans for the production of coal can be formulated or carried out on a car-supply basis that fluctuates as it does today, and has been doing since October.

Perhaps, if the public were more familiar with this important problem of car supply, it would better understand why coal mining is regarded as a hazardous industry, not alone for the miners, but for the mine owners and operators as well. Furthermore, what may seem like "profiteering" is, in reality, nothing but the result of a condition over which operators have no control; namely, car supply. N. H. Seaburg.

Boston, Mass.

Co-operative Merchandising

REGARDING the question of the high cost of living having much to do with the social unrest prevailing in the country, I do not think there is a dissenting voice. But, what does not seem to be so generally known, is the fact, easy of verification, that, high as is the cost of living in cities and districts bordering on the highways of trade, it is still higher in the more or less remote regions where coal mining is generally done.

The time is past and gone when the company store, unhampered by competition, charges as high prices as customers will stand. Even where no competing store is to be found within walking distance of a mining camp or village, the coal operator no longer thinks it good policy to get back, through the store, the largest possible proportion of the men's earnings.

It is true, of course, that where competition is lacking, the prices asked at the company store are much higher than they would be otherwise. But, no matter what competition there may be, the miner must always pay more for his food, clothes, shoes, etc., than he would pay if he lived within reach of the average city stores where market prices more generally control.

It seems strange that the miners' unions have not done what like organizations, similarly situated in other countries, have been doing for many years, to the great pecuniary benefit of their members. I refer, now, to the establishment, by those unions, of co-operative stores where all their members can, not only get their goods at cost plus a small percentage, but become partners in the business, participating in the profits in proportion to their dealings.

LABOR UNIONS IN AMERICA SUFFER BY COMPARISON WITH THOSE IN EUROPE

Surely, there must be, in the unions of workingmen in America, the same kind of honesty, goodwill and business talent that has enabled the unionized workingmen of Europe, for nearly fifty years, without any let up in their fight for social recognition, to keep the cost of all necessities of life at the lowest possible level, while at the same time raising the standard of existence to a higher plane.

Let those who are interested in this subject study what has been accomplished by such workingmen's unions as *"Voruit,"* at Ghent, and *"Maison due Peuple,"* at Brussels. One should not be misled by glib talkers and amateur economists who tell us that the American workingman is different from the workingmen of other civilized lands. Like measures adopted for similar purposes, under similar circumstances, and similarly conducted, are bound to give, in this country, results similar to those attained in Europe. There is undoubtedly a difference between America and Europe; but in this as in many other things, the advantage is in favor of this country. What took fifty years to accomplish in the land of precedent and prejudice, where, as was the case in Belgium until a couple of months ago, the unions of workingmen were only tolerated, can be done here in one tenth of the time.

New York City. F. C. CORNET.

Installing a Power Cable in a Shaft

AFTER reading the interesting and instructive article entitled "Some Methods of Suspending Electric Power Cables," by R. P. Hines, *Coal Age*, Apr. 15, p. 749, from which I gained much useful information, I am inclined to give a little of my own experience along the same line.

Although I am not an electrician, it fell to my lot to install a power cable in a hoisting shaft 365 ft. deep. The cable was armored and designed to carry alternating current, at a pressure of 2,300 volts, to operate a motor-generator set for charging storage-battery locomotives in the mine.

AN INGENIOUS METHOD

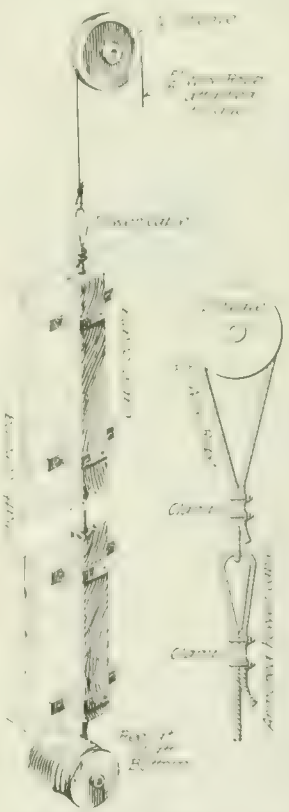
Instead of lowering the cable in the shaft, which might seem to be the natural way to make such an installation, I adopted the plan of starting from the bottom and hoisting the cable to the surface as it unwound from the reel at the shaft bottom. The reel was placed on the cage and lowered to the bottom of the shaft, where it was mounted on a steel bar and blocked up so that the reel would turn freely.

It should be stated, here, that the switchboard to which the cable was to be connected was located in the powerhouse, at a distance of 90 ft. from the shaft. It was necessary, therefore, to make allowance for this length of cable, which would enable it to be extended from the shafthead to the switchboard in the power house. For this purpose, the required length (90 ft.) was measured off on the cable, which was then doubled back on itself and clamped, using a cable thimble at the bend, to avoid injuring the cable, as shown in the accompanying figure.

The next step was to rig a 12-in. sheave on the tipple, about 15 ft. above the ground level at the surface. This being done, I employed a ⅝-in. wire rope, which had formerly been used as a means of retarding the movement of cars on an incline, and passing it over the 12-in. sheave lowered it into the shaft. The end of the rope was now put through the cable thimble previously mentioned, bent back on itself and clamped, as shown in the figure. The position of the 12-in. sheave, at the surface, was such as to allow the cable when hoisted to hang a few inches clear of the shaft curbing.

CABLE HOISTED IN THE SHAFT BY MEANS OF THE DESCENDING CAGE

When all was ready, the upper end of the ⅝-in. wire rope was fastened to the cage waiting at the surface. The lowering of the cage had the effect to hoist the cable slowly in the shaft. When the cable had thus been drawn to the proper height it was secured in that position by clamping the ⅝-in. wire rope to itself under the sheave. The cable was thus held fast in the position in which it was needed in the shaft. On the right of the accompanying figure is shown the detail of the suspension of the cable after clamping the wire rope to itself and detaching the end of the rope from the cage. On the left of the same figure is shown the manner of protecting the armored cable, after it had been hoisted into position in the shaft. For this purpose, pieces of 4 x 4 in. yellow pine were sent to a planing mill where they were milled out on one side, the entire length of each piece. The milling was sufficient to give a snug fit for the cable, which was 1¾ in. in diameter. When these pieces were clamped tightly over the cable, in the shaft, there was sufficient friction to give it the needed support. This shaft being lined with cement, it was necessary to drill holes, in the cement curbing, for the expansion bolts that were to hold the clamps or bands, as shown in the figure.



SHOWING DETAILS OF THE INSTALLATION

When all was complete, I arranged an emergency clamp, in the form of two blocks milled out and bolted together around the cable, a short distance above the top of the 4 x 4 in. guards. Although it is now nearly two years since the installation was made, this emergency clamp has not taken any of the weight of the cable, which is slightly slack below the clamp.

Kincaid, Ill. GEORGE J. KEARNEY.

Inquiries of General Interest

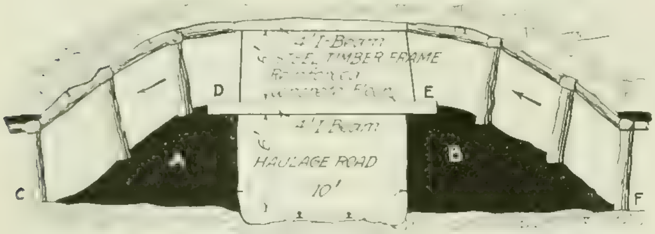
Answered by

James T. Beard

Building an Approach to an Overcast, in the Ventilation of a Mine

Last week I was visiting some friends employed in one of the largest collieries operating the Pittsburgh coal seam, within 100 miles of Pittsburgh. I was informed, that recently, a discussion had arisen among the mine officials regarding the effect of building an air-crossing or air-bridge, and excavating the coal up to the sidewall of the main road, on each side of that road.

In other words, referring to my rough sketch of an air-crossing built over a main haulage road, the coal is shown as having been left in, on each side of the main road, and is marked by the letters A and B. The question is, what effect would taking out this coal and putting in its place a good solid wall, on each side of the main road, have on the air current passing over the bridge. It is assumed that the sectional area of the airway leading over the bridge is uniform throughout, being the same at the points marked C, D, E and F.



STANDARD TYPE OF OVERCAST OR AIR-BRIDGE

It was argued by one of the officials that if this coal is taken out and the space it occupied left vacant, the the result would be an eddying of the air at those points, which he thought would have a tendency to obstruct the current and diminish the quantity of air passing. On the other hand, it was claimed that the taking out of this coal would increase the area at those points and assist the flow of air across the bridge.

It should be stated here, that the roof in this part has given considerable trouble, numerous falls having occurred to obstruct the airway. For this reason, it was thought that it would be an advantage to use these vacant spaces, at air-crossings, for the purpose of storing material fallen from the roof. If the coal was taken out, it was said that a gangway plank could be arranged to enable men to pass over the air-bridge whenever necessary.

With a view to securing the opinions of *Coal Age* and its readers, regarding this proposed scheme, kindly permit its presentation, as I believe it is a matter of much importance in the economical operation of a mine.

McKeesport, Pa. Andrew O. Bain.

Referring to the figure which represents the sketch presented by this correspondent, there is no question but that the taking out of the coal, marked A and B in the figure, and leaving this space vacant in the airway leading over the bridge, would cause an eddying of the air on both sides of the bridge. However, it is our opinion that this would have little practical effect on the quantity of air passing over the bridge. The impact of the air against the solid wall, on either side of the main road, would add very slightly to the mine resistance but this would be inappreciable.

Coal Leases Operating in Alaska

Will *Coal Age* kindly publish a list of the coal leases now operating in Alaska. For some time past, I have been watching the development of the coal resources in that region, and am greatly interested in its promise for the future. Prospector.

Yerker, Ky.

The following information has been received from a correspondent in Alaska, who is familiar with the development of coal in that country. The information is taken from the records and is therefore reliable and will prove of interest to many readers.

In the Chickaloon field, the Chickaloon Coal Co., Walter A. Gompertz, of Berkeley, Cal., manager, has been operating for the past two years. Recently, they have suspended operations, however, and we do not know whether or not they intend to resume.

The Matanuska Coal & Coke Co., Henry Baxter, of Anchorage, Alaska, manager, is in somewhat the same condition.

The Alaskan Engineering Commission, Sumner S. Smith, Eska, acting manager, mining department, is operating the Eska and Chickaloon mines.

In the Bering River field, The Bering River Coal Co., George Hazelett, of Cordova, Alaska, manager, is operating a lease; and the Alaska Petroleum & Coal Co., Clark Davis, Katalla, Alaska, manager, is developing some ground, a portion of which is under lease and on another portion they have secured a patent.

McNally and Maitland, of Anchorage, Alaska, are operating a mine on Cook Inlet, near Bluff Point, on which they have secured a lease within the past few months. This is an old mine and these gentlemen have been, for some time past, operating under a free-use, ten-acre permit. There are a number of people mining coal for their own use, on free-use ten-acre permits; but we have no complete list of these, at the present time.

There are also several smaller properties in the Nenana Coal Field with which we are not familiar. The names of these parties can probably be secured by writing to John A. Davis, engineer in charge of the Federal Bureau of Mines Experimental Station, located sometime since at Fairbanks, Alaska.

Examination Questions

Answered by

James T. Beard

Illinois Mine Inspectors' Examination Springfield, Sept. 18, 1916

(Answered by Request.)

Ques.—What is the difference between a coal seam and a mineral vein?

Ans.—A coal seam is a bedded deposit and conforms with the original stratification of the formation. It is, in other words, a sedimentary deposit. On the other hand, a mineral vein has been formed by the filling in of a crack or crevice in the rock formation. Not being a bedded deposit, a vein may have any direction with respect to the stratification. The crack or fissure may have been filled by intrusion of volcanic lava from below; or by the infiltration of water carrying mineral matter in solution and coming either from the surface or from the inclosing rock strata, the mineral matter crystallizing, later, and forming a solid incrustation on the walls of the fissure or completely filling the same.

Ques.—A steam jet and a fan, both acting together on the air in an upcast shaft, produce 75,000 cu.ft. per min. When the fan is stopped, the jet produces 15,000 cu.ft. per min. What quantity of air would the fan give alone?

Ans.—Assuming that there is no change made in the circulation of the air in the mine and the shaft, the mine potential or the resisting power of the mine is constant. In that case, the power producing the circulation is proportional to the cube of the quantity of air circulated. Then, since the total power on the air, due to the combined action of the fan and the steam jet, is equal to the sum of the powers due to the action of each of these agencies alone; and since the power on the air is a function of the cube of the quantity of air circulated, it follows that the cube of the total quantity circulated by the combined action of the fan and the steam jet is equal to the sum of the cubes of the respective quantities circulated by each of these agencies acting alone. Therefore, calling the quantity of air due to the action of the fan alone, x, since the quantity produced by the steam jet acting alone is 15,000 and the two agencies acting together produce 75,000 cu.ft. per min., we have

$$75{,}000^3 = x^3 + 15{,}000^3$$
$$x^3 = 75{,}000^3 - 15{,}000^3$$
$$x = 1{,}000\sqrt[3]{75^3 - 15^3}$$
$$= 74{,}800 \textit{ cu.ft. per min.}$$

which is the quantity of air that the fan would produce when acting alone, the conditions in the mine remaining unchanged.

Ques.—How many tons of coal underlie a square field containing five acres, the seam being six feet thick and lying at an angle of fifteen degrees, the specific gravity of the coal being 1.325?

Ans.—An acre of land contains 43,560 sq.ft. The cubic contents of a 6-ft. seam of coal underlying five acres and inclined at an angle of 15 deg. is

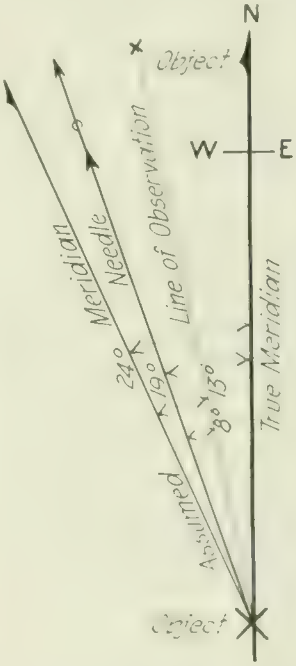
$$5(43{,}560 \times 6) \div \cos 15^\circ$$
$$= 1{,}306{,}800 \div 0.96593 = 1{,}352{,}900 \textit{ cu.ft.}$$

Then, taking the specific gravity of the coal as 1.325, referred to water as unity, since the weight of a cubic foot of water is 62.5 lb., the weight of coal in this five acres is

$$(1{,}352{,}900 \times 62.5 \times 1.325) \div 2{,}000 = \text{say } 56{,}000 \textit{ tons.}$$

Ques.—What would be the variation of a plan's meridian when the bearing of two objects thereon with its meridian is N 13 deg. E, and the bearing of the same two objects on the surface is found by an instrument whose needle has 19 deg. of west variation, to be N 8 deg. E.

Ans.—If the needle has a variation (declination) of 19 deg. W, and the magnetic bearing of the line joining the two objects is N 8 deg. E, the true bearing of this line is found by substracting the magnetic bearing, which is east, from the declination of the needle, which is west. The difference (19 — 8 = 11 deg.), being an angle to the west, the true bearing of the line is N 11 deg. W. The accompanying figure shows the relative positions of the true meridian, the line of observation joining the two objects, the magnetic needle and the assumed meridian of the plan. It will be observed that, since the line joining the two objects has a bearing of N 13 deg. E, referred to the assumed meridian of the plan, the angle between this assumed meridian and the true meridian is given by adding this bearing referred to the assumed meridian to its true bearing, which gives an angle of 24 deg. to the west of the true meridian, and the bearing of the assumed meridian is N 24 deg. W.



Ques.—What is the difference between a horseback and a step fault?

Ans.—What is known as a "horseback," in mining, is a hump or swelling, generally occurring in the floor of the seam, and causing the thinning out of the coal for a short distance. On the other hand, a step fault is a true fault, being an actual dislocation or slip in the strata. In that case, a break has occurred, crossing the stratification at more or less of an angle with the bedding plant. The strata on one side of the fault line has been thrown up or down, producing a sudden break in the continuity of the seam. The fault is called an "upthrow" or a "downthrow," according to the direction the slip has taken. In either case, it is a step fault.

Wholesale Coal Association Brief Opposes Seasonal Coal Rates

Such Legislation If Passed, the Organization Contends, Would Be But a Prelude to Further Interference with the Coal Trade

BECAUSE no member of the Frelinghuysen sub-committee disapproved of the bill providing for seasonal rates on coal, no minority report was available for the use of the full Committee on Interstate Commerce of the Senate. With the idea of placing some of the opposing views concisely before the full committee the American Wholesale Coal Association submitted a brief on the subject to the full committee. Extracts from the brief are as follows:

"The advocates of the bill, except two associations of operators in the far West, have had no experience as producers, consumers or distributors of coal. The opposition to the bill was by those who have had the broadest experience with coal.

"The experience of the nation during the last four years proves that it is impossible to regulate part of the coal business without regulating all of it. And, it is impossible justly to control coal without controlling all allied industries. That proposition rests upon our knowledge and belief that you cannot control the distribution of coal without influencing the price.

"If by statute you influence the price of coal you must soon so control that price that the coal man may avoid bankruptcy. If by statute you control the price of coal you must undertake to control the cost of production. You must naturally assume control of the wages of miners and regulate competition of the coal producer.

"If by statute you undertake to control the competition of the coal producer you must control all of the coal land of the United States to such an extent that you may say by law who may and who may not open coal mines and when and where those mines may or may not be opened.

"As a rule it is the common practice of all legislatures to try to correct a mistake not by repealing the law but by undertaking another and larger experiment. Thus, when the first and second experiments prove at fault, the common practice is to try a third experiment. Thus, if this statute is passed it will, we believe, be but the overture of a program.

"In support of our contention that this proposed legislation cannot be final but must be merely the initial step in a long chain of legislative acts we refer specifically to the history of the Interstate Commerce Commission. It started out to supervise rates. It progressively came to control rates, cost of operation and finally financial return.

"This measure cannot be effective without coal storage, which is so difficult and expensive as to be practically impossible in any general sense.

"As a matter of fact the storage of coal is a very difficult and delicate undertaking. If it is to be done successfully, it must be done according to the most scientific methods. Some coals will store in the open if not piled higher than a limited number of feet. Other coals will store safely in the open if protected against the infiltration of water from below. A few selected coals will store in the open if the sizes are very carefully segregated. Still other coals will store safely in the open if they are practically hermetically sealed.

"Some sizes of coal will not store at all unless free from alternate wetting and heating by the rain and sun. In some coals the larger sizes will store under certain conditions, while the smaller sizes of the same coal will not store at all.

"Regardless of all these technical niceties which have to be observed, the hearing before the sub-committee proceeded on the theory that no precautions whatever were necessary. The whole matter was passed over so lightly that there was not called before the sub-committee a single witness who could qualify or who tried to qualify as an expert on coal storage questions.

"The railways have today less than enough cars to move the coal even though all cars are employed steadily throughout the year. Under such conditions—known to all coal users—we cannot believe that summer movement of coal needs any legislative stimulant.

"Besides, there is known to be a coal shortage today. In fact, the high prices now charged for coal are directly attributable to a shortage of cars and to the competition of users for the less-than-sufficient amount of coal produced. We fail to see wherein there is any danger that coal cars will be idle unless freight rates are reduced by law. The current information is, on the contrary, that the coal mines are losing two million tons of production per week merely because the railways have not cars enough to move the coal.

"The bill is presented as an amendment to the Interstate Commerce Act. However, it is neither designed nor intended primarily to be a regulation of the carriers or of interstate commerce. Its essential purpose is to reform the coal industry and the practices of the people respecting their coal purchases.

Legitimacy of Regulation Questionable

"We wish to call to the attention of the committee the doubt which will exist as to whether such a purpose falls legitimately within the scope of the Interstate Commerce Act.

"We are disposed to hold that if it is either desirable or necessary to regulate or reform the coal industry by statute, the intention to regulate and reform it should be labeled for what it is. Especially are we disposed to say that this thing, if done at all, should be done under the powers which Congress has over private business rather than under its powers over commerce.

"If Congress has under the Constitution no power to regulate a private business we contend it is an immoral invasion of the rights of coal merchants and producers to seek to exercise such control under the subterfuge that an attempt is being made to simplify transportation by an amendment to the Interstate Commerce Act.

"We most respectfully direct the attention of the committee to the fact that the studied effort of this nation for a long period of years have been to divorce the coal industry and the transportation companies. And yet by this statute they are united for the purpose of enabling the carriers to try to reform coal. We contend that this amounts to a reversal of the nation's fixed program. We are convinced that it is a measure to which if understood the people will not give their consent.

"Finally, we wish to suggest to the committee that the issue raised in this proposed legislation amounts to such a reversal of our public policy since the establishment of this Government that it is an undertaking which should not be entered upon without the whole matter being first placed before and decided by the whole people."

The Labor Situation

Edited by
R. Dawson Hall

Strike of Shopmen on Virginian R.R. Curtails Coal Production

THE strike of shopmen at the Princeton (W. Va.) shops of the Virginian R.R., in which about 1,200 men were involved, had not been settled up until the last of May. On the contrary, it had extended to the piers of the Virginian R. R. at Sewalls Point, Va., and had brought dumping of coal at such piers almost to a standstill. As a result of the shopmen's strike practically no coal at all was mined on the Virginian R. R. during the last week of May.

Notice was served on the strikers toward the end of the week that unless they returned to work at once their places would be filled by others. It is stated that a number of striking shopmen have left the city of Princeton and that others have sougnt new employment.

Seven Alleged Union Organizers Arrested In Pond Creek

SEVEN men, all of them said to be union organizers, were arrested on Pond Creek, Wednesday afternoon, May 26, by officials of Pike County, Kentucky. At the time the alleged organizers were arrested they were on their way from Williamson to Stone, Ky. A movement is now in progress having for its aim the organization of the Pond Creek mines in Kentucky, adjacent to Williamson.

It is charged by the deputy sheriffs making the arrest that the men were extremely suspicious in their actions and that when searched pistols were found on them. The men arrested were: Lee Hatfield, Lindsey Tackett, Dave Connoly, James Parsons, Joe Hatfield, Martin Justice and Fred Hatfield. Those arrested were given a hearing at Pikeville on May 27 and were bound over to await the action of the grand jury, the charge against them being conspiracy. All the men furnished bond.

Though Organization Is Incomplete, Union Tries to Control Williamson Field

OFFICIALS of the United Mine Workers in the Williamson field have already begun to say who shall work and who shall not work, even though that field has not yet been entirely organized.

The Burning Creek Coal Co. is just completing construction work on a new plant at Kermit, W. Va. While the tipple has not been completed and the siding is not ready for use, the company has decided as a part of its development work to haul coal by wagons to the railroad and ship coal pending the completion of its plant. It had not had any trouble with miners because it had not attempted to operate.

When, during the last week of May, the company indicated that it would begin mining and shipping coal, a notice was served on the company by Don Vinson, president of the local at Kermit, that it could not operate. Vinson, it might be mentioned in passing, is not a miner but a farmer.

Fine for Failure to Report for Work Causes Strike near Terre Haute

MINERS employed by the Vandalia Coal Co.'s mine east of Terre Haute struck May 24 because the company had assessed and collected from them a fine of $1 each for failing to report for work Saturday, May 15.

The company asserts that the men took concerted action to observe their Saturday holidays, while the miners contend that each miner acted on his own initiative and that there was no agreement to remain away from work. Heretofore the Saturday holiday trouble has been confined to district No. 11, but it spread to district No. 8 May 23, when about 250 miners failed to report for work. All these men will be fined $1 by the company, officials stated.

French Coal Miners Return to Work

COAL miners of France, who have been on strike intermittently for several months and recently supported the railwaymen in their strike for nationalization of the roads, are now reported to be all at work.

It is computed that the 120,000 miners affected lost wages totaling 40,000,000 francs and caused a loss in production of nearly 800,000 tons of coal, which must be replaced by imports. It is also pointed out that production will be lessened another month because of the long idleness of the miners, and there will be a further economic loss to France in sending money out of the country for imported coal.

Clinton Shotfirers to Receive Wage Increase

SHOTFIRERS at a number of coal mines around Clinton, Ind., who have been idle since May 6, refusing to work for the scale of $8 a day, all returned to work May 24. It is said their demands have been met by the operators and, although no official announcement has been made as to the basis of settlement, it is understood that they will receive an increase of 13 per cent over their former pay, which was fixed by the miners at each mine and which ranged from $10 to $15 a day.

Adjust Strike of Raymond City, W. Va.

A TEMPORARY adjustment has been reached in a strike of about five hundred miners employed by the Otto-Marmet Co., Raymond City, Putnam County, West Virginia. The strike is reported to have followed the arrest of one of the miners for violation of the mining law of West Virginia in shoveling from the solid.

Williamson Operators Decline to Co-operate in Organization

Enlist Service of Sheriff to Supress Intimidation and Begin Newspaper Propaganda Campaign to Combat Efforts of Organizers

OPERATORS of the Williamson field have declined to negotiate with the United Mine Workers for the organization of the Williamson field and in an interchange of communications with officials of the United Mine Workers have made it plain that they believe no useful purpose could be served by any meeting with the miners.

The suggestion for a meeting was made on Thursday, May 27, by Fred Mooney, secretary of district 17, and C. H. Workman, a board member of the same district, the communication from Mooney and Workman being couched in the following language:

"To the Coal Operators of Mingo County and Vicinity:

"Learning that you are in session in the City of Williamson, and desiring to bring about a feeling of good will and comity between the coal operators of this section, and desiring especially to receive your co-operation in assisting the legally constituted authorities of the city, county and state in maintaining peace and upholding the supremacy of the law, we hereby propose that you meet us, the representatives of the United Mine Workers of America, representing the bulk of the miners of this immediate field, in joint conference. We feel that the mutual interests of all parties concerned would be materially promoted by such a meeting."

On the same day a committee of operators sent a response to the above communication as follows:

"A number of the coal operators of the Williamson field were in consultation today with the Sheriff, soliciting the activity of his office in the preservation of law and order in Mingo County. They were brought to this necessity largely, if not wholly, because persons not residents of this county have busied themselves during the past few weeks provoking discord and hostility between them and their employes.

"We have reported to the sheriff the fact that large numbers of men are parading the county, armed, and are menacing and threatening workmen engaged in the mines, and preventing them by threats and menaces from performing their work, and we have solicited him as the peace officer of the county for the protection of our employes. In consequence of this state of public outlawry numbers of workmen in the county are terrorized and are afraid to go to and from their places of work, and the mining industry in the county, at many places, is in a state of suspension.

"As citizens and property owners of Mingo County, we are hopeful that the officers of the county will, by the exercise of their constituted powers, be able to restore order in the county and maintain the law. With them in this aim we expect, as citizens, to co-operate to the very limit of our capacity, and trust that all law-abiding people of the county will feel a similar interest.

"We find no objections to your having similar consultations with the sheriff, if it should appear to you as non-residents that your concern in Mingo affairs is sufficient to warrant the presumption, but, replying to your invitation to meet you in conference, we must beg to believe that no useful purpose can be served by the arrangement.

"The concern of the people of Mingo County is in upholding the law, protecting property and preserving life as well as the reputation of our community."

Counter propaganda is a part of the program of the operators to offset the propaganda of the United Mine Workers circulated in Mingo County in an effort to organize that field. As the first step in the campaign of counter propaganda the operators have procured space in the newspapers published in Mingo County in order to present their side of the case.

It is pointed out by the operators in the initial statement made to the miners and other citizens of the district that the operators have property in the field valued at from $30,000,000 to $40,000,000, that they pay the taxes largely through which public institutions, public schools and public roads are maintained, and that they employ in their own industry more than five thousand of the best-paid workmen in the land. The operators also assert that "These operators are a permanent part of this community, and claim the right, above all question, to take their own part and to speak upon the welfare of the neighborhood and their business.

"The operators propose to show that the organization of this coal field by the United Mine Workers would prove hurtful to the coal industry and therefore damaging to the entire community. They ask their employees and all citizens to keep an open mind on the subject until they shall have fully stated their case."

President Wilson Names Anthracite Wage Commission

PRESIDENT Wilson has announced the appointment of an Anthracite Coal Commission, composed of three members, which will arbitrate the points in controversy in reaching a wage agreement between the anthracite coal operators and mine workers.

The members of the commission are Dr. Willian O. Thompson, president of Ohio State University, representing the public; Neal J. Ferry, of McAdoo, Pa., a member of the Executive Board of the United Mine Workers, representing the miners, and William L. Connell, an independent coal operator, of Scranton, Pa., representing the operators.

The appointment of the commission was announced by the President in a long proclamation reviewing the efforts to negotiate a new wage scale. A decision is to be rendered within sixty days, if possible, which will be made "the basis of a new wage agreement between the anthracite operators and miners in such manner as the commission may determine," to be effective from April 1.

As both sides have signified their willingness to accept and abide by the award of a commission thus constituted, a satisfactory settlement of the matters in dispute is confidently expected at an early date.

Officials of the United Mine Workers of America have expressed themselves as being well pleased with the men named as members of the Anthracite Commission. Ferry's name was suggested for membership by the mine workers and Connell has always been considered a friendly operator by the miners. Therefore while the mine workers know little about Dr. Thompson, they feel sanguine that they will get a square deal from the commission.

Before adjourning, Congress appropriated $10,000 for the expenses of the commission.

West Virginia Coal Managers Discuss Their Operating Problems

Suggestion That Railroad Equipment Be Transferred to Holding Corporation—Visiting Nurse and Mining Education Are Discussed—Lessee Ought To Be as Interested as Lessor in Conservation of Coal, for He Has Most at Stake

OWING to the labor unrest along the Tug River and in the Guyan region, the West Virginia Coal Mining Institute's twenty-second semi-annual session at the Frederick Hotel, Huntington, W. Va., was not as largely attended as usual, though its discussions did not seem to suffer from the dearth of members. On the opening day there were 37 present, among whom could be numbered not a single coal company man living in the city in which the meeting was held. This was perhaps quite natural in view of the fact that the operators who live in Huntington and Williamson are just now the objective of a concerted attack from the United Mine Workers, and they are quite busy coping with it.

Operators in a large section of West Virginia continue to question whether it pays to provide for an extraction of 90 per cent or more. They still believe it cheaper not to invest a dollar now in early entry development but to throw away a dollar or more in waste of development later and a number of operators in other states have a similar point of view.

In place of D. W. Brown, an attorney of Huntington, the address of welcome was given by Mayor Campbell, who emphasized the importance of the transportation needs of the country and the difficulties under which coal operators labored by reason of car shortage. He added that the Association of Federal Reserve Banks at a recent meeting, held within closed doors, had suggested that this problem be met by the turning over of all railroad equipment to a holding company which would hereafter provide for the equipment needs of the whole country, placing cars wherever at any time they happened to be in demand.

On this suggestion the mayor made little comment. It may be said, however, that it has certain somewhat obvious advantages. Cars are placed where there is need for them and it is done without the probability that the pooling will result in indifference as to the purchase of cars. As it is today, the pooling arrangement have taken cars from railroads which provided them and have given them to railroads which made only indifferent provision for the purchase of cars. This discouraged both railroads from buying cars, for it does not pay a railroad to buy equipment if in time of greatest need it does not have the use of it, and if a railroad, not having enough of its own equipment, can depend on a pooling arrangement to give it the cars of others, it has no incentive to buy in adequate quantities. While a holding company for car equipment would be unjust at the start, as tending to the disadvantage of provident companies, it might perhaps work no further injustice, and the incentive to buy would not be impaired as it is when ownership of a private corporation is fully recognized during a car plethora and denied as soon as there is a car famine. As it is now, the responsibilities of ownership are more obvious than its privileges and in consequence ownership of railroad property and equipment is no longer sought by any one.

J. R. Cameron, of Bluefield, responded in a few words to the Mayor's cordial address. As usual, the vice-presidents and the members of the executive board were called on for remarks, Frank A. Haas, of Fairmont, and E. D. Knight, of Kayford, responding briefly. A committee on resolutions was appointed, composed of R. Dawson Hall, Frank R. Haas, V. E. Sullivan and Lee Ott.

Dan Sowers, superintendent of welfare work, Portsmouth Solvay Coal Co., Edgarton, W. Wa., and his promised substitute, Mr. Mackintosh, not being present, W. A. Craven, of the S. J. Patterson Pocahontas Coal Co., Arista, W. Va., gave an impromptu address on "Does Welfare Work Help Production?" Mr. Craven said that he felt that it did, yet that at the same time there were adverse influences tending to decrease production, and in consequence the increased productivity might not be forthcoming, no matter how diligently welfare work was pursued. He remarked that what is looked upon one day as a luxury becomes shortly after a necessity, demanded by the employees and perhaps incorporated in state law as a positive requirement. A few years ago the Weyanoke Coal Co. opened a bathhouse for its men. It was perhaps the first bathhouse in the state, and the mine workers had hardly any use for it. They preferred to perform their ablutions at home. But now bathhouses are beginning to be no longer classed as welfare provisions but as operating necessities.

J. W. Bischoff declared that welfare work was most successful when it was most diplomatically approached. He had introduced the Young Men's Christian Association activities into his camp, but he felt and the association felt that the first work should be recreational and that the impulse to use the facilities for religious meeting should be the outcome of the better class sentiment in the neighborhood.

V. E. Sullivan declared that he believed that welfare work to be successful must include the women and children in the homes; that only in that way would the advantage of the work be reformative enough to be truly lasting. The pride of the foreigner in the institutions of this country and in the opportunities it afforded him would only be apparent when his wife and children shared with him in its benefits.

Along the same line and in favor of the village nurse were the remarks of R. Dawson Hall. He said that it would be found that the work of the village nurse was only secondarily nursing; that once nurses were introduced their influence would be felt in the better feeding, housekeeping and hygiene of the neighborhood. The byproducts of nursing were as valuable as the main products. He emphasized, also, the mischievous part often played by the mine clerk and the company doctor. Many mine clerks become greatly harassed by their multifarious duties and in consequence are not diplomatic in dealing with payroll disputants and many a doctor with his bluffness and lack of sympathy with the sick creates enmity in camp where harmony would ordinarily prevail.

Mr. Hall advocated the greater employment of women as assistant mine clerks. Not usually so perturbed as men by their many disturbing duties, they tend to meet payroll difficulties rightly in the beginning before feelings become unduly exasperated. With a woman clerk the employees are disposed to discuss quietly and sanely whatever errors they may think they have detected in the fortnightly statement. The work also offers something of a career to the girls of a mining village. It is well recognized that there are few, if any, careers for women folk around such communities and the tendency should be as far as possible to find such places for those who are competent to fill them, giving practical experience and finding executive positions for those who are clerical work.

Company Provides Churches and Dance Halls

J. N. Schweitzer, general superintendent, Lundale Coal Co., Lundale, W. Va., referred to the introduction of a Red Cross nurse into the Lundale village. He said that now, when there is sickness in the home, the man is still able to go on working, which is good for him, his family and the company. The nurse does not necessarily stay in constant attendance on the patient but she finds somebody who will, and thus the man is released for his work. The company with which he was connected had built three churches for its employees—a Catholic, a Protestant and a church for colored people. It had a dance hall for white people and one for colored and baseball teams and playgrounds for both classes. It started a local mining institute which met once a month and discussed such questions as "Motor Haulage versus Mule Haulage for Gathering," "Best Way to Maintain Room Tracks," "Best Method of Disposing of Slate" and "Timbering." The company had a dairy with thirty cows and was providing good milk. It had a farm of twenty or thirty acres, so as to have the freshest vegetables for sale.

Frank Haas spoke in favor of the visiting nurse. He declared that there was a degree of suspicion when the nurses entered the work, but the diplomacy and sacrificing devotion they displayed soon overcame all the malicious criticism. They were extremely welcome now at all homes. He confirmed the idea that nurses did not serve simply in the capacity that their title designated. It was perhaps the least important of the services they rendered, excellent and useful as it was.

In a few words, E. D. Knight, chief engineer of the Cabin Creek Consolidated Coal Co., Kayford, W. Va., then appraised the value of the "indirect approach" to mine problems through the school and the home and instanced the cordial and even financial recognition by the men in the Cabin Creek Valley of the work of a minister and school teacher whose community work had been gratefully received. The chairman, J. R. Cameron, having appointed as members of the auditing committee H. E. Gray, W. E. Fohl and J. S. Walker, declared the meeting adjourned.

In the afternoon A. C. Callen, professor of mining, West Virginia University, Morgantown, W. Va., spoke briefly and well on "West Virginia's System of Mining Education," adding the contents of an excellent paper on the subject. Mr. Callen urged that the operators of the state show a greater interest in the school, which with an annual appropriation of $10,000 a year is utterly unable to meet all the needs of the second greatest coal-mining state in the country.

He spoke of the three forms of instruction—the four-year course, the six-weeks' summer course and the courses in the field and of the need there was that the field instruction should be supplemented by addresses given by local men. Unfortunately, many local mining authorities are not good instructors. The cleverest men, he said, are quite apt to speak over the heads of their classes and merely mystify and tire them.

The discussion on this subject went somewhat adrift, for the breadth of the teaching at the West Virginia University and its extension work is so great that the specialized aims of the various parts of it are apt to be overlooked. The four-year college course is for engineers, superintendents and managers. The six-weeks' course is for mine foremen and putative mine foremen. The extension course is for the subordinate officials and for those who are seeking—on their way upward doubtless—such positions. There is a degree of commingling of purpose doubtless. A good way to become a competent manager is via a mine foremanship and consequently it is probably true that some college men have this foremanship in view or at least it might be better if they did, whether they do or not.

Practice a Necessary Supplement to Study

But while college work needs supplementing by practice there is other practice besides that of work at the face, loading, dumping, ditching, slate picking and what not. Surely, practice in surveying needs a certain period of apprenticeship. Laying out railroad tracks, mine tracks, switches, following coal outcrops, designing houses, evaluating properties, studying coals, boring, locating dips, laying out plants, calculating stresses, loading and unloading machinery, building foundations, etc., etc.—are not these also things needing experience just as long and as painstaking as should be given to shoveling and handling the pick? The so-called "practical" men were present who regard the manual as the only occupation needing the skill that time alone can give. The college, they believe, can develop ripened judgment as to the largest of mine operations but cannot inform the scholar how he should tap the roof, hold a bar when taking down slate or drill a hole and tamp it.

Josiah Keelay said that he was afraid that few individuals around the mines would wait sixteen years to go into the mines, spend five years underground to get a certificate and the four years at college, and after all this painful experience and expensive training be content with a mine foreman's certificate. He would like to see the age limit for entering the mine set at fourteen instead of sixteen. A boy around the mines between fourteen and sixteen, if normal, could hardly do otherwise than get into trouble in those two years when the law thought him too young to work but somewhat too old to be compelled to attend school. He feels to be too important to be doing nothing and as all the avenues of employment around a mining village are closed to him there is no other course than for him to spend his latent energies in bedevilment.

The chairman remarked that in leaving college he had gone to work in the machine shops and for only 18c. an hour, but he would have hesitated if that part of his practical experience had been lengthened to five years, hence he thought that a college man should be allowed some reduction in time when seeking a certificate of competency as a mine foreman. Surely the five-year period should be cut in two or even reduced to two years.

DESIRE TO ESCAPE HARD WORK IS WIDESPREAD

J. E. Vaughan, state mine inspector, said that one of the great drawbacks today was the desire of everyone to escape the burden of physical labor and to seek jobs as managers without having the competency of the workingmen whom they presumptuously undertook to direct. He defended the law which required that a boy be sixteen years of age before he went to work and the requirement that five years' experience at the face be required of men who are to be mine foremen. As one man remarked after the meeting, "We are faced with a condition. Mr. Vaughan may desire to set the world right. Let him do it if he can, but my judgment is that if the present standards of experience are required no college man will try to become a mine foreman, and if it is made obligatory that he become one on his way to higher executive positions, then the coal industry will have no college-trained engineers."

W. A. Craven wanted to know of Mr. Callen what effort was made in the six-weeks' course to teach costs of production. Mr. Callen replied that such training was regarded as merely incidental though it was emphasized in all the various departments of work. H. E. Gray and C. K. Brown, one the West Virginia University instructor at Elkins and the other occupying a like post at Moundsville, who also spoke, emphasized the work they are doing in that direction, the former saying that many of the students came to the work impressed with the idea that the cost of coal was practically the cost of loading it into the mine cars.

Messrs. Vaughan, Sullivan and Golden, state mine inspectors, then discussed safety and the necessity of the mine foreman's replacing his recommendations as to safety by commands which he personally sees are obeyed. R. Dawson Hall remarked that the state had a lot of men in its employ to whose duties might have been added the work of mine inspection. The legislators believed it best, however, to leave the work to men specially equipped and specifically paid for that office.

When, on the other hand, it wanted the operator to provide for safety it laid the burden on an executive officer who was already busy enough and whose work was daily becoming more burdensome—the mine foreman. The law required him to find time for safety inspection out of the multifarious commitments which his position as mine foreman—that is the executive officer of his mine—entailed on him. What wonder he neglected possible danger, a mere policing of the mine, for duties that were immediately necessary, which the economic needs of the mine demanded in no uncertain voice!

Successful supervision can never be obtained from men with recognized economic functions to perform, men responsible for the tonnage, men who are called to solve the actual difficulties which must be met as and when they present themselves. Patroling the mine is not work for men of this kind. Better make tax collectors and tax appraisers mine inspectors, for taxes can be collected at definite times, but mine difficulties—a wreck, a broken engine, a loosened water tube, a fallen fire arch, a stopped fan—must be immediately attended to; meantime the inspection of the company's employees is suspended. Specialization is needed if mine inspection by the operators' employees is to be made a success.

The morning session of the second day opened with a discussion on local mining institutes, the president saying that he had under instructions of the executive committee, which met April 17, invited each local mining institute to send two representatives of the meeting to discuss co-operation between the West Virginia Coal Mining Institute and their local organization. As none of the local institutes had held sessions since that time they did not have an opportunity to arrange an acceptance of the offer made and this meeting had to be content to listen to what the members of the West Virginia Coal Mining Institute thought would make the best line of co-operation.

PUBLICITY TO SUSTAIN INTEREST IN MEETINGS

A little pamphlet advising as to the recent and coming meetings of the locals apparently has been decided on as a means of sustaining interest by competition and publicity. It was suggested that the appointment of a paid secretary would be a positive service that would be appreciated and that though funds were inadequate a worthwhile secretary would take care of that difficulty. But no one seemed willing to have the association shoulder the risk even within the limits of its present surplusage and no one was mentioned who was likely to accept the proposed secretariat. Besides, what money was on hand was needed for publishing the proceedings. After talks by Bischoff, Vaughan, Reed, Craven and Hall the chairman left the matter to a committee on local institutes—Carson, Vaughan, Reed, Haas and Craven.

Discussing the matter of the "Relation of Percentage of Extraction of Coal Area to Cost of Mining," R. F. Carson read a short paper on the advantages of high-percentage coal recovery. W. E. Fohl, who followed, declared that the percentage of recovery regarded as somewhat generally feasible was about 90 per cent. Such a percentage gave about 1,500 tons per acre-foot. With a 60 per cent extraction only about 1,000 tons could be obtained for each acre per foot of coal thickness.

Where one desired to get as much coal with a 60-ft extraction as he would get out of a 1,000-acre plot with a 90 per cent extraction he would be compelled to buy not 1,000 acres but 1,500 acres, or 500 acres more than what with frugal coal getting would have supplied his needs. If this is 6-ft. coal and the price is $50 per acre-foot the coal land will cost $300 per acre, or $150,000. This will be quite a burden in the cost of coal production. Moreover, the larger acreage in the mine will involve more haulage cost, more drainage charges, high cost for ventilation, more timber, more rails, ties and electric wiring, in fact, an innumerable number of costs, many by no manner of means small.

It was suggested by another that the cost of coal in the hill was raised by the amount of money expended in its development, that the more coal a given plant produced the greater the saving on first cost, that it was profitable to take out near-hand coal clean even if the work were barely profitable, for the near-hand coal had at least the benefit of a short haul and waiting on its extraction delayed the inevitable expenditure of money for mine extensions and the charges for long hauls, expensive ventilation and what not. Moreover, an excessive land purchase at the commencement of operations involved large interest charges and taxes. It would pay best to buy less and use all of the coal purchased.

Mr. Kealey had a word about leased coal, but leased or not leased there are still development charges, and leased coal should not be wasted, the saving being based not so much on a desire to spare the property and salve feelings of the lessor as because to waste the lessor's coal is to waste the development of the lessee and make further operations more expensive.

Proper Extraction Necessary to Economy

Operators rarely have the matter of the economy of complete extraction put up to them in the proper light. It is to be pursued not only to save the expenditure for acreage but to save the outlay for development and to cheapen operation. The expense of driving advance heading enough to make a panel retreat is not so great as to overbalance all the economies of complete extractions when that extraction is made at the most favorable time and in the proper manner.

Frank Haas said that the recovery of coal pillars in the old workings of the Georges Creek region had been abandoned, but with much regret. At first the Consolidation Coal Co. obtained its output partly from new workings scientifically laid out to secure a maximum recovery and partly from the pillars of the old workings. The coal from the latter was extremely expensive, but the price obtained for the coal still made it possible to take the bitter with the sweet and run the mine with a proper degree of profit.

Gradually the new workings grew less and old workings formed a larger percentage of the whole. The outcome was, of course, not favorable, and with regret the recovery of old pillars was abandoned, but the means of access was left as before, and when it is feasible to pay the price the coal can be and will be recovered. No steps have been taken that will prevent recovery or make it difficult when the time for the work arrives. In fact the idea is merely to delay till a more favorable market makes work on the pillars profitable.

G. S. Jaxon, of the Link Belt Co's. Huntington branch, then read a paper on "Outside Coal Equipment." He stated that the plant should in every case be suited to the characteristics of the market to be entered and of the coal to be loaded. Figures should be given to the manufacturer, of the approximate percentage of each size to be accommodated, though with well-adapted equipment there is a certainty that the percentage of large coal will be increased considerably, and for this the designer will make full allowance. The operator should not ask for an hourly capacity based on a full eight hours' run, for no tipple works steadily for the full eight hours of running time. There are always delays more or less important due to wrecks and arrested transportation.

A six-hour day is about all that can be figured on. The hourly capacity should therefore be assumed as one-sixth of the daily capacity. Operators should not be satisfied merely to meet the present-day demands of the market they are entering or have entered for there is a growth in the demand for preparation and sizing, and consequently what is not demanded today is apt to be required tomorrow. But if the equipment is shaped to today's needs and not to those of tomorrow the outcome will be failure, for the equipment will have to be entirely overhauled and the tipple itself modified. Mr. Jaxon declared therefore that the operator must anticipate the future as far as he can, or he will have to rebuild every few years.

In the afternoon Joseph W. Reed, director of safety, Consolidation Coal Co., Fairmont, W. Va., read a paper on "Organization Methods and Results of Safety Departments," emphasizing the importance of a disposition toward safety as against a reliance on organization as if the latter were in itself an ameliorant of unsafe conditions. Safety work should be of two kinds, constructive and instructive. Every part of the plant should be made as near safe as construction can make it. Then officials and workers should each be trained in the needs of safety. He said the first dollar per man spent in instructive work with two dollars per man spent in constructive work will save five dollars in compensation. Another dollar in instructive work and no further expenditure in safety construction will save three dollars more and another still two more dollars. Thus the three dollars for organization and two dollars for construction will save ten dollars in compensation.

Machinery Vital During Labor Shortage

J. W. Knowlton, of the West Virginia Coal & Coke Co., Elkins, W. Va., read a paper on "Mechanical Coal Loaders" in which he expressed forcibly the need which exists for the development of these devices in an age when labor is at a premium and skill more readily than ever obtainable. Labor with the large muscles of the back is being replaced by labor with the small muscles of the forearm backed by machinery and electric power.

The committees then presented their reports. The committee on resolutions presented a motion urging the legislature of West Virginia and the governor of the state to provide $25,000 or more per year during the next biennium for the support of the mining courses, regular, shorter and extension, provided by the West Virginia University; it also laid a resolution before the meeting advocating the appointment of more inspectors.

The auditing committee approved the accounts in a report which was accepted by the institute, and the committee on local mining institutes introduced a resolution granting to such institutes the right to take out from two to ten memberships in the name of such institutes, paying for each membership $5 per year, the number of memberships thus taken being limited to one for every ten members in the local institute. The delegate members would have the right to vote. It was hoped that at the next meeting there would be a number of delegates present who could then make the wishes of the locals known and suggest ways in which more complete co-operation could be satisfactorily arranged. After J. W. Bischoff had presented a motion expressing the regret of the institute in hearing of the unfortunate illness of its former secretary, E. N. Zern, which motion was unanimously adopted, the meeting adjourned.

Federated American Engineering Societies Formally Organized

All-Inclusive Engineering Organization, Embracing National, Local, State and Regional Society Membership, Is Founded to Promote Professional Consciousness and Co-ordination of Effort and to Encourage Participation of Engineers in Public Service

PUBLICITY, class consciousness, co-operation and public service formed the major chord of engineering harmony developed at the organization conference of the national, local, state and regional engineering and allied technical organizations which met in Washigton June 3 and 4. Vigorous discussion and active debate, with numerous differences of opinion prevailed, but in every case majority rule and good sportsmanship for the common cause led to agreements that give promise of general support by the societies represented.

A joint conference committee representing the founder societies—the American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, American Society Mechanical Engineers and American Institute of Electrical Engineers—had labored for many months in the formulation of a program of organization which served as a basis of the call for this meeting. In its work this committee was supported by the accredited representatives of about sixty other technical organizations. The initial step in the conference of these representatives was the adoption of a resolution favoring the formation of an organization which should be made up not of individuals but rather of technical societies.

The question which required the most extensive consideration of the conference was whether or not the individual or the society should be the unit of membership. The American Association of Engineers, whose delegates represented a membership of nearly twenty thousand, advocated the individual basis of membership. After the majority's opinion became evident, however, even the American Association of Engineers joined in the adoption of the following resolution:

"That it is the sense of this conference that an organization be created to further the public welfare where technical knowledge and engineering experience are involved and to consider and act upon matters of common concern to the engineering and allied techical professions, and that it is the sense of the conference that the proper organization should be an organization of societies and affiliations and not of individuals."

There seemed clearly to be a realization that two distinct national functions must be served by the engineers collectively: (1) Welfare work, which in all comment should be left to the American Association of Engineers, which is already effectively serving the needs of the individual engineer in this way; and (2) Professional activity, for which it seemed necessary to have a new agency formed. This professional activity was advocated for the development of class consciousness of a professional type among engineers, the co-ordination of engineering effort, the accomplishment of publicity needed on behalf of engineers so that others will recognize this professional position, and most of all, encouragement of the engineer in his participation in public service and the politico-economic life of the nation.

Numerous splendid addresses developed important aspects most forcefully, but space permits only a bare recital of the topics and the speakers who thus contributed to the formal program:

"Functions of the Engineer in Public Affairs," Arthur P. Davis, President, American Society of Civil Engineers; Philip N. Moore, War Minerals Relief Commission, Washington, D. C.; and Leroy K. Sherman, President, American Association of Engineers.

Co-operation of the Engineer in State Affairs—"State Registration of Engineers," Theodore L. Condron, Chairman, Committee on License, Engineering Council, Chicago, Ill. Public Highways.—"Federal-Aid Roads," Thomas H. MacDonald, Chief, Bureau of Roads and Rural Engineering, Washington, D. C.; "Economic Value of Good Roads," William D. Uhler, Chief Engineer, Pennsylvania State Highway Department, Harrisburg, Pa.

"Co-operation of the Engineer and the Business Man in Public Affairs," Homer L. Ferguson, President, Newport News Shipbuilding Co., Newport, News, Va.

"Value of Publicity for the Engineer," James H. McGraw, President, McGraw-Hill Publishing Co.

"The Engineer and National Prosperity," George Otis Smith, Director, U. S. Reclamation Service, Washington, D. C.

"Rendering Service," Frederick H. Newell, Professor of Civil Engineering, University of Illinois, Urbana, Ill.

"Co-operation of the Engineer in Local Affairs."—(a) Need of Local Affiliations; (b) Relations of Local Affiliations to Local Government, Civic, Business and Other Welfare Organizations; (c) Duties of Local Affiliations to National Council. Discussion opened by Marshall O. Leighton, Chairman, National Service Committee, Washington, D. C.

"The Executive in Engineering," Samuel M. Vauclain, President, Baldwin Locomotive Works, Philadelphia, Pa.

"Education of the Engineer for Public Service," Robert S. Woodward, President, Carnegie Institution, Washington, D. C.

"Engineering Research and National Progress," James R. Angell, Chairman, National Research Council, Washington, D. C.

Membership is to be by national, local, state or regional organizations or affiliations, either local or state, made up of any of several sorts of subsidiary bodies. Representatives of these will form the American Engineering Council, from which an executive board of thirty will be selected.

The Engineering Council, whose activities will ultimately be superseded by the new organization, is to serve ad interim to bring into real being the new federation.

Four important resolutions adopted were:

1. Urging payment of adequate salaries for the teachers of engineering in technical institutions.

2. Advocating adequate salary for engineering and other technical services to the Government.

3. Endorsing the bill for the creation of a Department of Public Works.

4. Expressing appreciation of the work of the Engineering Council, especially in making effective and operative the plan of organization; and expressing thanks to the Washington Society of Engineers and the Cosmos Club for their courtesy and assistance during the sessions of the conference.

NEWS FROM THE CAPITOL

BY PAUL WOOTON

Will Urge That Assignment of Cars Is Only Available Alternative

THE Interstate Commerce Commission expects to report immediately on the Harding resolution which amounted to a challenge of the commission's right to use assigned cars for railway fuel. Probably the report will claim authority under the previous Supreme Court decision authorizing assigned cars, with the interpretation that the new law applies only to commercial coal and would be impossible of enforcement with respect to railroad coal, as the only alternative to it would be confiscation, which under the law is even less desirable.

Inquiry Into Profits Must Wait Awhile

A RESOLUTION proposed by Senator Harris of Georgia relative to the publication of excess profits in the coal industry passed the Senate and was referred by the House of Representatives to its Ways and Means Committee. This was practically the last legislative act of the session which closed June 5. This resolution provides that the Secretary of the Treasury furnish from income and excess profits tax returns of 1918 the following information for all corporations which earned in excess of 25 per cent of their capital stock: Invested capital, capital stock, net income, taxes, ratio of tax to income, and other items calculated to bring out in detail any large profits either calculated as percentage of net income or percentage upon invested capital. In view of the fact that the House did not act on this matter, no further developments can result until next session.

We Will Soon Know What Coal Is on Hand

IN COMPLIANCE with the request of the Bituminous Coal Commission that it make an immediate inquiry, the Geological Survey has sent out 5,500 inquiries regarding the present stocks of coal and the probable demand existing for bituminous coal. Replies by June 12 from this representative list are expected to develop facts regarding mine production needs for the balance of the year. The inquiry will cover the stocks of anthracite in dealers' hands.

A resolution was presented by Senator Walsh, and accepted by the Senate, requiring the Interstate Commerce Commission to ascertain the following important items:

"(a) What amount of bituminous coal mined in the Pennsylvania and West Virginia fields during the months of March and April, 1920, was dumped over tidewater piers;

"(b) What is the probable amount of the coal mined in these fields that will be shipped to tidewater in the next six months;

"(c) What percentage of the coal dumped at tidewater during March and April was used for foreign bunkers and export cargo;

"(d) From what ports were these exports made and how much from each;

"(e) What percentage of the coal dumped at tidewater in March and April moved coastwise;

"(f) How many railway cars were used in these months to carry the coal which went offshore for foreign bunkers and cargo;

"(g) To what extent has the price of coal for locomotive use on American railroads been raised due to the upbidding of coal prices by foreign buyers;

"(h) To what extent does the eastern coast section of the United States depend on shipments of bituminous coal by water; and

"(i) What is the total tonnage of bituminous coal shipped by water in normal times to supply the necessary requirements of the Eastern coast sections."

Trade Commission Not to Insist On Reports Unless Maynard Injunction Is Vacated

NELSON B. GASKILL, head of the Federal Trade Commission, has notified J. D. A. Morrow, vice-president of the National Coal Association, that the commission will not serve notices of default in filing coal production cost reports against such of the bituminous coal operators as may choose not to file such reports, nor will it proceed by way of mandamus or otherwise to compel such operators to file these reports, unless and until the injunction order issued by Justice Bailey in the Maynard case shall be vacated.

"The commission regards itself as bound by the Maynard decision only to the extent of the order therein issued," Commissioner Gaskill states, "but it believes that it would be unfair to those who stand on the same footing as the Maynard Company, to institute either penalty or mandamus proceedings against them and compel them to elect between additional litigation and the accumulation of penalties dependent upon the final result in the Maynard case."

The statement was made in response to the suggestion of Mr. Harkness, that such an expression on behalf of the commission would relieve a considerable uncertainty which exists among coal operators.

The commission, Mr. Gaskill said, had the hope that the value of these reports and the bulletins which are based thereon would continue to appeal to a sufficient number of the bituminous coal operators and that without regard to the Maynard decision or this expression of purpose to refrain from penalty or mandamus proceedings, the work might go on, the continuity of reports be unbroken and the body of statistics increase rather than diminish.

Doubts Authority of Commission To Forbid Coal Exports

Chairman Clark Recounts Events That Caused Acute Coal Shortage—Seeks Data That Would Justify Preferential Treatment

CHAIRMAN Clark of the Interstate Commerce Commission is not satisfied that the commission has the power to prohibit exports of coal. This and other very important statements are contained in letters written by Mr. Clark to Senator Lodge and to Senator Kellogg.

In that connection a further blow was dealt the embargo proposition by the refusal of the Committee on Interstate and Foreign Commerce of the House to report out a bill forbidding the exportation of coal.

Senator Lodge wrote Commissioner Clark concerning the shortage of coal in New England. In his reply Mr. Clark said:

"There is no disputing the fact that the fuel situation in the country is in a deplorable condition and that the necessities of various localities are most acute.

"In prewar days the New England supply of coal moved largely from tidewater ports such as Hampton Roads, Baltimore and Philadelphia by water. The rates were lower that way than they were all rail. During the war the price of water transportation increased so much that the rail-and-water rates became substantially higher than the all-rail rates. A vigorous effort was made to supply New England, with the result that when the armistice was signed there was an unusually large supply on hand in that section. Shipments immediately fell off to almost nothing. Now there is a serious shortage and every reasonable effort is being made to relieve it.

POWERS CONFERRED BY TRANSPORTATION ACT

"The Transportation Act confers upon the commission broad powers with regard to service and preferential movement. I confess that I am not entirely satisfied that we have power to prohibit export shipments in order to enlarge the domestic supplies unless it can be fairly based upon a transportation emergency. The export coal is what is commonly called spot coal and purchasers of it are bidding far higher prices than underlie the contracts for domestic coal. If export coal is embargoed the spot coal will move to those places where the highest price can be secured.

"We should be very glad indeed to see New England amply supplied with coal and to see that supply moved by water from the tidewater ports, because there is every reason to desire relief from the badly congested conditions of the railroads.

"Largely as a result of the strike in the bituminous coal mines last winter large quantities of coal were moved from the East to the West out of the normal current of traffic and of trade. When the men resumed work under the agreement to abide by the decision of the Bituminous Coal Commission a great deal of this coal that had been sent west to supply imperative needs and avoid suffering and distress was refused by the consignees because cheaper coal could then be purchased nearer at home. This had the effect of very seriously delaying a large number of cars and the railroads have been struggling with the effort to secure relocation of these cars; in other words to get them sent to the Eastern roads, where they are badly needed for fuel movement and where because of car shortage bituminous mines are producing much less than they would otherwise produce.

"The carriers finally decided that they were unable to effect this movement without the support of a service order by the commission. Several days ago we issued such an order and at the present moment large numbers of empty coal cars are moving from Western roads to Eastern roads, frequently in trainloads, and this movement is to continue from day to day until some 30,000 empty coal cars have been so relocated. This ought to improve the situation. I may mention that in like manner we are relocating some 20,000 empty box cars by sending them from Eastern roads to Western roads.

"It is true that we authorized the use of assigned cars for railroad fuel. This is the policy which obtained under a decision of the commission made some twelve years ago, contested by the railroads and sustained by the Supreme Court, until during the war the Railroad Administration set it aside. It rests upon the fundamental principle and fact which none can deny, that the railroad must have fuel or it can serve no one.

DIFFICULTIES NOT UNDERESTIMATED

"I do not underestimate the difficulties of the situation. I am inclined to think that the importance of the volume of movement of export coal is rather exaggerated. Of course, a million tons a month is a large amount when there is an acute shortage but it is only a small percentage of the normal production when the mines are fairly supplied with cars and the miners are at work.

"In addition to the relocation of cars, to which I have referred, we have issued a service order directing the rerouting of freight via open routes when the routes designated in the billing are congested and the freight is unable to move promptly.

"We have organized committees at the more important commercial and railroad centers of the country consisting of an employee of the commission, an official of the railroads and a representative of the shippers. These committees are actively engaged on the ground in doing everything they can do to facilitate the movement of freight and the release of cars, and the situation is being closely and carefully watched under an organization that it prepared to deal from day to day with new conditions or developments.

There is a shortage of equipment due to the fact that during the war period the units of cars acquired did not equal the normal number of retirements. The railroads find it extremely difficult to finance the acquisition of new equipment. We are endeavoring with due regard to business principles to utilize the fund provided for loans to railroads under our certificates in the Transportation Act. We are doing and shall do everything humanly possible to get the highest degree of efficiency out of the available facilities, but under the very best that can be done there will necessarily be inconvenience and a shortage of effective transportation as long as the volume of business offers and until the railroads can get to a more effective basis of operation and secure the construction of additional equipment.

"The switchmen's strike that has been on for a number of weeks has interfered much more with the movement of traffic than the public generally appreciates. Many roads are operating far below normal because of their inability to secure men to perform the switching service. They also are handicapped by inability to get men in their machine shops and car works to make repairs upon equipment.

"Presumably the Railroad Labor Board will in the not distant future hand down decisions on the wage questions that are before it. If they grant substantial increases in wages it is quite probable that more men will be attracted to the railroad service, but there is another side to that and that is that operating expenses of the railroads will be correspondingly increased and their demand for further increase in rates to compensate them for this increased expenditure will not be very welcome to a considerable part of the shipping public. The general sentiment of the country is, I think, in favor of granting the generally increased rates that are necessary under existing conditions. That is evidenced by thousands of expressions that come to us and by the indications that opposition to the proposal will be voiced in the proceedings now in progress before us by only a limited group or number of shippers."

Senator Kellogg's letter dealt with a similar situation in the Northwest. Chairman Clark's reply to Senator Kellogg in part is as follows:

"We are and for some time have been sensible of the situation and of the importance of getting the largest possible quantity of coal up the Lakes during the season of navigation. We have been and are striving in every way to augment the car supply on the Eastern coal carrying roads. There are, however, some conditions on the railroads which are entirely beyond our control. For example, the Pittsburgh & Lake Erie, one of the heaviest coal carrying and producing railroads in western Pennsylvania, has been functioning intermittently and to a fraction of its normal condition for several weeks on account of labor troubles. The same troubles have operated in a lesser degree upon other of these coal carrying roads and at some of the principal Lake ports.

"Several days ago we issued orders for the immediate return from Western roads to Eastern roads by continuous daily movement of about 30,000 empty coal cars. Yesterday instructions were issued to discontinue the use of open-top coal carrying cars for loading automobiles and other commodities that can be shipped in box of other kinds of cars. We are doing everything possible to increase the facilities for the movement of this coal.

"The fuel situation all over the country is acute. The New England interests are, as you know, pressing with equal vigor for movement of coal to New England. We hope to have a marked improvement in the situation promptly and trust that will continue, but, as I have said, we cannot control the labor difficulties. We have organized committees at the more important railroad and commercial centers throughout the country, each consisting of an employee of the commission, a representative of the shippers and a representative of the carriers, to keep actively in touch with the local situation, keep us fully advised and exert every effort for prompt loading, unloading and movement of cars.

"I was told something with regard to the coal situation at the head of the Lakes which seems disturbing and which ought to be cleared up, that is that while there was a great deal of anxiety about the supply of Lake cargo coal and because the season of navigation is wearing away, the usual dealers or puchasers of this coal have so far refrained in large measure from making contracts or placing orders because of their dissatisfaction with the prices which they could obtain. I am wondering if you can get at the truth of this matter and ascertain which of those dealers or purchasers has placed his contracts and orders, with what producing corporations or operators, from what mines, the roads on which those mines are located, and in what quantities. That information will be of substantial help in further consideration of the request for preferential movement."

Inspectorates of Pennsylvania Bituminous Field Are Redistricted

CHIEF SEWARD E. BUTTON of the Pennsylvania Department of Mines has just completed the redistricting of the bituminous mining region of the State.

Owing to the gradual changes that have taken place in the region, by which certain parts of it show increased mining operations, while other parts show a decline, a redistribution of the mines was necessary to the end that the work of the thirty inspectors might be made more equitable as well as more effective.

The bituminous region of Pennsylvania, comprising about 15,000 square miles, is the greatest coal-mining territory in the United States, producing annually about 160,000,000 net tons with an army of approximately 180,000 employees.

The work of redistricting the region and re-arranging the lines of the thirty districts was quite a task, requiring not only engineering and drafting skill but a thorough knowledge of the region and of mining conditions generally. The capability and versatility of the inspection force are evidenced by the fact that a committee of three, selected from their number, accomplished the task in a manner thoroughly satisfactory to the department. With their intimate knowledge of conditions in the different districts they were enabled to accomplish the work within a week without expense to the state, thus saving the necessity of employing engineers and draftsmen for the purpose.

Lake Coal Shipments Increase, but Are Still Below 1919

ON Saturday, May 1, the Lake season was formally opened. Complete figures given by the Geological Survey show that the dumpings of bituminous coal at Lake Erie ports during April amounted to 329,202 net tons, of which 27,630 tons were vessel fuel and 301,572 were cargo coal. Cumulative dumpings up to May 22 were about 1,159,000 tons, as compared with 4,269,000 tons and 4,945,000 tons for the corresponding periods of 1918 and 1919, respectively.

Dumpings of bituminous coal for the first three weeks of May have been as follows:

Week Ended	Cargo Coal	Vessel Fuel	Total Dumped
May 8	243,190	21,931	265,121
May 15	221,775	33,187	254,962
May 22	278,487	31,618	310,105

The total tonnage for the week of May 22 represented an increase over the preceding week, but was barely one-third of that of the corresponding period of last year.

Dumpings during the first three weeks of May, shown in the following table, were only 37 and 33 per cent respectively of those of the corresponding weeks of 1918 and 1919. Vessel fuel is included.

Week Ended	1918	1919	1920
May 8	723,294	718,366	265,121
May 15	796,727	911,309	254,962
May 22	713,126	906,201	310,105
Totals three weeks	2,233,147	2,535,876	830,188

Cokeburg Shaft, Just Sunk Into Coal, Explodes, Causing Death of Six Men

While Engaged in Constructing Airways and Setting Buntons of a New Shaft in the Ellsworth Field a Violent Explosion of Gas Occurred, Throwing Three Men Out of the Shaft and Hurling a Sheave Wheel 900 Yards

AT TWENTY minutes to nine on the morning of June 2 an explosion occurred in the airshaft of the Ontario Gas Coal Co. near Cokeburg, Pa., causing the death of six men. This mine is on the Pigeon Creek branch of the Monongahela Division of the Pennsylvania R.R.

Officials and owners of the Ontario Co. are all Pittsburgh men, and this operation is one of the latest attempts at further development in the so-called Ellsworth Field. The Ontario Co. owns about one thousand six hundred acres of coal of the Pittsburgh bed, which throughout this section averages 5 ft in thickness. To date activity has been confined solely to constructing the surface buildings and to the sinking of the main hoisting and air shafts. H. K. Knopf, of Pittsburgh, has had charge of both sinking operations, which have been under way since last November.

SIX MEN WERE AT WORK IN THE SHAFT

About a week before the accident occurred the coal bed was reached in the airshaft at a depth of 430 ft. The shaft measures 14 x 14½ ft. in inside dimensions and is concrete lined, the walls having a thickness of 16 in. A bucket was used for the hoisting and lowering of the men and materials. The men were employed mainly in driving four arched airways which will connect later with the main aircourses that have been planned. Work at the bottom was confined to the primary stage and when the explosion took place none of the headings had been driven more than 15 ft. from the shaft.

On the morning of June 2 three men were working at the bottom and a like number about half way down. These latter were placing buntons for the support of the stairway. Mines in this district are highly gaseous and the men had been frequently warned against carrying into the shaft either open lights or smoking materials. Especially was this impressed upon them after the coal had been exposed. Superintendent E. J. Hackett had personally cautioned Foreman A. H. Sweeney, one of the victims, not to let any of the men at work in the shaft or at its foot take any chances of this nature.

EXPLOSION BROKE WINDOWS THREE MILES AWAY

The explosion lasted about half a minute, and its force was sufficient to break windows in houses at Ellsworth, which is located some three miles distant. A 30-in. sheave wheel was torn loose from the temporary headframe at the top of the shaft and hurled for a distance of 900 yd. Upon landing this wheel buried itself in the ground past its axle. All six men in the shaft at the time were killed; the three who were working about half way down were ejected as if from the mouth of a cannon.

The following is a list of the victims:—Alva H. Sweeney, Tom Silak, Ignatz Sulitz, Eli Yonish, Charles Johnson (colored) and Steve Moloryski. Silak, Sulitz and Sweeney leave families. All of the men were from Cokeburg with the exception of Johnson, who made his home in Pittsburgh.

H. Klingensmith, who trained the mine-rescue team that won first place in the national contest at Forbes Field, Pittsburgh, last fall, was one of the first to hear of the accident. He immediately enlisted the services of Mark Jones, captain of the team; N. Moore and H. D. Scott to aid him in removing the bodies from the shaft.

In the afternoon J. T. Ryan of the Mine Safety Appliances Co. of Pittsburgh, arrived. He assumed control of the work and placed several trained men at the disposal of the company. It was late in the evening before the last body had been recovered.

It appears that but one conclusion can be drawn as to the cause of the explosion, namely that a large pocket of gas was liberated from the coal at the bottom. While the coal is but 5 ft. in thickness the men were driving a heading 7 ft. in height. A foot of drawslate overlies the coal and an equal thickness of roof coal occurs above this before a firm sandstone roof is encountered. The men at the bottom had been supplied with air through a line running down the shaft.

GAS BELIEVED TO HAVE BEEN LIBERATED

It is believed that much gas had been liberated at the bottom unnoticed by the men there engaged and that the gas in moving up the shaft encountered an open light of some kind held by one of the men placing the buntons.

The bodies of the men recovered from the bottom bore no marks indicating that they had been subjected to the main force of the explosion. All, however, showed evidence of subjection to heat. That the first and most violent explosion probably began about half way up the shaft appears to be the most plausible theory. In such a case the men at the bottom may well have been exposed to much less violence than those in the shaft. They were doubtless either killed by small explosions succeeding the first, in which event they probably met death from flame rather than through concussion, or succumbed to the blackdamp that settled at the bottom.

While the force of the explosion was great, no damage was caused to the buildings on the surface other than the breaking of glass by concussion and some minor damages inflicted upon the power- and boiler-house roofs by falling pieces of timber ejected from the shaft. Around the concrete collar of the shaft some of the effects of the explosive force can be clearly noticed. In many places the concrete wall has been cracked entirely through, and it is apparent that this portion was subjected to the full concussion.

That the gas was ignited from shooting at the bottom does not seem probable. If that had been the cause the bodies of the heading men would have shown to a greater degree than they did the effects of having been in the path of the expanding wave and indeed they might have been thrown out of the shaft altogether as were the bodies of the three men who were nearer the surface.

American Wholesale Coal Association Holds Annual Convention

Maintenance of Prices on a Reasonable Basis Is Keynote of Meeting—Taxes, the Transportation Act, Railroad Rates, Legislation and Wholesaling Are Among the Important Topics Treated Association Adopts a Platform

WITH more than 80 per cent of the eligible membership represented by registered attendants, the American Wholesale Coal Association held its third annual convention June 1, 2 and 3 in Pittsburgh. Not only was the registration excellent, but deep interest was demonstrated by an attendance estimated at more than three hundred at every session. The success of the meeting was assured, as the program included many matters of vital concern to the dealer.

As a keynote to the convention activities Noah H. Swayne, 2d, president of the association, emphasized the importance of price maintenance upon a reasonable basis. He made clear that any wholesaler who advanced his prices beyond a figure that could be convincingly defended was only subtracting from the uiltimate total income of the industry over extended periods.

The business reports of the session were covered by the secretary-treasurer, Mr. G. H. Merryweather, and the managing director, George H. Cushing. From these reports it was easy to realize the extended activities and the large importance to the coal dealer of the problems which have been handled in the Washington offices of the association. Federal regulation, many details of control of coal, transportation tax on exports, the merchandising margin, port embargoes, assigned cars, prepayment of freight on Canadian shipments, and other equally important topics were given their deserved attention in Mr. Cushing's report.

SMOKELESS COAL DEPENDENT UPON CAR SUPPLY

The problems of smokeless coal supply and exports were covered at length by E. J. McVann, secretary of the Smokeless Association. The whole problem was regarded by this speaker as one of transportation, and emphasis was particularly placed on the low car supply of the Norfolk & Western, between 50 and 60 per cent now being normal, instead of the former 100 per cent car deliveries which operators had come to expect from this railroad.

Tax gathering was entertainingly described and the problem of the tax gatherer effectively set forth by C. B. Hurrey, of the U. S. Internal Revenue Bureau. The speaker described in an interesting manner the large increases in taxation and the greatly aggravated problems in all lines of business and expressed sympathetic appreciation of what he now considers "a controlling factor" in business.

Naturally transportation appealed to the wholesalers as one of the most important factors affecting their business. Discussion of the Transportation Act of 1920 by E. J. McVann therefore commanded considerable interest. As a résumé of this act the association has prepared a circular summarizing the salient features of this legislation as it affects coal. This emphasizes, as was effectively pointed out by Mr. McVann, that the Interstate Commerce Commission now dominates the transportation problems in every aspect, with powers far beyond that realized by those who have not thoroughly studied this act. The speaker therefore urged that even greater attention be given to this important subject than it has thus far received by most coal interests.

To make clear the machinery by which legislation is developed in Washington, a discussion was prepared by Mr. George H. Cushing which elucidated the complicated system of congressional law-making. It was particularly emphasized that Congress rarely, if ever, is really responsible for the legislation; the blame or credit usually should go to the small sub-committees or more frequently to the chairman of the committee handling the legislation before it is reported to the houses of Congress.

WARTIME LAWS MAKE GOVERNMENT A TRUST

As a review of the present legal situation, Judge Milton C. Elliott, of Washington, addressed the convention on the subject "The Laws Which Control Private Business." Judge Elliott placed special emphasis upon the tremendous scope of governmental activity which was indispensable to the successful prosecution of the war, but which now leaves us in the hands of what may be characterized as the greatest trust which the world has ever known. The address afforded an excellent résumé by one who is thoroughly conversant with our present economic legislative situation.

William B. Colver, chairman of the Federal Trade Commission, addressed the convention on the subject of "Wholesaling." He developed the analogy of ordinary human relationship to the operations of the common carrier, emphasizing that one may justifiably demand from society in proportion to what he contributes. From this theme he outlined the regulation by the Federal Trade Commission which, in his opinion, should most concern the problems of the dealer interests.

Speaking on the subject of "Association" George D. McElvane, secretary of the National Association of Sheet and Tin Plate Manufacturers, dwelt particularly on open competition as affecting price problems.

TIDEWATER EXCHANGE ACTIVITIES DESCRIBED

The problems and activities of the new Tidewater Coal Exchange were described by Chas. A. Owen, who is chairman of the board of directors of this new organization.

The problems of reconsignment, diversion, and other analogous coal regulations were developed by a symposium in which L. W. McClennan, E. J. DuBois, W. R. Coyle, H. H. Morris and others participated. The importance of this subject has also led to the preparation by the managing director of the association of a comprehensive résumé of rules now in force on these subjects. This has been formulated in a pamphlet entitled "Present Diversion and Reconsignment Rules and Charges on Coal" issued under date of June 1 and distributed to the membership at that time. The resolutions on this subject set forth below make clear the stand of the association in these matters.

The membership of the organization in formulation of its resolutions desired to recognize the continuing importance of reconstruction activity and the combined opportunity and obligation of each industry to clearly develop the part which it proposes to take in these matters. Instead of conventional resolutions, it was therefore decided to adopt a comprehensive platform for the guidance of association activities and effort in the coming year. This took the following form:

We, the members of the American Wholesale Coal Association, in order to effect a reconstruction in our country, establish equality of opportunity and obligation, and retain the common heritage of liberty, do publish and declare this platform to be a true expression of certain of our rights, privileges and obligations as coal men and as Americans.

Repeal of War Laws Necessary to Production

"The powers not delegated to the United States by the Constitution nor prohibited by it to the states are reserved to the states respectively or to the people." (Constitution of the U. S. A.)

The waiver of rights in time of war, done for the common good, should not continue after the victory has been won, and the speediest return to a period of ample production and industrial prosperity is gained, not by new restrictive measures, but by the repeal of those laws which by the violation of sound economic principles have served to stifle and restrict rather than to foster and encourage.

We re-affirm and reiterate the position of the Cleveland convention (1919) that this association opposes any legislation tending to return coal to Federal control.

Specifically, it stands opposed to Senate Bill 4,087 (known as the Frelinghuysen Seasonal Rate Bill) and Senate Bill 4,089 (known as the Frelinghuysen Coal Commissioner Bill) and any other measures of similar purport as tending to return coal presently to Federal control.

While conceding to the railways the right to declare embargoes on account of congestion and for the duration of the congestion only, we insist that all embargo notices shall be so drawn as to restrict shipment to the congested district, and not to discriminate unfairly against any of the shippers who habitually use that terminal or district.

"To the efficiency and the permanency of our Union, a Government for the whole is indispensable. No alliances, however strict, between the members can be an adequate substitute." (Washington's Farewell Address.)

We believe this to be true of our nation and also to be true of our industries. We believe that coal can and will find intelligent and coherent expression when three great national associations, each being truly representative of its part of the coal trade, shall, through delegates properly appointed, meet and discuss all matters affecting the good of the industry and the welfare of our country in its relation to the coal industry, and we authorize the proper officer of this association to appoint, at any time, a committee to meet with similar committees from the other associations, for the purpose of advancing the interest of its members and the good of American industry.

Advocates Financial Help for Railroads

It recognizes that the railways need speedily vast sums of money, both as capital and as revenue, if they are to discharge properly their obligation to supply transportation to industry. It recommends that the railways be put in position to maintain a proper margin between operating cost and revenue.

"But let there be no change by usurpation, for though this in one instance may be the instrument of good, it is the customary weapon by which free governments are destroyed. The precedent must always greatly overbalance in permanent benefit any partial or transient benefit which the usage itself can at any time yield." (Washington's Farewell Address.)

It authorizes the Executive Committee, if at any time in its judgment it deems such action necessary, to assume in the name of the association the defense of any of its members who are prosecuted for alleged infringement of regulations, which in the judgment of the Executive Committee and its counsel are improper, invalid and unconstitutional.

This association is opposed to a further continuance of the theory that the right of contract between buyer and seller is subject to approval of and alteration by administrators.

It re-affirms the action of the Cleveland convention (1919) that the coal industry can never be properly profitable until a separate margin is added to the mine price to cover the cost of wholesale merchandising of coal, and paid to whoever earns it.

It endorses the recommendation of its officers that 8 per cent of the quoted basis should, under present industrial conditions, be considered the minimum wholesale merchandising margin.

This association disapproves of the existence of any necessity for the wholesale seizure of private property on the part of common carriers who happen to be custodians of that property. Should necessity for such seizure, in the opinion of the common carrier, arise in the future, the law existing as of January, 1917, is amply sufficient to determine the right and obligation which exists between the owners of the property on one hand and the common carrier on the other hand.

The association instructs its Executive Committee and other officers to use every proper effort to establish firmly the principle that when coal is confiscated by any transportation company it is taken with the merchants' rights attached.

This association approves the theory of a uniform set of rules regarding the presentation of claims and the settlement of claims between the shippers and the common carrier, and in order to open an intelligent discussion on this subject, it calls upon those officers of the Railroad Administration who are custodians of a certain set of rules covering the presentation of these claims, which rules were carefully drawn up by a joint committee of shippers and railroad claim agents, to publish these rules and to send them with the endorsement of the committee to the Interstate Commerce Commission or the proper tribunal for approval and promulgation.

Recognizes Need of Handling Traffic Problems

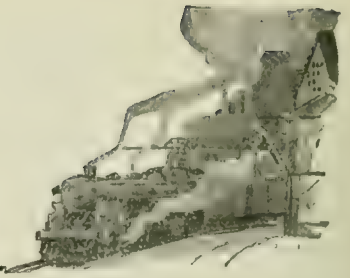
It takes cognizance of suggestions from several local associations that it should undertake to handle traffic questions of importance which need immediate and vigorous attention.

It endorses the recommendation of the Executive Committee that for the immediate future the employees of this association be used to gather all needed information on any national traffic question and that to the Executive Committee be left the employment of such experts as may be necessary to present any formal protest or institute other proceedings.

Having received from its officers a report that, owing to the rules and regulations of the Central Coal Committee and the U. S. Railroad Administration, many coal men were in December, 1919, dangerously near to bankruptcy, and having received from the same officers the report that this disaster was prevented largely by the good offices of W. P. G. Harding, Governor of the Federal Reserve Board, who procured payment to coal men of vast sums of money and other relief, it expresses itself profoundly grateful to Mr. Harding and his associates on the Federal Reserve Board and the War Finance Corporation for their disinterested action and timely helpfulness.

For the coming year the following officers will serve the association; President C. L. Couch, Weaver Coal Co., Buffalo, N. Y.; vice-president, Borden Covel, Northern Coal Co., Boston, Mass.; secretary-treasurer (re-elected), G. H. Merryweather, Waubun Coal Co., Chicago. These three officers, with twenty-five others elected to the Board of Directors, will select from their number the Executive Committee of ten to function for the same period.

Production and the Market



Weekly Review

Car Supply Changes Slightly for the Better—Buyers Make Offer Which Demoralizes Market —Anthracite Trade Featureless—Coke Somewhat Better—Demand Rising That Exporting Cease and Coal Be Reserved for American Factories

SLIGHT improvement in the car situation marked last week's business. The car movement is expected to improve slowly, but prophecy is not safe with so many uncertainties ahead. The Baltimore & Ohio Ry. seems the best equipped of any. It is running about 40 per cent of full strength, but the Pennsylvania R.R. is giving the poorest of car service and Pittsburgh & Lake Erie, if anything, less. Business on Lake Erie has made some improvement and much is needed, for fears are becoming quite acute as to what will happen next winter and even earlier if transportation facilities do not improve. Coal is still being commandeered by the railroads.

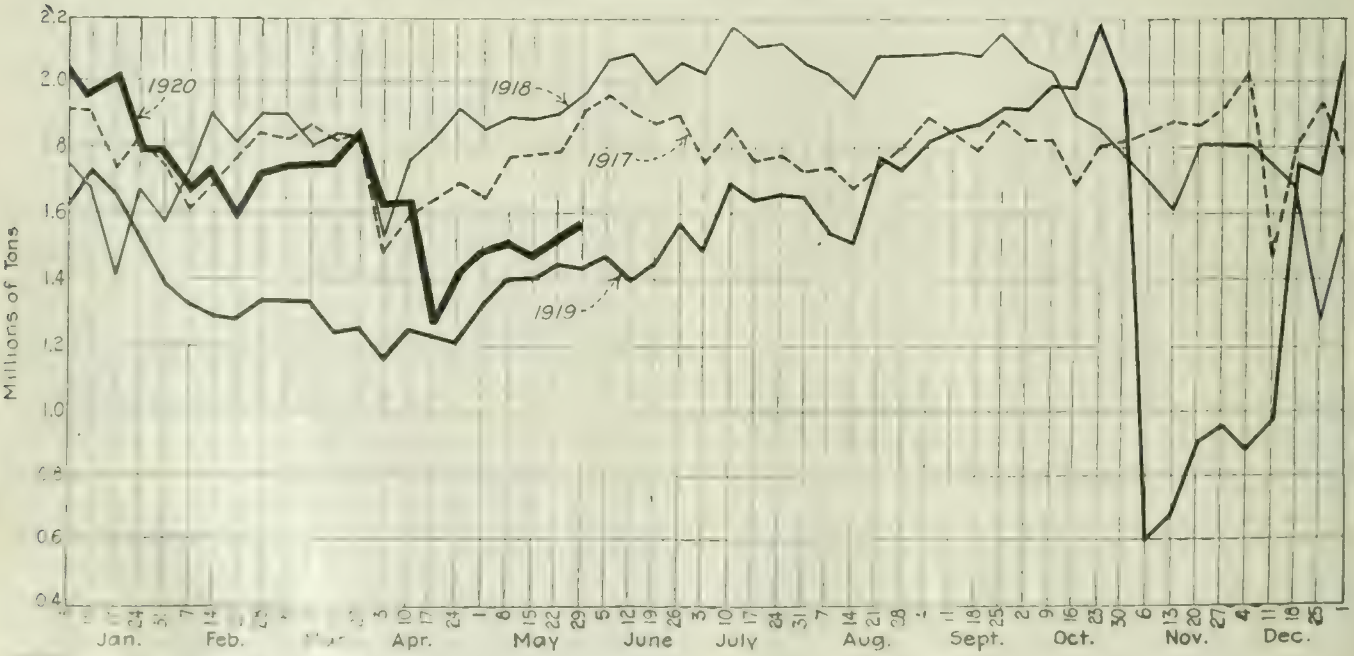
It is usually charged that operators conspire and combine to raise prices. The fact is that whenever prices rise spectacularly it is the buyer who furnishes what advances are made. Last week a firm startled the Pittsburgh market by offering $12.50 f.o.b. for 10,000 tons of coal when spot coal was selling around $8 and $9 per ton and smokeless entering pools 9, 10 and 11 was selling between $9 and $9.25. The effect on prices was distinctly bad. With such offers what chance has the conservative element to keep prices down?

Similarly in the Guyan region an exporting firm has been seeking coal at $9 per ton and it is hard for the producer not to accept what is so strongly urged upon him. There will always tend to be profiteers when there are profit offerers around.

Much feeling exists about the purchase of railroad cars by coal corporations in the southwestern section of West Virginia. It is felt that in a short time, if this is allowed, only millionnaires will be able to operate mines, for without private cars it will be impossible to do business.

Anthracite receipts are, of course, more adequate than bituminous, though in New York the tonnage does not meet with market demands. Philadelphia is better supplied. The coke situation is somewhat cleared and the byproduct ovens are receiving more nearly their requirements. A burning question in New England is whether coal exports shall be forbidden till the United States is supplied.

Average Daily Production of Bituminous Coal*



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*From weekly reports of Geological Survey.

Reports From the Market Centers

New England

BOSTON

No Change Is Noted in Bituminous Situation — Prices Continue Upward Swing — Gateways Are All Open — Trade Discounts Talk of Embargo Against Export—Hampton Roads Dispatch Continues About Normal — Anthracite Is Unchanged.

Bituminous—There are few signs now of any marked change for the better in the steam grades. The pressure to get spot coal continues quite strong and the extent to which railroad seizures continue adds much to the general anxiety. Admittedly, the problem is one of adequate transportation.

Continued light shipments all-rail and a general lack of cars and motive power will throw an increased demand upon the tide-water piers, and it is by no means certain this would have any favorable result.

In every direction there is a buoyant market. In Central Pennsylvania, especially, prices continue their upward swing. The demand is broad enough to take in practically all grades, which share in the most active market seen since August, 1917. In the Fairmont district $9 per net ton has been freely paid for spot shipment.

The Boston & Maine road lifted its embargo on May 29 and for more than a week now all the New England gateways have been open. A somewhat increased tonnage is already in transit.

Much has been said the past week about stopping the export of steam grades. The trade here is not taking any such move with any great seriousness, for it is realized it would not be much more than a quack remedy.

The State of Massachusetts has appropriated $25,000 to re-establish a State Fuel Administration and it is understood that J. J. Storrow will soon take charge. If the same energy could be directed toward curtailing non-essential industries here and elsewhere, it is the judgment of the trade that more good would result.

At Hampton Roads despatch continues about normal. Export prices are still soaring. Those consumers who decided early in the season to take Hampton Roads coals are getting their contract quotas.

Steam grades at wholesale are quoted about as follows:

	Clearfields	Cambrias and Somersets
F.o.b. mines, net tons	$6.75@$8.25	$7.25@$8.50
F.o.b. Philadelphia, gross tons	9.40@10.00	10.00@11.35
F.o.b. New York, gross tons	9.80@10.40	10.40@11.75

Pocahontas and New River are quoted on cars Providence and Boston at from $14 to $14.50 per gross ton for inland delivery.

Anthracite—In domestic sizes there is no material change. Barge movement continues with fair regularity, the aggregate tonnage comparing favorably with that of the last two years. Current receipts are somewhat better.

Notwithstanding the advance in the price of steam sizes, the latter continue in good request. There is so much difficulty this season in arranging for supplies of bituminous, that an increasing number of consumers is considering the use of the buckwheats for at least a portion of their supply. Buyers have learned to discriminate between grades, and fresh-mined rice coal is finding a ready market.

Tidewater

NEW YORK

Demand for Anthracite Is Strong—Receipts Are Below Requirements—Bituminous Situation Is Active—Supply of Coal Does Not Meet General Requirements.

Anthracite—There has been no letup in the demand for coal. Receipts for the week just ended show a slight improvement, but the volume of coal coming to the New York tidewater is still small. The harbor situation continues to be bad.

Production is reported to have recovered slightly. Demand is strong in all sections. Inland dealers between New York tidewater and the mines are said to be well stocked, while embargoes on shipments to New England are in the main removed. The West and Canada are in the market for heavy tonnages.

The market continues to be hazy. Price schedules are tentative and subject to alteration following the award to be made by the anthracite coal commission appointed recently by President Wilson.

Locally the situation is far from normal. Retail dealers are not receiving enough coal to keep all of their equipment busy and are short of stove coal. There is a good demand for the steam coals. Spot quotations at the mine for these sizes range about as follows: Buckwheat, $4.25 to $4.75; rice, $3.25 to $3.50; barley, $1.75 to $2.25.

Current quotations for company coal per gross ton at the mine and f.o.b. tidewater, at the lower ports are as follows:

	Mine	Tidewater
Broken	$5.95–$7.50	$7.80–9.35
Egg	6.35–7.35	8.20–9.20
Stove	6.60–7.70	8.45–9.55
Chestnut	6.70–7.70	8.55–9.55
Pea	5.30–6.75	7.05–7.50
Buckwheat	3.40–4.10	5.15–5.85
Rice	2.75–3.25	4.50–5.00
Barley	2.25–2.50	4.00–4.25
Boiler	2.50	4.25

Bituminous—Little improvement if any can be noted in the situation. Receipts are far below the requirements necessary to meet the demand, causing quotations to go higher. Car supply appears to be the stumbling block to larger production.

There is no great amount of coal at the local docks. Demand is strong at inland points and shippers are placing their tonnages there instead of sending them to tidewater to be held up because of labor troubles.

While there is considerable talk of $8 coal here, the major part of the spot buying is being done around $7.50. The larger portion of production is moving on contract and manufacturers are getting enough coal for their temporary needs.

Quotations heard on spot business at the mines ranged about as follows per net ton: Pools 1, 9 and 71, $8 to $8.25. No. 11, $7.25 to $7.50; No. 18, $7 to $7.25; and Pool 34, $8 to $8.25. Fairmont gas coal was quoted around $8 at the mines. Loaded boats were quoted at from $12.25 to $13.25 alongside within the harbor limits.

Local houses shipping from Southern ports were quoting Pools 1 and 2, (New River and Pocahontas coals) at from $8.50 to $8.75; and Pools 5, 6 and 7, (high-volatile gas, steam and byproduct coals) at from $8 to $8.50.

PHILADELPHIA

Anthracite Prices Increase 10c. for June—Fair Tonnage Coming In—Domestic Demand Continues—Chief Call Is for Stove — Steam Trade Is Quite Active, with Barley Only Slow Size—Bituminous Is Scarcer Than Ever, and Prices Soaring, Even on Slow Buying.

Anthracite—The biggest shipper recently advised the trade of an advance of 10c. a ton on egg, stove, nut and pea. All other sizes were allowed to stand at the previous figures. Soon most of the other producers followed the lead of the big company, a few even putting on more than 10c. The following table notes the comparison between company individual average prices on domestic sizes:

	Egg	Stove	Nut	Pea
Company	$7.30	$7.55	$7.65	$5.85
Individual	8.35	8.60	8.60	6.75

All the shippers continue to notify their trade that the prices as given are subject to withdrawal at any time without notice.

The consumer demand continues unabated and the dealers are receiving a fairly good volume of coal.

On some sizes there is a tendency toward a slight accumulation. This is particularly true of egg and pea coal. Stove coal is in greatest demand which complicates deliveries.

The steam-coal trade is extremely active, especially since the prices of soft coal continue to trend upward. The company price on buckwheat is still $4.10 and contracts are being made at this figure. The independent shippers have no difficulty in getting 25c above that price.

Rice coal is in good call and even barley is strengthening, but has not yet reached the point where it is being taken without an effort on the part of the shippers to move it.

The company prices per gross ton f.o.b. cars mines for line trade and f.o.b. Port Richmond for tide delivery are as follows:

	Line	Tide
Broken	$7 50	$9 35
Egg	7 30	9 45
Stove	7 55	9 40
Nut	7 65	9 50
Pea	5 85	7 45
Buckwheat	4 10	5 15
Rice	3 00	3 90
Boiler	2 50	3 50
Barley	2 25	3 15
Culm	1 50	2 40

Bituminous—Another upward movement is evident in the soft-coal market for spot coal. Recent quotations on steam coal from Pools 10 and 11 have been around $8.75, with no coal offering whatever from Pool 9. Even at the prices quoted the houses were not soliciting business. Gas coals are still higher in price, with most offerings close to $9. Despite these high prices the local demand for coal is not particularly heavy, as the consumers seem to be playing a waiting game.

The textile industry in this district is slowing down which lessens the demand for coal. The strongest call comes from outside territories and sales at even higher figures than those quoted are reported.

It is reported that the large consumers are considering a plan of a general closing down until the coal situation improves. Producers state that the car supply runs from 15 to 20 per cent of their assigned capacity. There is a heavy accumulation of coal at tide, with much delay in loading cargoes on account of labor troubles. A heavy tonnage is being contracted for export.

BALTIMORE

A Feverish Market Marks Soft-Coal Trade — Prices Are Around $9 at Mines — Local Business on Lower Schedule at Times — Hard-Coal Men Resigned, but Consumers Are Restive.

Bituminous—One of the most feverish markets in the history of the soft-coal trade is noted here. At this writing few if any coals can be obtained, either steam of gas, below $8 for lowest grades, while the best coals are gobbled up in most cases around $9 and over f.o.b. mines the net ton.

It is said that as high as $10 a ton at the mines has been paid for coal to make up a ship cargo. With at times close to 40 ships astream here waiting cargoes of coal, some of them under demurrage running into hundreds of dollars a day for weeks at a time, there is small wonder that efforts are being made to get coal aboard at any price.

Local coal men and the railroads entering here are endeavoring to take care of the immediate needs of local plants, and considerable coal has been released at prices far below the reigning market quotations. On the other hand some consumers here have had to pay fancy prices when caught short. In such a market it is almost impossible to set a genuine selling price.

Car supply has improved somewhat, the Baltimore & Ohio reporting a movement generally over 50 per cent and the daily number of cars loaded has jumped over the 3,000 mark on that system. The pier dumping for all the railroads has gone up heavily too, some 800 or more cars being dumped daily at tide, and the general pool handling is more satisfactory.

The official figures for May show a total export coal loading here of 523,251 tons, of which 466,784 tons was cargo and the balance bunker coal.

Anthracite—The appointment of an anthracite commission in Washington merely means to the local hard-coal man that he has a considerable period of waiting ahead before he can do business on anything like an assured basis. Meanwhile he is urging his supply connections to sell as much coal as possible under the schedules now in vogue.

Consumers are urging deliveries and having no assurance as the the price they must pay when delivery is made, they are restive. Receipts here continue comparatively light.

ANTHRACITE PRICES

The following quotations are from a number of prominent anthracite producers for the month of May at the mines:

	Egg	Stove	Chestnut	Pea
Philadelphia & Reading Coal & Iron Co*	$7 20	$7.45	$7.55	$5 75
Lehigh Coal & Navigation Co	7 35	7.70	7 70	6 00
Whitney & Kemmerer	8 25	8 50	8 50	6 50
Markle & Co. (Jeddo)	8 35	8 70	8 70	6 80
Markle & Co (Highland)	8 55	8 80	8 80	6 90
Pardee & Co (Lattimer)	8 25	8 50	8 50	6 50
M. A. Hanna & Co	8 10	8 45	8 45	6 30
Madeira, Hill & Co	8 10	8 45	8 45	6.50
Wentz Co	8 10	8 45	8 45	6 50
Lineaweaver & Co	8 35	8 60	8 60	6.25
Weston, Dodson & Co	8 50	8 50	8 50	6.50

*Prices of The P. & R. C. & I. Co. date from May 11. Prior to that date shipments were billed at former winter circular or 85c. less for egg, stove and nut, and $5 50 for pea.

It will be noticed that the variation runs up to as much as $1.35 on egg. Also with the exception of the Philadelphia & Reading the prices for stove and nut are on a parity. The Reading still maintains a difference of 10c a ton between the two sizes.

It should also be remembered that the above figures are for the gross ton of 2,240 lb. at the mines, although the bulk of the tonnage is sold at retail on the net ton basis of 2,000 pound.

Even in Pennsylvania, where the gross ton is established by legislative enactment, the dealers in many communities retail the coal on the 2,000-lb. basis. In Philadelphia and the surrounding territory for a radius of about 60 miles, coal is billed as so much per ton.

In regard to Pocahontas and New River coal at Hampton Roads, the situation continues remarkably even. Movement is good and enough coal is available at all times to keep the piers busy. Despatch continues normal, few steamers coastwise being detained more than one or two days.

Clearances for New England are still light, the great volume of Hampton Roads coal being moved elsewhere. Only relatively small tonnages are being sold at spot prices, most of these sales being made to piece out cargoes.

At Providence and Boston the regular agencies are charging their trade, even for spot coal, only the contract base price plus the actual charges. The result is a price around $11 on cars, under the conditions quite a moderate figure.

Current quotations on bituminous at wholesale range about as follows:

	Clearfields	Cambrias and Somersets
F.o.b. mines, net tons	$5.25@ $6 25	$6 25@ $7 00
F.o.b. Philadelphia, gross tons	7 75@ 8 90	8 90@ 9 75
F.o.b. New York	8 10@ 9 25	9.25@ 10.00

Pocahontas and New River are quoted at $7.50@-$9 for spot loading, Norfolk and Newport News, Va.

Lake

BUFFALO

Slight Improvement Shown in Bituminous Trade—Fancy Prices Still Hold—Anthracite Movement Is Much Better—Lake Trade Is Active.

Bituminous—The trade does not improve much, though the slightly better movement is much appreciated. It is easy for certain mines to ask enormous prices for their coal. There is no longer any quotable price, for it is just what the consumer can be made to pay. A good many are getting contract coal on the basis of about $3.50 at the mines, some of the larger mining companies being practically tied up to such prices; but the consumer who has no reliable contract and must buy coal on single orders must sometimes pay for it as high as $8 at the mines.

Anthracite—The anthracite movement is much better. Not only is the movement by Lake good, but probably more coal is distributed through the city than usual at this time of the year. The switchmen's strike seems to be mostly a matter of history. The yards are active and trains move, not as freely as they should, but so that business can be done.

Anthracite prices have not settled down to an exact uniformity, but the differences are small, amounting to 15c. or so retail. One leading company gives out the following retail prices: Grate and egg, $11.75; stove and chestnut, $12; pea, $10.40; buckwheat, $9, at the curb, per net ton.

The Lake trade is active, with all shipping agents eager to hurry the coal forward. A late start makes the total look small, the amount to June being 461,121 net tons to 793,202 at the same time last season. May, 1920, ran ahead of the previous May, the amount being 382,500 tons to 370,776 tons in May, 1919.

For the week the shipments were 110,600 tons, of which 42,400 cleared for Duluth and Superior, 28,200 tons for Milwaukee, 27,100 tons for Chicago, 2,900 tons for Green Bay and 1,000 tons for Sheboygan. Freight rates are unofficially 65c. to 70c. to Chicago, 60c. to

Milwaukee, Green Bay, and 55c. to Sheboygan.

Coke—The coke trade is following coal in wild prices, though but little is handled outside of the contracts. Prices asked are on the basis of $20 at the ovens, for either foundry or furnace, the Buffalo freight being $2.60, all per net ton.

CLEVELAND

Transportation and Conditions at Mines Are Slowly Improving—Lake Shipping Pool Is Being Formed to Prevent Distress in the Northwest.

Bituminous—Gradually improving labor conditions on some of the railroads are being reflected in somewhat better mine operations and shipments.

Operations in the No. 8 district continue at between 40 and 45 per cent of normal. Operators report that only scant lots of spot coal are available, for which unheard-of prices are being obtained.

Operators are concentrating upon supplying their contract customers and the Lake trade, but deliveries are far behind. An embargo on all but train loads is still in force on the Baltimore & Ohio, and this situation, due to labor troubles, is helping keep down operations in the No. 8 district.

Pocahontas and Anthracite—The supply of Pocahontas is estimated at about 10 per cent of demand. New orders are being taken subject to ability to get coal. Recently the shipments to dealers have been confiscated in part by the railroads. Anthracite receipts show a slight improvement, but prices remain firm.

Lake Trade—Figures compiled by the Ore & Coal Exchange show that the total of coal loaded at docks for the Northwest to June 1 was 1,639,607 tons, as compared with 4,934,040 tons for the same period one year ago. Plans for effecting a shipping pool arrangement are being speedily rushed to completion. This is considered necessary in order to prevent acute distress in the Northwest. The pooling arrangement is considered to be the only possible hope for a bad situation.

In 1918, when the pool was in effect, less than 8,000 cars daily were required to handle the same amount of coal at the docks as was handled in 1919, when from 14,000 to 15,000 cars were in use. Coal is now coming forward to the docks a little more freely. The supply of bunker coal is short of the demand.

Retail prices of coal per net ton delivered in Cleveland are as follows:

Anthracite — egg, $13.20; grate, $13.20 and $13.50; chestnut and stove, $13.50.

Pocahontas—Shoveled lump, $11.75; and mine-run, $9.25.

Domestic bituminous—West Virginia, splint, $9.50; No. 8 Pittsburgh, $8.75; Millfield, lump, $9.50; and cannel lump, $11.50.

Steam coal—No. 6 and No. 8 slack, $8.25; No. 6 and No. 8 mine-run, $8.25; and No. 8 ¾-in. lump, $8.25 to $8.50.

Inland West

CINCINNATI

Fuel Situation Improves But Little—Prices Continue Firm with Domestic Demand Good—Ohio River Furnishes Best Transportation.

Little improvement in the local fuel situation was noted during the past week. The car supply to the mines continues low but with enough betterment to give hopes to the coal man that a decided improvement is not far off.

Prices continue firm both in the wholesale and retail ends of the trade. Many domestic consumers wait until they can get smokeless coal, but the small industrial user is buying where and what he can get at retail prices.

A good deal of business is being done with buyers from the Lake and Canadian districts who are eager for the best grades of gas coal and in some instances it is reported they have paid as high as $7.25 a ton for anywhere near immediate delivery.

It was generally supposed that with the first of June there was to have been an increase in the price of coal from the retailer, but the change did not occur. The demand from the householder continues good, many orders being taken for delivery during June and July.

It is next to impossible to gage the prices for coal at the mines. The range of prices varies greatly. In some cases as high as $7.25 for best grades is being paid at the mines for spot cars.

The retailers are being favored with continued shipments down the Ohio which highway is still furnishing the one best transport for the local trade.

Retail prices are as follows:

Bituminous lump delivered	$8 00 to $8 25
Bituminous nut delivered	$6 00 to 7 50
Bituminous run-of-mine delivered...	$7 25
Smokeless lump delivered	$9 25
Smokeless run-of-mine delivered	$8 50
Anthracite delivered...	$14 00

COLUMBUS

Reduced Car Supply and Embargoes Hold Up Production—Industrials and Utilities Are Hard Pressed for Fuel—Domestic Trade Is in Bad Shape—Prices Are Advancing.

The Ohio coal trade shows little change from the previous week as far as production is concerned. Reduced car supply and embargoes are holding up both production and shipments, and commercial users are suffering as a consequence. Available tonnage is quickly snatched up and purchasing agents from large users are scouring the country for fuel. Little hope of improvement in the car supply is held out, although it is promised that a better run of cars will be had during July.

Manufacturing concerns in northern Ohio and in Michigan are on short fuel rations and in some cases the plants are on part time. Public service concerns are operating from hand to mouth. State institutions and hospitals are fairly well supplied. But on the whole the steam trade is in a strenuous condition and many industries are on the point of being suspended.

Domestic trade is also in bad shape. Retail stocks are so light and dealers are now booking orders for delivery when the coal is available and at the prices prevailing at that time. Retail prices are increasing as the price at the mines advances.

The usual margin now taken by dealers, over and above the cost at the mine and freight charges, is $2.25 per ton. Pocahontas is quite scarce and little is coming into the Columbus market. Other West Virginian grades are more plentiful although the tonnage is not large. Hocking, Pomeroy and Jackson grades constitute the large part of the coal for domestic purposes.

In general production in Ohio fields is said to be about 45 per cent of normal. For the various fields production is as follows: Eastern Ohio, 42½ per cent; Hocking Valley and Pomeroy Bend, 45 per cent; Jackson, 40 per cent; Cambridge, 35 per cent; Crooksville, 50 per cent.

Prices at the mines of the principal coals used in Ohio are:

Hocking lump	$5 00 to $5 75
Hocking mine-run	5 00 to 5 75
Hocking screenings	4 75 to 5 50
Pomeroy lump	5 25 to 6 25
Pomeroy mine-run	5 00 to 6 00
Pomeroy screenings	5 00 to 5 75
West Virginia splints lump	5 25 to 6 25
West Virginia mine-run	5 00 to 6 00
West Virginia screenings	4 75 to 5 75
Pocahontas lump	6 50 to 7 50
Pocahontas mine-run	6 25 to 7 25
Pocahontas screenings	6 00 to 7 00

MILWAUKEE

Improved Rail Conditions Serve To Make the Coal Situation Somewhat Easier—Anthracite Receipts by Lake Are More Liberal Than Those of Soft Coal—Prices Hold Steady.

The coal situation at Milwaukee has become somewhat easier, due to a better movement by rail, and dealers now talk more hopefully of being able to meet future demands. The supply of anthracite by Lake is more satisfactory than that of soft coal and many consumers are taking advantage of the opportunity to put in their supplies for next winter.

There has been no opportunity thus far to accumulate either hard or soft coal in the yards, as the outward movement keeps about an even pace with receipts. Small dealers are accorded coal quite sparingly and it is difficult for them to meet their orders. The spring price schedule is adhered to, despite the temptation to take advantage of the situation and give prices a lift.

During April and May last year the various dock yards received 162,033 tons of hard coal and 644,010 tons of soft coal by Lake. This year the record of receipts by Lake for the two months show 127,100 tons of anthracite and 154,962 tons of soft coal. The combined loss of coal tonnage for the two months, as against last year, is 523,981 tons.

ST. LOUIS

Conditions Show Improvement, but Car Supply Is Short and Tonnage in Demand — High Prices Prevail — Labor Troubles in All Fields.

This week shows considerable improvement in the matter of transportation, especially in the St. Louis terminals, although conditions are not yet normal.

A few embargoes are still on. Car supply is about 35 per cent, excepting for mines that run on railroad coal and the railroad demand for coal is heavy in all fields, with its usual abuses. The mines that do not load railroad coal do not get many cars and in time lose their organization.

In the Standard field commercial mines get about one and a half to two days a week. The prices in this district are as high as $5 for lump, egg, and screenings, and $4.50 for mine-run. Some of the regular operators hold their prices down to about $3.50@$4.

In the Mt. Olive field conditions are somewhat similar, with the exception that the prices are from about $3@$3.50. The railroad tonnage from both of these fields is heavy.

In the Carterville field mines are idle excepting where railroad coal is being loaded, especially on the Missouri Pacific. Other roads show fairer treatment for commercial loading.

The mine prices in this field are close to about $3.75 for domestic sizes. Here and there some operator disregards contracts and orders and sells on the open market, especially in the Duquoin field, at whatever it will bring.

In St. Louis proper the domestic demand is easy, while the steam requirement exceeds the supply. This condition prevails throughout the country districts, excepting that domestic call is quite good, especially on Carterville, which is not available.

Very little anthracite is coming in and something like 20 cars of smokeless in the past week, with no Arkansas. The coke supply is exhausted here, excepting a little byproduct. There is no change in retail prices.

DETROIT

Movement of Coal Into Detroit Is Curtailed by Deficiency of Transportation — Industrial Plants Are on Quite Short Supply—Soft-Coal Supply Comes from Ohio — Anthracite Situation Is Not Improved.

Bituminous—While the railroads report that coal is coming into Detroit rather more freely, local jobbers and wholesalers are still finding it difficult to provide stock for their customers. The steam-coal situation is apparently somewhat easier than a few weeks ago, though the shortage of transportation facilities continues to prevent movement of anything like a normal volume of shipments into the local market.

Users of steam coal, in most instances, have little more than three or four days' supply ahead, while many of the industrial plants are practically dependent on a hand-to-mouth supply.

Jobbers say there is scarcely any free coal to be found on terminal tracks in and around Detroit. Nearly the entire supply now available is coming from mines in Ohio with a small amount from Illinois and Indiana.

The Ohio coal is quoted at the mines on a short-ton basis at about $5 to $5.25 for lump; $4.75 to $5 for mine-run and about $4.75 for slack. With the present condition of car supply, many of the sizes that formerly found favor with various local consumers are not being produced at the mines, the operators being content to load available cars with mine-run.

Anthracite—No improvement is apparent in the supply of anthracite, delivery of the stock in Detroit being long deferred and uncertain. Meantime orders are accumulating on the books of the retailers and household consumers are complaining at their inability to obtain coal ordered for delivery in April and May. Uncertainty concerning prices adds to the unsatisfactory aspect of the situation.

Lake Trade—Coal for movement to the northwest is arriving at Lake loading docks in somewhat larger quantity, though the supply is still restricted by shortage of railroad facilities. Many of the carriers are obliged to make the upbound trip for ore, without cargo and in numerous instances considerable difficulty has been experienced in getting coal enough to fuel the ships.

South

LOUISVILLE

Market Advances Steadily, with Gas and Domestic Fuel in Strong Demand—Car Supply Improves Little—Local Domestic Stocking Is Light.

Prices continue advancing steadily at the Kentucky mines, with Western Kentucky showing an especially strong market on account of heavy buying from the Chicago, and Northwestern district. Gas coal from Eastern Kentucky is in quite strong demand, and production is far short of requirements..

Production of block coal continues light in view of the strong market that has been experienced for mine-run gas coals. Other than gas coals are meeting with a strong demand in domestic sizes, although non-gas steam coal is not quite so actively sought after as other grades.

Retailers report that business is practically at a standstill as the public is not stocking on the present market, and is waiting for steam and gas stocks to be filled, and for a production increase to force lower prices.

There has been little improvement in car supply, although transportation for May has been slightly over 40 per cent, which is better than conditions in April.

All Eastern Kentucky lump coal is now quoted at around $7.50 to $8 a ton, while mine-run gas coal is quoted at $8, some being bought at around $7.75. Screenings from gas coal are quoted at around $7.25. Non-gas coal from the same district is quoted at $7.50@$8; mine-run, $7@$7.25 and screenings, $5.50@$6. Western Kentucky lump is selling at $5.25@$5.50 at mine; mine-run, $5@$5.25; screenings, $4.25@$4.50.

BIRMINGHAM

Car Supply Is Poorer Than for Previous Week—Some Public Utilities Face Shutdown—Little Spot Coal Is Obtainable.

The activity of the trade in the Birmingham section is regulated entirely by the supply of cars available for the mines; the percentage of equipment furnished the past week has been lower than for the previous period.

The Louisville & Nashville furnished from 33⅓ to 40 per cent of the equipment needed, the Southern Ry. about 50 per cent and the Frisco road approximately 75 per cent. This condition disrupted working schedules at the mines and seriously affected production.

Very little fuel is to be had in the spot market. Inquiries from abroad continue to be received for heavy requirements. Considerable bunkerage coal is moving by rail and water to Pensacola, Mobile and New Orleans. Quotations on mine-run coal are as follows per net ton f.o.b. mines:

Black Creek	$4.00@4.50
Cahaba	4.00@4.50
Big Seam	2.95@3.50
Nickel Plate	3.35@3.50
Carbon Hill	3.50@4.00

Domestic prices are as follows, f.o.b. mines for lump sizes:

Big Seam	3.50@3.75
Cahaba	4.70@6.00
Black Creek	4.70@5.00
Carbon Hill	3.70@3.95
Montevallo	7.30
Corona	5.65

West

SAN FRANCISCO

Many Steamships Bunkered Here—Coal and Bunkering Facilities Satisfactory.

Steamships coming here in good numbers are bunkered by the King Coal Co. with fuel shipped from Utah. Some of the vessels are from the Atlantic, some from South American ports, and others from the Orient. These steamships are in addition to the cargo carriers that steam from this port to every part of the globe.

The big craft come here for fuel on account of the satisfactory quality of the coal, and state that no other variety of fuel is obtainable here which is as high in heat units as the Utah product; also by reason of the expeditious manner in which they are bunkered. In other years the vessels either called at Honolulu or used up valuable space in carrying extra coal.

The bituminous prices, f.o.b., mines, wholesale, Utah and Wyoming, per net ton, are as follows: Stove and lump, $4. The bunker price is $13.55.

News From the Coal Fields

Northern Appalachian

FAIRMONT

Poor Production Is Due to Dearth of Cars and Absence of Men from the Mines — Output One-Third of Capacity—Tidewater Is Embargoed Again—P. & L. E. Begins To Move Coal.

Production was as poor in the Fairmont and other northern West Virginia fields during the final working period of May as it had been at any time during the entire month, a dearth of cars being the principal factor in curtailing production. On Tuesday, May 25, many miners absented themselves from the mines in order to be at the polls so that comparatively little coal was produced.

For the first few days of the week, there was a better run of cars on the Monongahela R.R. than usual, but toward the end of the week the supply dwindled to quite material extent. The number of mines idle on the Monongah division of the Baltimore & Ohio during the last three days of the week averaged about 100 or more per day. Taking the week as a whole, northern West Virginia mines were not receiving more than enough cars to enable them to work more than 35 per cent of potential capacity.

Curtis Bay was under its periodical embargo again so that tidewater shipments were more or less limited; the embargo resulting from heavy shipments to tidewater during the week ended May 22.

Despite the tidewater embargo most northern West Virginia coal was being shipped to eastern markets, Lake shipments showing no material increase in volume over previous weeks.

It was possible to ship more cars over the Monongahela road in the last week of May than during the previous week, owing to the fact that the Pittsburgh & Lake Erie had begun to move coal from Brownsville for the first time in a month and a half.

Between privately owned cars and assigned cars, mines in northern West Virginia found it impossible to ship much commercial fuel during the last week of the month, the railroads securing the bulk of production for their own use.

PITTSBURGH

Better Car Supplies Are Promised—Spot Market Offerings Are Light.

According to estimates made in Pittsburgh coal circles, compliance with last week's instructions of the Car Service Commission to the railroads, in the matter of furnishing coal cars, would result in an increase of at least one-third in the number of cars furnished the mines in this district. Car supplies had been running at about 37 per cent of full quotas, while the order calls for priority up to 50 per cent.; cars beyond that amount were to be furnished to other industries up to 50 per cent., any surplus that might then be left being applicable to coal.

Pittsburgh coal operators were somewhat irritated by some of the statements made at last week's convention here of the American Wholesale Coal Association, particularly the statement that since coal is being produced in the United States at the rate of 9,500,000 tons weekly and the current requirements are 8,000,000 tons then there is a surplus of production. The correctness of both figures is denied, while it is pointed out that coal is largely a local matter; coal may be extremely scarce in the Pittsburgh district, while it may be plentiful at some Southern or Western points.

It is plain that quite small quantities of coal are being offered in the Pittsburgh market, with buyers, both on the part of industries and exporters, ready to pay more than $7 to get coal. If the limited offerings are due to producers shipping large tonnages on contracts, then the operators involved cannot be blamed, as the contract shipments realize very much less than the spot market. Market prices for spot shipment range within the limits of $7 and $8 per net ton at mine, Pittsburgh district, for mine-run.

CONNELLSVILLE

Car Supplies Improve Slowly—Coke Reaches Furnaces and Coal Is Supplied to Byproduct Ovens—Negotiations Are Beginning on Furnace—Coke Contracts

Car supplies in the Connellsville region have continued to increase, though at a decidedly slow rate. In the delivery of coke there is a greater improvement, as much coke that has been stalled en route for a long time is now reaching the blast furnaces.

While this clearing of the tracks represents in itself only a temporary gain to the furnaces, it of course releases cars which, if returned promptly to the region, will increase the supplies further. The Pennsylvania and Baltimore & Ohio are now functioning almost normal, as regards the Connellsville region, while the Pittsburgh & Lake Erie is doing better, particularly in the movement of solid train loads.

There has been a distinct improvement in supplies of coal to the byproduct ovens, particularly those in the Mahoning and Shenango valleys, and the increase in byproduct coke manufacture in the past three or four weeks is probably greater than the increase in the Connellsville region.

Taking the blast furnaces of the country as a whole, they are now operating at the rate of about 37,000,000 gross tons of pig iron a year, against a 40,000,000-ton rate in March and a rate of less than 30,000,000 tons when the rail strike was as its worst.

Offerings of Connellsville coke for spot shipment continue quite light, so light that former prices are easily maintained even though many consumers prefer to do without rather than pay such prices. The market is quotable at $15 spot furnace and $16 for spot foundry coke.

Estimates of Production

FROM THE WEEKLY REPORT OF THE GEOLOGICAL SURVEY

BITUMINOUS COAL

	1920		1919 (a)	
	Week	Calendar Year to Date	Week	Calendar Year to Date
May 15	8,764,000	193,111,000	8,430,000	158,415,000
Daily average	1,461,000	1,660,000	1,406,000	1,362,000
May 22	9,252,000	202,363,000	8,724,000	167,139,000
Daily average	1,542,000	1,655,000	1,454,000	1,367,000
May 29	9,425,000	211,789,000	7,938,000	175,077,000
Daily average	1,571,000	1,651,000	1,498,000	1,365,000

ANTHRACITE

	1920		1919 (a)	
	Week	Calendar Year to Date	Week	Calendar Year to Date
May 15.	1,726,000	31,256,000	1,751,000	28,678,000
May 22.	1,797,000	33,053,000	1,673,000	30,351,000
May 29	1,830,000	34,883,000	1,298,000	31,649,000

BEEHIVE COKE

United States Total

Week Ended				
May 29 1920	May 22 1920(b)	May 31 1919	1920 to Date	1919 to Date
428,000	415,000	256,000	8,937,000	8,382,000

(a) Less than one day's production during New Year's week to equalize number of days covered for the two years. (b) Revised from last report. (c) Subject to revision.

(All figures in net tons)

Negotiations on furnace-coke contracts for the second half of the year are being resumed, but in very reserved manner, neither bids nor offers having yet been made. It is a question whether most of the business will be done at flat prices or on a ratio basis, relative to the current price of basic pig iron at valley furnaces. Some operators have intimated that they might be willing to do business on a 4-to-1 basis, which would make nearly $11 for coke at the present quotation of $43.50 for pig iron. Some other operators, having in mind the possibility of a decline in pig iron, would prefer to close at a flat price of $10. In foundry coke there is a little inquiry on contract, but not much.

The market is quotable at $15 for spot furnace, $16 for spot foundry and $11@$12 for contract foundry, per net ton at ovens.

The *Courier* reports production in the Connellsville and Lower Connellsville region in the week ended May 22 at 185,728 tons, an increase of 7,478 tons. Before the rail strike production was running at about 245,000 tons weekly.

Middle Appalachian

POCAHONTAS AND TUG RIVER

Better Car Supply from the West Permits Larger Production at N. & W. Mines—Increased Shipments Go to the Lakes and West—Congestion Continues at Tide.

An impetus was given to production in the smokeless fields of southern West Virginia on the Norfolk & Western at the end of May by virtue of a somewhat better car supply, the improvement being due to a larger run of cars from Western territory. Because of the larger number of cars from the West, it was not necessary to use empties returned from tidewater and other eastern terminals for all the fields on the Norfolk & Western. The western supply was used largely for Tug River territory.

While tidewater terminals were securing by far the larger part of the smokeless product originating on the N. & W., yet there was a growing volume of smokeless moving westward. A part of the west-bound shipments was destined for Lake dumping.

Improvement from a production standpoint was more noticeable in the Tug River field, in the week ended May 29, than in the neighboring Pocahontas field, chiefly because of the increased number of cars from the West, Tug River mines usually depending on the western supply.

While there was greater regularity in work at the mines, still Tug River plants were not producing more than 50 per cent of potential capacity. However, with larger loadings it was possible to increase western shipments and especially Lake consignments, without in any way decreasing tidewater and Inland East shipments. Prices at tidewater markets remained about on the same level.

Production losses far outstripped the output of the Pocahontas field at the end of May and conditions were not as satisfactory as they might have been. Production was much below 50 per cent. There was coked in the Pocahontas field 11,863 tons of coal.

A return to normal conditions at some of the western points of interchange was reflected in an increased western movement of Pocahontas coal. Continued congestion at tidewater impeded to some extent the return of equipment from the seaboard.

LOGAN AND THACKER

Transportation Situation Is Serious in the Logan Field—Logan Coal Will Go West When Cars Are Returned from That Section—Thacker Mines Are Shut Down by Labor Agitation.

No headway was made by the mines of the Logan field in increasing the amount of coal mined during the final working period of May, production still being under 140,000 tons. The situation in the Logan field was serious from a transportation standpoint, the limited supply of cars from the West being a large factor in reducing production here. It was believed however that the first week of June might bring some relief in the way of more coal cars delivered to eastern lines.

No relief during the latter part of May had been obtained from the efforts of the Interstate Commerce Commission. Little increase in production may be looked for until more Western cars are received; nor is it likely that there will be much Logan coal shipped westward until there is some assurance that cars will be returned for re-loading. On the other hand Lake shipments from the field did appear to be on the increase.

Virtually the entire output of the Guyan mines found its way to tidewater during the entire month of May, partly because of transportation conditions described and partly because of higher prices prevailing at the seaboard.

Between a car shortage and labor agitation in the Thacker field in the last week of May, there was a heavy production loss, there being fully a 35 per cent loss from a shortage of cars, or in the neighborhood of 85,000 tons. Many mines had been shut down as a result of labor trouble, now impending.

The output of the field as a whole was not much above 40 per cent during the final week of May. Organizers and agitators are even dictating to new companies just preparing to begin operations as well as to established companies, and the prospect for a large output in the Thacker field is not bright.

Nearly the entire output is being shipped to tidewater although there has been a slight growth in Lake shipments and in shipments to the Inland West.

NEW RIVER AND WINDING GULF

Production of Gulf Mines Is Seriously Curtailed by Virginian Ry. Strike—Idleness Is Also Quite General at C. & O. Mines Throughout the New River Field.

New River and Winding Gulf production was cut down to quite a material extent in the final week of May not only by a car shortage on both the Virginian and Chesapeake & Ohio railroads but also by other causes.

When Sewell's Point (the tidewater pier of the Virginian Ry.) became affected by the railroad strike at Princeton, W. Va., production on the Virginian was brought almost to a standstill.

The little coal which was shipped over the Virginian found its way to tidewater. The new Sewell's Point Coal Exchange was put in commission on June 1 and it was believed that this exchange would prove quite beneficial in making increased dumpings possible.

While there was no strike on the Chesapeake & Ohio, yet mines on that road had a poor car supply throughout the week; absence of a number of miners from work on election day also affected production to some extent.

Idleness was quite general in the New River field throughout the last week of May. Insofar as the limited production permitted, tidewater consignments were heavy, so heavy in fact that no New River coal remained for Inland Western markets and for the Lakes. Little effort was made, however, to send much coal westward, owing to the difficulty in getting cars back into West Virginia for reshipment.

Coke shipments to Western markets were much larger than coal shipments. Prices offered for New River smokeless at tidewater were from $7 and upward.

VIRGINIA

Mines Produce Half of Capacity—Cars Are Held Due to Overloading — Coal Goes to Tide.

Car shortages forced production downward in the Virginia fields during the last week of May to an appreciable extent, the output amounting to only a little over 104,000 tons; on the other hand lack of cars had entailed a loss reaching 72,000 tons.

With car-shortage losses running so high, mines were unable to produce as much as half of potential capacity, car shortage losses alone accounting for a 51 per cent loss. Labor-shortage and car-shortage losses combined amounted to about 80,000 tons; a shortage of man power entailing a loss of 7,300 tons.

From the figures given it will be apparent that there had been no increase in the supply of empties as a result of the Interstate Commerce Commission's transportation order. In order to take advantage of the scant supply, all cars were loaded to the utmost. That resulted in a number of instances, however, in cars being held for overloading, shipments in consequence being somewhat impeded.

NORTHEAST KENTUCKY

Output Is About 45 Per Cent for the Field—Lake Shipments Show a Gain—Demand for Steam and Byproduct Coal Is Unusually Strong.

Out of a potential capacity of 300,540 tons, only 136,650 tons were produced, during the week ended May 29, in the Northeast Kentucky field; the gross loss being 163,890 tons or 55 per cent. A loss of 159,725 tons was directly attributable to a scarcity of cars.

Although it was possible to produce little more coal than had been the case during the previous week, nevertheless there was a further gain in Lake shipments; one-fourth of the output being sent to the Lakes during the week mentioned. The tonnage to the Lakes was increased still more at the beginning of June, approximately one-third flowing to the Lakes during the first day or two of June.

Little screened or lump coal was being handled, most of the output being mine-run, inasmuch as this grade of coal commanded about as high a price as special sizes. There was little demand for domestic fuel, but on the other hand the call for steam and byproduct coal was running unusually strong.

KANAWHA

Slight Increase in Cars Does Not Swell Production—Output Is About 40 Per Cent on C. & O.—Continued Shortage of Equipment from Western Connections.

There was a slight increase in the number of cars available at mines in the Kanawha field during the final week of May, but production was less than it had been in the preceding week, because on May 25—primary election day—most of the miners went to the polls. During the week in question there was a total output of less than 90,000 tons at the mines in the field supplied by the Chesapeake & Ohio.

Production was not more than 35 or 40 per cent of normal, except at mines served by the Kanawha & Michigan road, the increased number of empties at such mines being due them because of a previous existing deficit.

The continued shortage of equipment in the field was largely due to the small number of cars received from western connections. While there appeared to be a somewhat larger Lake movement, still far below that of the corresponding period for previous years, shipments in general to Western markets were limited because of embargoes on certain roads in Ohio and Indiana.

Middle Western

SOUTHERN ILLINOIS

Record Time Made in Reconstructing Mine No. 18—Car Supply Is Still at a Standstill—Sunnyside Mine Resumes Operation.

The work of rebuilding the engine and generator rooms at mine No. 18, of the By-Products Coke Co., located at West Frankfort, is progressing rapidly and Superintendent W. B. Ward has announced that a resumption of mine operation can be expected shortly. The fire caused much damage, practically destroying the engine room, the generator room and several smaller adjacent buildings.

With slight repairs the generators and hoisting engines will be almost as good as new. Brick masons and workmen from the entire surrounding community were at once put to work on the reconstruction work. The damage done was estimated at over $150,000.

The car supply in southern Illinois is still at a standstill with no prospect of a change in sight. With the exception of a few mines in Saline County, near Harrisburg, there is not a single mine averaging over 16 to 20 hours per week, actual working time.

The mines at Sesser and Valier in Franklin County had been getting a little the best of the argument in car supply, but they too fell back with the rest during the month of May. The mines in Saline County, which are mostly controlled by the O'Gara Coal Co., of Chicago, are getting four days and better per week.

Operations at the Sunnyside mine, near Herrin, have been resumed after a shutdown of several months. The tipple has not yet been completed, however it is in such a state as to permit the hoisting of coal. The fire destroyed the washhouse, tipple and other buildings around the plant.

Another large deal has been under negotiation near Zeigler, east of here. whereby the W. P. Rend Coal Co., of Chicago, proposed a trade with the Zeigler Coal Co., of Zeigler, for ten sections of land in Franklin county owned by the Rend people, for nine sections of land in Williamson owned by the Zeigler Coal Co.

Canada

VANCOUVER ISLAND

Important Coal Development on Vancouver Island Noted—Pacific Coast Coal Mines, Ltd., Will Spend $500,000 on Its Morden and Suquash Plants—Big Tracts of Coal Held by the Company.

Recently on assuming the position of general superintendent of the Pacific Coast Coal Mines, Ltd., George Wilkinson, late Chief Inspector of Mines for British Columbia, announced that his company had adopted a plan for the development of its Vancouver Island coal properties that will mean the expenditure immediately of some $500,000.

Already the company has invested over $2,000,000 in the opening up of its Morden Mine which is to develop 1,600 acres of coal land, underlaid by the Douglas, Newcastle and Wellington seams. The plant is thoroughly modern; the pit head and screening plant being constructed of steel and reinforced concrete.

It is about five miles from the mine to the shipping point at Boat Harbor, transportation being furnished by a standard gage railway. At Boat Harbor bunkers have been erected with a capacity of 5,000 tons and washing plants also have been installed. The loading is done by a conveyor of a capacity of 750 tons an hour.

The Morden mine now is producing about 400 tons of coal a day and it is expected that the daily output will reach 1,000 tons by the end of the year. It is estimated that the area held by the company at this point will yield 250,000 tons a year for 90 years.

The Suquash holdings of the Pacific Coast Coal Mines, Ltd., are situated on the east coast of Vancouver Island, about 200 miles north of Nanaimo. The coal field there is one of the largest undeveloped proved areas on the Pacific coast and the Pacific company owns some 10,000 acres of these lands.

Three workable seams have been located at a moderate depth. The mine workings on the second seam now are developed to a point where from 300 to 400 tons daily can be produced, when a second opening is made and permanent shipping facilities are provided. If the coal seams run as evenly and consistently over the whole area, as indicated by drilling and other development on a portion of the property, then the company will have sufficient coal here to yield 500,000 tons a year for 264 years.

The Suquash mine was closed down with the beginning of the war, but it is the intention of the company to resume operations here without delay. A modern plant will be installed.

NICOLA-PRINCETON COAL FIELD

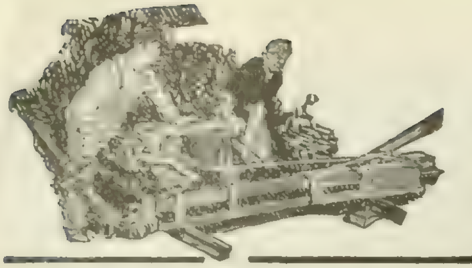
Considerable New Development Is Planned—Coalmont Collieries, Ltd., Will Construct Branch Line to Market Larger Output.

The Nicola-Princeton coal field of British Columbia has been attracting attention of late and responsible parties report that there is to be considerable new development in this section. The Harvard Coal Co., of Princeton, recently sold some of its product in Spokane, Wash., and it is said to have given satisfaction.

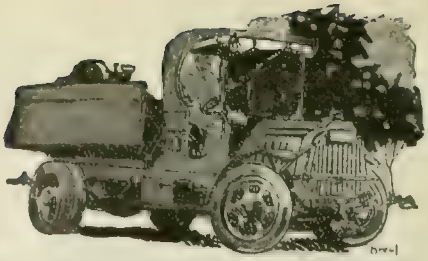
The property of the Coalmont Colieries, Ltd., also is to be extensively developed, a bond issue of $600,000 having been floated among Vancouver City and Calgary citizens to finance the undertaking.

A tramway is to be constructed for a distance of 2½ miles between the Kettle Valley Ry. and the mine shaft, and quarters will be provided for officials and men at the mine.

This work will be prosecuted with vigor during the summer, to the end that transportation facilities may be available to permit a much larger production than at present. This coal is to be marketed at Vancouver and elsewhere next winter.



Mine and Company News



ILLINOIS

Harrisburg—The officers and employees of the O'Gara Coal Co. had a get-acquainted meeting and general conference at the company's offices in Harrisburg, Saline County, Ill., recently. Among the officials present were vice president Frank A. Manley; D. B. McGehee, assistant to the vice president, of Chicago; General Superintendent, Ralph Brown and all the superintendents of the company's various mines in Saline County. This was the first of a series of such meetings to be held at stated intervals in the future.

Announcement has been made that O'Gara mine No. 12, near Harrisburg, which has been shut down for some time to have extensive repairs made, will resume operations as soon as a sufficient supply of cars can be secured. The improvements included concreting the shaft, overhauling the mine cars, building a new cage, improving the blacksmith shop and installing new shakers and screens.

INDIANA

Indianapolis—Governor Goodrich of Indiana and members of the state purchasing committee recently discussed the possibility of the state buying a coal mine, from which it could produce, partly by prison labor, the 150,000 tons of coal needed each year by the state penal and benevolent institutions. No decision was reached, but it is known that the governor is giving the matter some consideration. It was stated that officials of the United Mine Workers of America will fight the movement.

NEW YORK

New York—Andrade-Eyre, Inc., has been organized to carry on an export trade in coal and coke. The officers are C. Andrade, Jr., president; T. Lawrence Eyre, vice-president and Wallace D. Eyre, secretary-treasurer. Mr. Andrade until recently was treasurer of the Matlack Coal & Iron Corporation and is the president of the Wholesale Coal Trade Association of New York. He is also chairman of the Committee on Shipping of the American Manufacturers' Association and is prominently identified with the National Coal Association.

Mr. Eyre, the vice-president of the new corporation, is a state senator in Pennsylvania and is well known in the Central Pennsylvania Bituminous field. Wallace D. Eyre is the son of Senator Eyre and has been associated with his father in the management of the Eyre Fuel Co. He will continue with the latter company. The offices of the new company which will specialize in the coal export business are located at 80 Broadway, New York City.

OHIO

Pomeroy—The largest deal occurring in the Pomeroy Bend field was consummated recently when the Ebersbach interests of this city disposed of their big coal and mining properties to the Great Lakes Mining Co., which has large dock facilities and boats on the Lakes.

The deal includes all the coal holdings of the Martin Ebersbach Co. and Peacock Coal Co., together with all the mining equipment and power plants used in connection therewith.

In the properties sold is included the leases on the Charter Oak and Rolling Mill mines containing about 500 acres of coal, the Forrest Run and Dark Hollow mines containing about 2,000 acres of coal, together with about 600 acres of land where their big Forrest Run power plant is located and the Peacock Coal works located at Syracuse in connection with which there is about 4,000 acres of valuable coal land.

The consideration is stated to be not less than $2,500,000, with one-third of the amount cash in hand.

PENNSYLVANIA

Pittsburgh—The Westmoreland Coal Co., of Philadelphia, Pa., is preparing to install a revolving dump, conveying machinery and other improvements at its Export mine at Export, Westmoreland County, Pa. This is one of the largest mines in the Irwin gas-coal basin. A. J. Cameron, of Irwin, Pa., is general superintendent of the company.

Uniontown—George Whyel purchased the plant of the Superior Connellsville Coal Co., including 330 acres of Pittsburgh seam coal in Luzerne Township, Fayette County. He also obtained options for 180 additional adjoining acres. The plant will be electrified and 25 houses erected for workmen. Mr. Whyel paid $1,175,000 for the Superior holdings; and options on the 180 acres, known as the Porter and West tracts, will be exercised for $350,000. Electrification of the plant and the erection of the workmen's houses will mean an additional expenditure of $100,000, making the entire property a total investment of $1,625,000 by Mr. Whyel. The plant is between Uniontown and Brownsville on the Monongahela R. R. Mr. Whyel is a member of the Whyel Coal & Coke Co., of Uniontown, operating in Fayette and Westmoreland counties.

Johnstown—The Guaranty Coal Co., of Butler, Pa., has passed into the control of Messrs. R. T. Marsh, A. E. Koehler and Wm. Murphy, of Windber, Pa., and Wm. Morley, of this city. The Guaranty company is a Pennsylvania corporation with a capital stock of $80,000 and controls two seams of coal on 630 acres located near Worthington, Armstrong County. It is served with a 12-car siding on the Buffalo, Rochester & Pittsburgh R. R. The company, under its new management, contemplates extensive improvements and additional development.

VIRGINIA

Dante—The Clinchfield Coal Corporation is completing arrangements for extensive enlargements and improvements at its local mining properties. It is proposed to equip completely two additional plants; considerable machinery and equipment will be installed, including shaker screens, conveyors, picking tables, loading booms, etc., as well as the construction of a new tipple. The improvements will cost about $150,000.

WEST VIRGINIA

Bluefield—One of the large deals recently consummated in southern West Virginia was that involving the purchase by the Pocahontas Fuel Co., one of the largest producing companies in the state, of all the holdings of the Pulaski Iron Co. which has also been operating on a large scale. The Pulaski company only a short time ago acquired the holdings of the Shawnee company in McDowell County. The purchase includes the Shawnee and Pulaski collieries, the furnaces and iron properties at Pulaski and elsewhere, as well as the undeveloped Boutier tract.

Wheeling—Arrangements have been completed by the Bethlehem Steel Co. for the purchase of all the surplus coal produced in the West Virginia mines of the Monongahela Traction Co. The agreement provides for the delivery to the steel company of approximately 7,500 tons of coal monthly. The mines of the company are located in the Fairmont field, Monongalia, Marion, and Harrison counties. The same company is also securing the entire output of the Consolidation Coal Co. mines on Helens Run and on the Bingamon branch of the Western Maryland. From reliable sources it is learned that the Bethlehem company proposes to increase the capacity of one of its Penn Mary mines in Preston County to 15,000 tons a day which, if true, will make it the largest producing coal mine in the world.

Stockholders of the Glendale Coal & Gas Co., including Davis Thomas, Judge John Nichols, J. H. Anderson, John Bentley, C. W. Hill and others, have perfected plans for the organization of the Reymann Farm Coal Co., and arrangements are now being made for immediate development of coal property in the vicinity of Elm Grove. Machinery and equipment will be installed.

Maybeury—The Norfolk-Angle colliery is understood to be considering plans for the rebuilding of its tipple and washery recently destroyed by fire, with a loss estimated at about $200,000.

Beckley—The High Knob Coal Co. and the Bacontown Coal Co., of the Winding Gulf field, have been purchased by John W. Wilson, of Wyco, W. Va., and J. B. Clifton, of Beckley, from C. M. Lilly and associates. The Bacontown company has 700 acres of smokeless coal land under lease. The new owners of the companies have decided to operate both properties under one management and name, the new company to be known as the Welton Smokeless Coal Co., with a capitalization of $350,000. John W. Wilson is president and J. B. Clifton vice president. Mr. Wilson is closely identified with the Tams interests while Mr. Clifton is president of the Raleigh Smokeless Fuel Co.

Fairmont—Machinery and material have been ordered for the new plant of the Chesapeake Coal Co., which will develop a slope mine on the Andrew Ice farm in the Fairmont field. The work of opening the mine, which will form a part of one of the best plants in the Fairmont field, has been started. This company recently acquired 700 acres of Pittsburgh and Sewickley coal. The company will have a model mining town for its employees, houses to be built in units of 20. The president of the comapny is T. H. Johnson, of Bellaire, Ohio, and the vice president is J. A. Paisley, of Cleveland, Ohio.

Well-known business men have launched the Hite Barnes Coal & Coke Co. which will operate in the Marion County field, this company being capitalized at $200,000. The following had an active part in the organization of the company: R. M. Hite, Glen F. Barnes, Marcus C. Hite, Ray C. Hunsaker and W. H. Conway.

Cecil—Work on the reconstruction of the coal plant of the Sterling Coal Co., at this place, destroyed by fire about two months ago, is progressing. This fire destroyed the tipple, office building and a number of miners' dwellings. The company mapped out a new town site and is building a number of houses on the new site. Office buildings are nearing completion. The general offices of the Sterling Coal Co. are in Altoona, Canada, the Sterling company being a Canadian concern with 15 mines in Ohio and West Virginia.

Charleston—Although the Alabama Bound Co. will operate in Alabama, most of its stockholders are Charleston people, this company having been organized with a capitalization of $200,000, for the purpose of mining coal, iron and other minerals. Those actively identified with the new company are: W. G. MacCorkle, J. E. Chilton, J. H. Moore, T. S. Clark and A. W. Taylor, all of Charleston, W. Va.

Three West Virginia coal companies have increased their capital stock quite appreciably since May. The Elm Grove Mining Company, of Pittsburgh, Pa., of which J. A. Paisley, of Cleveland, is president, increased its capitalization from $900,000 to $1,000,000. The Atlantic Smokeless Coal Co., headed by George Wolfe and operating at Davy, W. Va., has increased its capital stock from $150,000 to $200,000. The capital stock of the Camilla Red Ash Coal Co., of which T. B. Bryan, Jr., is president, has been increased from $75,000 to $300,000.

Association Activities

West Virginia Department of Mines

It is planned to encourage first aid and rescue work and to stimulate interest in such work. The West Virginia Department of Mines, under the direction of R. M. Lambie, State Mine Chief, is preparing to hold a state-wide first-aid and mine-rescue meet late in the summer, probably in August.

So far the department has not attempted to arrange any details of this meet, owing to examinations to be held during June and July in order to permit miners to qualify as mine foremen and fire bosses.

On July 20 an examination is to be held at Mullens for the benefit of miners in Raleigh and Wyoming counties. Still another examination is to be held at Morgantown on July 30, following on the heels of the completion of the miners' short course there.

All emergency certificates issued by the department, permitting miners in certain cases to act as mine foremen, will be rescinded as soon as the coming examinations are completed and all papers graded.

Tidewater Coal Exchange

In order to relieve congestion at Sewell's Point, the tidewater terminal of the Virginian Ry., shippers on the Virginian and trans-shippers from Sewell's Point held a meeting at Norfolk, Va., recently and formed a tidewater coal exchange.

Nearly the entire tonnage shipped over the Virginian was represented at the meeting, and it was the opinion of nearly 70 per cent of those present that pooling arrangements were an imperative necessity at Sewell's Point.

As long as the old Tidewater Pool Exchange functioned, it was possible to keep cars under load down to 500 at a time, but with the discontinuance of the tidewater exchange the average number of cars under load at Sewell's Point had grown to 1,600.

Traffic officials of the Virginian were of the opinion that by re-establishing the tidewater exchange it would be possible to add fully 1,000 cars to the available supply and to increase the running time of mines by at least one day.

A special committee was appointed to draft plans toward establishing the exchange, consisting of C. H. Mead, of the C. H. Mead Coal Co.; W. W. Houston of the Pan Handle Coal Co. and J. T. Snead of the Fayett Smokeless Fuel Co.

Northern West Virginia Operators' Association

Operators of northern West Virginia have decided on a definite course of action in connection with the abuse of assigning cars by the railroads. Recently a special committee was appointed by the Association.

The railroads, in assigning cars to certain mines, have refused to count these cars against the number to which such mines are entitled, under their allotment.

The committee reached a decision to institute proceedings not only before the Interstate Commerce Commission but also in the Federal courts in the event no action should be taken by the National Coal Association.

In the event that proceedings in the Federal Court should be instituted the case would be tried before Judge Alston Dayton in the United States District Court of northern West Virginia.

At the same time another committee was appointed to organize a local association within the larger association for the purpose of dealing with local freight rates, car supply, etc.

Washington State Fuel Dealers' Association

Plans for conducting a "buy your coal early" campaign this summer, and the securing of a large representation from Seattle and other near-by cities to the State convention at Spokane, were discussed at a meeting and dinner held by 60 members of the Washington State Fuel Dealers' Association recently. The banquet was attended by members of the Seattle Retail Coal Merchants' Association and many fuel dealers from Tacoma and other cities near Seattle.

The western Washington fuel men intended to have a large delegation at the Spokane state convention, which was held June 3, 4 and 5, and the meeting in question was primarily to stimulate interest in the state conference.

A campaign similiar to that conducted last year, which is fostered by the Government Coal Commission, will be undertaken again this summer.

The objects of the early ordering of coal by consumers is for the employment of miners on an all-year basis, and also for preventing a sudden shortage of coal-hauling equipment at certain times.

Knox County Coal Operators' Association

Carl J. Fletcher, secretary of the Knox County Coal Operators' Association of Indiana, recently informed the Interstate Commerce Commission that under existing regulations the operators can not discriminate but must deal impartially with utilities, state institutions and industries in making shipments. Should priority regulations be instituted, it is said, enough coal could be shipped to provide utilities and the state institutions.

Reports from the Knox County field show that, during the first five days of the week beginning May 17, the railroads had billed to them 42 per cent of the coal mined. Officials of the mines declared that this amount, added to the coal confiscated for railroad use, would bring the figures up to at least 50 per cent. The ordinary percentage allowed or taken by the railroads is about 33 per cent.

Coming Meetings

American Institute of Electrical Engineers holds annual convention at White Sulphur Springs, W. Va., June 29 to July 2. Secretary, F. L. Hutchinson, New York, N. Y.

Pennsylvania Retail Coal Merchants' Association will hold its annual meeting June 23, 24 and 25 at Reading, Pa. Secretary W. M. Bertolet, Reading.

The Rocky Mountain Coal Mining Institute will hold its annual meeting in Denver, Col., in conjunction with the National First Aid Meet on Sept. 9-11. Secretary F. W. Whiteside, Denver, Col.

M. O. I. Coal Association will hold its annual convention June 16, 17 and 18 at Cedar Point, Ohio. Secretary, B. F. Nigh, Columbus, Ohio.

Industrial News

Chicago, Ill.—The report of the Trustees of the Fairbanks Morse Pension Fund, for 1919 shows [illegible] members pensioned, death benefits of [illegible] and net resources of [illegible] practically all invested in high grade bonds. The fund was established on Jan. 1, 1917, and at the close of 1919 had 1,139 contributing members.

New York, N. Y.—The Mine Safety Appliances Co., of this place, opened its new office at 82 Fulton St., on May 1, where it will continue to handle a complete line of safety equipment for mine and industrial safety.

Philadelphia, Pa.—Carl A. Baer & Co., engineers, announced that on and after June 1, the firm's business will be conducted under the name of Baer, Cooke & Co., with offices in the Land Title Building, Philadelphia.

New York, N. Y.—What is said to be the largest concrete building ever erected on Manhattan Island is now going up, for occupancy by the Western Electric Co. and the New York Telephone Co. The building, partly an 11-story office building and warehouse and partly a 5-story and basement warehouse, will occupy the entire block surrounded by Hudson, West Houston, Greenwich and Clarkson Sts. The construction will cover an area of 338 by 200 feet and will be throughout of reinforced concrete, with the exception of a veneer of brick on the exterior walls. Work was begun on the first of May. It is expected that the owner will occupy the building by May 1921. The cost of the whole operation will involve nearly $3,000,000.

The Telephone company will have a garage and warehouse, while the Western Electric Co. will use the building for its local New York territory sales and distributing forces. Executive offices will be located on the upper floors and there will be dining rooms, handball courts, shower baths and the like, provided for Western Electric employees. This follows an established practice of the Western Electric Co. to make working conditions as comfortable as possible.

It is said that there is no reason why New York City should adapt concrete in its entirety including the columns in all stories. The Middle Western, South Western, Southern and far Western cities almost exclusively use structural concrete instead of structural steel for buildings under 12 stories in height.

Personals

William Wignall, Division Engineer of the Greenwood division of the Lehigh Coal & Navigation Co., in Schuylkill County, Pa., has resigned to accept a position with the Hudson Coal Co. at Scranton, Pa. Herbert Seitzinger, a draftsman, has succeeded Mr. Wignall in his position with the Navigation company.

The Lehigh Coal & Navigation Co., of the Pennsylvania anthracite field, has created a new position, that of Accounting Engineer. This official will co-operate with the mechanical engineer on new appropriations involving abandonment of present equipment, with the [illegible] superintendent, electrical engineer and district superintendents on [illegible] of appropriations abandonment of equipment and transfer of equipment or material applying to any [illegible] appropriations. He will also be [illegible] **W. E. Davis,** who was formerly head draftsman of the mechanical department, has been appointed to this position.

James Haslip [illegible] superintendent and general manager of the McDonald Coal Co., with headquarters in Clarksburg, W. Va. [illegible] his new post Mr. Haslip [illegible] superintendent of the Rosemont Coal Co. for a [illegible]

John G. Pollock has been appointed by [illegible] Marion division of the Penn-Mary Coal Co. [illegible] Marion Gas Coal Co.

James J. Waldeck [illegible] of the Imperial Coal Corporation, of New York. Mr. Waldeck was until recently connected with the Tidewater Coal Exchange as an inspector.

W. A. Field, of the Johnston City Coal Co., of Chicago has resigned his position to accept one with the Lake & Export Coal Corporation.

R. R. Atkins, formerly with the Stonega Coal & Coke Co., of Virginia, has assumed his new duties as general manager for the Liberty Coal & Coke Co., Straight Creek, Ky., in the place of William N. Ewald, resigned.

W. D. Duncan, president of the United Mine Workers of America, district 23, has tendered his resignation and has been appointed a member of the International Executive Committee, succeeding George Baker, who has accepted a position as secretary of the Western Kentucky Coal Operators' Association. Lonnie Jackson succeeds Mr. Duncan as president of the miner organization in this district.

Trade Catalogs

The Wellman-Seaver-Morgan Co., of Cleveland, Ohio, has recently issued the following bulletins showing some of the notable installations made by this company: **Coal and Ore-Handling Machinery;** bulletin 41; pp. 36. **Special Cranes;** bulletin 42; pp. 22. **Hydraulic Turbines;** pp. 20. **Hoisting and Mining Machinery;** bulletin 44; pp. 36. **Coke Oven Machinery;** bulletin 46; pp. 12. **Port and Terminal Equipment;** bulletin 47; pp. 20. These bulletins are all 8½ x 11 in. in dimension and all illustrated. The scheme of each of these bulletins is to show, on facing pages, a picture of a particular installation and a working blueprint of each machine.

Roebling Wire Rope and Wire. John A. Roebling's Sons Co., Trenton, N. J. Catalogue for 1920. Pp. 176; 3¼ x 6 in.; illustrated. Complete information about the Roebling products and some of the company's installations.

Climax Coal Handling Machinery. The Good Roads Machinery Co., Inc., Bulletin Building, Philadelphia, Pa. Catalogue 6. Pp. 64; 7 x 10½ in.; illustrated. Description of coal handling machinery for retail coal yards, mills, factories, public buildings, etc. Numerous installations shown.

Wagon and Truck Loaders. Gifford-Wood Co., Hudson, N. Y. Bulletin 400. Pp. 32; 6 x 9 in.; illustrated. Description of loaders and bagging machines for handling coal, ashes, coke, stone, sand, etc.

Coal Handling Machinery. Gifford-Wood Co., Hudson, N. Y. Catalogue 19. Pp. 160; 6 x 9 in.; illustrated. Devoted to description of coal-carrying machinery, coal storage and related auxiliaries. Numerous installations shown.

The Specialty Engineering Co., of Philadelphia, Pa., is distributing the following publications together with a folder to contain them: **Specialty Boiler House Equipment for Handling Coal and Ash;** pp. 8. **Car Unloader;** bulletin 2; pp. 4. **Wagon Loader;** bulletin 5; pp. 4. **Coal Crushers;** bulletin 6; pp. 4. **Specialty Wagon Loaders;** bulletin 4-A; pp. 4. These bulletins are 8½ x 11 in. in dimension and illustrated. Apparatus is described and installations are shown.

Columbian Rope and Twine. Columbian Rope Co., Auburn, N. Y. Catalogue. Pp. 95; 6 x 9 in.; illustrated. History of how fiber twine and rope are made from plant to factory. An unusually fine publication as regards appearance.

Oil-Firing for Boilers. Alldays & Onions, Birmingham, England. Catalogue 161. Pp. 4; 9 x 11½ in.; illustrated. Shows diagrams and gives full particulars of a number of characteristic conversions to liquid fuel.

Davis No. 1 Blaster. The Atlas Powder Co., Philadelphia, Pa. Folder. Pp. 8; 3 x 6 in.; illustrated. Full information and description of a small light weight blasting machine.

Trade Channels from Europe Open. [illegible] Co., Cleveland, Ohio. Wall poster. Pp. 1; 22 x 28 in.; illustrated. Shows [illegible] with description.

Worthington Motorship Machinery Announcement. Worthington Pump & Machinery Corporation, 115 Broadway, New York, N. Y. Four-page announcement; 8½ x 11 in.; illustrated. Statement about the new Worthington [illegible] oil engine.

Electric Hoists, Chain Blocks, Cranes and Trolleys. The Franklin Moore Co., Winsted, Conn. Catalog. Pp. 8; 3½ x 6 in.; illustrated. [illegible] with price list.

Suggestions for Retail Coal Yard Equipment. Specialty Engineering Co., Trenton and Allegheny Aves., Philadelphia, Pa. Catalogue 4. Pp. 18; 6 x 9 in.; illustrated. Description of apparatus for handling coal by modern methods. Installations shown.

Brass. The Bridgeport Brass Co., Bridgeport, Conn. Bulletin. Pp. 78; 8 x 10½ in.; illustrated. A brief history of the ancient art of brass making and its early (and recent) method of production; contrasted with the method of the electric furnace process—a twentieth century achievement. An artistic publication.

Publications Received

New Provisions for Compensation and Medical and Surgical Care and Supplies Under the War Risk Act. Treasury Department, Bureau of War Risk Insurance, Washington, D. C. Circular LD-30. This circular is addressed to former service men; a copy may be obtained from the Bureau of War Risk Insurance. Full instructions are given to service men eligible for compensation. A warning is sounded to obtain a certificate of injury within one year from the date of discharge or resignation.

Twenty-sixth Report of the Board of Directors of the Lehigh & New England R.R. Co. For fiscal year ended Dec. 31, 1919. Illustrated; pp. 27; 9 x 12 in. Of interest to railroad and anthracite men, particularly to those interested in affairs of the Lehigh Coal & Navigation Co.

Recent Developments in Oxygen Cutting. By Stuart Plumley and F. J. Napolitan. Reprint of paper presented at a meeting of the American Welding Society. Published by Davis-Bournonville Co., Jersey City, N. J. Not illustrated; pp. 2; 6 x 9 in. On the subject of cast iron cutting with the gas torch.

Metallography of Iron and Steel with Reference to Oxygen Cutting. By F. J. Napolitan. Published by Davis-Bournonville Co., Jersey City, N. J. Not illustrated; pp. 3; 6 x 9 in. Paper connected with the cutting of iron by the gas torch.

Obituary

Edmund Gybbon Spilsbury, who was president of the American Institute of Mining Engineers in 1896, died in New York on May 27. Mr. Spilsbury was born in London in 1845 and was educated in Liege, Belgium, and in the University of Louvain, from where he was graduated in 1862. After taking a course at Clausthal, Germany, he came to this country in 1870. Mr. Spilsbury was a former president of the Engineers' Club of New York and a member of the American Society of Mechanical Engineers, the Institution of Mining and Metallurgy of Great Britain, the Mining and Metallurgical Society of America, and the American Electrochemical Society.

Dwight Hukill Coble, aged 46, secretary of the H. C. Frick Coke Co., died on May 23 of pneumonia in his home at Pittsburgh, Pa. A week previously his only son, Dwight S. Coble, aged 16, died of the same disease. Mr. Coble was born in Steubenville, Ohio. Before coming to Pittsburgh in 1896 he was associated with various steel companies, now a part of the United States Steel Corporation. In 1900 he became private secretary to the late James Gayley. In 1902 he joined the service of the H. C. Frick Coke Co. Mr. Coble studied at Princeton University. He was a member of various clubs and societies. He leaves a widow and his parents, Mr. and Mrs. Hugh S. Coble, of Steubenville.

James V. Morris, a prominent coal operator of Cleveland, died recently in his residence, Euclid Ave., Cleveland, Ohio, following an extended illness. Death was due to apoplexy. Mr. Morris had spent the winter months in the South in the hope of benefiting his health and had returned only a few weeks ago.

For the last 30 years he had been located in Cleveland. Mr. Morris owned large coal [illegible] which he had extensively and successfully operated.

Phillips G. Matheny, president and secretary of the West Side Coal Co., Springfield, Ill., died recently at his home in Springfield. He was quite a prominent man in Illinois coal circles and was affiliated with the Central Illinois Coal Operators' Association.

CURRENT PRICES—MATERIALS & SUPPLIES

IRON AND STEEL

PIG IRON—Quotations compiled by the Matthew Addy Company

	Current	One Month Ago
CINCINNATI		
No. 2 Southern	$45.60	$44.60
Northern Basic	42.80	42.80
Southern Ohio No. 2	46.80	43.80
NEW YORK, Tidewater delivery		
2X Virginia (silicon 2.25 to 2.75)	49.65	47.65
Southern No. 2 (silicon 2.25 to 2.75)	49.70	47.70
BIRMINGHAM		
No. 2 Foundry	42.00@44.00	41.00
PHILADELPHIA		
Eastern Pa., No. 2 x 2.25-2.75 sil	46.00@48.25	45.35@46.35*
Virginia No. 2	45.00*	43.25*
Basic	44.50†	43.00†
Grey Forge	43.50*	42.50*
CHICAGO		
No. 2 Foundry Local	44.25	43.25
No. 2 Foundry Southern	47.00	46.60
PITTSBURGH, including freight charge from the Valley		
No. 2 Foundry Valley	45.65	43.65
Basic	44.40	42.90
Bessemer	44.90	43.40
MONTREAL		
Silicon 2.25 to 2.25%	43.25	43.25

* F. o. b. furnace. † Delivered.

STRUCTURAL MATERIAL—The following are the base prices, f.o.b. mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

	Mill Pittsburgh	New York Current	New York One Year Ago	St. Louis	Chicago
Beams, 3 to 15 in.	$2.45@$4	$3.97@$5	$3.47	$4.04	$3.97
Channels, 3 to 15 in.	2.45@4	3.97@5	3.47	4.04	3.97
Angles, 3 to 6 in., ¼ in. thick	2.45@4	3.97@5	3.47	4.04	3.97
Tees, 3 in. and larger	2.45@4	4.02@5	3.52	4.04	4.02
Plates	2.65@4	4.17@5	3.47	4.24	4.17

BAR IRON—Prices in cents per pound at cities named are as follows:

Pittsburgh	Cincinnati	St. Louis	Birmingham
4.25	3.50	4.50	5.00

NAILS—Prices per keg from warehouse in cities named:

	Mill Pittsburgh	St. Louis	Chicago	Birmingham	San Francisco
Wire	$4.00	None	$4.15	$5.75	$6.00
Cut		None	7.00		8.50

TRACK SUPPLIES—The following prices are base per 100 lb. f.o.b. Pittsburgh for carload lots, together with the warehouse prices at the places named:

	Pittsburgh	Chicago	St. Louis	Cincinnati	San Francisco	Birmingham
Standard railroad spikes 9/16-in. and larger	$4.00	$3.62	$5.34	$4.25	$5.65	$6.00
Track bolts	6@6.50	4.62	7.50	5.50	6.65	7.50
Standard section angle bars	3@4	3.02	Prem.	....	4.90	....

COLD FINISHED STEEL—Warehouse prices are as follows:

	New York	Chicago	Cleveland	Cincinnati	St. Louis
Round shafting or screw stock, per 100 lb. base	$6.25	$5.80	$6.00	$6.50	$5.90
Flats, squares and hexagons, per 100 lb. base	6.75	6.30	5-6.50	6.85	6.40

HORSE AND MULE SHOES—Warehouse prices per 100 lb. in cities named:

	Mill Pittsburgh	Chicago	St. Louis	Birmingham
Straight	$5.75	$7.00	$7.00	$7.00
Assorted	5.85	7.15	7.15	7.25

Cincinnati—Horseshoe nails sell for $4.50 to $5 per 25-lb. box.

CAST-IRON PIPE—The following are prices per net ton for carload lots:

	New York Current	New York One Month Ago	New York One Year Ago	Chicago	St. Louis	San Francisco	Dallas
4 in.	$79.30	$75.30	$60.70	$78.80	$78.00	$93.55	$74.30
6 in. and over	76.30	72.30	57.70	75.80	75.00	90.55	71.30

Gas pipe and 16-ft. lengths are $1 per ton extra.

STEEL RAILS—The following quotations are per ton f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5c. per 100 lb. is charged extra

	Pittsburgh Current	Pittsburgh One Year Ago	Chicago Current	Chicago One Year Ago
Standard Bessemer rails	$45@60	$45.00	$45.00@$55.00	$45.00
Standard openhearth rails	47@60	47.00	47.00@57.00	47.00
Light rails, 8 to 10 lb.	2.585*@3.75	2.585*	2.585*@3.75*	2.835*
Light rails, 12 to 14 lb.	2.54*@3.75	2.54*	2.54*@3.75*	2.79*
Light rails, 25 to 45 lb.	2.45*@3.75	2.45*	2.45*@3.75*	2.70*

* Per 100 lb.

OLD MATERIAL—The prices following are per gross ton paid to dealers and producers in New York. In Chicago and St. Louis the quotations are per net ton and cover delivery at the buyer's works, including freight transfer charges

	New York	Chicago	St. Louis
No. 1 railroad wrought	$29.00	$27.00	$29.00
Stove plate	29.00	30.00	32.50
No. 1 machinery cast	39.00	37.50	39.50
Machine shop turnings	15.50	12.50	15.50
Cast borings	16.00	14.25	16.50
Railroad malleable cast	[illegible]	28.00	28.50
Rerolling rails	[illegible]	32@33	31.50@32
Relaying rail		40@50	50@55

COAL BIT STEEL—Warehouse price per pound is as follows:

New York	Cincinnati	Birmingham	St. Louis	Chicago
$0.10	$0.16	$0.18	$0.11	$0.15

DRILL STEEL—Warehouse price per pound:

	New York	St. Louis	Birmingham
Solid	14c.	13c.	15c.
Hollow	16c.	....	

PIPE—The following discounts are to jobbers for carload lots on the Pittsburgh basing card, discounts on steel pipe, applying as from January 14, 1920, and on iron pipe from January 7, 1920

BUTT WELD

Inches	Steel Black	Galv	Inches	Iron Black	Galv
⅛, ¼ and ⅜	47	20½	¾ to 1½	34½	18
½	51	36½			
¾ to 3	54	41½			
LAP WELD					
2	47	34½	2	28½	14½
2½ to 6	50	37½	2½ to 6	30½	17½
BUTT WELD, EXTRA STRONG PLAIN ENDS					
⅛, ¼ and ⅜	43	25½	¾ to 1½	34½	19½
½	48	35½			
¾ to 1½	52	39½			
LAP WELD, EXTRA STRONG PLAIN ENDS					
2	45	33½	2	29½	16½
2½ to 4	48	36½	2½ to 4	31½	19½
4½ to 6	47	35½	4½ to 6	30½	18½

Stocks discounts in cities named are as follows

	New York Black	New York Galvanized	Cleveland Black	Cleveland Galvanized	Chicago Black	Chicago Galvanized
¾ to 3 in. steel butt welded	40%	24%	40%	31%	54%	40%
3½ to 3 in. steel lap welded	35%	20%	42%	27%	50%	37½%

Malleable fittings. Class B and C, from New York stock sell at list + 23%. Cast iron, standard sizes, net.

WIRE ROPE—Discounts from list price on regular grades of bright and galvanized are as follows:

	New York and St. Louis
Hercules red stand, all constructions	20%
Patent flattened strand, special and cast steel	20%
Patent flattened strand, iron rope	5%
Plow steel round strand rope	30%
Special steel round strand rope	30%
Cast steel round strand rope	22½%
Iron strand and iron tiller	5%
Galvanized iron rigging and guy rope	+12%

San Francisco—Galvanized, less 5%, bright less 25%.
Chicago, +12½ on galvanized, 30 off on bright.

SHEETS—Quotations are in cents per pound in various cities from warehouse; also the base quotations from mill:

	Large Mill Lots Pittsburgh	St. Louis	Chicago	San Francisco	New York Current	New York One Yr. Ago
Blue Annealed						
No. 10	$3.55@$6.00	$7.09	$7.02	$7.50	$6.62@$8.00	$4.57
No. 12	3.60@6.05	7.09	7.07	7.55	6.67@8.05	4.62
No. 14	3.65@6.10	7.09	7.12	7.60	6.22@8.10	4.67
No. 16	3.75@6.20	7.09	7.17	7.70	6.82@8.20	4.77
Black:						
*Nos. 18 and 20	4.15@6.30	8.10	7.80	7.85	7.80@8.80	5.42
*Nos. 22 and 24	4.20@6.35	8.16	7.85	7.90	7.85@8.85	5.47
*No. 26	4.25@6.40	8.10	7.90	7.95	7.90@8.90	5.52
*No. 28	4.35@6.50	8.10	8.00	8.05	8.00@9.00	5.62
Galvanized:						
No. 10	5.80@7.50	9.60	8.50	8.60	8.25@10.00	5.97
No. 12	4.80@7.60	9.60	8.60	8.60	8.35@10.10	6.02
No. 14	4.80@9.60	9.60	8.60	8.60	8.35@10.10	6.07
Nos. 18 and 20	5.10@7.90	9.60	8.90	8.90	8.65@10.40	6.37
Nos. 22 and 24	5.25@8.05	9.60	9.05	9.05	8.80@10.55	6.52
*No. 26	5.40@8.20	9.60	9.20	9.20	8.95@10.70	6.67
*No. 28	5.70@8.50	9.60	9.50	9.50	9.25@11.00	6.97

For painted corrugated sheets add 30c. per 1,000 lb. for 5 to 28 gage; 25c. for 19 to 24 gages. *For galvanized corrugated sheets add 15c., all gages.

SHOP SUPPLIES

NUTS—From warehouses at the places named, on fair-sized orders, the following amount is deducted from list

	New York Current	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago	St. Louis Current
Hot pressed square	+$4.00	$.75	$1.90	$[illegible]	$2.00	$2.25
Hot pressed hexagon	+4.00	.75	1.90	[illegible]	2.00	2.25
Cold punched square	+4.00	.75	1.90	[illegible]	1.30	2.25
Cold punched hexagon	+4.00	.75	1.90	[illegible]	1.30	2.25

Semi-finished nuts, $\frac{9}{16}$ and smaller, sell at the following discounts from list price.

	Current	One Year Ago
New York	30%	50-10%
Chicago	50%	50%
Cleveland	50%	50-10%
St. Louis	45%	

MACHINE BOLTS—Warehouse discounts in the following cities:

	New York	Cleveland	Chicago	St Louis
¾ by 4 in. and smaller	list	40%	30%	50-5%
Larger and longer up to 1 in. by 30 in.	20%	20 10%	20%	40-5%

WASHERS—From warehouses at the places named the following amount is deducted from list price:

For wrought-iron washers:

New York list Cleveland $3.00 Chicago $3 00

For cast-iron washers the base price per 100 lb. is as follows:

New York $7 00 Cleveland $4 50 Chicago $4 25

RIVETS—The following quotations are allowed for fair sized orders from warehouse:

	New York	Cleveland	Chicago
Steel $\frac{7}{16}$ and smaller	30%	40% off	35 10%
Tinned	30%	40% off	35 10%

Boiler, ½, ¾, 1 in. diameter by 2 in. to 5 in. sell as follows per 100 lb.:

New York . . $7.00 base Cleveland . . $4.00 Chicago . . $5.37 Pittsburgh . . $4.72

Structural, same sizes:

New York $7 10 Cleveland $4 10 Chicago $5 47 Pittsburgh $4 82

CONSTRUCTION MATERIALS

LINSEED OIL—These prices are per gallon:

	New York Current	New York One Year Ago	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago
Raw, 5-bbl. lots	$1.87	$1 59	$2 00	$2 30	$2 05	$1.78
5-gal. cans	1.87*	1.72	2.25	2.45	2.30	1.98

*To this oil price must be added the cost of the cans (returnable), which is $2 25 for a case of six.

WHITE AND RED LEAD—Base price.

	Red Current Dry	Red Current In Oil	Red 1 Year Ago Dry	Red 1 Year Ago In Oil	White Current Dry and In Oil	White 1 Year Ago Dry and In Oil
100-lb. keg	15 50	17 00	13 00	14 50	15 50	13 00
25 and 50-lb. kegs	15.75	17.25	13.25	14.75	15.75	13.25
12½-lb. keg	16 00	17 50	13 50	15 00	16 00	15 50
5-lb. cans	18 50	20 00	15 00	16 50	18 50	15 00
1-lb. cans	20 50	22 00	16 00	17 50	20 50	16 00

500 lb. lots less 10% discount. 2000 lb. lots less 10-2½% discount.

COMMON BRICK—The prices per 1000 in cargo or carload lots are as follows:

Chicago	$14 00	Cincinnati	$24 00
St. Louis, salmon	16 00	Birmingham	15.00

PREPARED ROOFINGS—Standard grade rubbered surface, complete with nails and cement, costs per square as follows at manufacturing points:

	1-Ply c.l.	2-Ply l.c.l.	3-Ply c.l.
No. 1 grade	$2 40	$2 90	$3 45
No. 2 grade	2 15	2 00	3 10

Slate-surfaced roofing (red and green) in rolls of 108 sq. ft. costs $3.50 per roll in carload lots and $3.75 for smaller quantities.

Shingles, red and green slate finish, cost $7 75 per square in carloads; $8 00 in smaller quantities, in Philadelphia.

ROOFING MATERIALS—Prices per ton f.o.b. New York and Chicago:

Tar felt (14 lb. per square of 100 sq. ft.) per roll	$3 50
Tar pitch (in 400-lb. bbl.) per 100 lb.	1.85
Asphalt pitch (in barrels) per ton	46 50
Asphalt felt (light) per ton	118 00
Asphalt felt (heavy) per ton	119 50

HOLLOW TILE—Price per block in carload lots for hollow building tile

	4x12x12	8x12x12	12x12x12
Minneapolis	$0 087	$0 158	$0.248
St. Louis	none on market		
Seattle	09	175	30
New Orleans	198	264	[illegible]
Chicago	132	.2387	3581
Cincinnati	125	2186	[illegible]
Birmingham	122	224	

LUMBER—Prices [illegible] per M. in carload lots:

	1-In. Rough 10 In. x 16 Ft.	2-In. T. and G. 10 In. x 16 Ft.	8 x 8 In. x 20 Ft.
St. Louis	$53 00	$46 00	$42 00
Birmingham	[illegible]	70 00	58 00
Cincinnati	[illegible]	51 00	50 00

EXPLOSIVES—Price per pound of dynamite in small lots and price per 25-lb. keg for black powder:

	Low Freezing 20%	Gelatin 40%	Gelatin 60%	Gelatin 80%	Black Powder
New York		[illegible]	$0 3425		$2 30
Boston	$0 2475	[illegible]	30	$0 3425	2 45
Kansas City	.235	26	.385	.3275	2.40
New Orleans	2375 (50%)	[illegible]	2475		
Seattle	18	[illegible]	2475	29	2 45
Chicago	2175	[illegible]	2975	34	2 45
St. Paul	185	[illegible]	2525		2 25
St. Louis	2175	[illegible]	[illegible]	[illegible]	[illegible]
Los Angeles	25	30	[illegible]	275	[illegible]

MISCELLANEOUS

GREASES—Prices are as follows in the following cities in cents per pound for barrel lots:

	Cincinnati	St. Louis	Birmingham
Cup	8 5	3.7 3 8	8 5
Fiber or sponge	9.	7.2	8 5
Transmission	10	14	8 5
Axle	5.	5	4 5
Gear	6 5	6.5	8 5
Car journal	12 0	4 7	8.5

BABBITT METAL—Warehouse prices in cents per pound:

	New York Current	New York One Year Ago	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago
Best grade	90.00	87.00	74.50	79.00	70.00	75.00
Commercial	50 00	42 00	21 50	18 50	15.00	15.00

HOSE—Following are prices of various classes of hose:

Fire

	50-Ft. Lengths
Underwriters' 2½-in.	85c. per ft.
Common, 2½-in.	30%

Air

	First Grade	Second Grade	Third Grade
¾-in. per ft.	$0.60	$0.40	$0.30

Steam—Discounts from list

First grade 20% Second grade 30% Third grade 45%

LEATHER BELTING—Present discounts from list in fair quantities (½ doz. rolls):

Light Grade	Medium Grade	Heavy Grade
30%	30%	20%

RAWHIDE LACING—
For cut, best grade, 25%, 2nd grade, 30%.
For laces in sides, best, 79c. per sq. ft.; 2nd, 75c.
Semi-tanned, cut, 20%; sides, 83c. per sq. ft.

PACKING—Prices per pound:

Rubber and duck for low-pressure steam	$1.00
Asbestos for high-pressure steam	1.70
Duck and rubber for piston packing	1.00
Flax, regular	1.20
Flax, waterproofed	1 70
Compressed asbestos sheet	.90
Wire insertion asbestos sheet	1.50
Rubber sheet	50
Rubber sheet, wire insertion	.70
Rubber sheet, duck insertion	.50
Rubber sheet, cloth insertion	.30
Asbestos packing, twisted or braided, and graphited, for valve stems and stuffing boxes	1.30
Asbestos wick, ½- and 1-lb. balls	.85

MANILA ROPE—For rope smaller than ¾-in. the price is ½ to 2c. extra, while for quantities amounting to less than 600 ft. there is an extra charge of 1c. The number of feet per pound for the various sizes is as follows: ¼-in., 8 ft.; ⅜-in., 6; ¾-in., 4½; 1 in., 3⅓; 1⅛-in., 2 ft. 10 in.; 1½-in., 2 ft. 4 in. Following is price per pound for ¾-in. and larger, in 1200-ft. coils:

Boston	$0.35	Birmingham	$0 32
New York	29	Atlanta	295
St. Louis	265	Kansas City	30½
Chicago	275	New Orleans	31
Minneapolis	275	Seattle	28
San Francisco	27	Los Angeles	31

PIPE AND BOILER COVERING—Below are discounts and part of standard lists:

PIPE COVERING Pipe Size	Standard List Per Lin. Ft.	BLOCKS AND SHEETS Thickness	Price per Sq. Ft.
1-in.	$0 27	½-in.	$0 27
2-in.	.36	1-in.	30
3-in.	.45	1½-in.	45
4-in.	.60	2-in.	60
6-in.	.80	2½-in.	.75
8-in.	1 10	3-in.	.90
10-in.	1 30	3½-in.	1.05

85% magnesia high pressure		List
For low-pressure heating and return lines	4-ply	40% off
	3-ply	42% off
	2-ply	44% off

WIRING SUPPLIES—New York prices for tape and solder are as follows:

Friction tape, ½-lb. rolls	55c. per lb.
Rubber tape, ½-lb. rolls	60c. per lb.
Wire solder, 50-lb. spools	46c. per lb.
Soldering paste, 2-oz. cans	$1.20 per doz.

COPPER WIRE—Prices per 1000 ft. for rubber-covered wire in following cities:

	New York Single Braid, Solid	New York Double Braid, Stranded	New York Duplex	Birmingham Single Braid, Solid	Birmingham Double Braid, Stranded	Birmingham Duplex	Cincinnati Single Braid, Solid	Cincinnati Double Braid, Stranded	Cincinnati Duplex
14	$12 00	$13 90	$28 50	$13 90	$20 90	$35 80	$12 00	$14 66	$29 07
10	18 30	23 85	41 50	26 10	35.50	59 40	21 11	24 98	40 58
8	25 54	32 70	56 70	36 60	49 50	79 00	30 83	35 33	
6		51 40		60 00	67 25			54 27	
4		70 00			93 41			76 19	
2		101 80			120 40			109 60	
1		131 86			155 23			141 20	
0		160 00			188 77			171 20	
00		193 50			229 19			207 60	
000		235 20			278 [illegible]			257 40	
0000		288 60			338.41			306 80	

FREIGHT RATES—On finished steel products in the Pittsburgh district including plates, structural shapes, merchant steel, bars, pipe fittings, plain and galvanized wire nails, rivets, spikes, flat sheets (except planished), chains, etc., the following freight rates per 1000 lb. are effective:

Boston	$0 30	New Orleans	$0 385
Buffalo	0 17	New York	0 27
Chicago	0 27	Philadelphia	0 245
Cincinnati	0 23	St. Louis	0 24
Cleveland	0 17	St. Paul	0 495
Kansas City	0 59	Pacific Coast (all rail)	1 25

Note.—Add 3% transportation tax. Minimum carload, 80 000 lb.

COAL AGE

The Weekly Journal of the Coal and Coke Industries

Volume 17 NEW YORK, THURSDAY, JUNE 17, 1920 Number 25

Beware of the Bankrupts

EVERY time that the price of coal has to go up to meet wage increases comes the cry that the railroads, the electric companies or the gas companies cannot afford the increased price. Why cannot they afford it? Because the public in its zeal for its own profits —many of them profiteering profits—have bankrupted the public utilities. If the public would be fair to these utilities they could be fair to the coal industry. Is it not reasonable to suggest that the coal operator and mine worker would be wise to wish luck and bespeak kindly the public utility, so that when increases in the price of coal are necessary the public utility companies can pay the advance and pass it on?

Bankrupt concerns have been the cause of the pressure to keep the price of coal below or at cost. Bankrupt railroads have been successful advocates of assigned cars. Bankrupt plants have been slow to store coal. Bankruptcy in a client means bankruptcy of the merchant to whom he is client. Success in a client means success to the producer who does business with him. For this reason let the coal operator never cease to boost for the public utilities, to which division of society indeed he rightly belongs.

Geological Survey Will Inventory Coal Requirements

IN CO-OPERATION with the Council of National Defense, acting for the old Bituminous Coal Commission, the Geological Survey is making an inventory of the stocks and requirements of coal in the country as of June 1. This is the sort of investigation regularly made by the Fuel Administration during the war, which the Survey asked Congress to appropriate funds for maintaining subsequent to July 1, last. Fortunately, the remnant of the appropriation for the coal commission is available for the work this year at a time when such information is sadly needed.

The Survey has sent inquiries to a representative list of industrial consumers, public utilities, retail dealers and railroads, and from the data thus obtained will give us a comprehensive view of the stocks of coal as of June 1 and of requirements for the remainder of the year. The belief is general that the country is very short of coal, but no one can say with assurance just what is required to meet the emergency, except that it is evident that today the need is for more than the roads can transport from the mines to consumers.

It is becoming evident each week that the railroad strike and the general incapacity of the railroads are having a slowing-down effect on industry, and, as we pointed out several weeks ago, such a slowing down is reacting on the demand for coal. Consumers who must close their plants for a part of each week use less coal and have in the same measure less anxiety for supplies. An official investigation into the situation will dispel much of the present uncertainty and enable all to proceed to meet the demands of the country for coal with the dispatch the situation demands.

Will We Have Government Control of Coal Again?

THAT so many are apprehensive that this country is about to have a financial panic is good evidence, we are told by students of history, that no catastrophe will occur. So many are working to avoid trouble that their combined efforts and the warnings given will cure the trouble. So may it well be with the specter of Government-control of coal. Operators gathered last month at Atlantic City, jobbers recently at Pittsburgh, and now the retail coal dealers at Detroit have been solemnly warned by their leaders that if they do not one and all behave, the Government will again step in and dictate to them how to run their business.

There is reason for the belief and cause for the fear. The effort to frame a coal commissioner bill for action by the Senate stirred the coal trade as has nothing since the strike. We do not believe that Senator Frelinghuysen sees in his proposal as much danger to the coal industry as he sees benefit to the public. The Senator tried to get at the facts a year ago for the very helpful purpose of aiding all concerned, from the producer to the consumer. He found a vast lack of the kind of information needed for study of the problem. His proposal for a coal commissioner is to meet that lack. The coal industry sees it as an opening wedge for Federal interference with the coal business, and we have no doubt that once such a commissioner were in action there would be increasing meddling with the coal industry, not all of which would be harmful but some of which would be distasteful to coal men.

How to forestall such action by the Government and the demand for regulation by the public is troubling the leaders of coal today. No weapon is available except exhortation, for there is no legal or other means by which recalcitrant operators, jobbers or retailers can be held in line. John E. Lloyd, president of the retailers' association, told his members at Detroit to have always in mind that they serve the public and that they must have its confidence and support.

We are often reminded by the coal men that the public does not understand us, but the same man balks at letting the public learn anything about his business and never offers to tell his story to ears that are really sympathetic. The coal industry has about three months in which to educate the public to the reasons for the present coal situation. With the first cold weather the public without coal will not have patience to listen. The first move is to line up solid with your associations, next support them by money and figures, trust the leaders and hold your prices in line with reason.

Shippers Agree to Pool Lake Coal

AT THE request of the Interstate Commerce Commission the Lake shippers have voluntarily agreed to pool bituminous coal for transshipment by lake for the season of navigation of 1920, subject to rules and regulations that follow very closely those prevailing in the war year of 1918. The necessity for this action has been apparent for several weeks, and meetings were held in the first half of June that resulted in the shippers making the request that Federal support be given the movement. This action took the form of an embargo on all lake shipments except those under permit from the Ore and Coal Exchange, to head which the Interstate Commerce Commission officially appointed (without compensation) Herman Griggs, who has managed the exchange for more than two years. Rules and regulations have been agreed upon and shipments under the program began on Monday, June 14.

Lake Coal Dumped Season to June 12

(NET TONS)

	Cargo	Fuel	Total
1919........	6,704,000	303,900	7,007,900
1920........	2,199,000	216,600	2,415,600

No figures on car detention at Lake ports are available yet for this year, but it is certain that among the causes of low dumping have been the innumerable classifications. It is understood that no one expects pooling, which means the elimination of the majority of classifications and the speeding up of car movement, to solve the problem of getting sufficient coal up the Lakes this year. But pooling is the first necessary step and it is to the credit of the coal men that they agreed to bury their personalities in a pool, and proceed in the spirit of 1918.

National Coal Association Attacks Assigned Cars in Court

SENATOR HARDING asked the Interstate Commerce Commission to inform the Senate why there was apparent discrimination between coal operators in the matter of car supply—that is, why assigned cars were being permitted. The answer, recently given out, is a legal defense of the commission's position. The National Coal Association has announced that legal action will be instituted at once to settle once for all the right under the Transportation Act of the railroads to use assigned cars in securing fuel coal.

The reply to the Harding resolution, dated June 11, states with reference to the Transportation Act of 1920, "The act does not attempt to define in detail . . . what is a just and reasonable distribution of cars or rating of mines. The commission is authorized to determine . . . what are just and reasonable rules . . ." Futher it is pointed out that the commission can suspend such rules in any case of emergency and under the new act can establish new practices with respect to car service such "as in its opinion will best promote the service in the interest of the public and the commerce of the people."

The commission also points out that no other plan has been proposed which is workable and also preferable to the assigned car practice. It even says: "It seems not inappropriate to say that the coal operators are not able to entirely agree among themselves as to the advantages or disadvantages of the assigned-car practice." In effect the report is a defence of the assigned car rules as now practiced and gives no hint of any change so long as the commission is of the opinion that the fuel and transportation emergency continues.

Answer to the opinion of Chairman Clark of the Interstate Commerce Commission on the legal aspects of assigned cars was prompt and to the point. The National Coal Association has filed a suit against the Baltimore and Ohio R.R., with the Lamberts Run Coal Co. as plaintiff, alleging illegal discrimination in the distribution of empty cars for coal loading. The suit was filed on June 12 at Fairmont, W. Va., with hearing set for June 19. The finance committee of the National will meet this week to determine on instituting additional suits.

Steel Companies Obtain Injunction Against Trade Commission Requiring Cost Data

ON JUNE 12 Justice Bailey of the District of Columbia Supreme Court granted an injunction asked for by more than a score of steel companies, restraining the Federal Trade Commission from requiring monthly cost reports. At the same time the Trade Commission is proceeding in the New Jersey courts against certain of the steel companies in an effort to secure cost reports. It is reported that the more recent decision of Justice Bailey will not interfere with the New Jersey suit.

Coal Rate Hearings Begun

INTERSTATE Commerce Commission hearings on freight rate increases are continuing daily in Washington. Monday, June 14, was set as the date for consideration of the coal and coke rates and at that time many of the important aspects of these rates were to be covered. Not only rail rates but also coastwise rates were expected to be under discussion.

Consumers Report Stocks of Coal

MANY replies have been received by the U. S. Geological Survey in its census of stocks of coal on hand and of estimated needs. The final date for these reports was indicated in the call as June 12, but the Survey urges that all who have received forms reply even though they were not able to do so before that date. Co-operation in this is very important for all coal interests.

Will Settle Anthracite Wage Dispute

ON June 21 the Anthracite Coal Commission will meet at Washington to settle the wage controversy. The members of the commission are William O. Thompson, president of the Ohio State University; William L. Connell, a large anthracite operator of the Bernice field, and Neal J. Ferry, a member of the Executive Committee of the United Mine Workers of America.

The Anthracite Coal Commission expects on June 21 to outline its work and determine the time and place for the holding of hearings. It is likely that it will conduct these session in the anthracite field.

Retail Coal Dealers Advocate Open Shop

Annual Convention of National Retail Coal Merchants' Association at Detroit Takes Strong Position on Labor Question — Opposes Further Regulation by the Government — W. H. Williams Says Railroads Are Not Efficient — Harry Taylor Commends Support Given National Associations — John Lloyd Re-elected President

RETAIL coal dealers from nearly every state gathered at Detroit on June 10, 11, and 12 in the largest, most representative and enthusiastic gathering of coal men held this year. The sessions were characterized by earnestness of purpose and the talks and discussions were so directed at the problems of the retail dealer that no one who attended could fail to gain a larger view of the duties, responsibilities and difficulties of the retail coal dealer. The retailer is the representative of the coal industry who comes in closest touch with the public, because he is the one who meets the everyday problems of the coal-consuming householder. The keynote of this convention was service to the public—service that will put the public on the side of the coal man.

After the delegates were given a welcome to the City of Detroit by James A. Ballard, sales manager of the Semet Solvay Co., the president, John E. Lloyd, opened the convention, the third held by this association, with an address that inspired every man with the public responsibility of his calling and that set a high standard for the future activities of his associates. Service to the consumer that will gain public confidence and will bring public support for the coal man, he pointed out, is more important now than it has been at any other time in the history of the trade. Coal faces a crisis today, because we are sure to have a hard winter with plenty of trouble. The public blames the retailer when the fault is really with the railroads today. Mr. Lloyd said that if the dealers do not help to hold down prices, the Government will step in and do it for them.

"If we do not manage our business right, the Government will take it and manage it for us. A bare 5 or 10 per cent of the men in the trade can so misconduct their affairs that the whole structure will be made to suffer," was in part the warning conveyed by President Lloyd. He urged the dealers to unite more strongly than ever, to support their association by money and assistance and thereby help to regulate their own business and remove any necessity for Federal interference.

Direct shipments to consumers for domestic use, particularly through industrial plants, were opposed as uneconomic and because the replacement of a part of the regular trade of the dealer by this practice results in increasing the costs of handling the remaining tonnage and the price to the other consumers. Such forms of distribution of household coal were compared to the condemned system of rebates by railroads. Mr. Lloyd urged that the association be developed to the point where it could have a voice in legislative matters and be in position to make forceful opposition to such measures before Congress as the Coal Commissioner bill. He advocated a model Government but one that would not attempt to run the coal trade or any other industry.

A ringing declaration for the open shop, severe condemnation of the closed-shop principle and the statement that business men are too prone to discuss labor problems in hushed tones and too loath to tackle the question in characteristic American fashion brought the convention to its feet in applause. John Lloyd believes that labor can be trusted, he has confidence in the good sense and loyalty of the majority of the workingmen,

BANQUET OF NATIONAL RETAIL COAL MERCHANTS' ASSOCIATION, HOTEL STATLER, DETROIT, MICH., JUNE 11, 1920

Homer D. Jones was toastmaster and the addresses were delivered by W. R. Coyle and James Schermerhorn. Music was furnished by the Masonic Temple Chanters and Symphony Orchestra. There were more than 400 guests at the banquet but he deplores the kind of leadership labor has had for the last few years. He sees in the temper of the country at this time a set of laws to control labor that will be more drastic than those, such as the Sherman law, passed by Congress in the past to control capital. Labor is today using its power in a more drastic manner than capital ever did, and the reaction will be the stronger when it comes. He is not afraid to put himself and the retail dealers' association on record as ready to face the issue.

SECRETARY GORDON REPORTS A GOOD YEAR

Ellery B. Gordon, secretary-manager of the association, in his report to the convention told of the growth of the organization and the activities of the national officers during the past year. He pointed out in particular the necessity in 1919 for almost constant contact with the Federal Government at Washington, and forecast this year as one of contact with transportation interests. The office of the national association publishes a monthly paper called the *Coal Merchant*, described by Mr. Gordon as not a general news journal but one endeavoring to summarize for quick reading everything of immediate interest to the trade national in its significance. This paper carries no advertising. He commended the regular trade papers, which have a place of their own, with columns always open to the trade, and urged the support of the coal trade to the standard coal journals.

Mr. Gordon declared that the retailers' organization has one large aim—to establish a reputation for fairness—and is in the position of being willing to accept nothing less from others. To attain the position it deserves and can reach—of responsibility, influence and strength—moral support and financial assistance must be given in greater measure than heretofore. Education of the public and of the members of the trade was urged, the latter by better and more vigorous local associations.

W. H. Williams, vice president in charge of mining of the Delaware & Hudson R.R. and chairman of the board of directors of the Wabash R.R., addressed the meeting Friday morning. The feature of his talk was his description of the plight of the American railroads today and his expression of belief that they can overcome their present predicament by more efficient operation and management.

Mr. Williams' contention, supported by a volume of statistics that without effort or notes he quoted throughout his talk, is that if the railroads would this year increase the average car-miles per day to the figure reached in 1915, which was 26.9 miles per day, and would increase the average loading per car to the comparatively low figure of 71 per cent of rated capacity, a figure reached in 1916, the cumulative effect of this increase in efficiency in the use of transportation would be sufficient to meet the present needs of the country. To accomplish the same ends by investment in more cars that would be loaded and moved no faster than cars are loaded and moved today and to add motive power, labor, trackage and terminals to accommodate and handle such an increase in equipment would require from six to seven billions of dollars.

He declared that without question the solution of the transportation problem rests with the railroads themselves and with no one else. The railroads are not broken down, Mr. Williams declared, but they are not performing their functions as they should. He further pointed out that the railroad plant is not materially smaller than it was in 1917 and 1918, when vastly greater volume of traffic was handled with less effort than appears being made today.

Next winter's supply of anthracite was touched on but lightly by Mr. Williams, who said that the shipping companies are doing the best that they can to meet the orders of the retailers, but as long as it is so difficult to make delivery there will be shortage in supply at the points of consumption. Coal reserves in the ground are ample and the mine capacity is sufficient to meet our needs, but the problem this year is to get the cars of coal to the man who wants them.

He reviewed the advances made the past few years in mining methods. In the northern anthracite field machines have been successfully introduced; in the lower and thinner veins, where headroom for hand loading had to be made by taking down roof or lifting floor, loading machines are being tried out and in the preparation of fine sizes great advances have been made. Wet methods of cleaning have reduced breakage and the use of such machines as the Dorr thickener and the Deister tables has permitted the preparation of fine coal much lower in ash than any heretofore obtained.

EMBARGO WOULD AFFORD TEMPORARY RELIEF

But temporary relief would be afforded the country by the proposed 90-day embargo on exports of coal from the Atlantic seaboard, declared Harry N. Taylor, in answer to inquiries from the floor of the convention, following his address. The immediate result would be lowering of prices of those coals that are now being shipped abroad, but at the expiration of the proposed 90-day limit conditions would be far worse than now, and Europe needs the coal. He further stated that with the present short running time many mines are showing a deficit in their operation, and with labor getting the highest wages ever offered coal-mine labor relief stations in the coal fields today must assist the needy miner who is denied the opportunity to work because there are no railroad cars in which to load the coal.

Despite the fact that wages are the highest and prices beyond reason, both miners and operators are realizing the smallest profit they have had for several years. Bearing out the statements of Mr. W. H. Williams in a previous address, Mr. Taylor said that whereas cars of coal in 1918 had been moved from the mines in the Kansas field to Kansas City and the empties returned in four days, the same round trip now requires twelve and a half days. There is enough railroad equipment in the country today, if put in repair and properly used, to meet the transportation requirements of the country.

In answer to an inquiry regarding the Lake situation, Mr. Taylor said that there is no question but that the Northwest will be short of coal this year, but that even if there was a larger supply on hand it could not be moved off the docks to consumers because of a lack of railroad equipment. The result this winter will be that a tremendous load will be thrown on the coal fields in Illinois that can reach the Northwest by all rail routes.

Resizing of anthracite, trade relations, cost accounting, Governmental relations and transportation were the subjects of special committee reports.

Indiana Operating Problems as Illustrated By the Black Betty Mine

Keen Competition and an Exacting Trade Make Close Sizing and Careful Preparation Necessary—Roof Scales Badly, Keeping Roads Covered with Rock Dust—Coal Bed Being Dry and Level, Rooms Are Driven in Opposing Directions

BY DONALD J. BAKER
Pittsburgh, Pa.

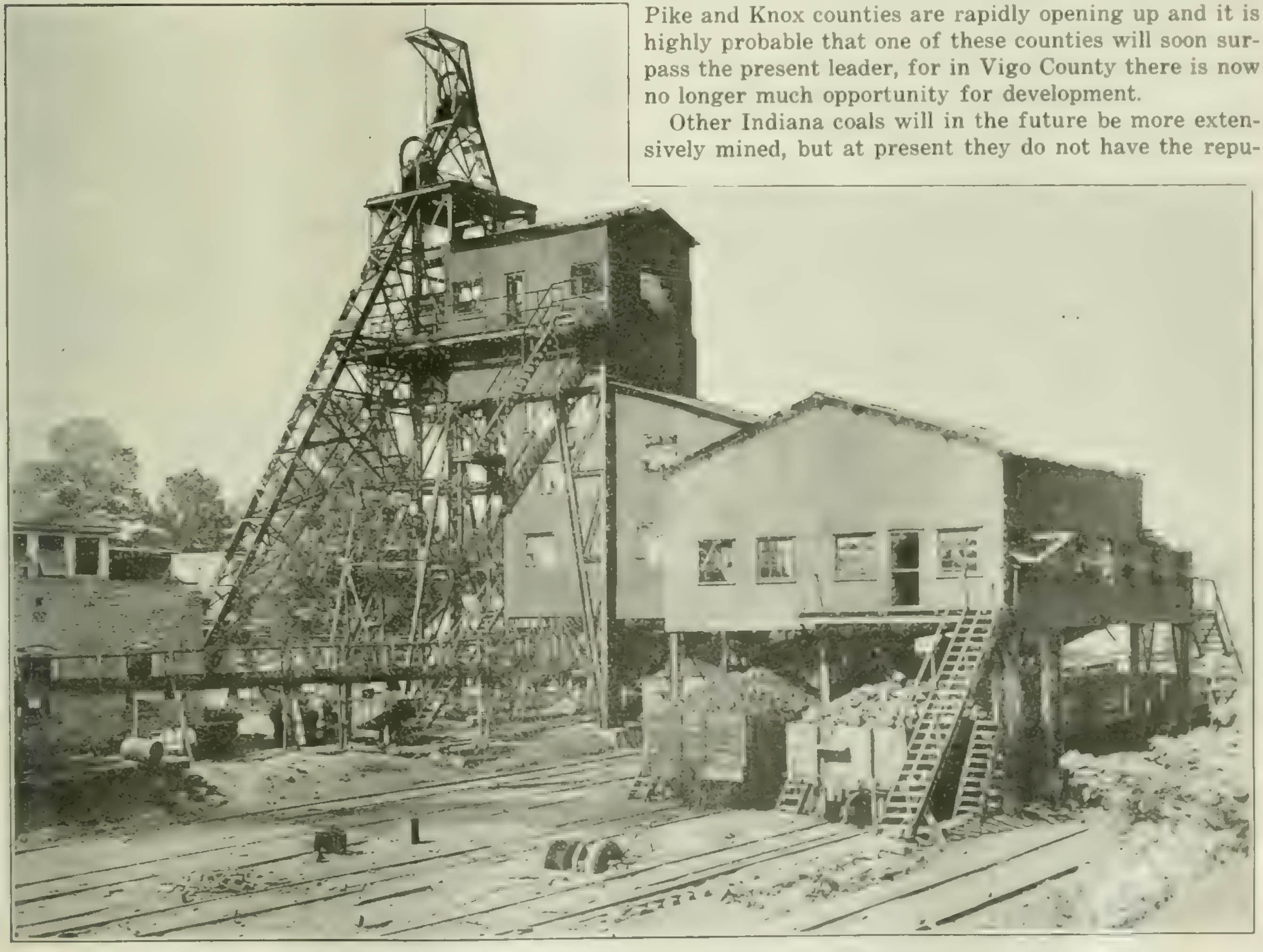
COALS from every section have each a degree of individuality in appearance that they can readily be recognized by the local expert. Not less marked a characteristic of each is its specific action in the furnace. In consequence of this individuality each finds its appropriate uses and each needs grate settings suited to its characteristics.

"Indiana Lump" is a coal of marked individuality. There is no question mark to be put after the word "lump" such as one would be disposed to put after the large coal from some other districts. It is a coal well suited to domestic use, while its slack has a non-caking quality which has its advantages. Due to its low-sulphur content it is peculiarly adapted to steel making and the ceramic industries. It is free burning, contains little sulphur as compared with coals from the other beds and leaves but a small amount of ash. An analysis of the No. 4 coal will show approximately the following constituents: Fixed carbon, 41.19; volatile matter, 37.80; ash, 7.05; moisture, 13.96; sulphur, 1.12. The heat content averages about 12,000 B.t.u.

SIX DEPOSITS IN WESTERN INDIANA

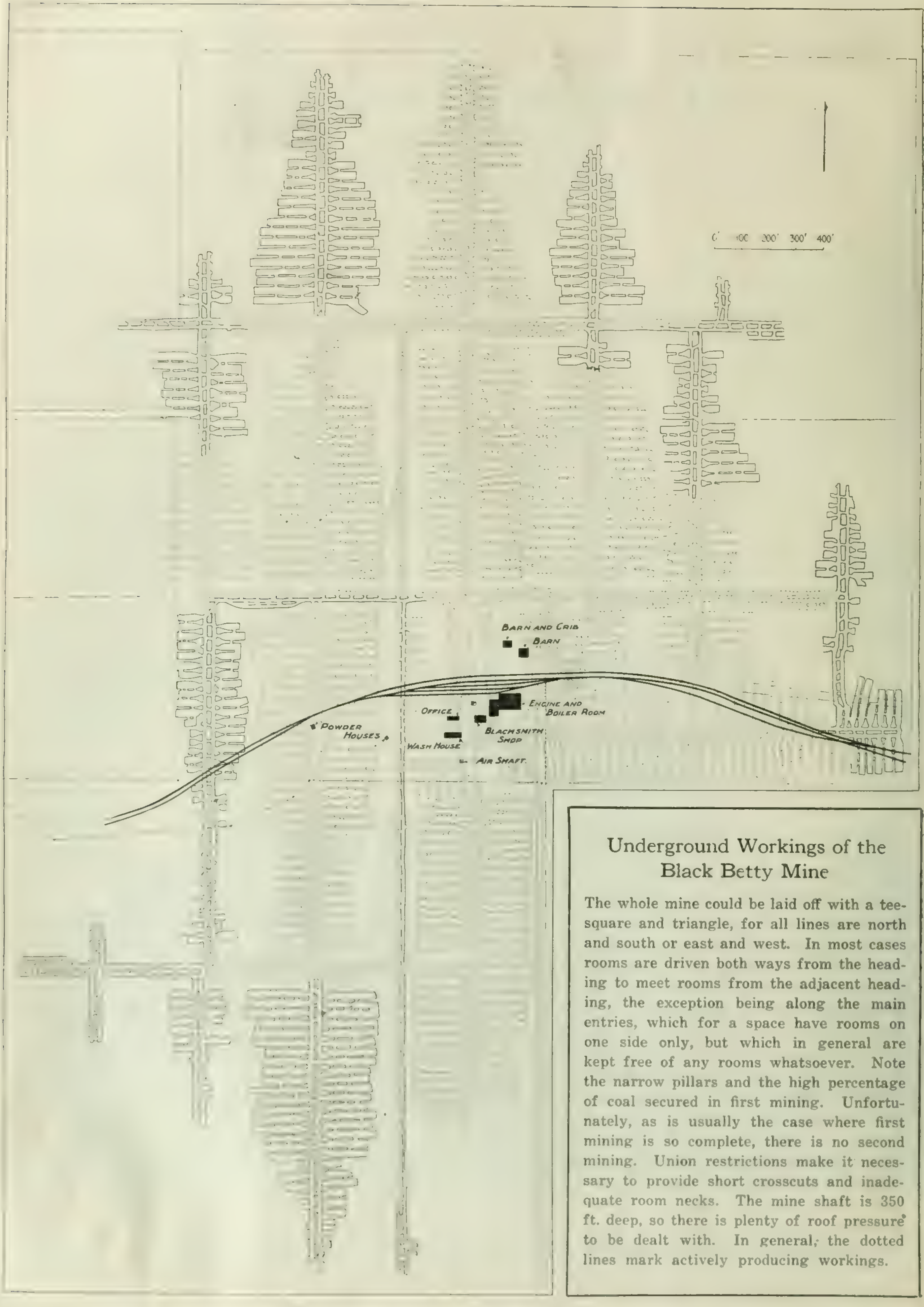
Notable among the varieties of the Indiana coal is the No. 4 bed, which is the most valuable of the group of the six distinct deposits found in western Indiana. Vigo County is the greatest producer of this coal, but Pike and Knox counties are rapidly opening up and it is highly probable that one of these counties will soon surpass the present leader, for in Vigo County there is now no longer much opportunity for development.

Other Indiana coals will in the future be more extensively mined, but at present they do not have the repu-



TIPPLE AND HEADFRAME OF BLACK BETTY MINE, NEAR TERRE HAUTE, IND.

Headframes in the Middle West are made lighter than in the Eastern mining regions, doubtless because the air in the hoisting shaft is not so humid and corrosive in the former instance. Owing to the fact that timber has to be brought in from some distance the Mid-West tipples are nearly always of steel, thus greatly decreasing the probability of fire and making more accessible all points under the structure. Four tracks pass under the Black Betty tipple, making it possible to load that number of sizes at any one time. Trifling changes in the screening apparatus make it possible at any moment to load any related four varieties of the twenty-one different sizes that the market demands. Note on the left the boiler-coal conveyor.



Underground Workings of the Black Betty Mine

The whole mine could be laid off with a tee-square and triangle, for all lines are north and south or east and west. In most cases rooms are driven both ways from the heading to meet rooms from the adjacent heading, the exception being along the main entries, which for a space have rooms on one side only, but which in general are kept free of any rooms whatsoever. Note the narrow pillars and the high percentage of coal secured in first mining. Unfortunately, as is usually the case where first mining is so complete, there is no second mining. Union restrictions make it necessary to provide short crosscuts and inadequate room necks. The mine shaft is 350 ft. deep, so there is plenty of roof pressure to be dealt with. In general, the dotted lines mark actively producing workings.

Undercutting the Seam

There being no marked cleating in the coal, the rooms are driven regardless of the structure of the bed but in rigid accord with mine layout. The bottom is a hard rock.

tation that the No. 4 bed enjoys. The fact that it is now impossible to purchase any acreage in the No. 4 bed testifies to its value and popularity with the consumer.

Located about 12 miles from Terre Haute and situated at a low point in the rolling country of the Wabash Valley is a representative mine that is developing a 1,000-acre tract of the No. 4 bed. This is the Black Betty operation of the Zimmerman Coal Co. This firm broke ground for its plant in December of 1916 and the following year began operations, sinking a 350-ft. concrete-lined main hoisting shaft.

FLOODED WITH WATER AND FILLED WITH DÉBRIS

Scarcely had the work of driving the main haulage entries from each side of the bottom been started, when a "cloudburst" occurred and filled the entire excavation with water and débris. For a considerable distance on either side of the bottom the roof came down as high as 35 feet.

The outlook for the eventual opening of the mine at this period was indeed dark. There is little question but that it would have been cheaper to have sunk a new shaft and begun all over again; however, there was no location on the tract that offered the same advantages for developing the coal. Accordingly the water was pumped from the opening and the best made of an unfortunate circumstance.

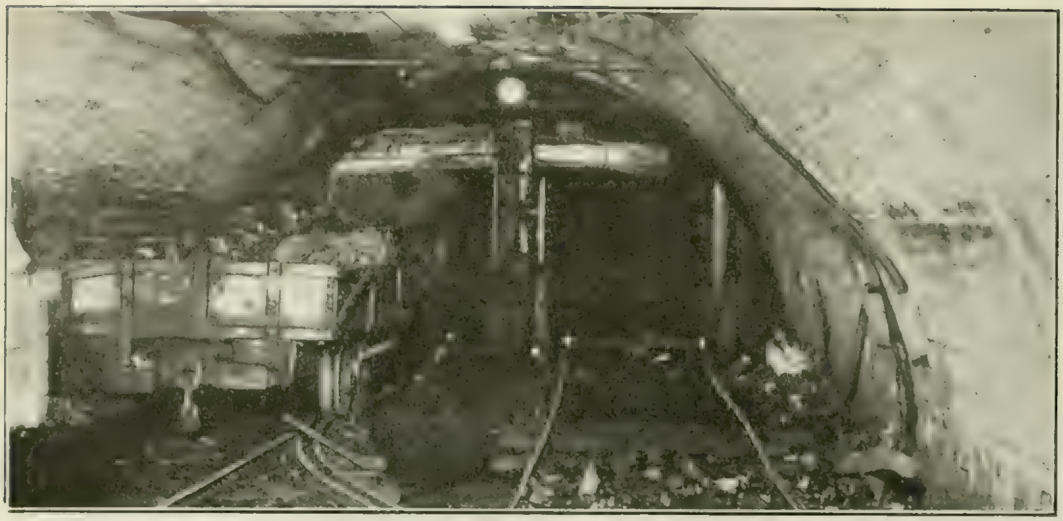
HEADING UTILIZED FOR HAULAGE PURPOSES

Fortunately, the cave did not extend over the parallel aircourse heading, and in order that the work of developing the mine might not suffer this heading was utilized for haulage purposes while the construction of a brick archway over the caved regions progressed. This archway, which is shown in one of the illustrations, was built of paving blocks made three blocks thick. It was constructed in 10-ft. lengths, each of which is 10 ft. high.

As each section was completed the débris ahead of the next section was placed above the finished arch to act as a cushion in resisting any future falls. The completed archway extends for a distance of 350 ft. upon one side of the bottom and 100 ft. on the other side. The longer portion of the arched way spans the loaded storage tracks, which are on a 1½ per cent grade. This

This is "Indiana Lump"

Free-burning, non coking and low in sulphur, the coal from No. 4 bed finds favored place in steel smelting, ceramic work and steam raising wholly aside from its recognized value as a domestic fuel.



Landing at Black Betty

In the early days of development Black Betty filled with water and débris and the landing caved till the heading roof was 35 ft. above the old floor. The landing had to be arched and the débris was piled as back filling over the archway as fast as the arch was constructed.

inclination permits the cars to run by gravity to an automatic caging device, which feeds them to the cages.

The opposite, or south, side of the shaft accommodates the empty cars as they leave the cage. The grade on these tracks is, of course, in favor of the empty cars and they are here made into trips before being removed by locomotives. As most of the development today is on the north side of the shaft, the trips pass along a heading that is parallel to the loaded storage tracks and emerge onto the main haulageway at a point directly north of the end of the archway.

TWELVE-FOOT ROOM PILLARS ARE NEVER DRAWN

The method of developing the mine is a variation of the triple-entry system, with a panel scheme applied to the working of the rooms. All entries, including main haulageways, are single tracked. A parallel heading serves as the aircourse. In the accompanying mine map it will be noticed that the mine was laid out to square with the points of the compass. As a result, the north and south sections of the mine are reached through true north and south main haulageways. Sub-entries running due east and west are driven every 1,320 ft. off these. From these sub-entries and at right angles to them room headings are driven every 450 ft. Thus a block of coal 1,320 x 900 ft. constitutes a panel and is developed by rooms 200 ft. long. The coal seam is 5 ft. 2-in. thick.

Except for a few local depressions No. 4 bed is practically level and rooms are driven from both sides of the entries. This is possible in a mine that is unusually dry and where the bed has no dip. Furthermore the mining law of the state permits ventilating this entire mine with two splits.

As fast as each panel is worked out it is sealed off and abandoned. Some gas is encountered in development, this being chiefly apparent immediately after the shooting of the coal. While open lamps are used throughout the mine, some gas is generated when the roof falls in the worked-out panels, and great care must be used in sealing off such workings.

The room pillars are 12 ft. thick, the roof over the coal at the time of its removal being quite reliable and the coal being strong. No attempt is made to draw these pillars and much good coal is thus lost by reason of the sealing off of the panels when the rooms have been carried to their full length. The coal thus abandoned approaches 40 per cent of that available.

In this section of the country the temptation to mine in the easiest possible manner is strong and it has resulted not only in leaving coal in the seam operated but in leaving undeveloped and unmined two other workable and valuable beds on this same property. No. 5 bed overlies No. 4 by some 100 ft. and No. 3 underlies it at an interval of 120 ft. Separated by such intervals, in the opinion of most people, No. 5 coal should be removed first, provided, of course, that all the beds were not to be operated concurrently. No. 4 coal could then be removed and there would then be some assurance that the floor and roof of each bed would present their natural resistance to crushing.

There is no drainage problem at this mine and the only water encountered is that which finds its way down the shaft. The floor of the coal is a firm sandstone. The roof is a sandy shale with some lime in it. Because of the dryness of the overlying seams this roof is quite firm when first exposed. In the winter months, when the circulating air is cool, no trouble is experienced; but during the summer the warm air which enters is chilled and moisture condenses in small globules on the roof. The action of the water on the lime is immediate and the roof starts to slack and flake off. No great amount of trouble is caused through this seasonal activity in the roof, and no measures have been taken in this mine to combat it. In other localities, however, a cement gun has been used advantageously.

MINE USES DIRECT CURRENT EXCLUSIVELY

The coal is cut by a Goodman shortwall mining machine and though this bed is harder than the Pittsburgh, no difficulty is encountered. Two-ton mine cars are used and mule haulage is employed within the rooms and along the room entries that are connected with the east and west headings. The locomotives are of the trolley type and operate on direct current. Incidentally only direct current is used both within the mine and around the surface plant.

Quite a number of the mines situated in the Wabash Valley purchase their power from the high-tension lines of the Terre Haute, Indianapolis & Eastern Traction Co., but inasmuch as the initial cost of constructing a transmission line from the nearest point appeared prohibitive, a power plant was built at this operation. The building is of brick construction, the roof being supported by steel and wooden trusses on brick columns. A brick partition divides the boiler from the engine room.

This latter also houses the hoisting engine. This building is situated adjacent to the tipple and is floored throughout with cement.

SPARE POWER UNIT SELDOM NEEDED

The main generating unit is a 22 x 25-in. Chuse nonreleasing corliss engine direct connected to a 300-kw. 550-volt Westinghouse direct-current generator, a 450-hp. Skinner engine that drives a 200-kw. 550-volt Westinghouse generator by direct connection being installed as a spare unit. This latter generating set is seldom used as the first mentioned unit supplies ample power. The hoist engine is of Lane & Bodley manufacture. The drum is 9 ft. in diameter and winds a 1⅛-in. cable. The cylinders of the driving engine are 24 x 42 in. in size, and the machine is equipped with a steam brake and a steam-operated reverse. A 10-in. steam line from the adjacent boiler room supplies all units in the engine room.

The boiler room houses five 150-hp. Frost boilers, each of which is equipped with hand shakers. The boilers are hand-fired with screenings. These are conveyed direct from the tipple to the floor by a button conveyor. The ashes are removed to a nearby dump by a steam jet which drives them through an 8-in. pipe line laid beneath the boiler-room floor. There are separate steam lines to both blacksmith shop and fan house, operation of these units being thus independent of the engine room.

Water for the boilers is secured from a small reservoir located near the surface buildings. This is fed from a large reservoir that is located at some distance from the mine. From the auxiliary reservoir the water flows by gravity to a cistern at the boiler house, whence it passes to the boilers through a feed-water heater.

The tipple was designed, fabricated and erected by the Wisconsin Bridge & Iron Co., the Eagle Iron Works of Terre Haute supplying all the interior equipment. The apparatus for preparing the coal is elaborate and was designed and installed with the purpose in view of pleasing a discriminating trade.

In fact there are in all twenty-one sizes prepared, as occasion demands, four of which can be loaded at any one time. These sizes vary from slack to a 6-in. lump and range through variations of pea sizes that run from ¼-in. to 1-in., thence through a nut size up to 2½-in. and lastly egg up to 6-in.

Why, it will be asked, should such a range of sizes be prepared? And is each of the different sizes actually made? The latter query may be answered in the affirmative, although many sizes are quite uncommon. In answering the first question it may be said that, owing to the keenness of competition in the Indiana field, the sales representative of a company that is not prepared to furnish any required size of cleaned coal finds himself under no small handicap.

LOADING BOOMS ARE USED AS PICKING TABLES

The tipple building is a steel frame with corrugated iron siding, while the headframe is of structural-steel construction. The cars as they come to the head of the tipple discharge their contents into a weigh basket, after which it passes into a hopper and is thence fed to a short apron conveyor. From the conveyor the coal passes over 30-ft. shaker screens. The different sizes are secured by changing the plates and employing those that contain the desired size of perforation.

Three loading booms and a slack chute permit four different sizes to be loaded at one time. From the end of the shaker screens the large lump enters one loading boom while the smaller sizes are distributed to two others. The slack travels by gravity to a chute beneath

LOOKING EASTWARD AT THE BLACK BETTY TIPPLE

On the right can be seen the small rock dump or, rather, bank. The coal being 62 in. thick, there is no need for room rock to be brought to the surface, but, as the lime in the roof causes it to scale whenever the damp and warm air entering the cool mine condenses on it, rock falls occur in the heading, and have to be removed. But the dumps are not as pretentious and costly as in some sections, where the rock handling in trips and on the dump makes an additional charge to the cost of deadwork, the importance of which is not always fully realized by those even who face these difficulties from which others are exempt.

the screens and is loaded without a boom. All the booms are used as picking tables as well as conveyors. Platforms have been constructed along the side of each, and here three men are stationed. Thus the coal is thoroughly cleaned before it enters the car.

No. 4 bed is mined unusually clean by reason of the firm floor, and no great amount of refuse is discovered in the tipple. All of the equipment within this structure is electrically driven from motors operating on direct current. In case the power is temporarily off at the power plant, the coal may be dumped over gravity screens beneath the shakers and loaded either as run-of-mine or as 1¼-in. lump and slack.

While the hoisting engine and the tipple were designed to accommodate a capacity of 3,000 tons in 8 hr., this figure is rarely attained. Perhaps 2,000 tons would be a fair average, although 2,500 tons have been loaded with ease when the cars were available. Car shortage has dealt this mine a severe blow, as it has many others in the Indiana field.

The mines in Vigo County are utilizing motor trucks in many cases to deliver domestic fuel. In this manner the shortage of railroad cars is alleviated. Hauls up to thirty miles are not uncommon and in this way the domestic and manufacturing needs of the surrounding industrial district may be filled. However, coal from the plant described is seldom delivered by truck and today it is operating at less than 50 per cent of capacity. This feature of intermittent operation is extremely trying.

NO HOUSING ACCOMMODATIONS PROVIDED

Houses for accommodating the men have not been built at this mine and as a result most of the employees live either in Terre Haute or Clinton and take a train to the plant. While the car allotment is less than 50 per cent of normal, production is further made more difficult by reason of the men not being available on short notice. Either the mine works an entire day or it does not work at all, and in either case the decision must be made the evening before.

Materials are taken down the shaft during odd times and the men use the coal cages before and after working hours. The airshaft is located near the tipple. Here a temporary wooden structure encloses a 20-ft. reversible fan that is driven by a twin-cylinder Bullock steam engine. The air is delivered at the rate of 217,000 cu.ft. per minute. The fan is one of the most important units of the surface equipment because the circulation of air must be always sufficient to immediately sweep away any gases that may escape from the abandoned panels. Some gas is encountered during the shooting of the coal and burning feeders are not uncommon. As a result, the firebosses must at all times be unusually vigilant. A few fires have occurred from these feeders; none, however, has been of serious consequence.

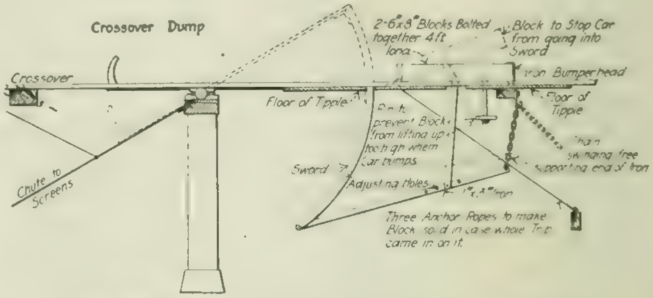
In a mine of this character that is exceedingly dry the possibilities of a dust explosion might appear to be considerable, but the action of the air on the roof during the summer months has caused a covering of rock dust to be deposited on the floor of the entries and this is believed sufficient to guard against the occurrence of any such accident. Mine fires and dust explosions are uncommon in the Indiana field despite what appears as a natural setting for such accidents. The dust along the entries at Black Betty is sprayed frequently from a water tank that is mounted on a mine truck.

Other surface and underground units at this operation do not differ markedly from those found at plants in western Pennsylvania. There is a motor-repair shop underground where locomotives and cars may be given light repairs or those of a nature that do not necessitate the removal of the equipment to the surface. Above ground there is the typical combination shop. For the operation of drills, lathes and other machines located in this building an engine is provided which operates a long shaft, and from this the various machine tools are driven by belt connection.

Automatic Car Stop for Crossover Dumps Prevents Breakage and Shutdowns

By G. E. Daugherty
Pikeville, Ky.

MOST mining men are familiar with the damage and delay that result from running a car or trip into an upended dump. Of course, such accidents do not occur when an automatic car feeder is employed which functions properly. Unfortunately, however, such devices as a rule are expensive and where the amount of material handled is small the operator is prone to question whether it would pay to introduce a car feeder.


Crossover Dump
Crossover
Chute to Screens
Floor of Tipple
2-6"x8" Blocks Bolted together 4 ft long
Block to Stop Car from going into Sword
Iron Bumperhead
Floor of Tipple
Pin to prevent Block from lifting up too high when Car dumps
Chain swinging free supporting end of Iron
Sword
Adjusting Holes
1"x3" Iron
Three Anchor Ropes to make Block solid in case whole Trip came in on it

DIAGRAMMATIC VIEW OF THE DUMP AND STOP

G. C. Wood, manager of the Tierney Mining Co., of Stone, Ky., has devised an attachment for crossover dumps that is intended automatically to prevent a car from running into the dump sword. This is in reality a bumping block that rises when the dump end goes up and drops back into place when the dump returns to its normal position. This attachment is shown in the accompanying illustration. Since it has been in operation at the mines of the above-named company it has frequently prevented the dump to which it was attached from being damaged and has saved the running of the mine from interruption.

Nova Scotia Men Demand Electric Lamps

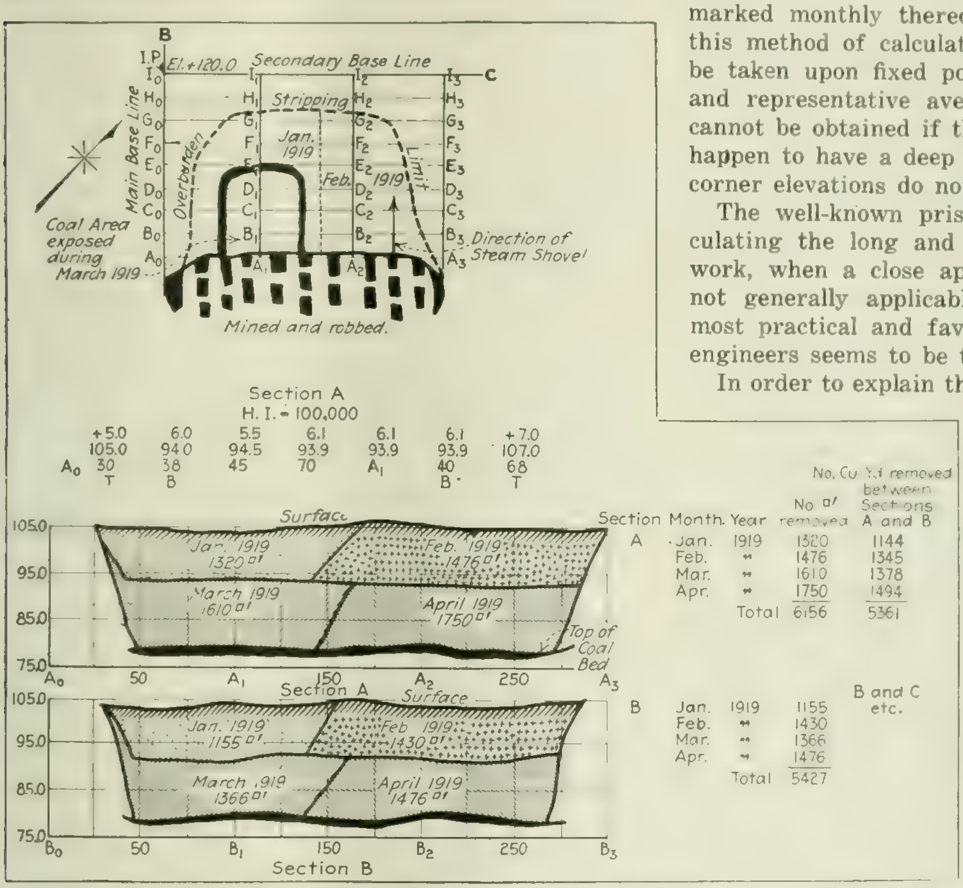
MINE workers in Nova Scotia are protesting against the continued use of the flame safety lamp. The men claim that not only would the air be purer and the work more safely performed if electric lamps were in use, but that the company would benefit also, for the output would be increased by the better light, the mine worker being better able to go about his work if so favored. The matter was taken up at the Phalen local, and the men charged that the coal company, which had promised to look into the matter, had been overlong in reaching a decision. They threaten a strike if nothing is done to replace their present lamp equipment.

Estimation of Quantities Removed in the Stripping of Anthracite*

Estimating Overburden Removed Is a Monthly Operation Devolving Upon the Engineer — Three Methods, the Square, Prismoidal and Average-End, May Be Employed for Calculating the Extent of Excavations, but the Latter Usually Is Preferred

By Thomas F. Kennedy
Scranton, Pa.

HAVING determined on paper the economic limit of any stripping proposition the next important step is to decide upon the method by which the overburden is to be removed. This must be known in advance if monthly estimates of the overburden handled are to be efficiently made. In connection with the foregoing statement it is pertinent to remark that the method for calculating the excavation also must be decided by the engineer as it may or may not be adversely affected by the plan of removal.



Section	Month.	Year	No □' removed	No. Cu Yd removed between Sections A and B
A	Jan.	1919	1320	1144
	Feb.	"	1476	1345
	Mar.	"	1610	1378
	Apr.	"	1750	1494
		Total	6156	5361
				B and C etc.
B	Jan.	1919	1155	
	Feb.	"	1430	
	Mar.	"	1366	
	Apr.	"	1476	
		Total	5427	

Sample Stripping Summary

Showing Plan of Area to be Stripped, Cross Section of Stripping Operations and Notes on Yardage Removed per Month.

Several good and practical methods have been planned for the estimation of the overburden removed. These include the square, prismoidal and average-end formulæ. In the application of the square method the surface of the proposed stripping is staked out in 20- or 25-ft. squares, and elevations are taken at each corner. After excavation the elevations are again taken at the same points and the volume of earth removed from each "square" is calculated by multiplying the average of the four depths by the area of the "square." The total volume removed is then the sum of the volumes of all the excavated squares.

As a rule a plan is provided only when the square method is used, the elevation of each corner being marked monthly thereon. The chief disadvantage of this method of calculation is that the elevations must be taken upon fixed points or corners, so that a true and representative average cut over the square area cannot be obtained if the interior of the square should happen to have a deep hole or high point in which the corner elevations do not partake.

The well-known prismoidal formula is used in calculating the long and narrow cuts found in railroad work, when a close approximation is required. It is not generally applicable to stripping problems. The most practical and favorite method used by stripping engineers seems to be the average-end formula.

In order to explain the application of this formula, as applied to monthly estimates, a typical problem will be assumed as shown in the accompanying sketches. By referring to the plan, let it be supposed that a stripping has been projected beyond a mined-out and robbed area, and that after an exhaustive study of the problem involving the staking out of the economic stripping limit the engineer has decided that the steam shovel will work most efficiently in a northwesterly direction. The question of cross-sectioning the proposed stripping is next in order.

In order to arrive at the most probable volume of the overburden removed it is necessary to have as many sections as possible, since the greater the number of sections the smaller is the probable error. It can be easily seen, therefore, that the greatest number of sections can be obtained by running the profiles perpen-

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*A series of five articles by the same author entitled "Anthracite Coal Strippings," was printed in *Coal Age*, beginning Oct. 3, 1918. The series was interrupted by the fact that the author joined the army. Article V of the series was actually written in camp.

dicular to the path of the shovel, as shown on the plan. This may not be true when a steam shovel is making short cuts perpendicular to the greater dimension of a stripping, but when possible it is advisable to have the shovel operate parallel to the longer sides of the stripping so as to avoid shifting the machine, which means additional expense to the contractor.

Generally, a main base line with a secondary reference line is laid out and section lines A_0—A_3, B_0—B_3, etc., are run every 20 or 25 ft. with stout wooden stakes placed every 100 ft. at points A_0, A_1, A_2, A_3, B_0, B_1, etc. The method is delineated upon the plan of the proposed stripping and the base and section lines are then staked out in the field. The stakes marking the overburden stripping limit are likewise placed and the elevations of the cross-sections are then taken.

With one set-up it is advisable to take all possible elevations on all decided breaks, being careful to run all points on each line separately. In order to reduce all possible errors to a minimum, the number of set-ups should be as few as possible. An iron pin 3 ft. long and 1½ in. in diameter, located a safe distance from the proposed stripping, should be used as a permanent bench mark. To check work ties should be run.

After all data concerning the elevations of the cross-sections have been collected the information is plotted upon cross-section paper to some convenient scale, as 1 in. to 10 ft., both vertically and horizontally, the scale depending upon the magnitude of the work, but as a rule the foregoing scale is generally used. The scales employed in the accompanying cross-sections are adopted for illustrative purposes only.

Wooden Stakes or Rock Slabs to Mark Points

Referring to the plan and cross-sections, sections "A" and "B", showing the surface line, are plotted with the position of the bed previously determined from information that has been gathered from boreholes. It will be further assumed that the steam shovel began operation in January, 1919, and finished the removal of the overburden after four months of activity. In order to calculate the amount of overburden removed during January, the following method is proposed: After the January cut has been made the 100 ft. points as A_1, A_2, B_1, B_2, etc., or points whose locations have been destroyed by the shovel operations, should be re-established and properly marked. Wooden stakes or even flat rock slabs may be used in establishing the identity of each point. The use of the flat slabs as markers is practicable and economical and by their adoption speed in estimating the yardage removed is obtained; moreover, wooden stakes are as a rule disturbed and sometimes removed during the activities of the stripping operation and must be replaced, so the use of small flat slabs is advisable.

After the 100-ft. points have been re-established the elevations on the cross-sections are taken, one man running the level or transit and taking the notes while two assistants handle the tape and level rod. For measuring distances from the reference points a 100-ft. steel tape may be employed. It gives good results as far as precision and speed are concerned. The transit which must be used in re-establishing the cross-section points can be and usually is employed in place of a level for taking the elevations, while a 7-ft. level rod, a small hand or Locke level, a few plumb bobs and a notebook, etc., make up the rest of the necessary equipment.

In keeping the notes, each transitman has his own methods and short cuts, but in general there are two systems, which I term respectively "vertical" and "horizontal." In the vertical system the points are recorded vertically in the first column on the left page of the notebook, while in the next column the back-sight readings are placed. Then follow in order the height of instrument, the fore-sight readings on the points and then finally the calculated elevations. In order to show additional information and assist the draftsman in plotting, a sketch drawn upon the right-hand page usually accompanies the notes.

In the horizontal method the left page of the notebook is used to carry the elevations, such as bench mark, turning points, heights of instruments and connections, while on the opposite page a set of notes, as shown by section "A", is kept. By studying the form of notes shown by the foregoing section, the height of instrument, which is assumed to be 100, is first recorded, while point A_0 is next noted, but as the cut does not involve this point, no elevation is determined; the distance from point A_0 to the top of the cut, 30 feet in this particular case, is next measured and a "zero" reading of plus 5 is obtained by holding the bottom of the level rod in the same horizontal plane of the line of collimation of the transit. The plus elevation to the nearest tenth is then recorded, while the rodman moves to the next point, which is shown to be the bottom of the cut, when a reading is taken and the distance from A_0 measured.

The foregoing operation is followed out on the section line until the transitman has secured all the necessary information on that particular cut that can be obtained from a single set-up; then the same procedure is carried out on the remaining sections. The letters "T" and "B", indicating top and bottom of cut, placed below the reference distances may be used in assisting the draftsman in plotting. The location of each point on each section line should be determined by measuring the distance from each lettered point used as a base.

Planimeter Method Found Practicable

After sections are plotted the areas are found, preferably by the planimeter, although this result can be determined by dividing the plotted area into triangles, squares, trapezoids, rectangles, etc., and finding the summation of each individual area. The planimeter method is more practicable and economical. After determining the area of each sectional cut, the monthly cut should be tinted with water color, using the same tint for the same month on the different sections, which idea is shown in a conventional manner upon the accompanying cross-cestions. In addition the month, year and number of square feet of cross-section in the excavation removed should be letetred upon the tinted area. Likewise a different color for the next succeeding month should be used.

To show the progress of the stripping, boundary lines describing both the area of overburden excavated and of the coal area exposed should be delineated monthly upon the plan.

To find the amount of overburden removed, the average-end formula is then applied: for example, in calculating the cubical contents between sections A and B for the month of January, the average of the area on both sections is multiplied by the sectional interval, which is in this case 25 ft. Using the different end areas between the different sections, the amounts removed between the various sections can be calculated. The total amount removed is the summation of the sectional quantities.

In order to keep a record of the quantities removed a good scheme is to tabulate the results as shown with the accompanying cross-sections. The last column shows the sectional yardage for each month and also the total contents removed between particular sections when stripping is finished.

If the superimposed overburden is composed of clay and hard rock, which in some cases is to be estimated separately, the elevations should be run at the proper time and the line of demarcation shown upon the plotted cross-sections.

The number of cars removed by the contractor, allowing for a certain percentage of swelling, will furnish information by which the number of cubic yards of overburden may be checked. In calculating the final volume removed the total area on each section should be run and verified, making an allowance for cleaning the top of the coal. Above all good judgment and common sense should be used in making the final estimate of the work done at any stripping operation.

Roads Mulcted for Excess Profits on Maintenance and Betterments

W. Jett Lauck Says Continuance of Recent Profiteering Will Cost Railways a Billion Dollars Additional During Next Three Years

THAT profiteering in coal, petroleum, steel and steel products has cost the railroads of the United States at least $600,000,000 during the last three years and, unless checked, will cost them more than $1,000,000,000 additional during the years of 1920, 1921 and 1922 is the crux of a supplementary report by W. Jett Lauck, consulting economist for the railroad labor organizations, transmitted to the Railroad Labor Board.

"Next to wage earners, the salaried class and people of fixed incomes, the railroads have been the greatest victims of the profiteers," says this report, "and the most serious aspect of this phase of the profiteering problem is that it means a fixed charge upon the public of millions of dollars annually for all time to come, for if the railroads are mulcted of a billion dollars in undue profits in the expenditures for maintenance and betterments during the ensuing three years, that amount necessarily becomes a part of the capital investment upon which the public must pay a fair return.

"In this connection it should be stated that if the railroads were protected against the profiteers, reasonable and necessary advances could be made in the wages of railway workers without material increases in transportation rates, and attention may be also called to the fact that in such legal steps as have been taken to punish or restrain profiteering not a move has been made against the profiteers in steel and steel products, coal, petroleum and railroad equipment and supplies."

The Lauck report fixes 12 per cent as the profiteering tribute which the railroads have paid to the producers of coal, petroleum, steel and steel products, car and locomotive manufacturers and others.

"This figure has been arrived at," states Mr. Lauck, "only after the most thorough and painstaking analysis of railroad expenditures and the profits of the corporations from which they buy. For instance, during the three years of 1917, 1918 and 1919 the railroads of the country combined bought 451,113,935 tons of coal at a total cost of $1,225,610,793. The companies from which this coal was purchased made an average profit of 52.6c. per ton, or $237,179,652, after paying all taxes and other charges. A survey previously made shows the average net profit of coal companies for the pre-war years to have been 21c. per ton, which would have netted them $94,733,926 in profits upon this tonnage. The amount of profiteering in coal for the three years, therefore, is ascertained by deducting the normal profit from that actually taken, which adduces an excess profit of $142,445,726 in coal alone, or practically 12 per cent.

"During the three years mentioned the railroads bought 4,508,213 tons of rails at an average price of $45.19 per ton, on which the steel companies made net profits of at least $11. For a great man years before the war steel rails had sold at exactly $28 per ton, on which the manufacturers realized about $4.69 in net profits, after paying interest and other charges. The total excess profit on this one item for the three years amounts to approximately $30,000,000, or more than 14 per cent of the cost."

Comparatively little money was spent by the transportation companies for extensions, improvements or new equipment during the period 1917-1919. The total was slightly more than $2,000,000,000, about $1,000,000,000 of which was for materials. Operating expenses, including salaries and wages, were approximately $10,000,000,000, about 40 per cent of which, or $4,000,000,000, was spent for fuel, supplies and equipment. The total expenditure for commodities was, therefore, about $5,000,000,000, 12 per cent of which, or $600,000,000, went into excess profits.

"A very exhaustive analysis of the amount needed for the rehabilitation of the railroads during the coming three years made by experts for the *Railway Age* estimates that, in all, $6,000,000,000 should be spent for new equipment, extensions, additional lines, grade revisions, buildings, and so forth. About one-half of this amount will go to purchase cars and locomotives. Of the remaining $3,000,000,000, it may be assumed that at least 50 per cent will be paid for materials, making a total of $4,500,000,000 of capital expenditure for commodities. Assuming that operating expenses remain the same as in 1918, another $4,500,000,000 will be expended for materials and supplies, a grand total of $9,000,000,000. And also assuming that the ratio of profiteering does not increase, it is easy to see that something over $1,000,000,000 will go into excess profits during the years 1920, 1921 and 1922. This huge sum will, of course, be an addition to the investment in railroad property, on which the public will have to pay 5½ per cent for evermore.

"A very good reason why the estimate is low is that prices of coal and steel products have advanced greatly within the past few months. This will result in increased profits to the producers and manufacturers. Coal, for example, is selling for at least $1 more per ton at the mines than it was in March. Authoritative information has reached me of railroad contracts for coal made recently at prices as much at $7 per ton over the former figure. Even $1 a ton increase is exorbitant. It has been conclusively shown that the recent wage increase to miners adds less than 40c. to the cost of producing a ton of coal. If the selling price is advanced $1 it means 60c. additional profit to the coal operator."

Bureau of Mines Proposes to Use Airplanes In Its Mine-Rescue Work*

Can Be Used Only in Fairly Level Country When Snow Does Not Disguise Ground and During the Day—Bureau Will Use the Planes Belonging to the Air Service Which Are Located on an Average 150 Miles from Safety Stations

By F. J. Bailey†

IN THE fall of 1919 the U. S. Bureau of Mines began an inquiry as to the possibility of utilizing airplanes for quickly transporting engineers and oxygen rescue apparatus to mine disasters.

It was realized that this proposed use of airplanes has serious limitations, and that if it were feasible, the Bureau would have to rely on the co-operation of the established aviation fields of the U. S. air service for furnishing airplane service. Therefore Van H. Manning, then director of the Bureau of Mines, under date of Oct. 28, 1919, wrote the director of air service, outlining the rescue and first-aid organization of the bureau, the location of headquarters of district engineers, the distribution of safety cars and stations, and other essential details, and asking whether the air service could co-operate with the bureau in the event of serious mine disasters. Major-General Charles T. Menoher, director of air service, responded that the air service would be glad to co-operate as far as possible, and designated those air service stations which, being nearest the district engineers' headquarters, might be best able to assist.

For a mine to avail itself of the airplane service, should it be installed, it will have to find nearby a field 1,800 ft. square or thereabout. Such a field will be about a third of a mile long and a third of a mile broad and will have an area of about seventy-five acres. Invention may yet lessen these requirements.

The Bureau of Mines has ten mine-rescue cars and eight mine-safety stations distributed throughout the mining regions of the United States. The cars are each equipped with sets of oxygen mine-rescue breathing apparatus and first-aid supplies. The car personnel consists of a mining engineer, surgeon, foreman, first-aid miner, clerk and cook. A foreman miner is in charge of each station and at five of the eight stations are mine safety trucks. The work of the cars and stations is twofold: (1) Assisting in rescue and recovery work at mine disasters, and (2) training miners in mine-rescue and first-aid methods, and in investigations looking to prevention of mine accidents. The country is divided into nine safety districts, an engineer in charge of each.

Dayton Airplane Station Will Assist

A preliminary survey has indicated that airplane service might be effectively utilized in the flat-lying coalfields of Illinois and Indiana, and a co-operative agreement has been made whereby McCook Field, Dayton, Ohio, will maintain in readiness planes for assisting the Bureau of Mines safety station at Vincennes, Ind., in its rescue work. The Bureau of Mines district engineer at Vincennes will collect data on possible landing fields near the mines in this district, with maps indicating these landing places, their proximity to mines, or to towns and railway stations.

When the Vincennes station receives word of a serious mine disaster at a mine where a nearby landing field is available, or where a landing field is so situated that train or auto connection could be made with a decided saving of time, a call for planes could be sent to McCook Field. The planes could land at the Vincennes municipal landing field, where the district engineer or foreman miner of the bureau's station would be waiting, could take on gasoline and other supplies needed from the Bureau of Mines service station which is maintained there, and could carry the bureau's engineer with sets of rescue apparatus to the landing field near the scene of the disaster.

The engineer from the bureau would thus be on the ground early. The preliminary steps to be taken in the organizing for recovery work he could assist in directing. In the meantime a fully equipped Bureau of Mines rescue car or auto truck could be rushed to the mine, and on arriving there would find an adequately directed organization already functioning. This will conserve valuable time and might result in saving lives of entombed men that might otherwise be lost, as every minute is precious.

Much remains to be done before any decisive statements can be made as to the extent and effectiveness with which airplanes can be utilized in mine-rescue work throughout the country. The difficulties and problems involved are many and some of these will be discussed in the following paragraphs.

The distance of the air service stations from the safety stations, and thence to the mines, is a prime consideration. The air service stations are on an average of 150 miles from the safety stations, but some of them are much farther. Information as to flying time compared with time of travel by railroad or auto service is needed to predict whether airplane service or combined air and surface service could be utilized with advantage.

The greatest problem is that of suitable landing fields. First, fields must be available at the town where the safety headquarters are situated; second, fields must be established at the mines. As regards establishing landing fields near mines, careful survey is necessary to determine where level places are available that could be prepared for landings without much difficulty. In mountainous mining districts there are at many mines no level places suitable for landing. Such conditions are found in metal- and coal-mining districts of the Rocky Mountain states and the Pacific Coast states, and in a number of the coal fields of the Appalachian region.

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*From [illegible] entitled "[illegible] Airplanes in Mine-Rescue Work." U. S. Bureau of Mines Reports of Investigation.

†Assistant to director, U. S. Bureau of Mines.

The present types of airplane require a landing space about 1,800 ft. in extent in both directions. The development of planes capable of ascending from and descending to a landing of limited area would overcome the present lack, at many mines, of safe landing areas, and there is good promise of the development of such planes in the not distant future.

The service stations must have planes suitable for the work. Some air service fields are not at present equipped with types of planes suitable for carrying additional load, such as a passenger and rescue apparatus, or with planes having a sufficient gasoline supply to provide a good flying radius.

OBSTACLES TO THE UTILIZATION OF AIRPLANES

Flying at night, especially in mountainous country, would not be feasible. Neither could airplanes safely take the air in stormy weather. In regions of heavy snow, as in the Lake Superior district, planes could not be used in winter months, because the obliteration of landmarks by a deep blanket of snow makes it difficult for the aviator to pick his route with certainty.

An aerial map of the mining districts, showing safe landing fields, established aerial routes, and similar data is essential. The civil operations branch of the air service has made much progress on the mapping of commercial landing fields and the development of a system of aerial routes. The Bureau of Mines engineers in their field work will be able to compile data on the surface conditions near each mine visited, and map places suitable for landing fields. This data will be submitted to the air service as fast as accumulated.

In conclusion it should be remarked that too much should not be expected for the present in the use of airplanes in mine-rescue work. The prospects for such utilization in the mountainous districts of the West or in hilly regions of the East are not bright. In the mining regions of Illinois, Indiana and other Middle Western states where the surface is comparatively level there are excellent prospects that airplanes can frequently be used with advantage. If such use should result in the saving of lives at even one disaster, it would amply justify all the time and effort expended in this work. Moreover, as the commercial use of the airplane expands and improved types capable of landing in a small area appear, the field of application of airplanes to mine rescue work will be greatly broadened.

Commerce Commission Awards Red Ash Coal Co. Reparation for Unreasonable Rates

IN THE complaint of the Red Ash Coal Co. against the Central Railroad of New Jersey, charging that unreasonable rates were exacted for the transportation of anthracite coal, in prepared and pea sizes, in carloads, from Red Ash Colliery, in the Wyoming coal region of Pennsylvania, to Elizabethport, N. J., for reshipment by water, the Interstate Commerce Commission has ruled in favor of the plaintiff, ordering reparation in the sum of $12,863.58, with interest amounting to $1,165.17.

Movement of Bituminous to Tide During April

BITUMINOUS coal dumped into vessels at North Atlantic ports in April amounted to 4,056,000 net tons. Of this, 717,000 tons were shipped by vessel to New England. Forty-seven per cent of the total dumped was destined for export. Five thousand tons were exported from New York, 149,000 tons from Philadelphia, 417,000 from Baltimore, 1,258,000 from Hampton Roads, and 74,000 from Charleston. The total exports—1,903,000 net tons—were somewhat larger than those of October, 1919 (1,819,000 net tons); hitherto the record for one month.

COASTWISE MOVEMENT TO NEW ENGLAND, AND EXPORTS AT NORTH ATLANTIC PORTS IN NET TONS

Month	New England	Exports	Total Dumped at Tide
1919			
January	721,000	456,000	2,954,000
February	554,000	334,000	2,537,000
March	490,000	266,000	1,962,000
April	635,000	379,000	2,703,000
May	772,000	476,000	3,082,000
June	790,000	755,000	3,388,000
July	711,000	739,000	3,389,000
August	839,000	1,129,000	3,875,000
September	839,000	1,526,000	4,304,000
October	657,000	1,819,000	4,597,000
November	703,000	230,000	2,235,000
December	674,000	182,000	2,036,000
Totals 1919	8,385,000	8,291,000	37,062,000
1920			
January	804,000	897,000	3,185,000
February	793,000	718,000	2,899,000
March	954,000	1,033,000	3,965,000
April	717,000	1,903,000	4,056,000

Commerce Commission Expected to Enforce Car Service Rules

OBSERVANCE of car service rules by the railroads is not likely to be the simple matter it now is when the Interstate Commerce Commission takes a real hand in this important phase of railroad operation with the board of powers of regulation and control contained in the Transportation Act.

Lax interpretation of the existing car service rules has been one of the reasons for the improper distribution of freight equipment as it existed some weeks ago and exists today. Some railroad operators favor the adoption of a per diem charge on all cars when off home lines sufficient at least to pay interest on the home line's investment as well as depreciation.

At present the per diem charge is only 90c. a day, and the temptation to reroute foreign equipment when business has offered that promised to yield a return far in excess of 90c. a day has proved too great to be ignored. Consequently freight equipment has been scattered widely. It is hoped that the increased powers of the Interstate Commerce Commission will bring about a strict observance of the car service rules in the future.

Substitute for Gasoline Sought by Congressman

REPRESENTATIVE Knutson has introduced a joint resolution in Congress providing for the appropriation of $250,000 to be used by the bureau of chemistry of the Department of Agriculture in the discovery of a suitable substitute for gasoline.

How Age and Occupation Affect Frequency And Duration of Disabilities[*]

Men Whose Records Have Been Noted Lost on an Average 6.6 Days Per Year—The Disabled Lost an Average of 28.1 Days—Frequency of Disability of Those Under Twenty Exceeds That of Any Other Group, but They Are Soon Cured of Their Ills

By W. W. Adams[†]

FOR many years people have questioned whether it is the experienced or the inexperienced miner who is most frequently injured in mine accidents. A satisfactory answer has never been forthcoming because of the absence of sufficient basic information. Any data, however incomplete, bearing upon this subject should therefore be welcomed by everyone interested in the matter. Two recent reports published by a Federal bureau set forth, in a limited way, the relationship between the age or occupation of an individual and the liklihood of his being disabled by accident or illness. The reports are based on a group of 185,018 men (whose ages varied from 16 to more than 70 years) engaged in 42 wage-earning occupations, during the five-year period 1912 to 1916. These men, who were members of a mutual-benefit association, formerly had been residents of Central Europe, and upon their immigration to this country entered employments of a wageearning character, principally in the industrial centers in the Eastern part of the United States. Of these 185,018 men, 43,485 were disabled for a period of time equivalent to 1,223,324 days. This represents a loss of 28.1 days for each disabled person, or 6.6 days for each of the 185,018 persons who were liable to accident or sickness.

> **Mine workers have a higher disability rate, both as to frequency and as to duration, than the average workingman and this is true of all periods of five years into which statisticians have divided the life of the worker. In no age-group, however, do miners have the greatest disability frequency and only between 35 and 44 do they have the largest number of disability days of all occupations.**

Of the total number of disability cases, 12,200, or 28 per cent, were due to accidental injuries; of the total number of days lost, 293,600 days, or 24 per cent, were due to injuries. Unfortunately, these figures cannot be segregated to show the industries to which they apply nor the ages of the persons disabled. Therefore the following remarks relate to disability caused mainly by sickness rather than accident. The 185,000 persons are shown in 5-year age-groups, beginning with those between 16 and 19 years of age, with the number of men in each group who were disabled and the length of time their disability continued. Sickness and accidents occurred most frequently (312.8 per thousand) to men under 20 years of age, whereas those between 30 and 34 years of age were disabled less frequently (222.2 per thousand) than any other group. From this point, however, the tendency to disability showed an almost unbroken increase with the age of the individual, although in no group did it reach the high record of those under 20 years old.

There was a marked difference between the number of cases of disability in each age-group and the loss of time caused by such cases.

Persons under 20 years old, although incapacitated more frequently than those of any other age, lost little time from their work, the average being 5.2 days for all wage earners of this age. The average time lost is even less for men between 20 and 24 years old, but from this point the period of disability, like the number of cases of disability, increases with advancing age, this increase becoming especially noticeable among men over 50 years of age.

DISABILITY CASES AND DAYS OF DISABILITY PER 1,000 MEMBERS, BY AGE-GROUPS

	Total Members		Cases of Disability			Days of Disability		
Age Group	Number	Per Cent of Total	Number	Per Cent of Total	Per 1,000 Members	Number	Per Cent of Total	Per 1,000 Members
Under 20 years	406	0.22	127	0.29	312.8	2,108	0.17	5,192.2
20 to 24 years	7,168	3.87	1,778	4.09	248.0	34,296	2.80	4,784.6
25 to 29 years	15,267	8.25	3,574	8.22	234.1	76,619	6.26	5,018.6
30 to 34 years	21,886	11.83	4,862	11.18	222.2	106,162	8.68	4,850.6
35 to 39 years	27,496	14.86	6,197	14.25	225.4	155,209	12.69	5,644.7
40 to 44 years	30,746	16.62	7,104	16.34	231.1	196,206	16.04	6,381.5
45 to 49 years	31,579	17.07	7,150	16.44	226.4	206,860	16.91	6,550.5
50 to 54 years	25,484	13.77	6,044	13.90	237.2	189,850	15.52	7,449.8
55 to 59 years	16,229	8.77	4,168	9.58	256.8	146,777	12.00	9,044.1
60 to 64 years	6,689	3.62	1,859	4.28	278.0	80,459	6.58	12,028.5
65 to 69 years	1,843	1.00	557	1.28	302.2	25,361	2.07	13,760.7
70 years and over	225	0.12	65	0.15	288.9	3,417	0.28	15,186.6
Total	185,018	100.00	43,485	100.00	235.0	1,223,324	100.00	6,611.9

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‡Monthly Labor Review for November 1919 and March 1920, published by the Department of Labor

[*]"Influence of Age and Occupation on Frequency and Severity of Disability," published in the Monthly Reports of Investigations" of the U. S. Bureau of Mines.

[†]Mine accident statistician, U. S. Bureau of Mines.

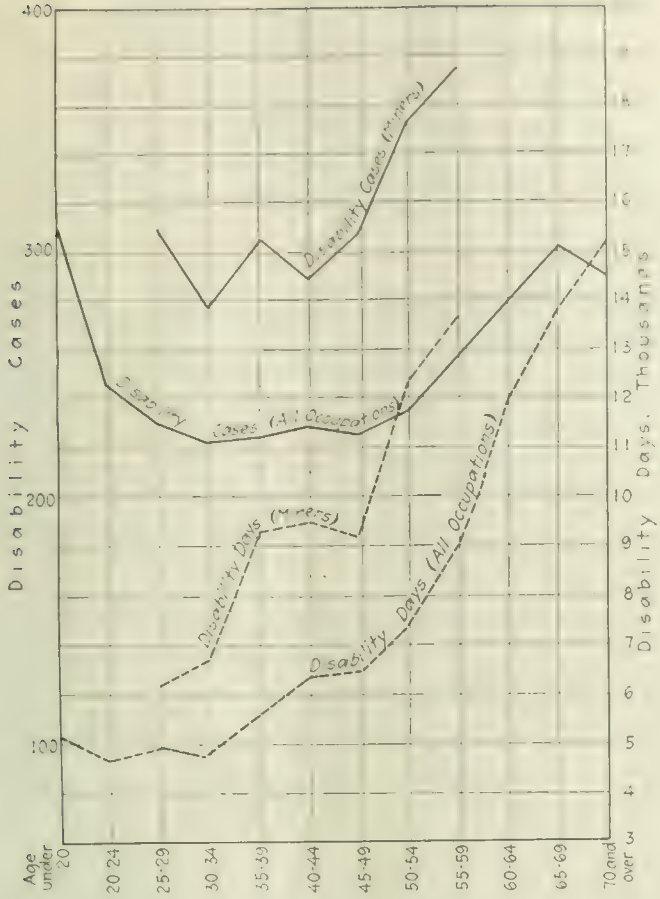

CHART SHOWING NUMBER OF DISABILITY CASES AND OF DISABILITY DAYS FOR AGE PERIODS

The experience of the insurance company makes it clear that the mine worker insured by it had more occasions for idleness due to sickness and accident than the man in the average occupation and that, for the mine worker the length of layoff was also longer. The duration of his disability and its frequency increased also with increasing years as was the experience with the average worker.

When the employees of a particular age among the 185,018 men are further classified to show the number employed in each of the 42 occupations, the number of persons in each group becomes so small that any accident or sickness ratio based thereon loses much of its value. Furthermore, the occupations are vaguely defined and the classes of employees included cannot be stated. Moreover, many occupations are not listed, some of which, notably deep-sea fishermen, would probably show a high disability rate. The figures should therefore be used merely as helpful guides until it is possible to obtain larger and more representative figures for each group.

With this observation as a caution, it may be pointed out that freight handlers between 25 and 29 years old were disabled more frequently than men of any other age or occupation (423 per thousand) while the greatest freedom from disability was enjoyed by jewelers between 50 and 54 years of age (107 per thousand).

As regards the length of time lost from disability, railway employees between the ages of 55 and 59 years lost the most time (19.4 days for each man so employed), and tanners between 25 and 29 years of age the least (1.4 days per man employed).

In the foregoing and all other comparisons persons employed in the professions are excluded as being of a distinctly different class as regards liability to accident and illness. The figures show that this group enjoys a low disability rate both in the number of cases that occur and the period of enforced idleness.

Taking each of the seven age-groups under separate consideration one occupation in each will stand out most prominenly as having the larger number of disability cases among its memmbers. For this part of the study the only information available applies to men between 25 and 59 years of age. As stated before, among men between 25 and 29 years of age the freight handlers were the workers most frequently disabled; between 30 to 34 years of age, the molders; between 35 and 39 years, railroad employees; between 40 and 49 years, drivers and between 50 to 54 years the blacksmiths led, being more fequently disabled than men of any other occupation in the same age-group.

In like manner we may learn in which occupations and at what ages disability occurs with the least frequency. The number of persons disabled in each age-group reached its lowest point in the following occupations: Age 25-29, tanners; age 30-34, plasterers; age 35-39, printers and engravers, and employees of clay-product manufacturing establishments, the length of disability for these two classes of employees being equal; age 40-44, dyers; age 45-59, jewelers.

DISABILITIES MAY BE FREQUENT YET NOT LONG

Employees of a particular age or occupation most frequently affected by sickness or accident are not always the employees who lose the greatest amount of time from their work. For example, among wage earners between 25 and 29 years of age disability occurs most frequently, as previously stated, to employees handling freight, but men of this age employed as barbers are idle over a greater period of time, although in these two groups the difference is but slight. In the other occupations and age-groups the employees losing the most time by reason of disability are: Age 30-34, employees of clay-product manufacturing establishments; age 35-44, miners; age 45-49, miscellaneous building-construction employees; age 50-54, freight handlers; age 55-59, railway employees.

As regards time lost from disability, the following occupations stand out most prominently in the respective age-groups as enjoying the greatest freedom from lingering periods of recovery; Age 25-29, tanners; age 30-34, leather workers; age 35-39, electrical workers and barbers, the rate for these two classes being equal; age 40-49, jewelers; age 50-54, electrical workers; age 55-59, jewelers.

DISABILITY AMONG MINERS ABOVE THE AVERAGE

Among the 168,687 men between the ages of 25 and 59 years whose occupations have been divided into 42 classes, 6,484 men were employed as miners. It is unfortunate that a larger figure is not available to serve as a basis for more trustworthy comparisons between disability among miners and that among persons engaged in other industries. In the absence of more reliable data, however, the statement may be made that out of the total number of men in the 42 occupations 39,099 were disabled and lost 1,077,683 days from their work through illness or accidents, or an average of 6.4 days for each of the 168,687 persons.

Of the total number engaged in mining 2,012 were disabled and lost about 59,300 days, or an average of 9.1 days for each miner employed. Thus the disability among miners caused by accidents and illness appears to be much higher than the average for all occupations combined; also among the employees of all occupations accidental injuries cause about 28 per cent of the disabilities and 24 per cent of the disability days, but among miners accidents are perhaps responsible for an even greater proportion of disability than illness.

Accidents and other causes of disability among miners could be more intelligently studied if similar detailed information could be obtained for a much larger number of persons. Many mining reports give information regarding persons injured or killed in mine accidents, such as age, nationality, specific occupation, and length of experience; but similar information regarding the total number of men employed in each of these groups is usually lacking. If such information were uniformly given for all employees, more accurate conclusions could be made as to the causes and severity of disability, especially that due to accidents. Greater accuracy along this line would doubtless be an aid in reducing the number of disabilities from industrial causes, as well as the compensation for loss caused by such disabilities.

North Atlantic Exports for 1918, 1919 and 1920 Compared

COAL exports from the United States in the calendar year 1918, as reported by the Bureau of Foreign and Domestic Commerce, amounted to 22,351,000 net tons of bituminous and 4,968,000 net tons of anthracite. Ninety-nine per cent of the anthracite and over 80 per cent of the bituminous coal went to Canada, by rail or lake.

In 1919 the exports of anthracite were 4,968,000 net tons, again almost exclusively shipments to Canada. The bituminous exports for that year were 20,126,000 net tons, of which 12,064,000 tons went to Canada and Mexico, and the balance were oversea shipments to Europe and other countries, largely from North Atlantic ports.

BITUMINOUS COAL DUMPED AT NORTH ATLANTIC PORTS FOR EXPORT BY MONTHS, JANUARY, 1918, TO DATE. (IN NET TONS)

Month 1918	New York	Philadelphia	Baltimore	Hampton Roads	Charleston	Totals
January		24,000	4,000	190,000		218,000
February	1,000	7,000	7,000	280,000	....	295,000
March	2,000	15,000	6,000	372,000	1,000	396,000
April	1,000	17,000	10,000	340,000	....	368,000
May	1,000	3,000	7,000	356,000	....	367,000
June	4,000	4,000	4,000	346,000	....	358,000
July	12,000	4,000	15,000	240,000	....	271,000
August	2,000	....	....	237,000	....	239,000
September	4,000	5,000	5,000	428,000	1,000	443,000
October	2,000		8,000	223,000	4,000	237,000
November		3,000	20,000	204,000	4,000	231,000
December	....	9,000	26,000	282,000	....	317,000
Totals 1918	29,000	91,000	112,000	3,498,000	10,000	3,740,000
1919						
January	1,000	26,000	36,000	392,000	1,000	456,000
February	....	22,000	33,000	273,000	6,000	334,000
March	....	12,000	30,000	217,000	7,000	266,000
April	1,000	9,000	86,000	280,000	3,000	379,000
May	1,000	33,000	99,000	328,000	15,000	476,000
June		79,000	192,000	471,000	13,000	755,000
July	2,000	134,000	197,000	391,000	15,000	739,000
August	..	185,000	289,000	621,000	34,000	1,129,000
September	1,000	271,000	362,000	860,000	32,000	1,526,000
October	3,000	327,000	433,000	1,056,000	....	1,819,000
November	2,000	42,000	11,000	135,000	40,000	230,000
December	....	....	2,000	158,000	22,000	182,000
Totals 1919	11,000	1,140,000	1,770,000	5,182,000	188,000	8,291,000
1920						
January		[illegible]	[illegible]	591,000	29,000	897,000
February		[illegible]	[illegible]	553,000	64,000	718,000
March	....	34,000	83,000	858,000	58,000	1,033,000
April	5,000	149,000	417,000	1,258,000	74,000	1,903,000
Totals 1920 to date	5,000	329,000	732,000	3,260,000	225,000	4,551,000

Power Produced and Fuel Consumed by Public Utility Plants

FIGURES of production of electric power and consumption of fuel by public utility power plants in the United States for the months of January, February and March, 1920, as compiled by the Division of Power Resources, U. S. Geological Survey at Washington, are printed below.

The figures are based on returns received from about 2,800 power plants of 100-kilowatt capacity, or more, engaged in public service, including central stations, electric railways, and certain other plants which contribute to the public supply. The capacity of plants submitting reports of their operations is about 90 per cent of the capacity of all plants of the country listed by the survey.

The mean daily output for the first quarter in 1919 was 105.3 million kilowatt-hours and the mean daily output for the first quarter of 1920 was 122.2, an increase of 16 per cent.

The curve of mean daily output for 1920 indicates a marked increase in the output for March. The April figures will be of special interest as they will show if this increase is maintained.

This report is subject to revision in subsequent statistical reports of the United States Geological Survey relating to power production.

THOUSANDS OF KILOWATT-HOURS PRODUCED

State	By Water Power January	By Water Power February	By Water Power March	By Fuels January	By Fuels February	By Fuels March
Alabama	34,864	36,780	39,354	14,452	7,929	9,736
Arizona	8,567	6,883	8,899	6,276	5,708	6,423
Arkansas	132	120	130	9,290	8,326	9,056
California	166,806	148,839	203,595	113,446	111,797	92,222
Colorado	12,784	12,082	12,665	22,811	19,282	20,416
Connecticut	9,069	8,553	17,607	59,256	49,801	52,120
Delaware				6,807	6,138	6,263
Dist. of Columbia	....	....	....	23,317	20,763	21,356
Florida	965	818	1,024	10,897	10,461	11,210
Georgia	43,816	42,016	43,697	10,696	8,260	8,770
Idaho	48,564	43,336	43,065	1,348	1,133	1,315
Illinois	14,831	14,147	14,588	260,723	239,928	246,478
Indiana	2,943	2,741	3,637	91,817	71,503	73,351
Iowa	55,538	49,415	54,417	31,733	30,337	38,846
Kansas	1,741	1,240	1,598	35,913	32,391	32,916
Kentucky	....	....	....	23,449	21,768	22,711
Louisiana	....	....	....	18,126	16,755	17,884
Maine	23,491	20,866	23,658	1,577	1,614	918
Maryland	284	327	131	31,261	26,889	21,530
Massachusetts	21,987	16,248	34,367	147,914	129,365	123,042
Michigan	51,749	47,291	64,503	138,379	129,875	130,523
Minnesota	28,053	26,705	32,889	36,157	30,083	25,681
Mississippi	....	....	....	5,848	4,783	5,075
Missouri	5,720	3,987	4,916	54,143	52,672	53,740
Montana	89,574	90,411	104,991	596	540	515
Nebraska	909	662	668	20,436	17,305	18,028
Nevada	3,416	3,420	3,180	852	845	882
New Hampshire	4,322	4,001	5,223	5,166	4,289	2,319
New Jersey	143	102	161	101,478	88,120	94,975
New Mexico	53	57	59	1,593	1,447	1,529
New York	227,033	203,282	248,218	382,194	338,960	328,475
North Carolina	52,880	45,576	57,560	10,745	9,040	9,670
North Dakota	....	....	....	2,718	2,270	2,170
Ohio	1,490	2,101	3,222	258,335	234,061	252,803
Oklahoma	217	182	231	17,163	15,245	15,935
Oregon	32,359	28,323	32,125	7,845	8,624	7,788
Pennsylvania	45,359	43,500	56,881	329,625	294,483	326,074
Rhode Island	355	436	719	37,114	32,599	26,876
South Carolina	60,531	52,212	55,165	5,768	4,563	4,976
South Dakota	477	474	1,162	3,382	3,258	2,789
Tennessee	39,443	31,664	40,125	9,926	11,581	9,818
Texas	74	231	380	55,424	49,651	53,266
Utah	13,932	14,635	18,565		8	12
Vermont	15,467	11,732	18,969	786	1,038	344
Virginia	13,809	16,441	21,310	30,435	24,240	22,219
Washington	103,981	94,907	98,839	4,480	2,849	3,450
West Virginia	1,776	2,334	2,101	96,221	83,501	94,479
Wisconsin	37,843	32,321	43,585	42,336	43,606	43,733
Wyoming	152	145	154	4,585	4,178	4,162
Totals	1,277,499	1,161,543	1,418,233	2,584,839	2,313,862	2,358,869
Total by water power and fuels	....	....	....	3,862,338	3,475,405	3,777,102

In some of the States electricity is produced by the use of wood as fuel. During March about 17.0 million kilowatt-hours, or 0.4 per cent of the total for the month, were produced by wood-burning plants. The following list gives the States and their output in millions of kilowatt-hours, which produces the larger amounts of electricity by the burning of wood: Oregon, 7.4; Minnesota, 1.7; Wisconsin, 1.3; Idaho, 1.3; Washington, 1.1; California, 0.5; Louisiana, 0.6; and Florida, 0.4

Coal-Mine Compensation in Kentucky*

Inspection Reports, Safety Engineering Service, Low Cost and Checking Up of Experience Records Are the Features of a System Designed to Exceed the Possibilities of Mutual or Self-Insurance

By Herbert M. Wilson

THE subject which you have assigned me infers a rather large commission and makes it necessary that I hastily review the history and underlying principles governing the operation of the workmen's compensation law at coal mines. You will, therefore, pardon me for repeating what many of you already know—that the Kentucky law requires insurance or the protection of self-insurance so as to make certain the payment of compensation benefits which may run over a long period of years; that because of the high loss rate from normal accidents as well as from catastrophes in coal mining, insurance carriers were at first unwilling to cover this line of risks; that in order to demonstrate the ability of stock insurance companies to protect their customers in every line, however hazardous, they organized the Associated Companies for the purpose of pooling the losses on this business. The Associated Companies at once organized an inspection and safety engineering force and developed a standard system of recording conditions revealed by inspection, and through them the modifying of premium rates so as to give credits or charges according as safety conditions within a mine are better or worse than the average.

First Schedule Rates Nearly Correct

The history of schedule rating under this plan has had its ups and downs, with slowly gained knowledge of the requirements by the insurance carriers, mine operators and state officials, with the following general results:

For the first year of the law the actuaries and safety engineers of the Associated Companies computed a base rate of $4.24 per hundred dollars of payroll, including medical benefits, as necessary to pay the costs of compensation insurance for coal mines. That their first effort was not far from right is evidenced by subsequent experience. The first year of schedule-rating inspection developed the fact that while the coal mines of Kentucky had an excellent official record for fatal accidents, they produced in fact a relatively bad non-fatal experience and were in decidedly substandard condition as respects the causes of normal accidents. It was at once evident that for the then conditions of mines the rate $4.24 was too low, and in 1917 the Workmen's Compensation Board, unwilling to increase this rate, directed a modification in the method of determining the schedule rate, with a view of earning a return premium rate of $5, which rate it was computed was necessary to carry the business with solvency. The result was to produce an increase in all schedule rates.

In consequence more intensive study was given the situation by mine operators and better safety service and co-operation were required from the inspectors of the insurance carriers, with the result that a rapid inprovement was made in the safety conditions of Kentucky mines and there was a correspondingly rapid drop in premium rate in 1918.

Recently, as a result of prolonged and intensive study of the accident experience in Kentucky mines under workmen's compensation by the board, by the insurance carriers and by the National Council on Workmen's Compensation Insurance, a base rate for Kentucky coal mines was recently promulgated, effective January 1, 1920, which is also the estimated average return rate needed to carry the business, namely, $3.65 per hundred dollars of payroll. This base rate is believed to reflect the present safety condition of the mines as compared with the standards adopted. It is equivalent, as compared with the former base rate of $4.24, to an average improvement in the safety condition of the mines of from five to six of the physical hazards found in mines.

Ratio of Losses to Premiums Shrinks

During the period in which the law has been in operation—namely, the policy years 1916 to 1919 inclusive—the ratio of losses incurred to premiums written has diminished from 112 per cent in 1916 to 69 per cent in 1919. This latter loss ratio is the maximum at which the business can be conducted without loss; for the cost of conducting the business, including taxes, inspection and agents, service, claims, settlements, etc., is 33 per cent of the premium earnings, not to mention the cost of catastrophes. It is, evident, therefore, that prior to 1919 the business was carried by the insurance carriers at a loss, and that to conduct the business at the present rate it is necessary that there be further improvement in the safety condition, with corresponding reduction in loss ratio and cost.

It is particularly worthy of note that while the cost of every other commodity entering into our living and business conditions has greatly increased during the period, the cost of workmen's compensation insurance has diminished. And this is in spite of the fact that during the same period the wage scale, has greatly increased, while during part of the period the safety conditions have not improved because the unsettled labor conditions in several states other than Kentucky, notably in Pennsylvania, the compensation benefits have in the same time been increased by amendments to the law.

Since I last addressed you, a year ago, a material change has been made in the system of inspecting and schedule rating coal mines, not only in Kentucky but in other states. This has been the natural outcome of the entrance into the field of competing insurance carriers and of the consequent desire of state authorities that the method of inspecting and schedule rating shall be so standardized as to eliminate as far as possible any likelihood that unfair competitive practices shall develop. This standardization has been effected through an organization having headquarters in New York City known as the National Council for Workmen's Compensation Insurance.

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*A paper by the general manager of the Associated Companies, Hartford, Conn., presented at the meeting of the Kentucky Mining Institute, Lexington, Ky., June 4, 1920

Membership in the council and the direction of its affairs is by state insurance departments or boards, state inspection and rating bureaus and all compensation insurance carriers, stock, mutual and reciprocal. The council has recommended, and the State of Kentucky has adopted, a system whereby all inspection is done by a bureau jointly managed by the state officials and insurance carriers, known as the Southern Coal Mine Rating Bureau, of which W. B. Johnston, formerly with the Workmen's Compensation Board of Kentucky, is manager, with offices in Louisville. All inspections are made and are schedule rated by the bureau in the same manner for all carriers.

RATE ADJUSTED AFTER SECOND INSPECTION

The safety standards are practically identical with and were developed from those of the Associated Companies, so that there is nothing in them with which you who have previously been insured are not familiar. The same is true of the schedule rating system, the effect of which must be to reproduce the average return rate sought, $3.83, which is the present average rate resulting from the inspection of your mines by the Associated Companies. But the effect of inspection by bureau employees will undoubtedly be a much closer adherence to the literal wording of the safety standards. The inspector will not be able to use his skilled judgment in not charging an item which is no real hazard, though it may be a violation of the standard. He must, in other words, charge every item regardless of whether for the particular mine the standard does not truly apply. As a result the average schedule rate of your mines after the first bureau inspection will produce an increase on an average of perhaps 50c. So soon as the exact amount of this increase is determined to reproduce the proper average premium rate the excess will be returned so that no mine will be unjustly charged. Wherefore as soon as your policy is renewed at the preliminary bureau rate, you will be entitled to a re-inspection, the result of which will be retroactive to the policy date.

It is presumptive that you will at once improve as far as possible any sub-standard conditions revealed by the preliminary bureau inspection, with the consequent result that the re-inspection should show a material reduction in charges and should consequently keep down to its present level or perhaps reduce your schedule rate below that last promulgated.

I have chosen at random a few examples of the practical operation of schedule rating inspection for the Compensation Insurance of Kentucky coal mines. These examples are typical of many in the various coal mining districts and were selected not because their experience was unique but only because they had continuous history of schedule rating from 1916, when the law went into effect, to 1919 inclusive and with rather uniform payroll throughout this period.

The first example is of a mine in the northeastern coal field, employing from 160 to 180 men; audited payroll $120,000 to $190,000 per annum. When first inspected in August, 1916, the mine was in excellent safety condition and reflected a good moral hazard, with the result that the first schedule rate was below the base rate, namely, $3.34. During this policy year there were accidents and the loss ratio was exceptionally good. In the second policy year, 1917-1918, and so far as audited for the year 1918-1919, equally good experience was developed; only one non-fatal accident in the second and five in the third year.

This condition is indicated by and only reflects the evidence of the schedule-rating inspections. The first re-inspection of 1918 showed improved safety conditions and reduced the schedule rate to $3.16. That of 1919 reduced the schedule rate further to $3.01. The last schedule rate promulgated shows still further reduction, viz., $2.83. At this time experience rating became effective and this assured earned an experience credit of 19c., making his present adjusted rate $2.64, one of the lowest adjusted rates developed for any mine in Kentucky. In view of the excellent record of safety work by this mine operator and co-operation with and by our inspectors, I feel that there can be no impropriety in stating that the mines referred to are those of the Northeastern Coal Co., of which Henry LaViers is manager.

SCHEDULE RATE A TRUE INDEX OF SAFETY

It is evident from the above that the improved safety conditions, as disclosed by inspection, and the reduction in schedule rate resulting therefrom have been a true index to the accident ratio of this mine, for though there has been no material reduction in the loss ratio, because it was already low, there has, on the other hand, been no increase and no abnormal accident experience. To offset this low compensation cost there has resulted a reduction in schedule rates from $3.83 in 1916 to $2.63 per hundred dollars of payroll in 1919, and a corresponding reduction in the total premium paid by the assured, even though in the same period there has been a very material increase in the wage scale and total payroll.

To go further into detail, the first inspection of this mine showed it to be sub-standard in about half a dozen features; among others, first aid supplies, obstructions in clearance and shelter holes, location of magazine, guarding of trolley wire, poor handling and storage of explosives. The inspection of the second year showed the removal of several of these conditions; viz., improvement in first aid, no obstructions in clearance and shelter holes and the guarding of trolleys. The last inspection showed practically all unfavorable conditions removed with the exception of location of magazines, storage of explosives underground and some insufficient timbering. Further reduction can be earned by this assured for improvement of physical hazards still remaining, by earning additional experience credits, and finally by earning the new credit above referred to, for perfection of safety organization, education and inspection, which latter credit alone may result in 40 cents further reduction.

A typical mine in eastern Kentucky, employing seventy-five men throughout the three years, had payroll ranging from $86,000 in 1916 to over $180,000 in 1919. This large increase was due to wage-scale increase and more active production. In 1916-1917 the audited premium was over $2,300. There were this year two fatals and twenty-three non-fatals, wherefore the insurance carried paid in compensation claims over $6,600, or nearly three times the premium earned. The loss ratio was 285 per cent. This is a good illustration of the hazards of compensation, as a fatal is often as likely to occur as a non-fatal. The only effect of this bad record on the Associated Companies was a more intensive effort by inspection and safety engineering to improve the experience. That this was effective and that the mine operator heartily co-operated is evidenced from the fact that in the next year, 1917-1918, with an audited premium of $8,470, there were no fatals, a few more non-fatals, viz., 28, and a material reduction in the compensation costs, viz., $2,300. For the year 1918-1919 the premium and losses are not closed, but they show about the same result as for the previous year but with 24 non-fatals, some of which may prove to be expensive.

RATES DECREASE DESPITE GROWING PAYROLL

This cost history is closely paralleled by the schedule-rating record. First schedule rate, 1916, $3.88; the next, at the end of 1917, which the schedule-rating system was changed to produce increases, $4.51; inspection made only a few months later in 1918, $4.30; first inspection 1919, $3.40; last inspection, 1919, $2.65, a drop from the maximum of $1.86. The experience of this mine not having been good, because of the fatal costs, the last schedule rate was modified by an experience charge of 46c., thus making the final adjusted rate for the last period $3.40. There is every likelihood that in this case there will be further reduction on schedule rating and improvement in the experience-rating modification and there may be credits for safety organization. During this period the assured has earned reductions in his premium rate corresponding with the reduction in schedule rate, also reduction in the total premiums paid, in spite of the material payroll increase to double that of the first year. At the same time, while there has been little improvement in the loss ratio, there were no further fatals and no increase in number of non-fatals.

I assure you that the above are typical records illustrating a very large number of the medium and larger mines insured in Kentucky, and this record is encouraging to the Associated Companies and I believe also to the Workmen's Compensation Board and is doubtless equally encouraging to the mine operators.

In the industries in general other than coal mining the best information indicates that from 70 to 80 per cent of the accidents are due to carelessness, indifference or recklessness. Only the remaining 20 to 30 per cent is due to physical conditions which may be safeguarded. In coal mines, we have, however, for schedule-rating purposes generally accepted 40 per cent as the portion due to safety organization and have accepted 60 per cent of the accidents as being due to physical causes which may be safeguarded. In fact we now insure many mines in which nearly everything has been done to correct so-called sub-standard physical conditions, and these mines are practically perfect in this respect, yet the number of accidents and the severity have not been reduced from 60 per cent.

The best available statistics would indicate that of this moral hazard which we place at 40 per cent of the total, about one-half, or 20 per cent, of the accidents, are due to what we may call bad discipline—that is, carelessness, indifference and negligence of the mine officials, and is due to the same causes among the mine employees. The latter we usually call disobedience of orders, carelessness or ignorance. The former may be due to indifference or neglect of the foreman or of some other official.

Rarely if ever is the management deliberately indifferent or the foreman deliberately negligent. In but few cases, however, have either yet come to realize the importance of compensation as an element in the cost and efficiency of the operation. Gradually with experience this is coming home to them. Many are the cases where we have urged the mine operator year after year to carry out some simple safety improvement costing little money or time, but without result until some higher official or the owner himself was personally impressed with the loss he was incurring by the indifference of his management to these matters. Suddenly in case after case it has been borne in on the mine operator that recommendations for safety improvements should be carried out, with the result that the underground management has got busy and produced results which were promptly reflected in a decreased accident rate and a reduced premium and rate.

EXPERIENCE RATING HELPS MORAL HAZARD

The addition a year ago of experience rating as a a further modification of the schedule rate has been helpful in producing a better moral hazard, that is, a more lively interest by the management in safety measures. A new and third feature has been added to the schedule this year, consisting of credits for the perfection of safety organization, education and for the more intensive inspection at the face. This has resulted in still other mining companies becoming interested more actively in safety measures. Until every mine operator makes it perfectly clear to each subordinate in his mine by his own actions and interest in their performance that he, "the old man," personally wants everything done that is proper to promote safety just as sincerely as he wants economy in operation, there can be no material improvement in the loss ratio from accidents or in the premium rate for insurance.

Taken in the gross the loss ratio in Kentucky in 1916 was 112 per cent. It was this which caused the change in schedule rate for the next year. The loss ratio in 1918 was 88 per cent, still on the debit side for the insurance carriers. Last year the loss ratio was 69 per cent, just on the edge of paying expenses. These results indicate to me clearly that coupled with independent bureau inspection and the consequent spur to added safety service by the insurance carriers, there will be a still further steady improvement in the physical and moral condition of the mines so far as safety is concerned, and a correspondingly steady reduction in the premium rate and in the total premium costs, with a diminishing accident record.

The mine operators of Kentucky will not find it advantageous either to self-insure or to insure partial coverage. Under such quasi-insurance protection they will not have the frequent impartial inspection reports concerning what their employees are doing to keep down their accident rate, which they do have from the schedule rating of the state bureau, nor the independent safety engineering service they get from full-coverage compensation-insurance carriers. Nor will it be possible for them otherwise to protect themselves at any less cost, for the reason that it is the duty of the Workmen's Compensation Board and of its agents, the National Council and the Rating Bureau to check up their experience from year to your, and to see if the rates charged are only such as will carry the business with a minimum margin of profit. The

Associated Companies ask only 1½ per cent profit, and with such a close margin of figuring it is evident that stock insurance, because of its absolutely gilt-edge protection, should be quite as attractive as any plan for mutual or self-insurance.

Coal Prices in England Increased

THE maximum price of industrial coal in England, the *Colliery Guardian* reports, was raised on May 12 by 4s. 2d. per ton, and that of household coal by 14s. 2d.

Sir R. Horne stated in the House of Commons on May 10 that the necessity for an increase would have arisen apart from the recent wage advance to miners; but the wage advance increased the cost of production by about 2s. 10d. per ton, and the increases necessary to place the price on an economic basis was made greater by that amount. The Government, he stated, thinks it essential that the present system of controlling inland distribution should be altered as soon as possible, and this could only be done if the artificial differentiation between the prices of household and industrial coal were removed.

The following extracts from a statement issued on May 10 explain the reasons for the increases in coal prices:—

The figures of cost of production and selling price of industrial coal are as follows:—

	s.	d.
COST PER TON:		
Wages, stores, together with owners' pre-war standard of profits	30	5
RECEIPTS:		
Average price per ton realized for inland disposals (excluding sales to workmen)	29	1
Deficiency	1	4

In the case of household coal, this deficit is greatly increased by the concession under which the allowance of 10s. per ton was made to the domestic consumer as a temporary alleviation of the price of coal during last winter. In the result the deficit on household coal is 11s. 4d. per ton. These deficits have hitherto been made up by the profits made on coal which has been exported. The recent advance of wages to the miners will now increase the adverse balance by 2s. 10d. per ton—that is to say, to 4s. 2d. per ton in the case of industrial coal, and 14s. 2d. per ton in the case of domestic coal.

With regard to the price now proposed for domestic coal, it is to be observed that the artificial differentiation between the price of household coal and that of industrial coal has caused great burdens in administration. Further, the control of inland distribution of coal has, in the view of the government, weakened supervision and retarded development in the industry, and they have decided that, in the interest of efficiency and production, it is desirable to remove the present system of controlling inland distribution as soon as possible. In these circumstances, an artificial discrimination between the price of household coal and that of industrial coal cannot be maintained. It therefore follows that the price for both sets of consumers must be placed on a uniform basis. Only by taking this action will it be possible to bring the industry back to normal conditions.

The prospects of the export trade, and the profits to be derived from it, cannot be accurately estimated. Whatever the surplus may be the view of the government is that it should go to the exchequer. It is obvious that if the coal trade were like other industries at present free of control, sums much greater than any that can be derived from profit on the export trade would accrue to the exchequer in the shape of excess profits duty. By the arrangement now proposed, the consumers of all classes in this country will still obtain coal at a cost very much cheaper than the world market price. This result, however, is effected not only by restricting the profits of the coal owner, but also at the expense of the exchequer, which will lose a substantial portion of the revenue which would otherwise go to it from the coal trade as excess profits duty.

[At the normal rate of exchange a shilling is worth 24.3c.]

Denver First-Aid and Mine-Rescue Contest Now Planned for September

A FIRST-AID and mine-rescue contest which in a way will be international in its aspects, in that miners of Canada and Mexico as well as those of the United States will be invited to participate, will be held in Denver, Col., Sept. 9, 10 and 11, under the auspices of the Bureau of Mines, Department of the Interior. It had been previously announced that this meet was to take place in August, but plans have since been rearranged and the events will take place in September on the dates above given.

These contests under the auspices of the Bureau of Mines are rapidly becoming the event of the year in mining circles. Last year, when the contests were held in Pittsburgh, Pa., more than one hundred first-aid and mine-rescue teams from mining companies participated for the cups and medals. So great was the general proficiency among those teams in life-saving methods that the judges of the contests had difficulty in picking the winners. A number of teams in different events were tied and it was necessary to run off the events again.

So many mining companies throughout the country now have their own teams at the mines that state contests are being held yearly and the best teams are generally sent to the Bureau of Mines events. At present the teams in the principal mining states are preparing for preliminary meets to select their best teams for the big affair. Last year teams were present at Pittsburgh from Colorado, Montana and Washington.

Trunk Lines to Relieve Coal Shippers of Prepayment Charges to Canada

TRUNK line carriers expect to decide very soon on the action they will take in regard to relieving shippers of coal to Canada of the requirement of prepayment of charges. The Canadian situation is becoming critical. The Dominion must have 18,000,000 tons of Eastern coal to keep warm and to keep its industries going. With the shortage of car supply and other difficulties the prepayment situation has added materially to the problem of moving coal to Canada.

Liability for Minimum Royalty.—Where a coal mining company took a lease on land supposed to contain coal, agreeing to pay "as a minimum annual royalty the sum of $1,000 per year," commencing three years after execution of the lease, the company could not avoid liability for the annual payments on the ground that no coal had been removed, in the absence of proof that no merchantable coal existed under the land in merchantable quantities. *(Iowa Supreme Court, Rowland vs. Anderson Coal Co., 162 Northwestern Reporter, 321.)*

The Engineer's Part in the Shaping of National Prosperity*

His Unremitting Efforts for Safety Make the Engineer an Insurance Agent of the First Magnitude Production and Distribution, the Index of Industrial Prosperity, Largely Depend on Engineering Foresight

BY GEORGE OTIS SMITH

NO PROFESSION can claim exemption from citizenship. The constitutional privileges of citizenship also are constitutional obligations, for democracy distributes broadcast duties as well as rights. The engineer cannot dodge his responsibility as a citizen unless he is a conscienceless slacker. Moreover then, a reconnaissance survey of the subject is enough to show that the engineer has the making of a good citizen.

The best American citizen is and always has been he who lives not for today so much as for tomorrow. The pioneer and the volunteer soldier alike choose hardship and danger that there may be a larger measure of comfort and safety in the future. Regard for the future is not only a good definition of civilization but it is a practical kind of simple test to apply to our every-day motives. Are you and I seeking an easy today or a safe tomorrow?

THE ENGINEER LIVES FOR TOMORROW

Now, as I understand the requirements of effective citizenship, the engineer measures up to the specifications: he is forward-looking, he seeks to safeguard the future, and he is constructive by training and habit.

Need I say much to convince you that while to look backward is a large part of the lawyer-statesman's code, to look forward is the professional habit of the engineer? Where could be found better evidence of the vision of the engineer than this city of Washington? Our first President was successively a civil engineer, a military engineer, and a nation builder; and his vision of the America-to-be was so far-reaching that his contribution to city-planning has proved no less adequate than beautiful, even though since he selected this site for the new Nation's capital the population of the United States has increased more than twenty-five fold. Washington the engineer planned for national prosperity and planned well.

The engineer of today also thinks in terms of the future, and because he ever keeps the factor of safety in mind as he works I have chosen to call him an insurance agent of the first magnitude. National prosperity will not satisfy us unless it is backed up with guarantees of permanence, and so it is that I appeal to the engineers to help write this nation-wide endowment policy to run to the benefit of our children's children. My political conviction is that the future of our nation will be largely what you engineers make it, and national prosperity must be worked out in terms of the nation's industry. The public questions of the day are largely matters of production and distribution, and however humanistic or idealistic or altruistic you and I may wish to be, the future of America can be safeguarded only as the plans are drawn up by citizens like you, who trust to the eternal laws of matter and energy rather than to the broken reed of political expediency. This industrial nation needs citizens who will patiently lay solid foundations of fact and erect upon them structures of just action in which there is a factor of safety large enough to safeguard the nation's future prosperity.

The third link that connects the engineer and national prosperity is his constructive habit. It is not enough to know the truth; we have to translate it into action, and herein lies the distinction I draw between science and engineering: what science has discovered engineering must apply. Take this thought over into politics, and the peculiar usefulness of the engineer-citizen becomes almost self-evident. He has no use for the abstract except as the formula or the equation may affect his working plan. The engineering habit of mind is to trust implicitly the constants determined by science and tested by experience, but such faith is only the point of departure—works, not faith, is the engineer's creed, and it is his task in life to construct.

CONSTRUCTIVE METHODS OF THE ENGINEER NEEDED

Now it is just this constructive tendency that we need more of in American politics. In political procedure we use practical engineering simply as a source of figures of speech—the terms "log-rolling" and "wire pulling," "steam roller," and "side-tracking" are suggestive of the world of work, but only suggestive. In keeping our political institutions in running order, the legislative habit is to putty up any cracks in the structure that indicate weakness, without making any inspection of the foundations. And I regret to record my observation that in our legislatures, whether State or Federal, we find too little confidence in experts, possibly because the best of our scientists and engineers are rarely if ever seen or heard by those who control matters of statecraft.

The skillful fakir has had a standing in Washington that he could not get in business circles. However, there has been some improvement in the status of the specialist, though even now a well-displayed sensational news item about a new motor fuel is likely to seem to the legislator a more acceptable basis for a governmental investigation than a well-considered and therefore conservative statement by a chemical engineer of world-wide repute. Nor is the perpetual-motion variety of optimist without a hopeful following. Now it is this condition, this need of light, that demands a larger interest in politics on the part of our engineers, not so much through their great national organizations as in the capacity of individual citizens.

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*Address delivered by the Director of the U. S. Geological Survey at the organization conference of the Federated American Engineering Societies, Washington, D. C., June 3, 1920.

Our political temper today puts too much stress on legislation and too little on execution—we do not even reach the stage of a working plan. A new law is offered as the cure-all, whatever the evil that appears, and in devising the new law often the chief feature sought is novelty; at least the remedy proposed must look new. The engineer's methods are different, both in planning his new structures and in putting them to use. To meet new requirements he usually adopts well-tested plans; he naturally seeks the safety of experience. And his structure, once erected, his machinery installed, or his process perfected, he provides for its operation in accordance with his plans. This reliance upon well-tested facts of experience, this attention to the many details which taken together provide the requisite factor of safety, this "seeing the thing through"—are all working habits that the engineer-trained citizen can well take over into his political life.

AN ENGINEER THE BEST TYPE OF PRESIDENT

As I read American history, I believe that the intensely practical yet altogether progressive leadership of George Washington in affairs of state was possible because he was thoroughly a man of affairs—an explorer and pioneer, a leader in experimental agriculture, an administrator of business, a promotor of interstate waterways, and even a drainage engineer. The earliest precedent that we have here in America, then, is that an engineer makes the best type of President; but most of us can only aspire to be useful private citizens, and more useful if active in public affairs.

The constructive habit is sadly needed in these days of change. The critic is abroad in the land, and he attacks our institutions as the wrecker rather than as the builder. My own conception of political reconstruction is best illustrated by what we have all seen, the erection of a new railroad bridge. The bridge-engineer may well be taken as the type of worker we need in public life. You have seen how, with his plans prepared to the last rivet, he has replaced the small and inadequate and possibly weakened bridge with the larger and stronger and up-to-date structure, and he has done this without interruption to traffic. His plans provide for one essential that is lacking in too many Utopian schemes; the bridge workers build up faster than they tear down, and therefore there is always a bridge to use.

This nation of ours is a going concern; indeed, the rate of our progress is much more rapid than many of our statesmen realize. Changes must be made to meet the demands of the heavier traffic, new structures must be erected, new motive power must be provided, and the effective citizen of today is one who can see ahead of the present moment, who can plan to meet safely the demands of the future, and who has likewise the will to build the needed structures, without tearing down too rapidly the house of state in which we live. I believe the engineer is a citizen of just that type.

Long Ton Made Mandatory in Sale of Coal In District of Columbia

UNDER the weights and measures bill which was recently passed by the House of Representatives it is specifically mandatory that coal must be sold in the District of Columbia only by the long ton, which is 2,240 pounds.

April Domestic Coal and Coke Exports From the United States

APRIL exports of domestic coal and coke from the United States by countries and by customs districts and the bunker coal supplied to vessels in the foreign trade at specified districts, according to figures compiled by the Bureau of Foreign and Domestic Commerce, were as follows:

EXPORTS OF U. S. FUEL IN GROSS TONS

	Coal		
	Anthracite, Tons	Bituminous, Tons	Coke Tons
Austria	...	1,328	...
Azores and Madeira Islands	....	6,684	....
Belgium	6,546	48,985	1,058
Denmark	....	55,059	
France	....	209,453	2,174
Gibraltar	.	9,103	..
Greece	.....	14,500	...
Iceland and Faroe Islands	....	2,510	..
Italy	15	385,977	..
Netherlands	.....	162,663	...
Norway	......	33,181	.....
Portugal	......	800	....
Roumania	.....	516	3,229
Spain	.....	9,358	....
Sweden	......	31,527	....
Switzerland	......	119,744	.....
Turkey in Europe	......	5,464	...
Bermuda	......	2,906	5
British Honduras	......	51	
Canada	331,485	839,696	34,223
Costa Rica	......	1,998	...
Guatemala	....	362	...
Honduras	47	149	7
Nicaragua	195	....	....
Panama	......	19,048	8
Salvador	...	1	9
Mexico	854	17,047	11,592
Newfoundland and Labrador	100	....	.....
Barbados	25	7,217	.....
Jamaica	..	2,435	....
Other Brit. West Indies	196	10,537	..
Cuba	3,790	118,654	83
Virgin Islands of U. S	......	4,069	2
Dutch West Indies	.	2,430	...
French West Indies	2,852	4,898	3
Dominican Republic	487	2,966	7
Argentina	...	115,702	213
Brazil	.	73,325	.....
Chile	...	37,160	.....
Ecuador	...	......	23
Peru	...	...	67
Uruguay	50	11,193	.....
Venezuela	2	3	....
Other British Oceania	.	3	.....
Canary Islands	.	1,622	....
French Africa		31,403	.....
Egypt	1,000	30,912	
Totals	347 644	2,431,639	52,703

FUEL EXPORTS BY CUSTOMS DISTRICTS

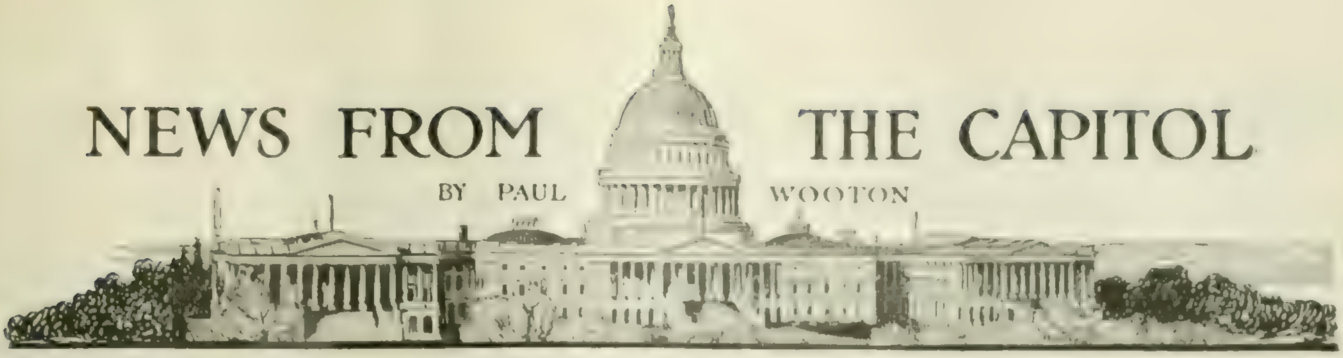
	Coal		
	Anthracite, Tons	Bituminous, Tons	Coke Tons
Maine and New Hampshire	166	....	53
Vermont	870	1,851	219
Massachusetts	27	..	
St Lawrence	106,990	133,246	1,620
Rochester	29,050	65,800	983
Buffalo	190,968	446,857	21,392
New York	9,637	1,385	2,283
Philadelphia	8,159	111,885	162
Maryland	169	313,109	4,125
Virginia	..	1,050,749	218
South Carolina		69,242	34
Georgia		15,373	.
Florida	2	13,543	..
Mobile	..	3,000	.
New Orleans	342	1,413	65
Sabine		..	81
San Antonio	300	1,541	1,055
El Paso	450	9,536	6,335
San Diego	4	18	1
Arizona		964	4,028
San Francisco		6	84
Washington		1	76
Alaska		6	..
Hawaii		3	.
Dakota		2,310	181
Duluth and Superior	318	16,504	1,436
Michigan	192	106,980	8,198
Ohio		66,141	65
Porto Rico		176	9
Totals	347,644	2,431,639	52,703

BUNKER COAL

Customs Districts:	Tons
Maryland	58,006
New York	214,371
Philadelphia	49,946
Virginia	247,011

NEWS FROM THE CAPITOL

BY PAUL WOOTON



Railroad Incomes Increase Under Private Control

A PARTIAL summary issued by the Interstate Commerce Commission records the net operating income of the railroads for March, 1920, the first month after the return to private control, as practically a million dollars greater than that of March, 1919. The figures are: For March, 1920, $10,206,576; for March, 1919, $9,396,592.

Carrier Representatives Ask an Increase in Freight Rates

RAILROAD representatives appearing before the Interstate Commerce Commission at the increased freight rate hearing presented a proposal for an increase of from 24 to 31 per cent in inter-territorial joint rates between the Chicago switching district and shipping points in the West, Southwest, South and Central West.

Rates on bituminous coal from Illinois and Indiana mines would be advanced 27 per cent to all points east the Mississippi river, including St. Paul and Minneapolis; to all points west of this territory, 24 per cent.

Rates on commodities originating at Mississippi river crossings and points west thereof in southern Missouri, Arkansas, Louisiana, Oklahoma, and Texas, and sent to all points except the Pacific coast and intermountain territories would be increased 31 per cent.

Increased freight rates, to take effect at the same time rail carriers are granted higher rates, were asked by steamship companies in a petition presented to the commission. The lines asking these increases are engaged in Chesapeake bay and coastwise transportation. They include the Baltimore Steam Packet Co., Chesapeake Steamship Co., Clyde Steamship Co., Mallory Steamship Co., Merchants and Miners' Transportation Co., Ocean Steamship Co. of Savannah, Southern Pacific Co., Atlantic Steamship Lines and Southern Steamship Co.

Government Fuel Yard Announces Opening Of Bids for 1921 Supplies

CAPTAIN C. A. Dravo, chief of the raw materials branch of the Quartermaster's Corps, in charge of the Government fuel yard, announces that at 10 a. m., July 15, bids on Government coal requirements for 1921 for the stations enumerated below will be received and opened:

Zone 1, on all requirements less coke, smithing coal and wood.

Zone 2, on all requirements less coke, smithing coal and wood.

Zone 3, on the following stations: Tullytown Arsenal, Neville Island, Schuylkill Arsenal, Constructing Quartermaster Terminal, Philadelphia, Pa.; Pier No. 78, Philadelphia, Pa.

Zone 4, on all requirements less coke, smithing coal and wood.

Zone 5, on all requirements less those for Ft. Screven, and less all coke, smithing coal and wood.

Zone 6, on all requirements except coke, smithing coal and wood.

Zone 7, on all requirements except coke, smithing coal and wood, less 3,900 tons of bituminous lump over 2 in. screen for Columbus Barracks, less 10,000 tons of bituminous run-of-mine for McCook Field, and less all requirements at Fort Thomas, Ky.

Zone 8, submit bids only for Park Field, Scott Field, Warehouse No. 1, St. Louis General Supply Depot, Camp Zachary Taylor, and Camp Henry Knox, omitting therefrom coke, smithing coal, and wood requirements.

Zone 16, on all requirements except smithing coal, coke and wood.

Bids opened May 14 for similar requirements have been rejected.

New I. C. C. Members Receive Recess Appointments

PRESIDENT Wilson on June 9 announced recess appointments of Henry Jones Ford of New Jersey, Mark W. Potter of New York and James Duncan of Massachusetts to be members of the Interstate Commerce Commission.

These appointees were nominated some weeks ago, but the Senate failed to act on them. When they take office all vacancies on the commission will have been filled, including the two new places created by the Transportation Act, which increased the membership from nine to eleven.

Modification of Reading Decree Asked

THE Reading Coal Company has asked the Supreme Court to modify the decree recently handed down in the Reading anthracite coal case so as to permit the Reading company to retain stock of either the Philadelphia & Reading Coal & Iron Co. or the Philadelphia Railway Co., and that the Central Railroad of New Jersey be allowed to retain stock of the Wilkes-Barre Coal Co.

The request is based on the injury to minority stockholders and the public and the existence of heavy obligations by the companies which would be affected by the original decree. The Department of Justice has opposed the request on the ground that it would reopen the case and nullify the dissolution decree.

Opportunities for Reducing Mine Costs by Standardizing Equipment*

Uniform Mine-Track Gages and Tipple Clearances Advocated to Reduce Accidents and as Beneficial to Operator and Manufacturer — Co-operation Indispensable to Results — Standards Adopted Should Follow Established Good Practice

By Warren R. Roberts†
Chicago, Ill.

THE subject of "standardization" of equipment and machinery, whether for use by the coal mining industry, for metal mining, or for any other industry, is one which must be given careful consideration before its advantages will appeal to those who are to use this equipment and machinery, or to those who are to design and manufacture it.

Standardization of machinery or equipment should not be attempted simply for the sake of uniformity, but only when standardization will simplify operation and lower the cost of production. To be successful, any program contemplated must show advantages to mine operators, manufacturers of mining machinery and equipment and engineers and builders interested in the coal mining industry.

This statement is based on a very considerable experience by the writer for the past two years, during which time he has had occasion to present the subject to various groups of men representing the different branches of the industry to which the improved equipment or machinery was expected to be applied.

When the desirability of standardization of any equipment is first mentioned to one who has not yet thought of the matter, it is perfectly natural that certain objections to any attempt to standardize the equipment in which he is interested should first present themselves, and only by a careful discussion of the subject and the pointing out of the definite benefits to be derived from standardization, will he be convinced that the advantages to be gained by standardization of any line of equipment very greatly outweighs any objections to such standardization.

This statement also is based on the experience of the writer, and may be accepted by the gentlemen of this convention, pending the arguments in favor of the standardization which will be presented later. It will be best, however, to first define both the scope and the limitations which any program on standardization should embrace.

It has been found advisable, in planning for the standardization of equipment or machinery for any particular industry, to establish certain general lines of procedure and to begin with the adoption of certain principles which are recognized by both the profession and the industry as good standard practice. Then; having established these fundamental principles and standard practices, we can gradually branch out and bring under standardization certain equipment on which there is the most general favorable opinion towards standardization.

To illustrate what we have in mind, it is conceded by all concerned that in designing a tipple for a mining plant, for instance, there are certain track clearances; certain overhead clearances; certain clearances above the point of dump for over-wind, etc., which are recognized as good practice and for the safety of operation. However, we have all observed many plants on which these well-recognized standards are not followed and due to the violation of which many accidents occur. It would therefore seem to us easy to reach an agreement as to the desirability of the adoption of certain standards along these particular lines, such standards, of course, to follow established good practice as far as is possible.

We believe there are few connected with this industry who would not agree to the desirability of some reasonable standardization of mine track gages. At present we have gages varying 18 in. up to 48 in. Without doubt some standardization of mine track gages would be of great benefit, both to the operator and the manufacturer, as affecting mine cars, mine locomotives and coal cutting machines. To one who has given much thought to this subject, such illustrations could be multiplied indefinitely. These few plainly show the scope which our program of standardization may assume.

Now, to define the limitations: It is important, both on behalf of the operator and the manufacturer, that attempts should not be made to standardize any machinery or equipment just for the sake of standardization which will in any way add expense either to the operation or the manufacture of such machinery, but only when standardization will simplify operation and cheapen production.

Benefits That Will Accrue to the Operator

Having in mind these well established lines of standardization, let us now point out very briefly some of the benefits to accrue to the various interested parties:

Any program of standardization must have in mind first the benefits to accrue to those operating the equipment or machinery to be standardized. Some of these benefits which occur to the writer are as follows:

The adoption of standards of clearance in the tipple structure as mentioned above would not only facilitate operation but lessen expensive accidents, and thereby prevent delays to operation and expensive repairs.

Standardization of mine track gages after once adopted would not only facilitate the use of cars from one mine to another—a very material advantage to an operator owning several mines—but would reduce the cost of his mine cars, his haulage motors, and his coal cutting machines.

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*Address delivered at the meeting of the Kentucky Mining Institute, Lexington, Ky., June, 1920.

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The standardization of certain other lines of machinery used by all operators would in time reduce the cost to the purchaser for such standardized machinery. Standardization of any line of machinery very greatly reduces the cost of the repair parts which an operator must carry in stock to insure the continuous operation of his mine. Standardization of the equipment and machinery for a mine not only reduces its cost but lessens the time required to secure such standardized equipment and machinery as against the time required to buy unstandardized machinery.

BENEFITS TO THE MANUFACTURER

The next most interested party in any scheme of standardization is the manufacturer of the equipment or machinery to be standardized, and before such manufacturer can be persuaded to join a standardization movement he must be shown the benefits that will accrue to him. These may be enumerated briefly as follows:

All that has been said regarding the benefits to the operator by the standardization of mine-track gages would apply equally to the manufacturer of mine cars, mine locomotives and coal cutting machines, or any other variety of mine equipment which must run on a mine track.

It is clearly apparent that a standardization of mine-track gages which would enable manufacturers of all such equipment to adopt standards would very greatly reduce the cost to the manufacturer in maintaining plans, patterns and shop room for handling through his factory machines for a few standard gages, as compared with a multitude of machines of various gages.

The very large saving in the cost of manufacture of machinery to a few standards as against miscellaneous sizes cannot be calculated. But any manufacturer will admit that the saving is very material and very beneficial from his viewpoint.

The advantage of standards to the operator in reducing the number of repair parts which must be carried to insure the continuous operation of his mines applies equally to the manufacturer, for the reason that to enable him to furnish repair parts for a multitude of sizes of any line of machinery necessitates his having patterns for all such sizes, and manufacturing and shipping of a few of each of these various sizes instead of a greater number of the few standard sizes.

These are only a few of the advantages to the manufacturer which have occurred to me at this moment, but many others could be mentioned.

ADVANTAGES TO THE ENGINEER AND BUILDER

It may appear at first thought that any program of standardization of mine equipment and machinery would be a disadvantage rather than an advantage to the engineering profession interested in the designing and building of mining plants. However, such conclusion is incorrect. Any engineering profession worthy to endure must be based on advantageous service rendered to those who pay for such service. Only by making such service of value will it continue to be employed. It is therefore to the interest of engineers and builders of mining plants to promote standardization as outlined above, and thereby indicate to operators not only their desire but their ability to promote his interests at every opportunity that presents itself.

NECESSITY FOR CO-OPERATIVE PROGRAM

The above discussion makes it apparent that if any movement looking to the standardization of mining equipment is to be successful it must have the hearty support of men representing the operating end of the mining industry; of men representing manufacturers of equipment and machinery used by the industry, and of engineers and builders interested in this line of work.

There are also several other outside interests which must be consulted and whose co-operation should be secured in connection with the adoption of standards that affect such interests. This applies to the interest railroads may have in tipple clearances or other features of a mining plant as affecting the operation of their roads. Certain states also have laws regulating tipple clearances, some of which laws are unnecessarily severe and should be revised to meet good standard practice. Other states which have no such laws should be encouraged to pass laws establishing the standard practice for such clearances.

A brief statement of the progress which has been made on standardization by certain national technical societies and by certain departments of the U. S. Government may be of interest to this convention. I will therefore outline the work already accomplished by such agencies.

NATIONAL ENGINEERING SOCIETIES

All five of the national engineering societies have for several years been interested in the standardization movement. Certain of these societies have had standing committees which have devoted a great deal of time to studying the question of standardization as applied to their particular profession and the industries in which they were interested. Some of these committees have made a very considerable progress in adopting standards of practice as well as standards for certain equipment and machinery.

However, as progress was made by these national technical societies acting independently it was discovered that often certain equipment and machinery as standardized by one society did not meet the approval of some other society which might be interested in the same equipment or machinery. A careful study of this particular situation led these five national engineering societies to establish an independent agency in which they were all interested.

Somewhat more than a year ago, after a very considerable discussion of the matter, these five national engineering societies established the American Engineering Standards Committee, which was to be a joint agency representing all of these engineering societies, so far as standardization was concerned. In establishing this joint agency it was agreed by the founder societies that standards adopted by any one of these societies should be referred to this joint committee for approval and adoption, after which it would become a "national standard."

This was a most excellent progressive movement and has given great impetus to standardization. At the same time it will safeguard the movement and avoid duplications and conflicts in adopting standards.

The U. S. Government has long been interested in the adoption of standards. Many years ago a Bureau of Standard Weights and Measures was established, which has gradually grown into the present National Bureau of Standards, operating under the Department of Commerce. This bureau has very extensive laboratories with ample equipment and an able staff of engineers and scientists for carrying on the investigations, making tests and otherwise effecting standardization.

During the late war, by the advice of and under the direction of General Goethals, Assistant Chief of Staff, a consolidation of all the purchase and supply agencies of the War Department was made. This consolidation became a necessity as the war progressed, to enable the War Department to supply the increasing demands of the army.

Soon after this consolidation became effective, in the spring of 1918, many difficulties arose in trying to harmonize the requisitions furnished this now consolidated purchasing agency from the various corps and divisions of the War Department. To harmonize and co-ordinate these requisitions and the specifications accompanying them it became necessary to establish a branch in the purchasing agency for the standardization of the requisitions and accompanying specifications. The writer had charge of this branch of the service from the time it was established until the close of the war.

Standardization of Supplies Used by Army

The advantages and economies that resulted from this standardization of the Government's specifications for many of the largest commodities used by the army was very great. Production and transportation also were facilitated by the methods of standardization as adopted. These facts are recorded here simply to indicate the advantages of standardization as applied to this great enterprise of carrying on the war.

At the time the above-mentioned American Engineering Standards Committee was established by the national engineering societies the War Department and the Navy Department were asked to join this "committee." After a careful investigation and on the advice of the writer these two governmental departments, as well as the National Bureau of Standards, joined this committee and became active agents in promoting its work.

During the past year other engineering, technical and industrial societies have been invited to join this standardization movement as represented by the American Engineering Standards Committee, and several such societies, including the American Mining Congress, have joined in the work of this committee.

Committees Working Out a Program

It may be of interest to the gentlemen of this convention to learn that the American Mining Congress has during the past year been carrying on an extensive program for the standardization of mining equipment. To accomplish this work two general committees were organized, one representing the coal-mining industry and one representing metal mining.

These general committees in turn established sub-committees to take charge of and direct the standardization for certain classifications of machinery and equipment. There are seven such sub-committees working under the general committee, standardizing coal-mining equipment and machinery. These sub-committees are composed of men representing the coal operators, the manufacturers of coal-mining equipment and machinery, mining engineers, etc. Several of these sub-committees have made very considerable progress in their work and their reports will be presented through the general committee at the annual convention of the American Mining Congress next November.

It is hoped that the presentation of this subject to your convention will awaken a lively interest in the standardization program by your members. Any information desired on the subject may be secured by addressing the writer, who is chairman of the general committee, having charge of this standardization work on behalf of the coal-mining industry.

Dock Interests Seek Government Help To Move Coal on the Lakes

REPRESENTATIVES of dock interests at the head of the Great Lakes are in Washington seeking relief from the situation which is resulting in an alarmingly small movement of Lake coal. The representatives point out that shipments during April were 700,000 tons below normal, while May forwardings are expected to be fully 3,500,000 tons less than normal.

Official attention is being called to the fact that grave danger exists of not having enough coal in the Northwest to meet next winter's needs. Because of the high prices which are being paid for coal, the tendency is to distribute it directly to the consumers rather than store it at the docks.

Trade of the United States with the Orient Makes Giant Strides

THE share of United States in the rapidly growing trade of the Orient has increased from less than 10 per cent in the year before the war to over 20 per cent in 1919. The total trade of the Orient, including in this term Asia and the adjacent islands, aggregated, says a statement of The National City Bank of New York, about $5,200,000,000 in 1913, of which about $475,000,000 was with the United States; but in 1919 it had advanced to $8,750,000,000, of which $1,880,000,000 was with the United States.

While the general trade of the Orient nearly doubled during the war period, that with the United States quadrupled. Our exports to Asia and the Philippines, which in 1913 amounted to only $158,000,000, were in 1919 $775,000,000, and in the fiscal year about to end will exceed $800,000,000. Our imports from the section in question, which amounted to only $300,000,000 in 1913, were $1,100,000,000 in 1919 and probably will aggregate $1,200,000,000 in the fiscal year ending with next month.

New York Skyscraper to Use Oil Instead of Coal Fuel

BELIEVING that oil is superior to coal as fuel, the owners of the Singer Building in New York are about to adopt oil for providing steam. Two of the five boilers in the steam plant have already been converted and the other three will be changed soon, it is understood. About one hundred barrels of oil will be needed daily for the building, it is believed, and a contract has been let for supplying oil needed the first three years.

Expect Commerce Commission to Give Data on Assigned Cars

Correspondence Discloses Adverse Effect on Miners Earnings and Other Evils Resulting from Inequitable Carrier Distribution

JUST before adjournment an ineffectual effort was made to secure action in each house in questioning the Interstate Commerce Commission in regard to assigned cars. The measure passed the Senate, but failed of passage in the House. It is expected, however, that the information called for will be furnished by the Interstate Commerce Commission in compliance with the Senate resolution:

"Whereas the railroad companies are making assignments of freight cars; and

"Whereas the said railroad companies, or a part of them, are making such assignment in a manner alleged to be discriminatory and prejudicial to the common public welfare; and

"Whereas authority for making assignments of cars by said railroad companies is predicated upon an order of the Interstate Commerce Commission, dated April 15, 1920, and entitled 'Notice to carriers and shippers,' and is in the following words and figures:

" 'The commission recommends that until experience and careful study demonstrate that other rules will be more effective and beneficial, the uniform rules as contained in the Railroad Administration's Cars Service Section Circular CS31 (revised) be continued in effect, except that rule 8 as contained in said circular should be amended to read:

DIRECTED TO CITE AUTHORITY FOR ORDER

" ' "Private cars and cars placed for railroad fuel loading in accordance with the decision of the Interstate Commerce Commission in RR. Com. of Ohio et al. v. H. V. Ry. Co., 12 I. C. C., 398, and Traer v. Chicago & Alton Railroad Co. et al., 13 I. C. C., 451, will be designated as 'assigned' cars. All other cars will be designated as 'unassigned' cars" ':

"Therefore be it resolved, That the Interstate Commerce Commission be directed to inform the Senate upon what authority, if any, said order was issued."

In that connection correspondence was introduced in the record of the proceedings, the first a letter addressed to Representative Roscoe C. McCulloch by John Moore, president of the Ohio Mine Workers, and Walter J. James, legislative representative of the United Mine Workers of America, as follows:

"On behalf of all the bituminous miners of the United States, particularly the miners of the State of Ohio, we desire to call your attention to the fact that a large number of miners and their families in every coal-mining district of Ohio are in a deplorable condition because of their lack of work, due primarily, as we understand it, to a recent order issued by the Interstate Commerce Commission which gives preferential car assignment to certain mines, making it possible for those miners to work almost continuously, while the miners employed at other mines are working, in many cases, less than 25 per cent time.

"The miners, as a rule, do not measure their earnings by the amount of money that is in their pay envelope, but rather by comparison with the earnings of their neighbors, and when the men working in one mine are making $2 more than the men working in some other mine it creates a condition of dissatisfaction and unrest at both mines. The man earning the most money is usually more dissatisfied than the fellow earning the small amount. This condition is prevalent throughout all the bituminous mining districts, and no doubt will result disastrously unless some correction is made.

"The Bituminous Coal Commission, created and appointed by the President of the United States, made the recommendation in their report that the preferential car assignment be discontinued, as it was discriminatory to the mine operator and to the coal miners, as well as to the general public. The miners in accepting the award of the commission believed that this recommendation, with the other recommendations, would be complied with; and no doubt would have been had it not been for the order of the Interstate Commerce Commission to the contrary.

CONSIDERED PREFERENTIAL TREATMENT ABOLISHED

"Our understanding of paragraph 12, section 402, of the Esch-Cummins Act is that the preferential car assignment was forever abolished, and we ask that you join with other Congressmen from our State in passing a resolution, or by some other legislative means correct the abuses as complained of above, making it so plain that the Interstate Commerce Commission will be compelled to recall the recent order."

The second communication, also addressed to Representative McCulloch, was from C. H. Bryson, secretary of the Federated Boards of Trade of Southeastern Ohio, as follows:

"Our commercial bodies wish to direct your attention to violations of the provisions of a recent act of Congress by the present management of the railroads under an order of the Interstate Commerce Commission. The violations are of paragraph 12, section 402, of the Transportation Act.

"The practice now engaged in by the railroads in violation of this act is the inequitable distribution of cars known as the assigning of cars for the loading of railroad fuel, which cars so assigned are not being distributed to mines on the basis of each mine's ratable share of cars.

"Many evils result from this practice; in fact, nothing has done so much injury to the people generally in the mining regions, and nothing has caused so much discontent as the assigned-car practice. It is altogether unfair and unjust.

UNFAIR DISCRIMINATION DUE TO THE PRACTICE

"It gives to some of the men nearly full-time employment and pay, while others are permitted to work but one or two days per week. Much suffering as a result is inevitable. It makes all of the citizens—laborers, business men, and others—of one town or community prosperous while an adjoining town or community dependent upon mines not favored with an assigned-car supply is barely able to exist. It keeps the men constantly moving from one town to another in the hope of securing work at a mine favored by the railroads, only to find perhaps after securing such employment that the railroad-fuel contract and consequently the car supply had been shifted to some other mine. Such intolerable conditions cannot be allowed to continue.

"We happen to be located at the source of the trouble, and consequently are the first to suffer. But the suffering will soon be extended to those dependent upon us for next winter's coal supply.

"In this connection we are advised that 30,000,000 tons of coal must go up by way of the Lakes to the people of the Northwest for next winter. This amount is essential to their comfort under normal winter conditions and must go during the navigation season of seven months.

"Due to lack of cars but 1,500,000 tons, or 5 per cent of this amount, has been shipped to date, whereas 6,000,000 tons, or 20 per cent, of the amount should have been shipped.

INSUFFICIENT COAL CAR SUPPLY IN WINTER

"While the railroads are getting their own fuel under the assigned-car practice, they are not furnishing cars to transport the winter fuel supply of the public. Those coal cars which should be carrying the public's coal are being used for transporting automobiles and various other articles and materials which produce more revenue for the carriers than the transportation of coal would produce.

"The assigned-car practice has received adverse comment by every individual and group not interested in railroad revenues who have studied the question deeply. This includes the Bituminous Coal Commission, the Railroad Administration, the Fuel Administration, and both labor and commercial organizations. A perusal of of the history of the practice shows it to have been universally condemned.

"The writer has interviewed personally many members of both the House and the Senate who were intimately connected with all the legislative activities leading up to the passage of the act referred to. Without one single exception or shadow of doubt in the minds of any of them, all are agreed that it was the intent of Congress in this legislation to get rid of the assigned-car practice and its many evils. A correct interpretation of the language of the act is in accord with that intent.

"The Interstate Commerce Commission refuses to interpret the language of the act correctly, and therefore refuses to carry out the clear and express intent of Congress. We can be heard fairly in the matter only by you who have undertaken to remedy these evils. What is to be done?"

Retail Prices of Food Made Record Increase in April

ACCORDING to reports received by the Bureau of Labor Statistics of the U. S. Department of Labor from retail dealers in fifty-one cities, the average family expenditure for twenty-two articles of food increased more than 5 per cent in the month from March 15 to April 15. This is the largest percentage increase in any one month except April, 1917, immediately following the entrance of the United States into the great war, when the increase was 9 per cent over March, 1917, prices.

The cost of food in April, 1920, reached the highest point yet attained, being 5 per cent higher than the heretofore record high point of January, 1920. The figures for April, 1920, show an increase of 16 per cent as compared with April, 1919, and an increase of 115 per cent as compared with April, 1913.

Car Service Commission Issues Rules Governing Use of Coal Cars

W. C. KENDALL, chairman of the American Railroad Association's Commission on Car Service, on June 2, 1920, issued the following, designated as circular CCS-33, to railroads:

"The production of bituminous coal during April and May has been averaging two and one-half million tons per week less than what is necessary for the country's adequate fuel supply and particularly to permit a sufficient movement up lake to the Northwest and ocean and rail to New England to protect next winter's consumption in those sections. The average placement on bituminous coal loading roads has been approximately 50 per cent.

"In order that coal production may be increased and discrepancies in placement as between commodities made up it is necessary that:

"1. Railroads must distribute available coal cars for loading coal to a minimum of 50 per cent of actual requirements before distributing coal cars for loading other commodities.

"2. Railroads may distribute available coal cars for loading other commodities requiring open cars to an extent not exceeding 50 per cent of actual requirements based on ability to load and ship, and any surplus as available shall be applied to increase the supply for coal loading.

"3. Railroads having no coal loading will restrict the supply of coal cars for loading of other commodities requiring open cars to an extent not exceeding 50 per cent of actual requirements based on ability to load and ship. Foreign cars used in this manner must be loaded strictly in accordance with car-service rules, and must not be back hauled for loading.

"4. Coal-carrying cars must not be used for the loading of automobiles and other commodities which can be transported in box cars and other types of equipment."

Supreme Court Denies Peterson Petition for Mandamus Against Judge Hand

IN AN opinion delivered by Justice Brandeis, the U. S. Supreme Court on June 1 denied the petition of Walter Peterson, as receiver of the Interstate Coal Co., Inc., for a writ of mandamus against Judge Augustus N. Hand of the U. S. Court for the Southern District of New York.

Peterson had brought an action in the latter court against Arthur Sidney Davison to recover a balance of $21,014.43, alleged to be due for coal sold and delivered. The answer substantially admitted the items set forth in the schedule filed by the plaintiff, but denied that it represented a full account of the transactions between the parties, alleging that there were other deliveries of coal and other payments which the defendant had made, and also that he was entitled to additional allowances. It further alleged, by way of counter claim, that the plaintiff was indebted to him for failure to perform its contracts for coal in the sum of $9,999.10. In response to a demand for a bill of particulars, defendant filed schedules containing more than two hundred items which he proposed to establish by way of defense.

Upon motion of defendant and against the objection of plaintiff, Judge Hand appointed an auditor with instructions to make an investigation of the facts with a view to simplifying the issues for the jury which was to make final determination of all issues of fact.

Thereupon application was made to the Supreme Court for leave to file a petition, praying that Judge Hand and the auditor named be prohibited from proceeding under the order appointing him and that Judge Hand, or such other judge who may at the time hold the trial term of that court, be commanded to restore the case to the trial calendar and that the same be tried in the regular way.

Justices McKenna, Pitney and McReynolds dissented.

Committee Chairmen of Mining Congress To Discuss Program for Year

COLONEL WARREN R. ROBERTS, chairman of the coal mining section of the Standardization Committee, and Chairman Mitke, of the metal mines division of the American Mining Congress, expect shortly to call a meeting of all sub-committee chairmen of both coal and metal mining committees in Denver to discuss the program for the year in connection with the reports to be made at the twenty-third annual convention at Denver during the week of Nov. 15 next.

Movements of Coal and Coke by Fourteen Leading Railroads During February 1919 and 1920

SHIPMENTS of coal and coke carried over fourteen leading railroads during February, 1919 and 1920, and during the two months ending with February for the same respective years, compiled by the division of statistics of the U. S. Department of Commerce, are as follows:

Coal and Coke Shipments for February, 1919, and February, 1920, Compared

Classes and Railroads	Originating on Line		Received from Connections		Total	
	1919	1920	1919	1920	1919	1920
For Revenue Only	Short Tons	Short Tons	Short Tons	Short Tons	Short Tons	Short Tons
Anthracite:						
Buffalo, Rochester & Pittsburgh			13,178	11,593	13,178	11,593
Buffalo & Susquehanna			254	570	254	570
Chesapeake & Ohio	381	397	2,616	781	2,997	1,178
Erie	449,229	515,094	161,149	215,340	610,378	730,434
Huntingdon & Broad Top Mountain			97	45	97	45
Pennsylvania	328,604	473,920	234,379	510,579	562,983	984,499
Pittsburgh & Lake Erie				333		333
Pittsburg, Shawmut & Northern			146	2,788	146	2,788
Virginian	159	255	149		308	255
Western Maryland			20,699	31,903	20,699	31,903
Totals	778,373	989,666	432,667	773,932	1,211,040	1,763,598
Bituminous:						
Buffalo, Rochester & Pittsburgh	428,504	515,492	47,422	9,009	475,926	524,507
Buffalo & Susquehanna	96,472	139,794	108		96,580	139,791
Chesapeake & Ohio	1,152,634	1,790,268	172,196	225,974	1,324,830	2,016,244
Erie	20,925	40,732	515,393	819,129	536,318	859,862
Huntingdon & Broad Top Mountain	40,658	59,443	719	60	41,377	59,501
New York Central (Buffalo and east)	389,909	531,467			389,909	531,463
Norfolk & Western	1,327,873	1,529,673	170,181	256,762	1,498,054	1,786,435
Pennsylvania	2,627,106	2,765,878	620,867	640,281	3,247,973	3,406,159
Pittsburgh & Lake Erie	336,182	443,952	422,817	618,483	758,999	1,062,435
Pittsburg & Shawmut	118,864	206,791			118,864	206,791
Pittsburg, Shawmut & Northern	27,237	59,749	16,769	36,406	44,006	96,155
Virginian	205,504	373,106	36,237	40,438	241,741	413,544
Western Maryland	167,637	295,193	455,219	649,256	622,856	944,449
Totals	6,939,505	8,751,538	2,457,928	3,295,798	9,397,433	12,047,336
For Company Fuel						
Anthracite:						
Buffalo, Rochester & Pittsburgh				464		464
Erie	13,603	16,567		1,206	13,603	17,773
Pennsylvania	7,429	11,416	410	5,043	7,839	16,459
Totals	21,032	27,983	410	6,713	21,442	34,696
Bituminous:						
Buffalo, Rochester & Pittsburgh	47,817	60,124	230	89	48,047	60,213
Buffalo & Susquehanna	7,185	9,409	....		7,185	9,409
Chesapeake & Ohio	116,178	189,254			116,178	189,254
Erie	72,755	134,712	151,395	177,124	224,150	311,836
Huntingdon & Broad Top Mountain	8,865			1,833	8,865	1,833
New York Central (Buffalo and east)	91,228	160,181			91,228	160,181
Norfolk & Western	231,076	177,489	39,443	45,783	270,519	223,272
Pennsylvania	661,338	885,564	34,003	79,861	695,341	965,425
Pittsburgh & Lake Erie	22,959	25,217	27,068	33,056	50,027	58,273
Pittsburg & Shawmut	2,491	3,341			2,491	3,341
Pittsburg, Shawmut & Northern	2,254	6,088			2,254	6,088
Virginian	24,861	37,207	199	1,352	25,060	38,559
Western Maryland	19,458	49,863	26,285	5,176	45,743	55,039
Totals	1,308,465	1,738,449	278,623	344,274	1,587,088	2,082,723
Coke for Revenue and Fuel						
Buffalo, Rochester & Pittsburgh	23,997	16,612	23,791	39,329	47,788	55,941
Buffalo & Susquehanna	28,559	30,998			28,559	30,998
Chesapeake & Ohio	49,309	35,632	9,091	18,423	58,400	54,055
Erie	12,036	15,498	29,354	53,906	41,390	69,404
Huntingdon & Broad Top Mountain	963	7,257	696	2,333	1,659	9,590
Norfolk & Western	121,225	87,998	13,912	24,060	135,137	112,058
Pennsylvania	570,320	532,009	130,035	147,676	700,355	679,685
Pittsburgh & Lake Erie	46,671	37,859	418,561	417,980	465,232	455,839
Virginian			32		32	
Western Maryland	3,279	3,505	36,492	20,572	39,771	24,077
Totals	856,359	767,368	661,964	724,279	1,518,323	1,491,647

Coal and Coke Shipments for Two Months Ending February

Classes and Railroads	Originating on Line		Received from Connections		Total	
	1919	1920	1919	1920	1919	1920
For Revenue Only	Short Tons	Short Tons	Short Tons	Short Tons	Short Tons	Short Tons
Anthracite:						
Buffalo, Rochester & Pittsburgh			26,908	25,936	26,908	25,936
Buffalo & Susquehanna			433	3,016	433	3,016
Chesapeake & Ohio	911	1,701	5,372	4,981	6,283	6,682
Erie	1,160,637	1,161,731	393,329	478,623	1,553,966	1,640,354
Huntingdon & Broad Top Mountain			97	101	97	101
Pennsylvania	820,380	919,596	657,293	950,055	1,477,673	1,869,651
Pittsburgh & Lake Erie			48	333	48	333
Pittsburg, Shawmut & Northern			1,582	4,913	1,582	4,913
Virginian	429	455	248	100	677	555
Western Maryland			53,679	58,089	53,679	58,089
Totals	1,982,357	2,083,483	1,138,989	1,526,147	3,121,346	3,609,630
Bituminous:						
Buffalo, Rochester & Pittsburgh	1,161,148	1,179,010	75,723	22,176	1,236,871	1,201,186
Buffalo & Susquehanna	213,798	295,743	296		214,094	295,743
Chesapeake & Ohio	2,954,314	4,109,314	351,703	426,894	3,306,017	4,536,208
Erie	52,164	81,492	1,376,379	1,704,086	1,428,543	1,785,578
Huntingdon & Broad Top Mountain	119,916	145,976	833	2,205	120,749	148,181
New York Central (Buffalo and east)	998,586	1,201,354			998,586	1,201,354
Norfolk & Western	2,638,676	3,297,642	383,090	519,589	3,021,766	3,817,231
Pennsylvania	5,996,448	6,138,239	1,436,168	1,378,082	7,432,616	7,516,321
Pittsburgh & Lake Erie	829,875	1,001,977	1,024,254	1,370,558	1,854,129	2,372,535
Pittsburg & Shawmut	319,204	427,981			319,204	427,981
Pittsburg, Shawmut & Northern	69,711	128,979	45,537	76,842	115,248	205,821
Virginian	586,419	865,179	93,958	101,896	680,377	967,075
Western Maryland	454,776	728,361	1,128,634	1,533,358	1,583,410	2,261,719
Totals	16,395,035	19,601,247	5,916,575	7,135.686	22,311,610	26,736,933
For Company Fuel						
Anthracite:						
Buffalo, Rochester & Pittsburgh				1,089		1,089
Erie	26,077	38,009		2,023	26,077	40,032
Pennsylvania	16,273	29,755	5,563	11,741	21,836	41,496
Totals	42,350	67,764	5,563	14,853	47,913	82,617
Bituminous:						
Buffalo, Rochester & Pittsburgh	126,215	135,057	773	137	126,988	135,194
Buffalo & Susquehanna	15,384	21,287			15,384	21,287
Chesapeake & Ohio	284,204	399,368			284,204	399,368
Erie	195,471	252,967	407,746	428,631	603,217	681,598
Huntingdon & Broad Top Mountain	10,901			3,268	10,901	3,268
New York Central (Buffalo and east)	270,541	314,466			270,541	314,466
Norfolk & Western	435,517	420,281	75,602	103,135	511,119	523,416
Pennsylvania	1,796,501	1,620,808	74,080	181,760	1,870,581	1,802,568
Pittsburgh & Lake Erie	46,183	66,281	59,911	60,761	106,094	127,042
Pittsburg & Shawmut	7,574	7,684			7,574	7,684
Pittsburg, Shawmut & Northern	5,820	10,781			5,820	10,781
Virginian	55,830	77,582	810	2,554	56,640	80,136
Western Maryland	44,995	110,814	74,559	9,158	119,554	119,972
Totals	3,295,136	3,437,376	693.481	789.404	3,988,617	4,226,780
Coke for Revenue and Fuel						
Buffalo, Rochester & Pittsburgh	46,828	33,265	70,946	67,067	117,774	100,332
Buffalo & Susquehanna	53,784	63,184	37	39	53,821	63,223
Chesapeake & Ohio	102,787	74,204	17,375	26,584	120,162	100,788
Erie	25,667	55,296	57,989	89,133	83,656	144,429
Huntingdon & Broad Top Mountain	7,732	10,911	2,230	13,543	9,962	24,454
Norfolk & Western	286,463	177,914	34,170	44,913	320,633	222,827
Pennsylvania	1,265,973	1,183,676	312,270	298,775	1,578,243	1,482,451
Pittsburgh & Lake Erie	108,220	81,331	981,886	842,405	1,090,106	923,736
Virginian			32		32	
Western Maryland	8,680	6,789	84,023	35,283	92,703	42,072
Totals	1,906,134	1,686,570	1,560,958	1,417,742	3,467,092	3,104,312

NOTE.—No report was received from the Baltimore & Ohio R.R.

Favors Acquisition of Tract for Coal Experiments

DIRECTOR MANNING, of the Bureau of Mines, has recommended Government acquisition of a tract of 77 acres covering a coal mine near Pittsburgh at a cost of $19,000, for coal experiments, so that the experimental station at that point may not be disturbed by possible future mining, although the bureau does not plan to mine coal. At this station coal dust from all parts of the country is tested to determine its explosibility.

Based on experience of the government fuel yard in the District of Columbia, which supplies government departments with coal, Director Manning favored centralized coal buying for the entire government service throughout the country under one agency. Chairman Good of the committee said there was merit in the suggestion. The fuel yard had saved the government from 39½ to 70 cents a ton on the 300,000 to 350,000 tons used annually by government departments in Washington, and had reduced business of private dealers about 20 per cent.

Director Manning said the bureau would co-operate with State or municipal governments, corporations, associations or individuals on scientific work with the understanding that the results of experiments should be for the benefit of the general public. At present the bureau is co-operating with thirty-three agencies, among them the Sinclair Refining Co., on fuel development with a view of saving oil and bringing about more efficient use of coal.

Advocates Mine Exhibit in Celebration of Sesqui Centennial of Independence

REPRESENTATIVE DARROW, of Pennsylvania, has introduced a bill favoring the celebration of the 150th anniversary of the signing of the Declaration of Independence by holding an international exhibition of arts, industries, manufactures and products of the mine, soil and sea, in Philadelphia, in 1926.

Kentucky Mining Institute Meets at Lexington

Important Moves Made to Increase Interest and Value of the Meetings
Provision for Company Membership Expected to Strengthen Organization—
Well-Filled and Skillfully-Contested First-Aid Meet Features the Conclave

First-Aid Contest

Owing to a severe rain the Kentucky Mining Institute authorities decided that the Stoll Athletic Field would not be dry enough for the contest of the following day and so decided to use an empty tobacco warehouse for the purpose, an excellent idea which if followed regularly would relieve much anxiety from the minds of all concerned in such events.

Here Are the Winners

The Pioneer Coal Co. of Kettle Island took the honors with a team comprising J. D. Wyatt, captain; H. E. Grace, Joseph Lowe, Wesley Lowe, J. G. Gross and Dewey Brock. This team received the engraved plaque which is the leading prize of the Kentucky Mining Institute's annual event. Its rating was 99.2 per cent.

MEETING for the first time in more than a year, the Kentucky Mining Institute gathered at Lexington, Ky., on June 4 and 5 for reorganization on a peace basis and for a grand get-together convention. The meeting was well attended, particularly by the operators from the eastern part of the State. The two days were filled with the meeting and the first-aid meet in the afternoon of the last day.

Several important changes were made in the organization that are certain to strengthen the work and increase interest on the part of the members, as well as add to the membership. The position of secretary was made a salaried one, dues were increased from $3 to $5 per year, and provision was made for company memberships, without voting power, each at $10 per year. These steps will place the institute on its feet financially and with a paid secretary able to devote more time to the work than any volunteer has so far been able to give, the membership can and will be materially increased and the operators in the State be kept informed of the activities of their institute.

The opening meeting on Friday, June 4, was well attended. Mr. George Eshrick, Jr., fuel engineer with the International Coal Products Corporation of New York, read a paper describing the Smith process of low-temperature distillation of coal and the briquetting of the product. In his paper Mr. Eshrick pointed out the waste in burning raw coal, indicated that the demand for smokeless coal was in excess of the combined production of the anthracite and smokeless fields and informed his audience that from high-volatile Kentucky coal a smokeless product can be prepared by this process that will have all the good points of the present well-known brands of low-volatile fuel. The vision of plants at the coal mines in Kentucky producing hard coal briquets, with benzol, tar and ammonia as side lines, appealed to the operators present and the paper was the subject of much discussion and the speaker was called upon to answer many questions.

Mr. Herbert M. Wilson, the director of inspection and safety of the Associated Companies, read a paper on the practical operation of coal-mine compensation insurance under the Kentucky law. The paper, which will be found in this issue of *Coal Age*, answered the questions of many regarding the operation of the law and showed by examples from the records of cases in Kentucky the advantages in decreased cost of insurance of the inspection and help offered by the inspection service of the insurance companies. Cost of insurance was shown to be in direct ratio to the risk offered by the mine, and improvement in mining practice and observance of the rules of safety progressively reduces the cost.

General disappointment was felt at the unavoidable absence of John Callahan, of the National Coal Association, and George Cushing, of the Wholesale Coal Dealers' Association. Mr. Callahan was to have talked on the new Transportation Act, but was called to Chicago for consultation on the subject of assigned cars. Mr. Cushing sent his paper on the history of the coal industry and although the absence of the author was regretted the paper was read and enjoyed by all present. The paper was printed in the last issue of *Coal Age*.

The evening of the first day was spent in a business session and smoker at the Phoenix Hotel. The last session of the institute was in the morning of the 5th. Two papers were read, one by C. E. Lesher, editor of *Coal Age*, on "Some Wage Problems" and the other on the "Use of Combination Battery and Trolley Mine Locomotives," by John B. Hicks, assistant superintendent, Consolidation Coal Co., Jenkins, Ky. Both papers will be reprinted in *Coal Age*.

First-Aid Contest a Success

No Kentucky State Institute meeting would be complete without a first-aid contest. The contest, held June 5, was highly successful in point of interest, number of contesting teams and excellence of the work of the men. Eight teams were present, all from the eastern part of the State. The contest was originally scheduled for Stoll Field, at the State University, but rains the preceding day rendered the field unfit for the contest, which was held instead in a large warehouse. Preceding the meet the teams, in uniform and with their equipment, and the visiting members of the institute gathered to have their photograph taken and to march to the gathering place, led by Prof. Norwood, newly-elected president of the institute.

Mr. G. E. Daugherty, chairman of the first-aid committee, pronounced the meet the best he had ever attended. Each of the eight teams competing in the five events made a total of more than 90 per cent. The teams in the order of their record were as follows:

First prize, Pioneer Coal Co., Pineville, Ky., 99.2 per cent; second prize, Consolidation Coal Co., mines 204-205, Jenkins, Ky., 98.8 per cent; third prize, Consolidation Coal Co., mines 212-213, McRoberts, Ky., 97.4 per cent; fourth prize, Pond Creek Coal Co., Stone, Ky., 97.2 per cent. The remaining four teams in order were: Kentucky Coke Co., Echols, Ky., 96.1 per cent; Edgewater Coal Co., Hellier, Ky., 95 per cent; First Creek Coal Co., Blue Diamond, Ky., 94.2 per cent; Lechies Collieries Co., Aflet, Ky., 93.6 per cent.

The winning team was awarded the engraved plaque of the Kentucky Mining Institute, which is awarded each year to the winning team; the Phoenix Hotel Cup, which will become the property of the team winning first place two years in succession; bronze medals from the American Red Cross and medals from the National Safety Council. The second team received fountain pens for each member of the team. Lamps were awarded to the members of the teams standing third, fourth, fifth and sixth. Pins were given all contestants.

More than usual interest centered in the selection of the officers of the institute for the coming year. On every hand H. M. Ernst and C. W. Strictland, president and secretary-treasurer respectively the past year, were praised and commended for their faithful and excellent work. Both, however, begged off from another year and the nominating committee made the happy choice of Prof. C. J. Norwood for president and Mrs. Elizabeth C. Rogers for secretary-treasurer. In making the nomination the chairman of the committee said that presidents had been selected from the north, east, south and west, but it remained this year to take a man from the center.

Prof. Norwood has been identified with mining in Kentucky for many years and as chief of the Department of Mines is well and favorably known to every mining man in the state. Mrs. Scott has been recorder for every meeting held by this institute. She knows the work, is popular with the members and by reason of her location in Lexington, home of the new president, will be able to render the best possible service.

The desirability of better attendance and more lively interest in the institute on the part of mine superintendents and foremen was discussed, and as a result steps were taken to encourage district meetings of the institute at which these men could attend without great loss of time from their work. Vice presidents were elected with the particular purpose in view of encouraging this development. The new vice presidents are A. G. Spellman, Earlington, Ky.; A. L. Ware, Hazard, Ky.; Joe Cane, Stearns, Ky.; W. E. Davis and W. H. Davis, both of Lexington, Ky.; C. W. Conner, Esco, Ky., and J. T. Bradley, Pineville, Ky.

Strike Idleness Extends in Thacker Field

MORE mine workers in the Thacker field have been induced by the United Mine Workers to join the union. As many of these are at plants which have not hitherto had locals and as the men as fast as they join the union are called upon to cease working and obey the admonition, mines are continually closing down.

So many mines are now affected that the weekly loss from lack of man power and because of idleness at mines is running above 50,000 tons. The purpose of the organizers in closing down the mines is to make the operators enter into negotiations with a view to recognizing the United Mine Workers. Thus far there is no indication that the operators will do this.

So far the campaign for the organization of the Thacker field has not only failed to be of any advantage to the miners but, contrariwise, has been detrimental to their welfare in that it has resulted in a total loss of income among all the miners who have joined the union. It is claimed by the operators that the rate of wages paid is higher than the rate paid in union fields.

In connection with the organization of the Thacker field the United Mine Workers are also attempting to organize Kentucky mines across Tug River from the Williamson field and reports of intimidation in connection with such organization work are not uncommon.

Coal Road Declares Extra Dividend

THE Mahoning Valley Coal Railroad Co. has declared a $15 extra dividend on the common stock, payable July 1 to stock of record June 21. This is in addition to the regular semi-annual dividends of $5 on the common and $1.25 on the preferred stocks.

Discussion by Readers

Edited by
James T. Beard

Posting Entries and Roads

BEING interested in the Nova Scotia coal fields, I desire to add a word to the excellent reply given to the inquiry of "Mac," *Coal Age*, April 29, p. 874.

Some years ago, while I was assistant to the general mining superintendent of one of the large coal companies operating in Nova Scotia, I had reason to study the timbering problem in that coal field. The cost of this timbering was excessive and the amount of broken timber was beyond all reason.

In order to arrive at an intelligent conclusion, I examined the working places in each of the mines operated by our company. I took exact measurements, made sketches and noted particulars in respect to the timbering in every place visited. This field was working a submarine area, which had been developed to a distance, under the sea, of about two miles out from the coast line. The thickness of strata at the working face was about 1,500 ft. and in addition to this weight was that of the sea water above.

Some idea of the pressure on the pillars will be understood when it is stated that, although large pillars were left for the support of the overburden, these were forced into the roof or floor about two-thirds of their height. Where the original thickness of the seam was 5 ft. 9 in., this was reduced to about 2 ft. by the time the pillars were to be withdrawn. In this instance, we experienced no trouble in taking out all the pillars and withdrawing the timber. There was no inflow of water, but the workings were very dry.

INVESTIGATION SHOWED SYSTEM OF TIMBERING TO BE GENERAL IN THE MINES

The method of posting entries suggested by "Mac" and illustrated on the right of his sketch is exactly what I found in my examination of the places. This system of posting, however, was giving no end of trouble and the cost of timber and labor in replacing broken parts was such that something had to be done to reduce the expense.

After considering the situation carefully, I recommended shifting the track close to the rib and taking out the rib posts on that side of the entry. Two rows of posts were set staggered, on the other side of the entry, between the track and the lower rib. Where the floor was hard these posts were sharpened or tapered at the bottom, which fact permitted them to burr, under the great roof pressure, and prevented their breaking. The plan not only required less timber but diminished the cost of labor for resetting broken posts and the expense was greatly reduced.

I fully agree with what was said in the reply to this inquiry regarding the danger of standing posts on a haulage road. As there stated, where the roof needs support, booms or crossbars should be used and, if possible, the legs supporting these crossbars should be cut short and set in hitches cut in the ribs.

Another plan is to rest the bar in two hitches cut in the ribs close to the roof. A hitch is cut in one rib, about six inches deep, and one end of the bar being first inserted, into this, the other end is slid into a sliphitch cut in the other rib. A narrow wedge is then driven at that end of the bar to hold it in place. This narrow wedge will yield under the side pressure that may come and prevent the breaking of the bar.

I also agree with what is said regarding the driving of wedges between the crossbar and the roof. No wedges should be driven in the center of the bar; but, a wedge should be driven near each end which has the effect of overarching the weight of the roof and throwing it on the rib on either side of the road.

McKeesport, Pa. ANDREW O. BAIN.

Working With Carbide Lamps Where Oil Lamps Cease To Burn

SOME time ago a mine foreman stated an instance that occurred in the robbing of pillars in a mine where the generation of carbon dioxide increased to such an extent that the oil lamps of the miners would not burn, and it was necessary to give them carbide lamps instead. He asked, "To what danger, if any, were the miners exposed when working with the carbide lamps?"

In my opinion there are two dangers to which men are exposed when working in an atmosphere in which an ordinary oil lamp will not burn. First, the men may be overcome with blackdamp, which means not only the presence of carbon dioxide in the air but a deficiency of oxygen on which the health and life of the miner depends. Second, the carbide light does not, in my opinion, indicate the possible presence of blackdamp, for which purpose the Haldane tube is the best test.

MEN SHOULD HAVE BEEN WITHDRAWN

What should have been done, in the case cited by this mine foreman, is to have withdrawn the men from the place and not allow them to return until the atmosphere would support the combustion of an oil-fed flame. The fact that the oil lamps failed to burn shows that there may have been, perhaps, 15 per cent of carbon dioxide in the atmosphere; but there is no guarantee that there was not sufficient of this gas present to have caused the death of a man in a short time.

It is true that a man can breathe a much greater percentage of blackdamp present in the air than what is required to extinguish an oil-flame lamp. However, my conviction is that it is never safe to remain long in an atmosphere where these lamps will not burn. As I remarked before, the men should have been withdrawn from the place, which is the only safe practice to follow on such an occasion.

In discussing this situation, Jerome C. White, *Coal Age*, Apr. 29, p. 870, advocates strict compliance with the mining laws, which require the adequate ventilation of mines, or sufficient air to dilute and sweep away the gases formed therein and make the mine safe for work. In my opinion, our mining laws should go still further and make it an offense against the act when the oxygen in the air of a mine is permitted to fall below 20 per cent. Then, and only then, will there be a less number of accidents resulting from poisonous gases.

Scranton, Pa. MICHAEL STARRS.

To Conserve Mine Timber

CONSERVING mine timber is one of the most important problems in the operation of a coal mine today. To those who have not, as yet, come to appreciate this fact, it will soon become evident through their failure to obtain timber from outside sources at a reasonable price, when the local supply has been exhausted.

The fact is plain that more timber is being used in the mines, at the present time, than is being cultivated. Aside from the efforts made by the Forestry Commission, little attention is being given to the growth of young timber. It is true that there are some exceptions to this, as large mining companies have, in a few instances, planted acres of trees that will go far toward replenishing the timber supply in a few years to come. However, it occurs to me that there should be a more general effort made to cultivate timber for mine use, and that this should be enforced by statute at the earliest possible moment.

ECONOMIZE IN THE USE OF TIMBER

In considering the growing scarcity of mine timber, there is another phase of the subject that demands as much attention as that of replenishing the timber supply. I refer to the adoption of such methods of mining as will require the use of less timber and be less destructive of what timber is used in the mines. Where such methods are in use it has been possible to recover much of the timber and use it again and again to good purpose.

In order to fully appreciate what an enormous amount of timber is wasted in mines, consider for a moment, the number of props that are required when driving up a 300-ft. room, under fairly normal conditions. When driving a room two posts are commonly required every four feet of advance, which means 150 posts to drive the room 300 ft. Then, when drawing back the pillars at least three times this number will generally be necessary to make the work safe.

ESTIMATING THE AMOUNT OF TIMBER USED

Where the timber is not recovered or conditions are such that it cannot be used again, it will mean that 600 posts will be required for the extraction of the coal in a single room. Assuming there are 30 rooms on a heading and allowing for those recovered and used a second time, we must estimate on, say half this number of posts or $30 \times 300 = 9{,}000$ posts, on a single heading.

Practical men familiar with mining conditions will readily admit that this is a conservative estimate of the amount of timber required when mining coal under fair conditions. But, when the conditions are less favorable, one is almost paralyzed to think that 25,000 or 30,000 posts may be required to take out the coal from a similar area. The conclusion is pressed forcibly home on our minds that improved systems of mining coal must, of necessity, be adopted and made to replace the wasteful methods now employed.

The use of mining machines in place of the hand pick, for under-cutting the coal, demands greater support for the roof, since the machine cuts deeper and faster than is possible in pick mining. As a consequence, there is a greater roof pressure on the face of the coal, and this must be met with the use of more timber. In hand-pick mining, the miner sets the posts where his judgment tells him they are needed; and, often, the standing of a post is only temporary and in a short time it is taken out and used again. In machine mining, it is necessary to set the posts to facilitate the operation of the machines. A larger number of posts are then required and the same care is not exercized in their use.

I remember the time when a mine wagon containing 30 or 40 posts was given to a man when he started to take out a pillar, and when the pillar was drawn back to the entry there would still be some few posts left. Such a thing is not known today. At that time there was no pillar boss or rib boss.

DOES NOT CONDEMN THE RIB BOSS

Now, in saying this I am not condemning the rib boss of today. On the contrary, let me say, he is more needed now than ever before, as the coal is being mined more rapidly and the proper use of timber to make the work safe, requires every possible precaution being taken. This calls for a very careful man to fill the position of rib boss, and his work is almost indispensable.

The question is, what can be done to make the mining of coal more efficient and safe and, at the same time, conserve the fast diminishing supply of timber suitable for mining. I feel confident that something *can* be done and *will* be done along this line, if those who have the power take the necessary steps for that purpose. Many of the readers of *Coal Age*, no doubt, have plans and methods that are practical, and no time is more appropriate for their employment than the present.

Perryopolis, Pa. R. W. LIGHTBURN.

The Miner and His Powder Flask

THE instance cited by William B. Jackson, *Coal Age*, Apr. 15, p. 771, describing a mine foreman and a mine inspector as finding fault with a miner who had stowed his powder flask in what he considered a safe place in the gob, instead of putting it in a cubbyhole in the rib of the pillar that he was drawing back, is an interesting illustration of how frequently a mine official will not appreciate the real conditions existing in a miner's place.

No one will deny that in driving a room or entry, it is a good idea for a miner to stow his powder flask in a cubbyhole cut in the rib of the entry or room, at a safe distance back from the face. But, consider for a moment the conditions described by this correspondent, who was engaged in drawing back a pillar, which he says was overlaid with a strong top that crushed the coal, often throwing it from the rib into the road, for a distance of several yards ahead. It is probable that neither the mine foreman nor the inspector took into consideration these conditions that were well known to the miner who worked on the pillar.

Judging from the description given by Mr. Jackson, it would have been unsafe for him to have placed his powder flask in a cubbyhole in the rib of the pillar when working under these conditions. At any moment, the flask would have been liable to have been crushed and the powder spilled on the bottom, which would have been dangerous where open lights are in use, or where there are electric wires in the place.

In my practice, I have used wooden kegs in which the miners placed their powder flasks and stowed them away in the gob, a safe distance, say six or eight feet back from the track. At another time, I have had wooden boxes made for the men, to be used for the same purpose. Each box had a strong lid and made a good safe place for a miner to keep his powder flask while he was at work. The box was kept on the gob side of the road, in a safe place away from the track and electric wires.

Not to be misunderstood in this matter, let me say that I would never place a powder flask in the gob, without it was first put in a box or other strong container. However, in the present case, it is probable that Mr. Jackson had no other choice than to select what he thought was a safe place in the gob. My conclusion is that the mine foreman would have done better had he had strong wooden boxes made for the men in which they could keep their powder flasks. He would not have been obliged, then, to find fault with his men for doing the best they could under the circumstances.

Oak Hill, W. Va. WILLIAM DICKERSON, SR.

Was the Explosive Needed?

DRAWING back pillars under a heavy roof pressure when the conditions were such as described by William B. Jackson, *Coal Age*, April 15, p. 771, suggests a doubt as to whether it was necessary for the miner, in that case, to have a powder flask, which he is said to have placed where he thought it would be safe in the gob. Mr. Jackson states that the coal was often thrown from the rib into the roadway for a considerable distance back from the end of the pillar.

Assuming that the coal was being crushed in the manner mentioned, I fail to see why he required to keep a powder flask with him in the mine. Surely, it would not be necessary for him to blast the coal from the pillar when the roof pressure was breaking it down, it would seem, as fast as it could be loaded and taken out of the mine. It appears to me there was no necessity for the use of powder in this place.

My own idea is that the inspector was testing the miner, in order to ascertain if it was his habit to keep his powder flask in the gob; or whether he knew that it should be kept in a cubbyhole in the rib, on the opposite side of the road from the trolley and other electric wires.

MUST COMPLY WITH THE LAW

It seems to me quite probable that both the inspector and the mine foreman observed and realized the conditions in the place, and knew that it would not be practical to keep the powder flask in a cubbyhole in the rib, except it was placed at a safe distance back where it would not be affected by the crushing weight of the roof as the pillar was drawn back. These men probably had in mind that the keeping of a powder flask unprotected in the gob was not in compliance with the requirements of the mining law regarding explosives.

From a safety point of view, it must be remembered that conditions in the gob when pillars are being drawn are liable to change with scarcely a moment's warning. What this miner thought was a safe place when putting his flask away, might soon become unsafe for such keeping.

My conclusion is that if it was at all necessary to have a flask of powder for this work, the explosive should have been kept in the prescribed cubbyhole, at a point sufficiently far back from the end of the pillar to be out of danger. It would certainly pay to take a little trouble and time in going back for the powder when it was needed, rather than to run any risk of danger.

"Safety first" is the great cry today and, yet, the law permits loose powder to be taken into the mine, although compressed powder is handier and safer in every respect. Considering the carelessness that exists in the handling of loose powder in the presence of open lights, it is surprising that so few accidents occur, and I have seen miners who could speak little English, in violation of the mining law of Pennsylvania, make up a cartridge of loose powder, with their lamp on their head, thus endangering not only their own lives but that of others about them. SAFETY INSPECTOR.

McKeesport, Pa.

Powder Flask in Pillar Workings

ANSWERING the inquiry of William B. Jackson, of Houston, Pa., *Coal Age*, Apr. 15, p. 771, concerning the safe storage of explosives at the working face, with particular reference to black powder in flasks, permit me to say that the description he gives of the working conditions is worthy of careful consideration and inclines me to think he probably was not far wrong in placing his flask on the gob.

As a general condition, however, the things to be considered in regard to storing the daily supply of explosives are: First, that they are placed at a safe distance from the working face; out of the way; up off the bottom; and out of the direct line of blast. Second, that they are stored separately and away from carbide, fuse, paper, squibs, caps, oil and tools. Third, that the container is in a safe condition.

If these considerations be given to the storage of the day's supply of explosives many accidents would be avoided. MINER.

Pikeville, Ky.

Trolley-Wire Guards

ONLY recently, my attention was attracted to the inquiry of "Triprider," regarding the proper width apart of the guardboards protecting a trolley wire in a mine, *Coal Age*, March 11, p. 506. He suggests that the requirement of five inches, in compensation-insurance regulations, should be made five and one-half inches to avoid, as he says, the trolley wheel becoming wedged between the wire and the board should the wheel jump the wire.

When placing a guardboard the first thought should be the purpose of the guard, which is: (1) The protection of the lives of workers in the mine by preventing accidental contact with the wires; and (2) permanency of construction. The opinion of the average motorman is that a guardboard is more trouble than it is worth and, with proper care on the part of the men working in the mine, there should be no necessity for such protection. The motorman would be right, in this regard, if the rules of safety did not demand the proper protection of all points of danger that are liable to cause accidents owing to the carelessness or lack of caution on the part of workmen.

Good workmanship is required to construct trolley guards at a distance of even five inches apart and to increase this width would make the construction still more difficult. The danger of contact with the wire, moreover, would be much greater should the width be increased even one-half inch, as suggested. A man coming under the wire and suddenly raising his head would have little protection if the boards were spaced too wide apart.

The trouble mentioned by the correspondent is generally due to the loose jointing of the boards, which would allow one or more of them to come close to the wire and catch the wheel as it passes or cause it to jump the wire. In my opinion, the five-inch requirement, affords little chance of the trolley wheel jumping the wire and, at the same time, gives the necessary protection.

In my practice, I have found that the most satisfactory trolley guard is one made of damaged water hose, three and one-half inches in diameter, split on one side and placed over the clamp supporting the trolley wire. A hole is cut in the hose for the expansion bolt. In putting up the hose, it should be stretched with a turnbuckle or block so as to hold it out taut and keep it from sagging and in place. This provides the nearest approach to a 100 per cent efficient guard. It lays close to the wire and will not permit a person to come in contact with the wire, even though directly under it.

Pikeville, Ky. G. E. DAUGHERTY.

American vs. British Mining Practice

WITH deep interest I read both the article of George S. Rice, entitled "Why do American Mine Workers Produce More Coal than British?" *Coal Age*, April 15, p. 762, and the editorial commenting on the same, under the head, "British vs. American Practice," page 766 of the same issue. It is by no means the first time that the subject of the greater production, per man, in American mining as compared with that in the mines of Great Britain, has been discussed.

Only recently, a Colorado mining man contributed a paper, to the Institution of Mining Engineers in England, in which he ascribed the larger production of American miners as due largely to the size of the mine cars in this country. He supported his opinion by giving a large number of facts and showed by sketches the style and dimensions of the cars used.

Strange as it may seem, Mr. Rice does not refer to the question of the size of the cars used in mines. He calls attention to the influence of the depth of the coal, stating that the average of American coal mines do not lie at a greater depth than 400 ft. below the surface, while most modern British mines lie at a depth of 2,400 ft. He also compares the longwall system of working, which is so general in the mines of Great Britain, with the room-and-pillar system of mining commonly employed in this country.

The comparison is unfavorable to the British mines. It is not made clear, however, why the working of a longwall face should have the effect to reduce the output, per man, and make it harder for him to mine the same tonnage of coal as he is able to do in the room-and-pillar system of working.

Depth, of course, will influence the proper control of the roof in mine workings and, on this account, mines lying at a less depth below the surface have the advantage over deeper mines. In the former case, there will generally be lesser quantities of explosive gas with which to contend, and the timbering be less difficult and require a smaller outlay for that purpose. The supervision of the work in the shallower mines, also, will require a smaller number of officials and bosses than is necessary for the same service in deeper mines, per ton of coal mined.

SAFETY THE FIRST CONSIDERATION

Where safety is made the first consideration there can be no doubt but that the longwall system of working presents a decided advantage. In that system, the practice of blasting off the solid is impossible. In British mines, the practice would not be permitted under the Mines Regulation Act. On the other hand, shooting off the solid prevails in many American mines worked by the room-and-pillar method of mining.

Particular attention is drawn to the method of shooting the coal, in the editorial I have mentioned, which regards this as a more important factor in the larger tonnage, per man, produced in American mines than the employment of improved mining machines. Doubtless, machine mining in American mines accounts largely for the difference in man tonnage, as compared with British practice where pick mining is mostly employed. Pick mining, in Great Britain means the use of the pick for undermining the coal and not putting in a little cut and then shooting the coal off the solid, which is so common in many of the mines in this country.

Reference is also made to the relatively lower cost of underground haulage, in American mines, as compared with the same item of expense in the mines of Great Britain. In few British mines could electricity be employed for haulage purposes in the manner in which it is used in this country. On this point, however, Mr. Rice appears to be quite optimistic, stating that hauling by the trolley system is forbidden in the mines of Great Britain because of the danger of electric sparks causing the ignition of gas in those deeper mines.

HAND LOADING IN BRITISH MINES

The output, per man, in British mines is also greatly influenced by the fact that in most of those mines the coal that can be loaded with the bare hand is the only coal sent out. The fine coal and slack is left in the mine, except where the coal is of such a quality that it can be used for the manufacture of coke. It is obvious that this fact alone is sufficient to account for a considerable portion of the deficit in the tonnage, per man, in British mines.

In summing up the advantages possessed by American mines, which enables them to show a larger output, per man employed underground, than is possible in the mines of Great Britain, I would add to the items already mentioned, the greater average thickness of the coal seams in this country; also, the fact that they do not show the same frequency of bands of rock and shale interspersed with the coal. The absence of these bands makes the preparation of the coal for market much easier, as there is less work required to separate the clean coal from its impurities. This fact is one well worthy of consideration in drawing a comparison in the tonnage, per man, in the mines of these two countries.

Livingstone, Alta., Canada. JAMES ASHWORTH.

Inquiries of General Interest

Answered by

James T. Beard

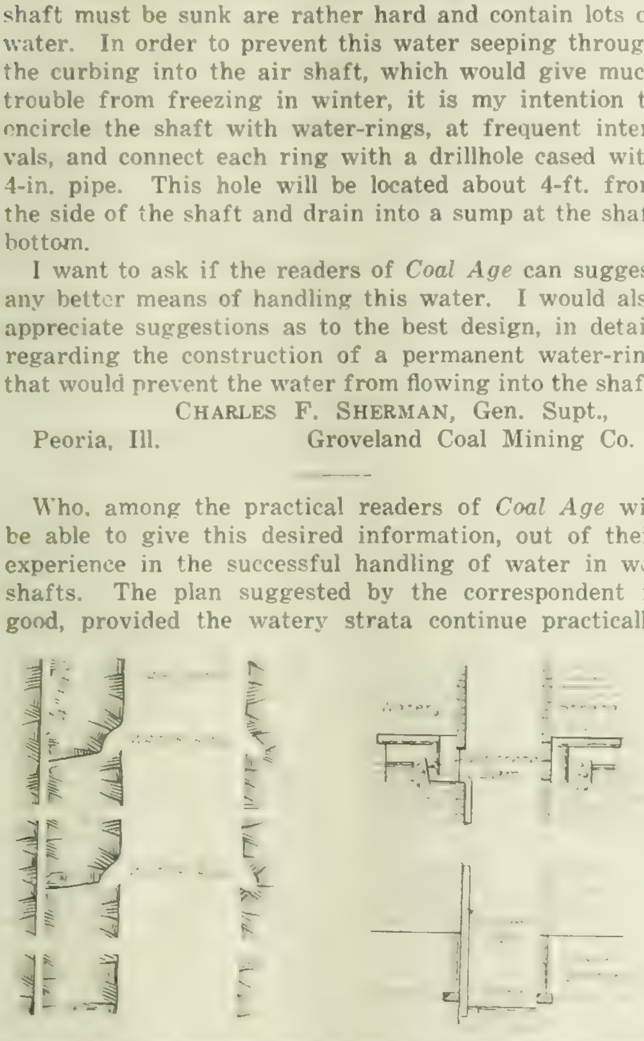
Caring for the Water in a Wet Shaft

WE ARE starting to sink an air shaft 10 x 14 ft. deep, in the clear. The strata through which the shaft must be sunk are rather hard and contain lots of water. In order to prevent this water seeping through the curbing into the air shaft, which would give much trouble from freezing in winter, it is my intention to encircle the shaft with water-rings, at frequent intervals, and connect each ring with a drillhole cased with 4-in. pipe. This hole will be located about 4-ft. from the side of the shaft and drain into a sump at the shaft bottom.

I want to ask if the readers of *Coal Age* can suggest any better means of handling this water. I would also appreciate suggestions as to the best design, in detail, regarding the construction of a permanent water-ring that would prevent the water from flowing into the shaft.

CHARLES F. SHERMAN, Gen. Supt.,
Peoria, Ill. Groveland Coal Mining Co.

Who, among the practical readers of *Coal Age* will be able to give this desired information, out of their experience in the successful handling of water in wet shafts. The plan suggested by the correspondent is good, provided the watery strata continue practically throughout the depth of the shaft, which would make it necessary to drain all the water to the shaft bottom. On the other hand, if the watery strata lie near the surface and over a hardpan it is always advisable to save the extra power that would be required to pump water from the bottom of the shaft.



SHOWING TWO TYPES OF WATER RINGS FOR DRAINING A WET SHAFT

This can be done by making an excavation for a sump of sufficient capacity in the hardpan and installing a pump, at that point in the shaft, for the purpose of pumping the water to the surface. The latter will mean a considerable saving in the cost of pumping, over what would be required if the water must be drained to the bottom of the shaft and then pumped to the surface.

In the accompanying figure, we offer suggestions on the construction of water-rings, but these will vary with the conditions in particular cases. On the left of the figure is shown the excavation of a simple water-ring in reasonably hard strata, each ring being connected with a 4-in. column pipe, as described by the correspondent. Where the strata are sufficiently self-supporting, water-rings of this kind can be excavated all around the shaft. A good plan is to line the excavation with a good hydraulic cement. It is important to give the ring a sufficient inclination to enable the water to drain properly into the column pipe.

At the right of the figure is shown a type of water-ring that is better adapted when strata are not self-supporting, and are pervious to the water. In that case, a concrete dam is formed around the shaft and the excavation lined with concrete to prevent the leakage of the water into the shaft. Here, the drain pipe leading from the water-ring to the bottom of the shaft is shown as being conducted down the outside of the shaft curbing to the sump at the bottom. We hope to hear from others regarding their experience and practice.

Estimating Weight of Coal Required for Hoisting in a Shaft

KINDLY answer this question: From a shaft 400 ft. deep; we are hoisting 1,000 tons, in four hours. How much coal should be burned, assuming that 7 per cent of the heating value of the coal is available in the production of steam? STUDENT.

Cambria, Ill.

It is only possible in this case to estimate the weight of coal burned per hour, in a very general way. For example, the work performed in hoisting 1,000 tons of coal, in 4 hr., in a double-compartment shaft where the weight of the cage and car is balanced, allowing an addition of, say 10 per cent for the friction of the hoist, is

$$1.1\,\frac{(1{,}000 \times 2{,}000 \times 400)}{4} = 220{,}000{,}000\ \textit{ft.-lb. per hr.}$$

Now, assuming the hoisting engine has an efficiency of, say 83⅓ per cent it will be necessary to add one-fifth more to this work to allow for the operation of the engine making the hoist, which shows the gross work performed, in that case, is 264,000,000 ft.-lb. per hr.

Again, assuming the heating value of the coal as, say 12,000 B.t.u. per lb. and taking the efficiency attained in burning the coal as 7 per cent, the available heat in the coal is 12,000 × 0.07 = 840 B.t.u. per lb. of coal burned. But, one B.t.u. is equivalent to 778 ft. lb (mechanical equivalent of heat) and one pound of this coal, on the assumed basis will develop 840 × 778 = 653,520 ft.-lb.

Finally, if the gross work required, in this hoist, is 264,000,000 ft.-lb. per hr. the weight of coal required to be burned per hour is 264,000,000 ÷ 653,520 = say 400 lb. per hr.

Examination Questions

Answered by

James T. Beard

Miscellaneous Questions

(Answered by Request.)

Ques.—Explain the law of the diffusion of gases and its effect on their behavior in mines. Give the rules and an example showing how to find the comparative velocity of the diffusion of different gages?

Ans.—According to Graham's law, gases and air diffuse into each other in the inverse ratio of the square roots of their densities. The lighter the gas, the more rapid is its rate of diffusion. For example, the specific gravity of methane or marsh gas being 0.559, referred to air as unity, its rate of diffusion into air is $1/\sqrt{0.559} = 1.3375$; that is to say, while 10,000 cu.ft. of air is passing into the methane, 13,375 cu.ft. of this gas will pass into the air.

The specific gravity of the resulting mixture is found by multiplying each of these relative volumes by the corresponding specific gravity and dividing the sum of the products, by the total volume of the mixture, thus

$$\frac{(10{,}000 \times 1) + (13{,}375 \times 0.559)}{10{,}000 + 13{,}375} = 0.747$$

In other words, the mixture resulting from the diffusion of methane into pure air is practically three-fourths of the weight of pure air.

Ques.—Suppose that, in a fiery mine, the quantity of air in circulation is 175,000 cu.ft. per min., measured in the return current, which contains 4 per cent of marsh gas when the barometer is 30 in.; what quantity of gas is given off in the mine?

Ans.—If the return air contains 4 per cent of gas, the quantity of gas generated in this mine is $175{,}000 \times 0.04 = 7{,}000$ cu.ft. per min.

Ques.—(a) In the last question, what is the least decrease in the quantity of air that will render the return air explosive? (b) What increase of gas will render the return air explosive?

Ans.—(a) The lower explosive limit of pure methane mixed with pure air is reached when the proportion of gas to air is 1:13. In that case, the gas is one-fourteenth of the mixture. Then, since the mine, in this case, is generating 7,000 cu.ft. of gas per minute, the total volume of gas and air when the mixture first becomes explosive is $14 \times 7{,}000 = 98{,}000$ cu.ft. The decrease in the quantity of air passing on the return, necessary to render the current explosive is $175{,}000 - 98{,}000 = 77{,}000$ cu.ft. per min.

(b) Since this mine is generating 7,000 cu.ft. of gas per minute, the volume of air in the return current is $175{,}000 - 7{,}000 = 168{,}000$ cu.ft. per min. Then, if the lower explosive limit of the mixture is reached when the proportion of gas to air is 1:13, the quantity of gas required to make this volume of air explosive is $168{,}000 \div 13 = 12{,}923$ cu.ft. per min. Therefore, the increase of gas that will produce this condition is $12{,}923 - 7{,}000 = 5{,}923$ cu.ft. per min.

Ques.—What first-aid service would you render a person suffering from: (a) compound fracture of limb, (b) electric shock, (c) powder burns, (d) fractured rib?

Ans.—(a) Having ascertained that the injured man suffers from a compound fracture of limb, the first-aider must use the best means at hand to adjust the injured limb in the easiest possible position, and bind it there very carefully to prevent further injury from the fractured bone cutting into the flesh and causing fresh bleeding. The injured man should be carefully placed on a stretcher and removed to better air or taken to the mine hospital to await the arrival of the physician, if his removal is practicable.

(b) Where a man has received an electric shock, the first duty is to shut off the current, or short-circuit it at a point between the man and the powerhouse; or else to remove the person from contact with the wire. It is not always possible to shut off the current quickly; but a short-circuit can generally be effected by dropping a bar or drill across the wire, on the side of the person toward the power. Avoid standing on wet ground or handling the wet clothing of the person; but with a quick movement push or drag him from the wire by means of a dry pole or a dry garment. No time must be lost in needless delay.

After removal from the wire, apply artificial respiration, by stretching the victim at full length on the ground, with his face downward but turned slightly to one side to permit easy breathing through the nose and mouth. See that the mouth is clear and the tongue drawn forward. Then, straddle the man's thighs and, placing the palms of the outstretched hands across the back, alternately press forward to expel the air from the lungs and draw backward to allow air to again enter, keeping up this motion at the rate of natural breathing, say fourteen times a minute. This should be continued until the victim shows signs of returning life and consciousness, or until he is pronounced dead by a physician.

(c) Burns from powder should be treated to exclude the air from the burned surface, by applying a thin paste of baking soda, starch or flour, mixed with water. Vaseline, olive or caster oil, fresh lard or cream, are all good when available. These should be gently applied to the surface and covered with light cloth.

(d) In the case of a fractured rib, tie a large handkerchief or a triangular bandage firmly around the chest and bind with a large towel or garment suitable for the purpose, so as to limit the motion of the chest and diminish the pain. Use great caution and care in removing the patient to another place, while awaiting the doctor.

Some Wage Problems*

Definition of a Living Wage Difficult, to Begin With—Increasing Wages to Meet Living Cost Fails to Compensate for Shortage of Goods—Distinction Between Wages and Earnings Is Significant

By C. E. Lesher

THE title of this paper—"Some Wage Problems"—is rather broad. It might better have been "Wages—Some Problem." Wages and the high cost of living are the two questions of paramount interest to all people today; they are so inter-related that one can hardly think of one without calling up the other. In this paper I shall attempt to outline a few of the wage problems as they apply to the question of coal-mine labor.

We all agree, of course, in the fundamental proposition that the wage paid labor, whether a wage or a salary, should be a living wage, and that American labor should be given the opportunity to earn such a wage. The difficulty comes in agreeing upon the definition, in dollars and cents, of a living wage. A wage by the hour, day, week or month, is a definite thing with which we may compare the cost of living and thereby arrive at some conclusion as to whether it is adequate. A piece-rate wage—the tonnage wage of the coal mines—must be interpreted into possible earnings per day, week or month before we can make such a comparison.

Wanted—An Effective Stabilizer

The one big problem that confronted us with the rise in the cost of living in the past few years has been the adjustment of wages to meet that increase in the cost of living. Nearly all the wage adjustments in the past three years have centered about that fact. Inquiries and statistics on the rise in the prices of essential commodities and in the cost of maintaining life have been the starting point in nearly all important wage adjustments. On this basis wages in all industries have again and again been boosted upward, but we are no better off today than we were a year ago. Further advances will be made for the same reason until something happens to bring us to a condition of stable equilibrium.

To quote George E. Roberts, vice president of the Natonal City Bank: "It seems reasonable as a proposition standing by itself that wages should increase to correspond to increases in the cost of living; but nothing is more certain than that a general advance in wages cannot compensate for a shortage in goods. If you were to double all wages in the United States today, it would not give you another bushel of wheat, or pound of sugar, or yard of cloth. It would simply give everybody the means with which to compete for what he wants, with the result that prices would rise to absorb the additional purchasing power. The only remedy for a scarcity of goods is more goods."

We must have clearly in mind the distinction between wages and earnings. Earnings are the measure of the adequacy of wages. The distinction is by no means equally significant in every occupation. For instance, in occupations such as the building crafts and production of bituminous coal, the larger rate of pay or wage may be offset by unemployment or shorter hours. On the other hand, low rates may sometimes be brought to relatively higher earnings by excessive overtime or period of continuous employment. Neither rates nor earnings should, therefore, be taken alone on a study of the wage situation.

The range or variation in wage rates, as well as in earnings in various geographic areas, for many similar kinds of work and sometimes for a specific occupation, is so broad that conformity to the prevailing wage does not mean a great deal. Illustrating these two points in the coal industry, we note that the tonnage man has a wage that gives him a higher daily earning capacity than the dayman, but the company man, because of steadier employment, approaches the monthly earning of the higher-paid direct labor. Rates of pay for the same work as between districts vary because of local conditions. We may well illustrate this by a table of tonnage rates from some of the more important coal fields.

The most striking thing about these rates is the variation in the differentials, both as between fields and as between pick and machine rates. The districts selected by no means represent extremes, but may be considered as representative of the industry. They include fields both large and small and union and non-union. The variation in pick rates is explained, of course, by the difference in mining conditions, or should be so explainable. In the figures cited we find a range in pick mining rates from about 71c. per ton in Harlan, Ky., to $1.13 in Iowa. These figures are those of the Washington Wage Agreement, in effect before the strike last Novem-

MINING RATES PER NET TON AND DIFFERENTIALS IN CERTAIN OF THE BITUMINOUS COAL FIELDS

As of October, 1919

District	Pick Rate	Machine Rate Cutting	Machine Rate Loading	Machine Rate Total	Machine Differential
[illegible]					
Pittsburgh thin vein	$0 8764	$0 1260	$0 5740	$0 7000	$0 1764
Pittsburgh thick vein	7911	.1088	5343	6431	1280
[illegible]					
[illegible]	8764	1040	5960	7000	1764
[illegible]	9400	1248	6126	7374	2026
[illegible]	9060	.1160	5840	7000	2006
[illegible]	8764	1125	5875	7000	1764
[illegible]	.9060	1475	.5960	7435	[illegible]
[illegible]	8764	1000	6000	7000	1764
[illegible]					
Vermilion	8400			7400	1000
[illegible]	8000	1067	6233	7300	0700
[illegible]	8800			8100	0700
[illegible]	8400			7700	.0700
Springfield	8470			.7700	0700
[illegible]	8000			.7300	0700
[illegible]	8400	1120	.6080	.7200	.1200
West Virginia:					
[illegible]	8232	1192	4892	[illegible]	2148
Fairmont	7125	1082	4625	[illegible]	1418
[illegible]	1 0332	0877	8040	[illegible]	1415
Kentucky:					
Hazard	7486	1080	4559	5639	1847
Northeast Ky	8050	0999	5011	6010	2040
[illegible]	7083	0977	[illegible]	5783	1700
Southern Appalachian	8401	1408	6324	7732	0669
[illegible]	1 0529	0808	[illegible]	7190	.3339
Iowa	1 1269	0921	8561	.9482	1814

[illegible]

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*Address delivered at the meeting of the Kentucky Mining Institute, Lexington, Ky., June 4, 1920.

ber, which were increased 24c. per ton by the Coal Commission. Though not those in effect today, they serve equally well to illustrate the differentials.

Loading rates range from about 46c. per ton in the Fairmont and Hazard fields to 85c. per ton in Iowa. These differences are the field differentials and are more or less fixed. You appreciate the reasons for wanting field differentials in given cents per ton, and why when changes are made in wages these changes are not accomplished by percentage adjustments. A mining rate in the Hazard field averaging about 75c. per ton is 5c. lower than this corresponding average in northeastern Kentucky of about 80c., and, all other things being equal, the cost of production is 5c. less. Oklahoma pays a pick rate on the average of $1.03, which is about 10c. less than in Iowa; Hocking pays 6c. less than in the Jackson field. These field differentials are the net result of years of wage agreements, adjustments and trade requirements. They have become so fixed that to both miner and operator they are almost sacred.

DIFFERENTIALS MUST BE CAREFULLY CONSIDERED

Nevertheless, one of your wage problems is either to maintain these differentials, or such of them as are in your favor, or to break down such as are not in your favor. The effort to change may come from the field that has a high rate, but more generally the agitation comes from the miners—witness the demand for the abolition of the differential between the thick- and thin-vein rates in the Pittsburgh field, made last winter by the United Mine Workers. In fact, the miners, according to the record, would have opened the whole question of differentials before the wage commission.

Machine differentials are the differences between the pick mining rates and the total rates for cutting, shooting and loading behind the machine. This type of differential is calculated to represent the element of cost accruing to the operator because of his investment in the machines. The variation in machine differentials from field to field is more difficult to analyze. It ranges from 7c. in the southern Appalachian and many of the Illinois fields, 16 and 17c. in Ohio and western Pennsylvania and the Harlan fields, to 20c. in northeast Kentucky, 21c. in Kanawha and 33c. in central Pennsylvania.

Now, these figures are either the contract scale of prices or, in the non-union fields, averages of actual rates. At each mine there may be local variations, the result of peculiar conditions, such as hard coal, abnormal thickness or thinness, desirability or undesirability of working conditions. These local variations are settled in each case by agreement between the men at the mine and the operators and are usually carried forward year after year in much the same manner, and the settlement in each case represents a wage problem for each of you—a problem that must be settled on its merits; let us hope always in a spirit of fairness to the wage earner.

As a result of investigation made by the coal operators working through their local and national organizations we have available representative figures on the earnings of coal-mine labor under the pre-strike wage rates. Those for the union fields have been made public in the records of the Bituminous Coal Commission, so that we are able to make certain valuable and interesting comparisons.

The first conclusion of the disinterested observer of these data is that by all means a wide readjustment of wage rates in bituminous coal mining is necessary on the theory that rates should afford comparable monthly earnings. One does not, however, delve far into the subject until he realizes that wages are not thus scientifically determined, that though labor is not a commodity its price is based on the law of supply and demand just as surely as is the price of coal.

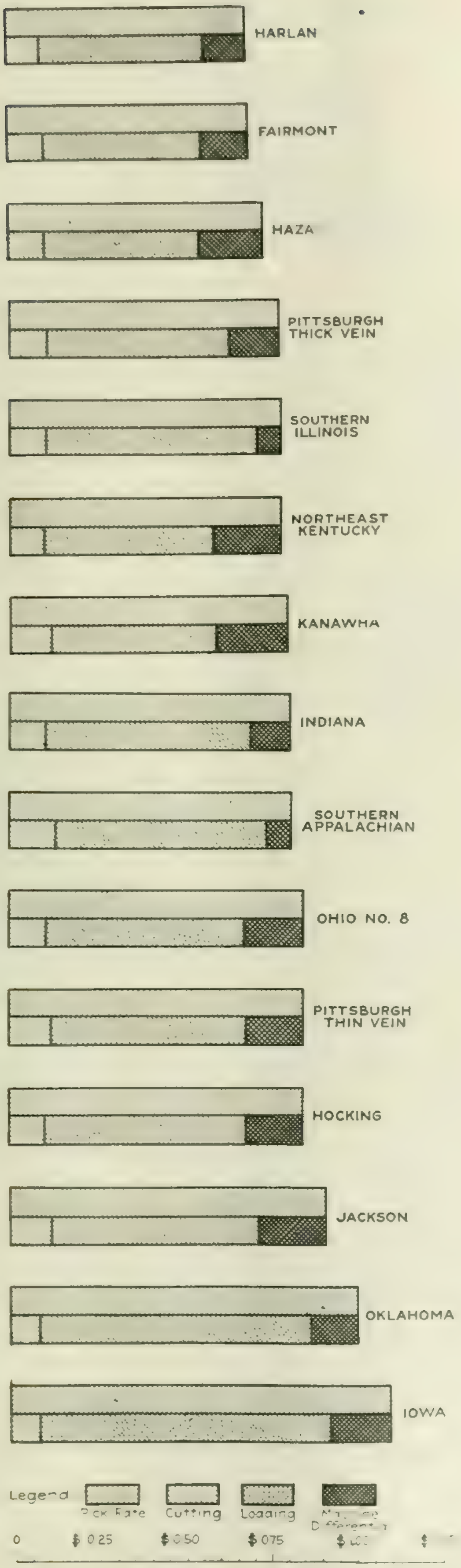
These differences in wages and the earning power under them are not lightly to be cast aside. You will recall that the President's Bituminous Coal Commission recommended that, as the question of differentials was too large a subject for its short endeavors, a commission be selected in the Central Competitive Field to make a study of this burning question and report to the joint conference in 1922. We have heard nothing of the appointment of that commission and we will hear nothing, because neither side cares to open the subject. It is plainly not safe to open the question until such time as wages and relations with labor are determined by impartial tribunals, and not, as now, by barter and trade, charge and counter charge.

We are all aware that the only result of the efforts of the Bituminous Coal Commission was to reaffirm the principles laid down by Dr. Garfield the day before Thanksgiving. He found, from the information at hand, that 14-per cent increase was due mine labor to equal the increase in the cost of living. The commission had later data indicating the necessity of 27-per cent increase to reach the same level. The weeks of hearings, the volumes of speeches, and truckloads of statistics were wasted, unless we consider it essential that each side be given a chance to get into the "record." Perhaps in our present state of civilization and development of industrial relations, there is no other way to settle wage disputes except, in the last analysis, by force.

LEADERSHIP AMONG OPERATORS PRESSING

The outcome of the wage dispute and strike of last winter was the largest increase the bituminous miners ever gained at one time, with which they have agreed to be satisfied for two years. The victory went to the miners; the operators have never told their story. The miners have a common leadership that leads, that can speak for them, and in the presentation of their case both to the public and to the commission they were more effective than the operators, who were divided in every detail and a unit on only the main question. Have any of you seen or heard a clear-cut statement of why the operators were willing to give the miners 20 per cent, and why they did not consider 31.61 per cent reasonable? Did the operators at any time present their case as have the miners? I am making this reference to recent history because the development of leadership in the coal industry, as pressing on the one side as on the other, is one of the problems that concerns wages and labor.

To my thinking there is no reason why the operators, union and non-union, should not join in wage discussions and settlements. Such a course was proposed for the National Association last winter and was defeated largely by operators from the non-union fields. Our non-union production is none too great as matters now stand, and the coal industry should unite on a policy that will keep for the country this bulwark of protection, the one-third of our output that is not to be called out on strike. The miners have their protection and



MINING RATES AND DIFFERENTIALS

Graphic presentation of mining rates showing field differentials and machine differentials in certain bituminous coal fields, as of October, 1919

more, in the union that represents two-thirds of the mine labor in this country. We are not safe with less non-union production than we now have. To join on this policy—giving non-union miners the same advantages that are afforded union men as a result of their collective bargaining, to prevent the spread of the union beyond its present limits with the un-American check-off, but never to lag behind the standards of wages and working conditions set by this arbiter of labor—is one of the complex wage and labor problems of the coal industry.

The most general and important characteristic which we observe in the study of war-time and post-war wage increases is that the wages of the lowest paid increased in markedly greater percentage than did those of the better paid. These increases, when considered in money rather than in percentage, present a different aspect; the low-paid received a greater percentage of increase during the war and since than did the high-paid, but the actual money increase has been about equal. We see this illustrated in the coal industry by the relatively greater advances given the daymen than the tonnage men. The base rate in the Central Competitive Field of $2.84 per day for company men was increased from 1914 to 1919 by 76 per cent, or $2.16. During the same period the tonnage rate for pick mining was increased only by some 40 per cent, which percentage gave the miner almost as large a money increase in earning power. That is, a miner who was earning $5 per day under the old scale, was enabled by the 40 per cent increase to earn $7, or $2 more, which gave him about the same money increase as the dayman.

This observation is important because when the turn comes and you are obliged to propose to the miners that they accept a decrease in wages, in order that you may continue to operate and they to have work, for such a time is coming, the question of relative changes in high and lower paid labor will be of greater importance. Whether day-paid labor drops back to its relative position of before the war will depend on the relation of supply and demand for common labor at that time. It is most certainly true that today the indirect labor cost—that is, the per-ton cost of day labor—is too high, and the only way it can be reduced is for the men to work more efficiently or for reduced wages.

Operators and Transshippers Inspect Jersey Central's New Equipment

COAL operators and transshippers were the guests of the Central Railroad of New Jersey last week on a visit to the new pier 18 of that road, to inspect dumping facilities and equipment, thawing sheds, classification yards, etc. General Superintendent J. W. Meredith and Assistant Engineer Zabriskie met the party with a special tug boat and acted as hosts. Among those present were W. Hartmann, of the Hartmann-Blanchard Co.; Dr. H. M. Payne and George N. Reed, of the Bertha Coal Company; W. P. Harriman, Export Department, Irving National Bank; C. K. Sutton, Debevoise Anderson Company; Charles S. Allen, N. Y. Wholesale Coal Trade Association; V. N. Heermance, Kentucky Coal and Navigation Co.; H. T. S. Ellison, Armstrong Transportation Co.; Mr. Koenig, Alden Coal Mining Co.; Mr. McGowan, B. Nicoll & Co., and C. Andrade, of Andrade-Eyre, Inc.

Foreign Markets and Export News

Turkey Offers $100 a Ton for Alabama Coal

Export coal merchants of Birmingham, Ala., have received inquiry from an American business house in Constantinople with the statement that the Constantinople consumer is prepared to pay as high as $100 per ton delivered there.

Spain, also, wants Alabama coal. So do Italy, France, South America, Cuba and Switzerland wish it. Likewise one of the largest yard men of Atlanta city has been in Birmingham to place orders. His yards, which usually at this time of the year have large stocks on hand for summer delivery, have none.

A capitalist who has been considering the purchase of three ocean-going barges to ply out of Mobile to Cuba and the east coast of Central America, in the export coal trade, came to Birmingham to see about a supply of coal. As he could get no guarantee, he may not purchase the barges.

The ships are in Southern waters, but the shortage of gondola cars prevents the moving of coal from Alabama mines. There would be several more blast furnaces in operation were there cars to move the output.

The steam and domestic demand for coal is as strong as that for export, but car shortage prevents filling that demand.

Aden Imports South African Instead of British Coal

Aden, Arabia's trading center in the Red Sea district, Consul Addison E. Southard reports, is an important coaling station and the item of coal is always a considerable one in the annual imports. A feature of the last two years has been an almost total cessation of imports from England and India, and very greatly increased imports of South African coal. In 1918-19 there were imported 77,171 tons of coal, valued at $2,421,897. During 1913-14, the last normal year, the imports, more than half of Welsh coal, amounted to 126,482 tons, valued at $849,670.

According to these figures the coal imports in the last year before the war had an average value of $6.71 per ton, and for the year under discussion the average value per ton was $31.38. At times during the current year there has been an almost complete exhaustion of private, as distinguished from Government, coal supplies in Aden, and many ships have been turned away which normally depend upon Aden for coaling. At the time this report was written one of the two leading coaling companies in Aden had exhausted its stocks and probably would have to wait some weeks for new supplies.

The Interstate Commerce Commission has ordered the originating railroads to return cars to the owning roads. This has at once affected car supply at numerous operations. Various plans for direct routing are suggested, but it is hard to see how this will possibly benefit New England.

Tonnage Supply to Europe Is Plentiful

W. W. Battie & Co.'s coal trade freight report announces that numerous steamers for export coal are being offered. During last week a number of prompt boats were offered each day at $18 Antwerp/Rotterdam and to other destinations at rates quoted below. To the West Indies and to South American ports the situation remains unchanged. Shipping rates are:

	Rate			Tons Displaced
Copenhagen	$21 00	22 00		1,000
Stockholm	22 00	23 00		800
Gothenburg	21 00	22 00		1,000
Antwerp Rotterdam	17 75	18 00		1,000
Hamburg	18 00	19 00		1,600
French Atlantic, excluding Rouen	About	18 00		700
Algiers	21 00	21 50		800
West Italy	About	21 00		1,000
Marseille	About	21 00		1,000
Piraeus	About	23 00		1,000
Trieste Venice	About	23 00		1,000
Port Said	About	24 00		1,000
Constantinople	About	24 00		500
Gibraltar	About	18 50		1,000
Pernambuco	14 50	15 00		500
Bahia	14 50	15 00	—	500
Rio	14 50	15 00		1,000
Santos	15 00	16 50		600
Buenos Aires or La Plata or Montevideo	13 50	14 00		1,000
Para	About	14 50		500
Rosario	About	13 00		750
Bahia Blanca	About	15 50	—	1,000
To Nitrate Range	9 00	10 00		750
Havana	About	6 50		600
Sagua or Cardenas	About	8 50		300
Cienfuegos	About	8 00		500
Caibarien	8 00	8 50		300
Guantanamo	About	8 00		500
Manzanillo	About	9 00		300
Bermuda	About	7 00		300
Bermuda [illegible] Kingston	About	8 75		400
Barbados	About	9 50	—	500
St. Lucia	About	9 50		500
Santiago	About	8 00		500
Port of Spain Trin	About	9 50		500
Curacao	About	9 00		500
[illegible] Curacao				
Demerara	13 00			400
St. Thomas	8 50	9 00		500

All above rates gross form charter

France To Receive British Coal Exports

France will receive 45 per cent of British coal exports, according to the London *Evening Telegram*, under an agreement reached by Premier Lloyd George and Premier Millerand in their recent conference at Hythe.

Prices Quoted at Panama Canal On Coal and Fuel Oil

Coal, according to the Panama Canal Record, is being supplied to steamships including warships of all nations, delivered and trimmed in bunkers, at $13.50 per ton of 2,240 pounds at Cristobal and $15.50 at Balboa. For ships in transit through the Canal, which are directed to take coal at Balboa for the convenience of the Panama Canal, $13.50 per ton at Balboa. For ships taking less than carload lots from plants or less than 25 tons from lighters, the price is $15 per ton at Cristobal, $17 at Balboa.

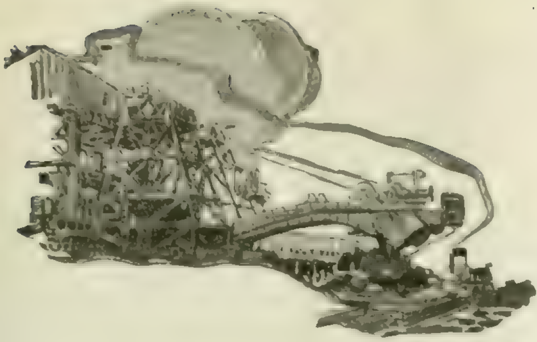
Crude fuel oil is delivered to vessels which utilize that form of fuel. passing throug the canal in either direction, at either Cristobal or Balboa for $1.50 per barrel of 42 gallons.

Natal To Market Byproducts From Low-Grade Coal

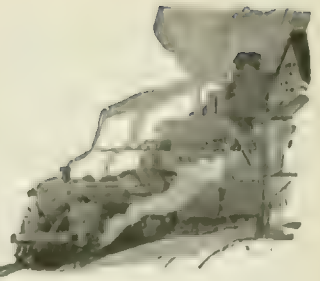
Vice Consul Charles J. Pisar, Cape Town, reports that the manufacture of byproducts from second-grade coal which is hardly good enough for steam purposes is about to be commenced in the Province of Natal by the South African Carbide & Byproducts Co., of Burnside. This company has an authorized capital of £250,000 ($1,217,000). A carbide and byproducts plant is now in the course of construction. The seams of this second-grade coal are very thick, and consequently the raw material is easily obtainable. Tests made some time ago show that the coal is high in nitrogen and yields over 120 lb. of sulphate of ammonia, 2½ gal. of benzol, and 16 gal. of tar oil per ton of coal.

Southwest Africa Is Without Workable Coal Beds

A considerable amount of prospecting done in Southwest Africa, Vice-Consul Charles J. Pisar, Cape Town, reports, has failed to uncover any coal seams which could be mined on a profitable basis. Some years ago small lenticles of coal, up to 4 centimeters [centimeter = 0.3937 inch] in thickness, were struck in dark Dwyka shale near Keetmanshoop in the course of sinking a well. Prospecting pits and boreholes were at once put down, some to a depth of almost five hundred feet, but the results were negative. In no other parts of Southwest Africa, as far as authentic records show, have any traces of workable seams been found.



Production and the Market



Weekly Review

Pooling of Lake Cargo Coal and Threatened Embargo on Exports Features of the Week—Production Keeps Up Slow Improvement—Gains Not Sufficient to Hold Back Buyers Who Are Making the Present Market

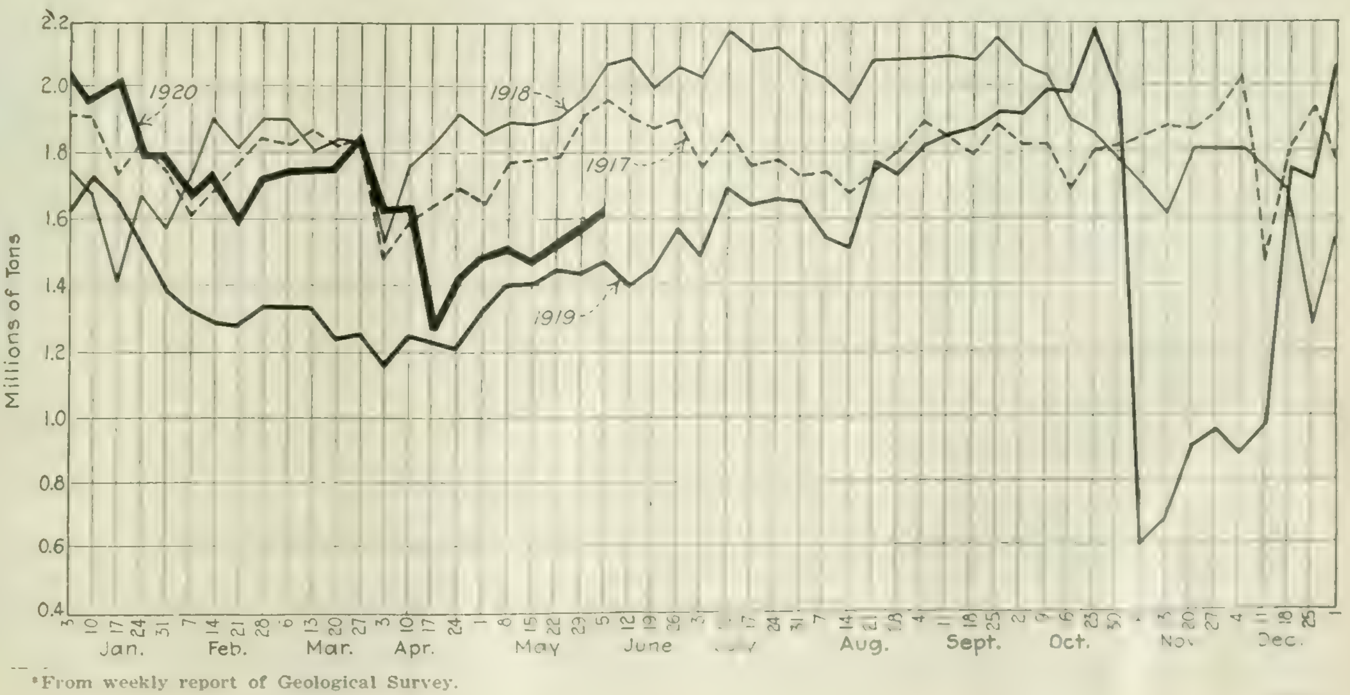
EXPORT embargoes and resumption of Government control of distribution of coal were the major proposals last week of those who would correct the present out-of-joint fuel situation by legislative or governmental action. Coal men who see in the present erratic movement of bituminous coal to abnormal markets a repetition of conditions that resulted in the zone system during the war, are looking forward to the adoption of some such scheme in the near future. No one appears optimistic regarding the ability of the railroads to make up the losses that have been piled up in the last three months and forecasts for next winter are indeed gloomy.

Pooling of Lake coal was agreed upon last week and began this week. Less than 2,500,000 tons had been dumped, including vessel fuel, up to June 13, compared with something over 7,000,000 tons in the same period of last year. The performance so far this year indicates a total for the year of 13,000,000 tons, compared with estimated requirements of 30,000,000 tons. Pooling alone will not speed up movement to make up the deficit. The next step the commission will suggest is being awaited with interest.

Export cargo coal from the East continues to move in volume and prices generally are going up. The high quotations are on sales made by operators of little mines up in the hills to which eager buyers with open check books make daily rounds in search of stray cars of free coal. The price on this class of business ranges from $10 per ton up at the mines. Between $6 and $8 is the more regular spot market price, representing business done on larger scale than single-car purchases. Small wonder the railroad with no contracts is assigning cars in part payment for coal.

Anthracite is in short supply in the Middle West and in Michigan, to which markets the producers say they are having great difficulty in getting transportation. Dealers in the Western territory are buying premium coal at $10 and more per ton at the mines. NewEngland is not complaining very loudly about the supply of hard coal, as nearly all communities are faring well. The East generally is in better shape for domestic sizes.

Average Daily Production of Bituminous Coal*



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*From weekly report of Geological Survey.

Reports From the Market Centers

New England

BOSTON

Active Spot Market Establishes New High Levels—Car Supply Shows Some Improvement — Hampton Roads Slowing Up—Urgent Demand for Gas Coal Develops — Anthracite Car Supply Is Threatened — Domestic Sizes Are in Strong Demand.

Bituminous—Each week sees spot prices mount to new high levels. The industries here are clamoring for prompt shipments and they are indifferent as to price, for the most part. The great urgency in the present situation is to keep supplies coming forward. The New Haven embargo has been restored, as of June 15.

There are no signs of a receding market. Nothing whatever has come of the attempt of the Massachusetts state government to interfere in the coal situation. Meanwhile, mills and other large buyers are placing orders through middle houses, and in some cases are sending their own representatives to central Pennsylvania to bid for spot coal.

The railroads here are also actively in the market. There are enough conservative operators who are still selling at prices around $6@$7 to furnish such buyers with a moderate supply of spot coal, and there are still others who are willing to make contracts with railroads at $3.75@$4 where the railroads will furnish assigned cars.

In car-supply there has been some improvement the past week. Sections near Pittsburgh have shown a better yield of railroad fuel, and to such extent has this proved true that the New York Central, for instance, has reduced the number of cars that were being confiscated each day at the scales.

Despatch at the Virginia piers has been slowing up the past week, due largely to slow handling at the piers. There has been no appreciable increase in movement to New England, buyers here being content for the present to confine themselves to securing emergency supplies all-rail.

Receipts are up to contract quota. There is a sharp local demand for Pocahontas and New River at re-handling points like Boston, Providence, and Portland.

There is especially urgent inquiry for gas coal. Prices have risen to $9.50 for screened high volatiles and there is vigorous competitive buying among different industries requiring these grades. The amount of coal still being confiscated in transit adds to the anxiety of buyers who are using their best efforts to get coal forward.

On cars Providence and Boston, Pocahontas and New River are quoted at $11.50@$15. At Portland $15 is a representative figure. At Hampton Roads f.o.b. vessel there is a wide range of prices, as high as $14 having been realized on special sales.

Anthracite—The trade has been anxious the past week over the anthracite roads having been directed to withhold a certain percentage of cars from anthracite collieries to help out the bituminous situation.

Domestic sizes continue in quite strong demand. The prices of independent coals are strong and no real improvement in supply is expected. The renewed embargo on the New Haven road makes the outlook for that territory very serious. Steam sizes are in slightly better request.

Tidewater

NEW YORK

The Anthracite Situation Improves Slightly—Domestic 10c. Increase Becomes Effective—Domestic Demand Is Strong — Bituminous Market Active, with Good Demand and Quotations High—Car Supply at Mines Is Poor.

Anthracite—Receipts of anthracite at this tidewater are heavier and the general situation shows a slight improvement. Shippers do not look for any let-up in the demand for many weeks to come.

All producers have now advanced their mine prices to the rates announced by some of the large producers in May, and in addition (with a couple of exceptions) have added an increase of 10c. per ton to the original prices for the domestic sizes, effective June 1. These prices, however, are tentative pending the outcome of the award to be made by the President's Anthracite Commission.

The demand for domestic coal remains strong. Dealers are receiving plenty of coal for their immediate requirements but have little surplus. Egg, stove and chestnut are most in demand, with a strong call for broken. Deliveries from the docks are slow because of the harbor troubles.

The producing companies have many orders ahead and efforts are being made to distribute the tonnage satisfactorily. Independent quotations ranged as high as $9.50 at the mines. Buckwheat was being quoted by some shippers at $4.65 at the mines.

Current quotations for company coal per gross ton at the mine and f.o.b. tidewater, at the lower ports are as follows:

	Mine	Tidewater
Broken	$7.45-$7 50	$9.30-$9.35
Egg	7.30- 7.45	9.15- 9.30
Stove	7.55- 7.80	9.40- 9 65
Chestnut	7.65- 7.80	9.50- 9.65
Pea	5.85- 6.25	7.60- 8.00
Buckwheat	4.00- 4.10	5.75- 5.85
Rice	3.00- 3.50	4.75- 5.25
Barley	2.25- 2.50	4.00- 4.50
Boiler	2.50	4.25

Bituminous—The bituminous market is active. Orders are plentiful but the continuance of the harbor troubles so delayed deliveries that toward the end of last week embargoes were in force at South Amboy, Port Reading and Arlington, the first named port being entirely closed to shipments, while at the other docks shipments were subject to permits.

Poor car supply is a big factor in the present situation. Reports from the mines fail to show any improvement. Along the Pennsylvania road the mines report about a 25 per cent supply; while those along the Baltimore & Ohio and the New York Central fare slightly better.

This Port continues to lose considerable bunker and export business because of the local harbor troubles. Coal for export is in heavy demand with prices firm.

Early in the week quotations were easier than they were at the end of the week when quotations for loaded boats ranged from $11.75 to $13. Mine quotations were around $8 to $8.75. The railroads continue to confiscate coal but are paying for it at the prices on which it was originally billed.

PHILADELPHIA

Stocks of Anthracite Are in Fair Volume Here—Retailers Stock Up—Stove and Nut Are in Demand, with Steam Sizes Quiet — Bituminous Supply Is Unimproved — Cars Withdrawn from Other Industries.

Anthracite — The dealers in this vicinity continue to be moderately well supplied with the various sizes and this market is well above the average on the amount of tonnage received. Embargoes against anthracite shipments by connecting lines has served to throw increased shipments to the city all spring.

While the car supply in the anthracite region has been all that could be desired, the supply will probably be cut, in order to relieve the car shortage in the bituminous region. Some of the retailers accordingly are taking in as much coal of all sizes as they are able to procure.

Stove and nut have lost none of the pressure of demand for these two sizes, with the call silghtly in favor of the former. Egg and pea, while not so active, are giving no dealer any difficulty in moving them.

The steam sizes are in a fair position. Buckwheat is moderately well taken care of. Rice is only in fair demand, with barley very quiet, if not dull. Most of the dealers are putting buckwheat back for the winter so as to have a stock on hand when the real demand comes.

Bituminous—Of course car supply is the ruling factor in the bituminous trade, and there is hardly a shipper who will admit receiving more than a 25 per cent supply. The prices for Pennsylvania steam coal in the spot market run from $8.50 to $9.25, with very little offering. Gas coals of the Fairmont grades are selling spot from $8.25 for slack up to $9.50 for ¾.

While the car supply has improved very little of late, it is understood that open-top equipment is to be immediately withdrawn from every other industry until the soft-coal trade reaches a 50 per cent supply, even the anthracite trade being cut in the same manner.

BALTIMORE

Bituminous Market Is Making New High Levels—Ten-Dollar Coal at Mines Is Recorded—Export Demand Heavy—Railroads Cannot Deliver Coal to Market—Anthracite Prices Move Up.

Bituminous—With a growing demand for fuel at fancy prices the market here is again making new high levels. Ten-dollar coal, f.o.b. mines, on both steam and gas production, the net ton, has come to be a fact.

However, the real market price for best steam coals is probably around $9 to $9.50, and for best high-volatile screened from $9.25 to $9.50. Even the least desirable coals are bringing $8 at the mines, the net ton, or better. Most coal handlers here report that such coals readily command $8.25. Intermediate coals sell closer to the high marks than to the low at present writing.

This high-priced fuel at the mines, means between $13 and $14 a ton delivered to some of the plants here, who are not fortunate enough to get part of the railroad coal that is being distributed to some plants at lower figures to keep them going, or who are not being kept running by coal-firm connections of long standing at prices closer to the real market value of products.

Transportation has caused this situation. For six months the Baltimore & Ohio R.R. in many mining sections has not made a record of better than 40 per cent, and the Pennsylvania and Western Maryland, while better for a time, are now about in the same class.

Export demand keeps up and the reports for the first five days of June showed a total of about 90,000 tons of cargo and 13,000 tons of bunker for the same vessels loaded for foreign delivery here.

Anthracite — Hard coal men have again seen several wholesale advances. The independents have advanced prices 15 to 25c. a ton over the May delivery rates. Company prices have gone up 10c. a ton. However, little coal is coming through.

Coal men here are beginning to worry over the situation, realizing that the Government preferential treatment for cars for delivery to the Lakes, just announced, will further delay receipts of hard as well as soft coal here.

Lake

BUFFALO

Spot Bituminous Is High and Scarce—Anthracite Supply Is About Normal — Lake Movement Active — Coke Trade Is Badly Demoralized.

Bituminous—The main feature of the trade is the mounting of prices. The situation looks bad, but the tonnage of high-priced coal is small in comparison with the full amount moving. So much of the output has been contracted for that many of the larger operators are selling next to no coal on single orders. Consumers who have scant contracts are paying about $7.50 at the mines for their extra coal, though the asking price is sometimes a dollar more.

A good many of the jobbers, unable to control the trade in any way, are striving to get coal as cheaply as they can and as much of it as they can for their old customers and they are finding the task no easy one. If any coal can be bought the cars are scarce and the movement is slow. If the customers have contracts the task is still harder.

The Buffalo switchmen's strike has died out, but it is found that a good many other railroad centers are tied up more or less by a similar strike and that adds to the complications. The harbor men have declared their strike off and are back to work.

Anthracite—The supply of anthracite is much better than that of bituminous, so that city distributors are of the opinion that more has been delivered to customers than ever before to date. This means a good winter supply.

The situation at the mines is not good, but the men work and the car supply is sufficient to keep this market and shipping center busy. Independent mines are still asking premiums of from $1.50 a ton up, but the demand is not heavy in that direction.

In the Lake trade the movement is as large as it usually is at this time of the year. The Lake fleet is active.

Coke—The trade is in a pretty badly-demoralized condition, owing to the uncertain condition of the car supply and the consequent fluctuation of prices. The oven price for foundry and furnace coke is $20. One shipper who sells a good amount of it quotes domestic chestnut coke at $9.10 f.o.b. Buffalo, and breeze at $5.60. The furnaces are not buying coke on single orders to any extent, depending on their contracts for supply.

CLEVELAND

Ohio Operators Are Not Receiving Cars Ordered from the West by I. C. C.—Industrial Stocks Continue Extremely Low — Pooling Plan Is Approved and Priority Given to Lake Coal.

Bituminous—The recent geological survey, which discloses coal production almost 2,000,000 tons short of normal, shows that the bulk of this shortage is concentrated in the mines which produce for Cleveland and for Lake shipment.

Much complaint is being voiced by operators (with headquarters in Cleveland) to the effect that they are not receiving the anticipated number of cars ordered east by the Interstate Commerce Commission. An effort is being made to have the Cleveland district given a preference for a month until the shortage is relieved.

Industrial stocks continue extremely low. Some factories in order to obtain coal are paying as high as $8 a ton for small lots of spot fuel.

Pocahontas and Anthracite—As the season progresses the demand for Pocahontas increases apace, but retailers are unable to meet anything like the demand. Prices remain firm. Anthracite receipts continue to show a slight improvement, although they are still far below normal.

Lake Trade—The Interstate Commerce Commission has approved plans for pooling Lake shipments on the 1918 basis. Instructions are being sent to all railroads to give priority to all coal consigned to the Ore & Coal Exchange. Embargoes will be placed against any Lake coal except that covered by permits authorized by the exchange. Cargoes will be dumped faster under the pooling plan. Retail prices of coal per net ton delivered in Cleveland are as follows: Anthracite — egg, $13.20; grate, $13.20 and $13.50; chestnut, $13.50; stove, $13.50. Pocahontas—shoveled lump, $11.75; mine-run, $9.25. Domestic bituminous—West Virginia splint, $9.50; No. 8 Pittsburgh, $8.75; Millfield lump, $9.50; Cannel lump, $11.50. Steam coal—No. 6 and No. 8 slack, $8.25; No. 6 and No. 8 mine-run, $8.25; No. 8 ¾-in. lump, $8.25 to $8.50.

MILWAUKEE

Better Supplies Cause Easier Market, but Stocks Received Are Below Normal—Situation Causes Anxiety—Prices Are Maintained.

The coal situation at Milwaukee is temporarily easier, because of a betterment in the flow by rail. Deliveries of anthracite are being freely made, the small dealers being allowed more liberal allotments.

This reduces the clamor for the present, but those upon whom the burden of maintaining the general supply rests are not in a very complacent state of mind.

With the month of June well advanced and the supply of soft coal thousands of tons behind the amount received last year up to this time, coal men are naturally fearful of the outcome of the season's receipts and the resultant howl from the public when the coal bins become exhausted.

Everybody connected with the coal-handling trade is busy trying to loosen up channels of supply. April prices continue to be maintained. Receipts thus far this season aggregate 170,278 tons of anthracite and 213,492 tons of soft coal, against 177,980 tons of the former and 828,853 tons of the latter during the same period last year.

Inland West

DETROIT

Shortage of Coal Continues — High Prices Cause Steam-Coal Users To Delay Buying — Domestic Trade Is Uneasy.

Bituminous—Wholesalers and jobbers say there is no improvement in Detroit's coal supply. The amount of bituminous coal arriving in the city is insufficient for the steam and domestic trade and in consequence very little of the stock is finding its way to retail yards.

By far the larger proportion of the shipments are coming from mines in Ohio with a small quantity from Illinois and Indiana fields. Ohio lump is quoted at $7.50 per short ton at the mines, with mine-run holding at about $7.25 and slack obtainable at $6.75 to $7.

With the coal trade in its present condition and the transportation situation in such shape that many months must elapse before anything like adequate car supply will be available, the jobbers feel that the buyers who hold off hoping for lower prices are destined to meet with disappointment.

Anthracite — Few shipments of anthracite are arriving in Detroit. Stocks in yards of retail dealers have been wiped out. With distribution of next winter's supply set back and no immediate prospect of deliveries to dealers in quantity, that will permit an early start on catching up, the prospect is far from encouraging for the household consumers.

Lake Trade—Owing to insufficiency of car supply, the movement of coal to Lake loading docks continues to fall short of requirements. Vessels are also having much difficulty in getting fuel coal.

ST. LOUIS

Transportation and Working Conditions Show a Little Improvement — Strong Call for Steam Coal, but Domestic Demand Is Light—Heavy Buying from the North and Northwest Recorded.

The past week has shown a little improvement in the matter of transportation and car supply. The car supply in the past week has averaged from 35 to 40 per cent on the trunk lines, but the greater portion of this has been railroad tonnage.

Short working time continues to cause unrest among miners. The mines in the Standard field on commercial coal average 2½ days and in the Mt. Olive field a trifle over 3 days.

Embargoes were effective against some Western lines this past week. The terminal at St. Louis is gradually getting over its strike troubles and while conditions are not normal, they show considerable improvement. Abuse of coal equipment still continues.

In the Carterville field a better tonnage of domestic came out the past week, especially to points north, quite little moving to the St. Louis market.

The railroad still takes nearly all the coal produced at Missouri Pacific mines and local points on this road in the South are hard pressed for fuel.

Locally St. Louis is strong for steam coal, but domestic demand is somewhat light. Buyers from Michigan and Indiana, as well as Chicago and Northwesternpoints, have been buying coal here the past week at from $4.50@$5 for every size from all fields.

The prevailing prices on outside shipments from the Standard field have been $4.50 to $5 on all sizes. The local price averages about $3@$3.50 on domestic sizes, and $3 on steam, from both Mt. Olive and Standard fields.

Carterville prices range anywhere from $3.60@$4.50 on domestic sizes and from $3.25 upwards on steam, depending upon what the traffic will bear and who the seller happens to be.

Retail prices advanced 25c. on Mt. Olive, making Carterville $7.25@$7.50; Mt. Olive $6.25; Standard $5.50.

CINCINNATI

Good Stocks of Coal on Hand but Demand Has Slackened—Ohio River Furnished Transportation—Prices Are Steady with Little Spot Coal Available.

All dealers in Cincinnati have good stocks of coal, but the warm weather has slackened the demand. The Ohio River has enabled them to stock up to a great extent. However, the business with the retailers, who supply the household demand, is not as brisk as during the first months of the spring.

The average daily car supply at the mines is only 39 per cent, with more than a normal demand. Furthermore, only 50 per cent of the amount of coal that went to tidewater last year has been shipped to this territory during the present year.

Coal men state that as a result of the Ohio River transportation, Cincinnati buyers are paying from two to three dollars a ton less for coal than consumers in other cities.

Operators with headquarters here see a faint shadow of hope in the report from the West Virginia fields where production in the past ten days has improved, although the car supply is away below normal.

Prices seem to be more steady, there being no reports of advances, although they still are on quite a high level. There is little spot coal available and that is being sold at $7 for mine-run gas coal. The demand for steam, gas and byproduct coal is enormous. Companies are now only loading mine-run, as special sizes bring little more than this grade.

There has been no increase in prices in the retail field, the prices quoted on coal delivered during the past week being as follows:

Bituminous lump	$8 00@$8 25
[illegible]	6 75@ 7 00
Bituminous run of mine	$7 25
Smokeless lump	9 25
Smokeless run of mine	8 50
Anthracite	14 00

COLUMBUS

The Coal Trade Does Not Improve—Lake Situation Is Deplorable — Steam and Domestic Business Active and Prices Are on the Upgrade.

Instead of getting better, the coal trade in Ohio appears to be getting in worse shape. Car supply in all of the producing fields is still reduced to below 50 per cent and as a result production is at a low point. Stocks are being depleted and large users are unable to accumulate any surplus.

The Lake trade is attracting the attention of producer, shipper and consumer alike. Government officials are also taking cognizance of the situation with the likelihood of preferential orders for equipment for Lake shipment. Records at all of the lower Lake docks show that scarcely 20 per cent of the usual tonnage being moved up to this time has been started to the Northwest.

This presages an acute shortage in that section with the likelihood of all-rail shipments later on. Railroads are not equipped for a heavy all-rail movement and if it is necessary other sections of the country will suffer because of lack of equipment.

Steam business is active in every way. Large consumers are continuing their practice of bidding for available tonnage with the result that prices are still on the upgrade. Plants are unable to get sufficient fuel to run on full time and in many instances have had to close down entirely.

Prices for Hocking mine-run on the open market range from $5 to $7.50 while other grades are the same. All grades command about the same figure and many of the large producers are still endeavoring to hold down the price. Such operators cling to a price of $4.50 for all grades. Some prices are soaring. West Virginia prices are higher than those in Ohio.

Domestic trade is also active and prices are advancing in sympathy with the rates at the mines. Hocking lump and mine-run retail in the neighborhood of $8.50. West Virginia splints retail at $9.50 and Pocahontas if available around $10.50 to $11. Practically no Kentucky coal is coming in.

Production is slow as the car supply is generally less than 50 per cent of normal. The Hocking Valley produced about 45 per cent last week while Cambridge, Jackson and Crooksville report less than 40 per cent. Pomeroy Bend had a slightly better run with 50 per cent. Eastern Ohio is running about 35 to 40 per cent with a large part going to railroads and to the Lakes. Commercial users have only a small percentage of the reduced output.

Prices at the mines are as follows:

Hocking lump	$4 50 to $6 50
Hocking mine-run	4 50 to 6 25
Hocking screenings	4 50 to 6 25
West Virginia splints, lump	5 75 to 8 00
West Virginia splints, mine-run	5 50 to 7 75
West Virginia splints, screenings	5 50 to 7 75
Pocahontas lump	7 00 to 8 00
Pocahontas mine-run	7 00 to 8 00
Pocahontas screenings	6 75 to 7 75
Pomeroy lump	5 00 to 7 50
Pomeroy mine-run	5 00 to 7 50

CHICAGO

Coal Supply Improves Materially—Anthracite and Eastern Coal Moves More Freely Into Chicago—The Switchmen's Strike Has About Straightened Out Here.

Chicago's coal supply today is very much more substantial than it was two weeks ago, or even a week ago, as nearly every retail yard, as well as practically every factory, has enough coal on hand to run them at least two or three days a week.

This is quite a great change for the better, when one considers it was only two weeks ago when retailers had practically no coal whatsoever, and manufacturers had just enough coal to run from hour to hour.

Anthracite coal is moving into Chicago more freely than heretofore and this is also true of certain high-grade Eastern coals which are generally used in large quantities in the city. The congestion of the Eastern seaports is probably responsible for this. However, it is not arriving in large enough quantities to take care of the great demand for it.

Railroad authorities state that the congestion brought about by the switchmen's strike practically has now been straightened out and that freight is moving in a fairly normal manner through Chicago terminals. This ought to benefit the coal industry as during the strike and the consequent congestion following the strike a great number of coal cars, both loaded and empty, were stranded in Chicago.

MIDWEST REVIEW

Coal Experiences Slight Lull in Active Demand—General Car Situation Does Not Improve — Long Hauls Do Not Benefit Matters—The Price Situation Changes Little.

Owing to a spell of hot weather and the Republican convention in Chicago, the fuel problem, during the past week, no longer occupies the center of the stage.

With the exception of one or two spots in Indiana, and the Central district of Illinois, the car supply has been just as poor as ever. The average for the fields, not including the Central district, will show about a 33 per cent supply. The reason why the Springfield district is getting a better supply than the rest of the field may be because it is the first one to feel the effect of the Interstate Commerce Commission's ruling that all Eastern cars are to be returned.

At this writing operators in the Middle West are not very optimistic as to an improvement in the car situation on account of the recent rulings of the Interstate Commerce Commission.

The present great shortage is due to a number of interesting things. Inquiries from Eastern states, requesting quotations on Illinois and Indiana coals have been fairly common. Illinois and Indiana coals, all grades, have been moving into Michigan, to points in the western part of Ohio and to Canada, either through Minnesota or the Detroit gateway.

Operators, as a rule, frown on this long-haul business as they believe it would be for the best interests of everybody to avoid long hauls and widespread distribution of coal-carrying equipment.

There has not been much change in the price situation. Some of the coals, however, which were selling at around $6 per ton a couple of weeks ago, are now moving at lower levels. Some of the Franklin County operators are said to be asking $3.90 per ton f.o.b. mines for their prepared sizes.

South

BIRMINGHAM

Transportation Conditions Show No Improvement—Operations Handicapped by Lack of Cars, Local Strikes and Labor Delinquency—Coal Is in Strong Demand with Prices Steady.

The condition as regards car supply remains about stationary. This field is expected to receive some benefit in this respect from the order of the Interstate Commerce Commission, instructing the delivery to eastern lines from western roads of 39,600 coal cars.

About 2,500 of these cars will be available to the Louisville & Nashville for use in the Kentucky-Tennessee and Alabama fields, and the supply to the former section should relieve to some extent the constant drain on the Birmingham district to enable the Kentucky-Tennessee mines to equalize operating time with Alabama.

Delivery of cars from foreign lines to the Illinois Central at New Orleans and Chicago will also enable that line to maintain a better equalization with the Frisco and Southern in serving the Alabama mines. Mines on the Southern and L. & N. have been receiving a fair quota of cars where fuel contracts were held, but commercial mines have only received about a 50 per cent supply. Frisco mines have been served better.

Local strikes in Walker, Bibb and Tuscaloosa counties have some dozen or more mines partly or entirely closed down, and idleness at these operations is curtailing coal production considerably. Labor is slow in reporting for work at active mines, while there is some shortage of men at some plants which are attempting steady operations.

Steam coal requirements are much larger than the district can supply, and the mines are taking on but little new business, as they are unable to take care of what they now have in hand. Prices are remaining practically stable, the small tonnage available for spot buying not being sufficient to affect market conditions, though almost any price named can be obtained for such coal. The market for domestic sizes holds good and the same general conditions govern the trade for this grade of fuel as in the case of steam coal.

LOUISVILLE

Car Supply Is Much Improved—Gas and Byproduct Coal Is Moving Freely—Domestic Demand Light—Western Ky. Steam Coal Market Weakening—Export Trade Light.

During the first week of June the Kentucky operators had the best car supply of months, securing a 50 to 60 per cent supply, and getting in three full days.

The principal fuel demand at the present time is for gas and byproduct coal which is moving freely. There is also a stocking demand from Canadian, Northwestern and Lake regions. There is also a good demand for coal from public utilities, railroads and general industries.

There is no contracting being done on present markets, and practically all coal is sold for spot delivery, and most of it for cash. Demand for western Kentucky steam coal has been slumping off somewhat, and the market is weaker.

Export movement is comparatively light due to shortage of facilities at Southern ports for handling, with the result that not much over 100,000 tons a month is moving from Kentucky, Virginia and Tennessee to Charleston and Savannah.

Mines continue to turn out little other than mine-run. Screenings are quite scarce and in big demand. Coal prices at the mine are as follows:

	Eastern Kentucky		Western Kentucky
	Gas Coal	Non-Gas	
Lump	$8 00@8 75	$7 75@8 40	$5 25@5 50
Mine-run	8 00@8 75	7 50@8 00	4 75@5 00
Nut and slack	7 75	6 75@7 00	3 75@4 00

Canada

TORONTO

Moderate Supplies of Anthracite Are Coming Forward — Bituminous Is Still Scarce — Fuel Administrator Says Industries Must Use Anthracite — Prices Unsettled and Increasing.

Since the lifting of the railway embargo conditions have shown improvement. Moderate supplies of anthracite are coming forward, but dealers are still much behind with deliveries and are only accepting orders at the price prevailing when delivered.

Little bituminous has been received and the situation as regards the supply for industrial plants remains serious. H. A. Harrington, provincial Fuel Administrator, made a trip to the American coal fields in order to secure enough coal to keep the gas plants in Toronto and other cities in operation, otherwise they would have had to close down.

Prices are variable with a decided upward tendency. Present retail quotations for short tons are about as follows:

Anthracite egg, stove, nut and grate	$15 00
Pea	13 50
Bituminous steam	14 00
Domestic lump	15 00
Cannel	14 00

News From the Coal Fields

Northern Appalachian

FAIRMONT

Production Decreases—Embargo Is Placed on Curtis Bay Coal—Railroads Take Large Part of Coal Output.

Lowered production still featured the week ended June 5 in northern West Virginia, a pronounced shortage of cars still being at the seat of the trouble. An added source of shortage, however, was a suspension of work on the part of miners on Decoration Day.

Tidewater shipments were somewhat retarded during the week due to an embargo covering coal for Curtis Bay, owing to an accumulation of about 1,000 cars at the piers. Although numerous vessels were on hand awaiting cargoes, it was found impossible to load coal as fast as it arrived. By the end of the week nearly all the tidewater piers of the Baltimore & Ohio were under embargo.

Since traffic has been resumed on the Pittsburgh & Lake Erie R.R., it has been found possible to move more coal through Brownsville, Pa., so that more cars were being received in the early part of June on the Monongahela R.R. than during the greater part of May, though the supply was still far short of requirements.

Railroads were showing no disposition to cease assigning a large part of the limited car supply to mines loading railroad fuel, and consequently during the first week of June, in the Fairmont as well as in other northern West Virginia fields, the carriers were securing the lion's share of the coal produced, leaving a comparatively small volume available for shipment to commercial consumers.

There was little or no increase in the volume of western or Lake shipments.

CONNELLSVILLE

Furnace Coke Contracting Begins on 4-to-1 Ratio—Spot Prices Remain High—Byproduct Oven Production Increases Faster Than Beehive.

Contracting in furnace coke for the second half of the year has begun, with the closing of about 25,000 tons a month on the basis of a 4-to-1 ratio, against basic pig iron at valley furnaces, now quotable at $43.50, a price that would make the coke on such contracts $10.87.

These contracts provide for a maximum of about $12, so that if iron went above $48 there would be no further advance in coke, while there is also a minimum for coke.

Some sellers would quote a 4-to-1 ratio but would refuse to have any maximum specified. Two or three sellers have quoted a flat price of $12.

The spot market is a shade easier in tone, but prices are not quotable at materially lower levels. The spot market is quotable at $14.50@$15 for furnace and $15@$15.50 for foundry, per net ton at ovens, against $15 for furnace and $16 for foundry quoted a week ago.

Car supplies in the Connellsville region continue to increase, but at quite a slow rate. The supplies of cars at coal mines furnishing byproduct coals seem to have increased more than the supplies for loading coke in the Connellsville region, for the byproduct ovens are now operating fairly well.

The *Courier* reports coke production in the Connellsville and Lower Connellsville region in the week ended June 5 at 189,580 tons, an increase of 2,852 tons. The showing is quite favorable in its way since the week included Memorial Day.

PITTSBURGH

Empty Cars Are Not Being Moved Promptly—Little Coal Offered in Open Market—Coal Consumers Are Buying Railroad Cars.

Car supplies in the Pittsburgh coal district continue to increase, but at a slow rate. All the railroads are functioning better, the Baltimore & Ohio nearly normal, the Pennsylvania not far from normal, and the Pittsburgh & Lake Erie at a much better rate, though still quite far from normal.

There is still complaint among shippers that railroads are not getting the best results from their equipment, the difficulty not being wholly a shortage of ordinary labor. For illustration, a certain fairly large blast-furnace interest in the valley has had no trouble in shipping pig iron, or in getting iron ore in and little difficulty in getting coke, but it has had a great deal of trouble in getting the railroad to remove empty cars after unloading.

While coal production has increased, the insistence of buyers has also increased, and producers are so well tied up by contract requirements that they have little coal to offer in the open market, the consequence being that prices have soared still higher.

There have been times in the past few days when buyers were not certain of finding even steam coal at under $10, while $9 seems to be about the lowest price that has been secured on any grade.

Promises of early deliveries might be had at considerably lower prices, but the buyers who make the market now require car numbers, and for spot shipment (with car numbers) the market is quotable at $9@$10 per net ton at mine, Pittsburgh district.

The feeling among large coal consumers that there is no assurance of good railroad service, even when the roads are fully manned and in command of their equipment, is shown by the following car orders lately placed by coal consumers: Koppers Co., 1,000 cars; Youngstown Sheet & Tube Co., 500 cars; Bethlehem Steel Co., 1,000 cars; International Harvester Co., 500 cars; Weirton Steel Co., 200 cars. All these concerns operate byproduct coking plants.

Estimates of Production

FROM THE WEEKLY REPORT OF THE GEOLOGICAL SURVEY

BITUMINOUS COAL

	1920		1919(a)	
	Week	Calendar Year to Date	Week	Calendar Year to Date
May 22b	9,246,000	202,358,000	8,724,000	167,139,000
Daily average	1,541,000	1,655,000	1,454,000	1,367,000
May 29b	9,548,000	211,906,000	7,938,000	175,077,000
Daily average	1,591,000	1,652,000	1,498,000	1,372,000
June 5	9,138,000	221,043,000	8,927,000	184,004,000
Daily average	1,650,000	1,650,000	1,488,000	1,377,000

ANTHRACITE

	1920		1919(a)	
	Week	Calendar Year to Date	Week	Calendar Year to Date
May 22	1,797,000	33,053,000	1,673,000	30,351,000
May 29b	1,834,000	34,888,000	1,298,000	31,649,000
June 5	1,510,000	36,398,000	1,703,000	33,351,000

BEEHIVE COKE

United States Total

Week Ended				
June 5 1920	May 29 1920	June 7 1919	1920 to Date	1919 to Date
413,000	427,000	271,000	9,343,000	8,653,000

[illegible] days [illegible] New Year's week to equalize number of days covered for the two years. (b) Revised from last report. (c) Subject to revision. (d) Counting Memorial Day [illegible]

(All figures in net tons.)

Middle Appalachian

NORTHEAST KENTUCKY

Cars Are Far Less Plentiful on L. & N. Than on C. & O.—One-Third of Big Sandy Tonnage Goes to the Lakes—Use of Assigned Cars Disturbs Operators.

Less coal was mined in the Northeast Kentucky field at the outset of June than was the case for a similar period during the greater part of May, only 110,240 tons being produced out of a possible total of 294,760 tons, leaving a gross production loss of 184,520 tons. A scarcity of cars was responsible for a loss of 179,530 tons.

While there was little change in the car supply situation on the Chesapeake & Ohio R. R., there was a decided change in the situation on the Louisville & Nashville, cars being far less plentiful on the latter road than on the C. & O. It is stated that L. & N. mines were limited to a supply equal to about one-third of requirements.

An increased Lake movement was in evidence throughout the week in the Northeast Kentucky field, it being estimated that fully one-third of the Big Sandy tonnage at least was being billed to Lake points. As the result of the increased Lake movement, not so much coal was shipped to tidewater.

What continued to disturb many companies in the field was the large number of assigned cars, all mines loading railroad fuel having an ample supply of empties; while on the other hand commercial-loading mines in many instances were forced to shut down because of lack of equipment for loading.

LOGAN AND THACKER

Car Supply Improves in Second Week of June—Lake Shipments Increase and Tonnage to Tide Is Embargoed—Efforts to Organize Thacker Field Interfere with Output.

While no direct benefits were derived from the new Interstate Commerce Commission regulations governing the movement of cars to the East, during the week ended June 5, in the Logan field, there was unquestionably an improvement during the following week in the car supply.

However, it was impossible to produce any more coal in the first week of June than it had been during a similar period in April and May, the output for the entire week reaching only 142,000 tons; while on the other hand production losses amounted to between 250,000 and 275,000 tons. In other words there was only about a 35 per cent output.

Slides on the C. & O. leading into the Logan field, as well as on the main line, were factors in reducing production in addition to the poor car supply, eastern shipments of course being entirely suspended toward the end of the week.

More than 92 per cent of the working time of mines in the Logan field was taken up in loading assigned cars. There was a perceptible increase in Lake shipments during the first week of June, but at the same time tidewater tonnage was heavy. However, early in the second week of June, Logan coal was debarred from tidewater because of an embargo growing out of the slides (of the preceding week) on the C. & O.

Losses in production were steadily mounting in the Thacker field at the advent of June largely because of the organization campaign which is being waged here by the United Mine Workers, total losses aggregating in the neighborhood of 150,000 tons.

There has been a suspension of operations at many mines as a result of the attempt to organize the field and that was responsible during the first week of June for a loss in production said to be in excess of 50,000 tons. However, the loss was even larger from a car shortage, amounting to approximately 80,000 tons.

Production on the Chesapeake & Ohio system as a whole was beginning to show signs of improvement during the first week of June though still below normal. During this period the road handled on its system a total of 9,528 cars, or about 476,400 tons.

NEW RIVER AND WINDING GULF

Car Supply Averages About 40 Per Cent for First Week of June—Coal Goes to Tide—Coke Is Shipped West—Transportation on the Virginian Is Subnormal.

Operators of the New River and Winding Gulf fields found little or no encouragement during the first week of June, since satisfactory operation of the mines was possible only twice during the weekly period, cars being so scarce during the other four days that it was impossible to operate more than the fraction of a day.

The car supply for the week did not average over 40 per cent, that measuring the production of the field. On Saturday a slide at Montgomery had its baneful effect on operations in the field.

As far as the movement of New River coal was concerned, shipments were mostly for tidewater, Inland East shipments consisting mostly of prepared sizes. No attempt was made by producers to ship enough coal westward to amount to anything, not even to the Lakes, and it is stated that there will continue to be a small western movement until it is possible to secure the quick return of equipment from the West.

Coke was being shipped, however, mostly to Western markets. Some operators were of the opinion that coke prices might recede, owing to lowered prices on pig iron. If such was the case it had no effect on New River coal, no reduction in the price of that coal being recorded.

Mines in the Winding Gulf field were still handicapped owing to the fact that transportation conditions on the Virginian Ry. were sub-normal following the strike of Princeton shopmen. However it was stated that the strike situation had undergone improvement.

POCAHONTAS AND TUG RIVER

Empties Come in from the West and Increase N. & W. Output—Fancy Prices Are Offered for Spot Coal—Contract Coal Sells for About $5—Properties Change Hands.

Production in Norfolk & Western territory was on a somewhat larger scale during the first week of June than had been true at any time since the middle of April, the improvement in conditions following an augmented car supply, resulting from an increase in the delivery of empties from the West.

Coal Loading in the Tug River field for the week ended June 5 totalled 75,450 net tons. It was pronounced the best output in two months.

Prices even in excess of $9 a ton are reported as having been offered for coal to tidewater but there is only an exceedingly small amount of coal not under contract. Operators say that by far the greater bulk of the best coal in the Tug River field is tied up at a price not in excess of $5 a ton.

Spot coal from the Pocahontas field was bringing at least $9 a ton. However, there was little spot coal available even at that amount. Contract coal was being shipped at approximately $4 a ton less than the spot prices offered. There was at the outset of June no let up in the demand.

KANAWHA

Slides on C. & O. and Decoration Day Cut Down Output—Shipments to Tide Decrease, and More Coal Goes to Lakes.

Slips and slides on the Chesapeake & Ohio R.R. at the end of the first week of June played havoc with production in the Kanawha field, as it was impossible to furnish any mines with cars on Saturday or to move any coal in the area affected.

Not only was traffic completely blocked on the main line of the C. & O. but branch lines were also affected so that production was seriously affected in the Cabin Creek area and in the Logan area. Between a holiday partly observed on May 31—Decoration Day—and the slides already mentioned it was an extremely poor production week in the Kanawha field.

Tidewater shipments were not quite so heavy as they had been in previous weeks, but on the other hand there was an increase from some mines at least in the amount of coal being shipped to the Lakes, the percentage of Lake shipments being estimated at 23 or 24 per cent. General western shipments, however, were slightly retarded by embargoes applying to consignments to certain Western markets.

What further cut down the equipment for use at mines shipping commercial coal was the large number of cars being assigned for railroad-fuel loading, the assigned-car practice in the Kanawha region as well as in other regions having become extremely pernicious in the opinion of operators.

Middle Western

SOUTHERN ILLINOIS FIELD

Jefferson County Men Are Drilling for Coal—Franklin County Operators Are Erecting Houses—I. C. Strike Affects Franklin County Fields.

Drilling for coal in a field that has never been prospected is now in progress in Jefferson County. The hole is being sunk a few miles west of Mt. Vernon, and the prospecting is being done on land under lease to local parties. The sale of the field is assured should the seam prove to be thick enough to pay for mining. A good seam of coal has been found in the extreme southern edge of this county, but the test hole there was the first ever sunk in the vicinity of the Mt. Vernon operations.

The Bell & Zoller Mining Co. is erecting a large number of houses at Zeigler, in Franklin County, to take care of the increasing number of miners needed by the rapid development of the No. 2 shaft of this company. Other large operators in the Franklin County field are considering this method of providing homes for their men, as local parties are not inclined to invest money in rental property under the present excessive cost of construction.

The strike of the Illinois Central R.R. switchmen at Duquoin, Carbondale and Centralia, who came out the second time recently, has resulted in shutting down many mines in that section, and has affected the already serious car shortage in the Franklin County fields. The repair men and clerks have also joined the switchmen and the walkout is seriously affecting all mines depending on the Illinois Central for a car supply.

The Lewis mine at Pinckneyville, in Perry County, property of the Hale Coal Co., was destroyed by fire of unknown origin recently. The tipple and superstructure were a total loss. This property was recently remodeled and improved, and was the main source of supply for local dealers. It is undecided at this time whether the property will be rebuilt.

SENTIMENT OF ST. LOUIS COAL MEN

Frelinghuysen Bill Is Discussed—Members Are Opposed to It as Outlined—Straw Vote Is Taken.

As to how the coal men in the Middle West feel in connection with the seasonal rates on coal, as proposed by the Frelinghuysen bill, was evidenced at the last meeting of the St. Louis Coal Club, when a straw vote was taken to ascertain the sentiment.

Only one member of all those in attendance at the meeting was in favor of the bill as proposed.

Many of the members were of the opinion that something along those lines might be worked out to advantage, but not as outlined in that bill. It was the opinion of those present, as taken in the straw vote, that the railroads and the distribution of coal should be let alone and not interfered with by the Government until the railroads and the coal men were unable to properly conduct their own business. This bill was favorably reported by the sub-committee of the Senate Interstate Commerce Committee.

Important Events of the Coal Industry During May

[The bracketed figures in the text refer to the number and the page of the volume in which references to the matter may be found and should the reader desire further information he can obtain it in the place indicated].

May 4—A wage-scale agreement is reached at Cleveland, Ohio, between the scale committees representing the operators and miners of the eastern Ohio field [XVII, 1017]—Freight-train crews on the Morgantown & Kingwood R.R., a coal carrier in northern West Virginia, go on strike demanding an 8-hr. day [XVII, 1058].

May 5—At a meeting of the Senate Frelinghuysen sub-committee, Middle-West consumers support seasonal freight rates [XVII, 1000]—Illinois coal operators who were indicted at Indianapolis a few weeks ago, for violating the Lever Act, bring individual suit in Chicago, asking that the U. S. Government be restrained from prosecuting them further [XVII, 1001].

May 7—Operators and miners meet at Fairmont, W. Va., to consider scales for deadwork in northern W. Va. [XVII, 1059].

May 8—President Wilson issues an order directing the Council of National Defense to take over the records of the War Labor Board and complete any unfinished business [XVII, 1037].

May 12—The sub-committee of the Senate Interstate Commerce Committee favorably reports the Frelinghuysen bill to establish seasonal coal transportation rates [XVII, 1042].

May 13—The sub-committee of the Senate Interstate Commerce Committee reports favorably the Poindexter anti-strike bill for railroads [XVII, 1042].

May 19—Miners at plant of Consumers' Coal Co., at Downs, Marion County, W. Va., strike following discharge of three miners for loading dirty coal [XVII, 1169].

May 20—Interstate Commerce Commission issues orders to relieve freight congestion. Of special importance is the order relating to the relocation of open top cars from western to eastern territory [XVII, 1116].

May 21—U. S. Senate passes the House Merchant Marine bill [XVII, 1165].

May 22—President Wilson issues ultimatum to anthracite operators and miners forbidding strike in anthracite mines. He will appoint a commission to consider a wage increase if necessary [XVII, 1116]—A wage agreement is concluded at Cheyenne, Wyo., between the mine operators and mine workers [XVII, 1169].

May 24—Matewan men implicated in connection with death of Baldwin-Felts detectives and otners are arrested [XVII, 1170]—Director General of Railroads makes public a report of the financing of the U. S. Railroad Administration. History of the financing of the railroads is given from the beginning of Federal control on Jan. 1, 1918 [XVII, 1150]—Miners employed by the Vandalia Coal Co., at Terre Haute, Ind., strike because the company assessed and collected from them a fine of $1 each for failing to report for work Saturday May 15 [XVII, 1215].

May 25-27—National Coal Association holds its annual meeting at Atlantic City, N. J. [XVII, 1161-1164]—Joint convention of district No. 11, strip mine operators and miners of Indiana, adjourns. Most of workers' demands granted [XVII, 1166].

May 26—Judge A. B. Anderson, of the Indiana District Federal Court, overrules demurrer of Charles E. Hughes to quash indictment in case of 57 bituminous operators and miners, declaring Section 9 of Lever Act constitutional [XVII, 1166]—Seven men said to be union organizers are arrested on Pond Creek Pike County, Ky. [XVII, 1215].

May 27—Officials of United Mine Workers of America request the operators of the Williamson, W. Va., field to negotiate with them regarding the organization of the Williamson field [XVII, 1216]—Mine workers at tri-district convention in Wilkes-Barre, Pa., accept President Wilson's offer to appoint an arbitration committee to settle the anthracite wage dispute [XVII, 1170].

Mine and Company News

ALABAMA

Gadsden—W. L. Smith, of Gadsden, and associates, are understood to be arranging plans for the development of a coal mine in the vicinity of Boaz, Ala. Modern machinery and equipment will be installed, and electric power will be utilized wherever feasible. The plans include the construction of a large number of homes for miners' dwellings.

Birmingham—The remaining block of 60 Semet-Solvay ovens at the plant of the Sloss-Sheffield Steel & Iron Co. has been charged and is now producing coke and byproducts. The 120 ovens at this plant will provide sufficient coke for the separation of all the furnaces of the company, consuming 2,500 tons of coal per day; the plant will displace about 1,500 beehive ovens located at the different coal mines of the company in this district. The oven plant will also generate electric power for the equipment at all the coal and ore mines of the Sloss-Sheffield company, transmission lines now being strung and machinery placed at all its operations in the district to supplant steam power.

ILLINOIS

Chicago—Contract for the new steel tipple for the Jackson Coal Co., at Hallidayboro—the old structure of which was reecntly destroyed by fire—was placed with the Roberts & Schaefer Co., of Chicago, who has already erected a steel head frame and temporary weigh box and screens.

This piece of reconstruction work has been one of the fast jobs of the State. The new tipple when fully completed will be equipped with Marcus screens and shaker loading booms, and will be one of the fine installations of the State.

INDIANA

Indianapolis—The Globe Coal Mining Co., operating at Rogers, six miles east of Petersburg, Ind., is building a railroad switch half a mile long in order to get into its coal property. The company also is constructing what is said to be one of the largest coal mines in southern Indiana. Two stripping machines are being used to move earth away from the railroad right-of-way.

The Gladstone Coal Co., near Petersburg, Ind,, is installing electric haulage and power, which will increase the daily capacity of the mine from 400 tons to 1,500 tons.

Officials of the Wulfman Coal Co., operating near Winslow, Ind., have been given the right to build a steam tramway through the eastern part of the town to connect with the Southern Ry.

KENTUCKY

Manchester—The Cumberland & Manchester R. R. Co., which is operating a line tapping rich coal fields, has increased its capital from $50,000 to $500,000, and plans eventually to construct several spurs.

Louisville—Among the new coal companies formed recently in Kentucky are the following: The Jacks Creek Coal Co., of Prestonburg, with a capital of $200,000, has been incorporated by, A. J. Johnson, James Sailsbury and J. W. Shober. The Porter Mining Co., of Ashland, with a capital of $150,000 has been incorporated by, S. S. Porter, J. E. Long, Fred Blackburn, and Dr. M. M. Collins. The Apex Coal Co., of Whitesburg, of which R. F. Haskins, of the Diamond Block Coal Co., near Hazard, Ky., is the head, is planning to install a plant with a daily capacity of 500 tons, on the Craft property near Millstone, Ky., in the Elkhorn field.

Lynch—Converting a mountain wilderness of Kentucky into a thriving and modern mining town in less than three years was the achievement of the United States Coal & Coke Company here, a subsidiary of the United States Steel Corporation.

Some 18,000 acres of coal lands were purchased by the company and on Sept. 1, 1917, the first workmen arrived to lay out the town and open the mines. The company built its own railroad out of Benham.

One of the features of the operation is that the mines are electrically lighted.

The projects planned by the company include two miles of concrete streets from the Benham line to the upper end of Lynch. Macadamized roads will be built in the town, fences constructed around the houses, sewerage installed, and a large grammar school and bank built. A hospital has been recently built for the benefit of the 7,000 or 8,000 employees of the company.

It is estimated that there are about 500,000,000 tons of coal to be worked here. The capacity of the plant is 2,500,000 tons of coal a year.

PENNSYLVANIA

Pittston—William P. Jennings, superintendent of the Pittston division of the Pennsylvania Coal Co., recently appeared before members of the Mine Cave Bureau of Pittston and assured that organization that the company will not only repair all damage occasioned by recent surface subsidence in upper Pittston, but will see that no further damage is done streets of the city and will likewise file maps of its underground workings as required by a city ordinance.

A warrant was issued under Section 6 of the Davis act of 1913, which makes it unlawful for any person or corporation engaged in the mining of coal to damage streets or public thoroughfares by surface subsidences through failure to leave adequate supports.

Conviction under the act calls for a fine of $1,000 or a maximum sentence of 90 days in the county jail or both at the discretion of the committing magistrate.

The cave which resulted in the issuing of the warrant occurred recently in the Curtis Street slope of the No. 9 colliery of the Pennsylvania company and damaged Wilford Street.

Three months ago the Scranton-Pittston Coal Co. was brought into the Luzerne County Court for failure to file maps. The court held that the ordinance was legal and directed the company to comply. To date the company has not filed its maps and as a result operations have been suspended.

Wilkes - Barre — Extensive improvements are now under way by the Susquehanna Collieries Co., including sinking new shafts at the Richards and the Pennsylvania collieries, the construction of a large new breaker to prepare coal from both operations and the erection of a new power plant. The breaker, which will be of steel construction, will have a capacity of 3,000 tons of clean coal a day and will replace the breakers at the Pennsylvania and Richards collieries. The power house will have a boiler capacity of 12,000 hp. and an electrical capacity of 9,000 kw. The transmission line will be double and will have a total length of 40,000 ft.

Uniontown—The sale of 2,600 acres of Greene County coal, for a consideration of almost $3,000,000 to the W. J. Rainey interests by the Youghiogheny & Ohio Coal Co., is reported to have been concluded in Pittsburgh. The property, located in what is known as the Clarksville tract in the northern section of Greene County, brought $1,180 per acre which is said to be a new high figure for coal lands in that section of Greene County. The tract is located along Ten Mile Creek. The purchase is being made by the W. J. Rainey interests, it is understood, to provide a reserve source of fuel for the byproduct plant of the Rainey-Wood company in the eastern Pennsylvania territory.

Johnstown—The A. B. Crichton Coal Co. is understood to have completed negotiations for the acquirement of the holdings and property of the Chaffee Coal Co., in the Upper Potomac field, located in the vicinity of Westernport, Md., for a consideration of about $500,000. The property comprises about 2,000 acres of coal lands, and it is understood that the new owner is planning for extensive improvements and enlargements to provide a capacity of about 1,500 tons daily, or more than double the present output.

Mercer—Enoch W. Filer and William Jenkins, who have been operating the Pardoe mines under charter held by the Mercer Mining Co., for the past three years under a lease, have purchased the mines from the Mercer Mining Co. and are planning to make improvements including a new shaft and other developments.

WASHINGTON

Bellingham.—Additional men have been employed by the Bellingham Coal Mines Co. and its output increased to 500 tons. By next fall the daily output is expected to be 700 tons. The market outlook is promising and the company's product is growing in popularity. The company is constructing a car shop and repair house and is building its own mine cars. It is also extending its spur track.

WEST VIRGINIA

Williamson—The Williamson Coal & Coke Co. has been purchased by A. H. Land, J. L. Dickinson and others. The purchase includes all the holdings of the company in the Williamson field and in Kentucky. The consideration involved was approximately $150,000. The present output of the mines of the Williamson company amounts to about 30,000 tons a month. The new owners, however, will probably make a number of improvements with a view to increasing the capacity of the plant.

Morgantown—The Gaston Run Coal Co. has increased its capital from $50,000 to $100,000, for general business expansion. Ernest H. Gilbert is president.

Fairmont—The Tarr Coal Co. is getting ready to make improvements that will increase the production of its mine on the West Fork River between this city and Monongah. The Tarr company operates six mines in Pennsylvania and West Virginia.

Glen White—The E. E. White Coal Co., the largest producer on the Virginian Ry., announces that it expects to sink four shafts in Raleigh and Wyoming counties.

Huntington—Operations on a large scale will be conducted in both West Virginia and Kentucky by the Logan-Elkhorn Coal Corporation. The capitalization of the company has been fixed at $1,500,000. It will operate in Logan County, W. Va., and in Letcher County, Ky. Those principally interested in the new company are: J. K. Parsons and A. R. Parsons, of Mallory, W. Va.; A. F. Parsons and Ettie Parsons of Huntington, W. Va.; W. S. Peters of Seco, Ky.

The Overseas Coal Co., First National Bank Building, has been incorporated with a capital of $50,000 to engage in general coal mining operations in Lincoln, Cabell, Logan and Boone counties. It is understood that machinery and equipment will be installed for active work at an early date. H. K. Marcum and J. W. Tague head the company.

Charleston—Smokeless coal land in Fayette County is to be developed by the Kettle Run Coal Co., with headquarters in this city, the new concern having a capitalization of $150,000. Principally interested in the new company are: T. C. Beury, J. A. Thayer, A. S. Guthrie, E. H. McNeil and John W. Fry, all of Charleston, W. Va.

Three companies to act as selling agencies for Pike County, Ky., coal, and Mingo County, W. Va., coal, have been organized by E. L. Bailey, of Williamson; E. H. Sudduth, of Welch and others. The new corporations are: The Bailey Fuel Co., of Charleston, W. Va., with a capitalization of $100,000; the Sudduth Fuel Co., of Charleston, with a capitalization of $100,000, and the Williamson Fuel Co., of Charleston, with a capitalization of $200,000.

Companies whose capitalization has just been increased are the Ashford Coal & Coke Co., of Charleston (headed by Frank D. Barron), from $25,000 to $50,000; and the Delmar Coal Co., of Fairmont, W. Va. (John T. Phillips, president), from $300,000 to $1,000,000.

Association Activities

Western Coal Operators' Association

In order to better co-ordinate the coal-mining industry in the Province of Alberta, Canada, from the viewpoint of the operators, an amalgamation has been effected which will bring under the jurisdiction of the Western Coal Operators' Association, six sub-district organizations, including the Red Deer Valley Coal Operators' Association.

While each sub-district will deal with questions inside its own association, all matters of policy will be referred to the Western Coal Operators' Association. The officials of the new organization are: President, O. S. Whiteside; first vice president, Jesse Gouge; second vice president, John Shanks; secretary-treasurer, W. R. McNeill.

Sewell's Point Tidewater Exchange

Producers and shippers of coal on the Virginian Ry., many of them in the Winding Gulf field of Southern West Virginia, put the finishing touches on the new Sewell's Point Tidewater Exchange on May 28 at Washington, D. C., where a meeting of the shippers was held, G. H. Caperton acting as chairman of the meeting.

Of the entire tonnage originating on the Virginian Ry., 70 per cent of it will hereafter be shipped to Sewell's Point so as to facilitate handling the tonnage. The following board of governors for the new coal exchange was elected: C. H. Mead, S. A. Scott, W. P. Tams, G. H. Caperton, P. M. Snyder, Frank Ellison and J. B. Clifton.

Coal to the exchange at Sewell's Point will be classified as follows: Low-volatile coal from mines on the Navy acceptability list, run-of-mine, Pool 1; other high-grade low-volatile coal, run-of-mine, Pool 2; low-volatile slack, Pool 3; other low-volatile coal, not classified in pools 1 and 2; run-of-mine, Pool 4; high-volatile byproduct, run-of-mine, Pool 7; low volatile, Eagle seam, Pool 8; low-volatile lump, Pool 44.

Logan Coal Operators' Association

The Logan Coal Operators' Association, at a meeting held in Huntington on May 31, arranged to file an appeal with the Interstate Commerce Commission for the early return of coal cars needed in shipping coal to the Lakes.

It was pointed out at the meeting that unless cars, now in the far West and usually utilized in transporting coal to the Lakes, are returned to the Chesapeake & Ohio and to the Hocking Valley, then there will be an unparalleled shortage of coal in the Northwest during the coming winter.

Lake shipments which up to this time should be 7,000,000 tons, have only reached the 1,000,000-ton mark thus far, although it is estimated that the Northwest will need 30,000,000 tons to meet requirements. While the Chesapeake & Ohio and the Hocking Valley are prepared to handle Lake coal expeditiously, refusal of connecting lines to return empties has greatly limited such shipments.

During the last week of May only 24 per cent of the tonnage of the Logan field was shipped to the lakes, and it is estimated that if the relief asked for is given by the Interstate Commerce Commission, then it will be possible to increase Lake shipments to 50 per cent of the region's output.

West Virginia Coal Operators' Association

Suit of the Northern West Virginia Coal Operators' Association against certain railroads in northern West Virginia, including the Pennsylvania, Pittsburgh & Lake Erie, Monongahela and Morgantown & Wheeling railroads, was planned to be heard by the Interstate Commerce Commission on June 11, owing to the inability of the railroads named to have their evidence ready before that time. The case was to have been heard on May 28. It was brought by the operators to require the carriers named to furnish a sufficient number of cars to overcome a deficit of about 16,000 cars covering a period of a year.

COAL AGE

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Commission Acts Decisively

WHATEVER may be your viewpoint on the present coal situation all must agree that the Interstate Commerce Commission has acted quickly and decisively. A virtual embargo for a time on foreign exports of coal and an actual embargo on the use of open-top cars in the area east of the Mississippi for any purpose other than loading coal is a program that reminds us of war days. We may next expect a Lake car-priority order, for the Northwest will expect treatment equal to New England's.

The tidewater order will lower prices offered New England, expedite contract shipments coastwise, quickly satisfy the New England demand and raise export prices. Positive assurance of supplies will take the edge off the Boston appetite for coal.

The general order affecting the use of open-top cars in Eastern territory, coupled with the previous mandate ordering such equipment across the Mississippi is drastic and shows how seriously the situation is viewed at Washington. Before the end of the thirty days provided in the order production of bituminous coal will reach 12,000,000 tons and may go higher, *unless* railroad labor troubles again break out in protest against the delay in the award of the Railway Wage Board.

The stoppage of foreign shipments can be but temporary. Mr. Storrow, we are advised, will be satisfied with less than 1,000,000 net tons a month, an increase of about 300,000 tons over what New England is getting now. And having satisfied the preference for coastwise movement and the navy, the agents of the commission are free to permit bunker and export cargoes to load.

It is worth noting in passing that we are now following in effect the policy of Great Britain in the control of coal. The Board of Trade through the British coal controller restricts exports of coal from the United Kingdom to the extent necessary to protect the requirements of consumers at home, which, of course, is just what the commission has done in its order of June 19.

Coal Freight Increases

JUST because the freight rate has little or no influence on coal movement today and differentials have for the time ceased to determine markets, the coal men are not neglecting the opportunity to put in the record on rate increases now being taken by the Interstate Commerce Commerce Commission their conflicting views. The Commission is gathering evidence on which to base a general rate increase sufficient to afford the railroads a "living wage." The National Coal Association put into the record the resolution passed at its third annual convention last month (*Coal Age* June 3, page 1162) endorsing the plea of the roads for increased revenues. Individual operators and representatives of producing fields, however, have appeared before the Commission and befogged the issue by selfish claims. What the Commission needs in these troublsome days is help, not more tangles to untie.

How much better it would have been for the operators to have joined through the National Coal Association in a presentation to the Commission that showed clearly the main contention that the first consideration should be to restore the old differentials in coal rates, disturbed by the more or less uneven advance of June, 1918! What has happened, it appears, is that such fields as suffered by the change of that date have asked for readjustment, and those fields that were not affected or were favored have asked even better treatment.

It would seem that the way could have been left open to settle these local differences at some future date and to have now put forth a united front on the question of coal rates. How can anyone accuse the coal industry of being a trust and to represent a monopoly when every national issue finds such a lack of common purpose and lack of common leadership? The presentation of the coal man's case to the Commission is so confused by local contentions that the decision when given cannot be other than disappointing.

The Significance of the World Market for Coal

IN the new order of things, participation in the affairs of the world is inescapable, the Republican party to the contrary. A year ago the State Department was seriously debating the advisability of our attempting to participate in the export coal business on a large scale. It was pointed out that notwithstanding the control of foreign business by the British and despite our national desire to save the best of our coal for use in this country, the United States would soon find itself in the position of the only dependable source of coal for the world.

Whereas in 1913 the United Kingdom produced some 320,000,000 net tons of coal and exported 106,000,000 net tons or nearly 33 per cent of the total, in 1919 production was but 257,000,000 net tons of which about 52,700,000 net tons or 20.5 per cent was export cargo. The average per month in 1919 was 4,400,000 net tons compared with which we learn that 2,200,000 net tons were shipped from the United Kingdom in the month of April, 1920, or less than 12 per cent of the total output that month.

In the meantime exports by sea from the United States have been increasing. From the low figure of 3,740,000 net tons or less than .7 per cent of the output of the country in 1918, off shore export cargo shipments increased to 8,291,000 net tons or 1.8 per cent of the total in 1919. In April, 1920, cargo shipments from Atlantic ports reached the high figure of 1,903,000 net tons or 5 per cent of domestic production. The present rate of dumping for export is at the rate of nearly

24,000,000 net tons a year. The maximum performance of the railroads and piers at Atlantic ports was in 1918 when 44,500,000 net tons of bituminous coal were dumped at these piers for all purposes.

British opinion on the question of the world market in coal is well expressed by the editor of *The Compendium*, who says that "The [British] export trade has been arbitrarily suspended to insure necessary supplies of coal at home. Never was there such an opportunity for our export coal trade as at present. But the country is impotent to grasp it, and, meanwhile America has stepped in the breach and is literally sweeping the coal trade of Europe into her lap." This authority also states that "old time customers in Europe are weary of trying to get coal from Britain. They are sick to death of strikes, delays, and control confusion, and they turn gladly to America for relief." But not to America alone, for Indian and Natal coals are reaching the Mediterranean and in far off Australia coal has been sold for use in France.

Compare $10 or $15 a ton at Hampton Roads with 140s. in May at Cardiff. At the present rate of exchange 140s. is about $28. The difference in shipping rates from the two sources to Continental ports is all that will prevent prices on this side from climbing still higher.

The wise policy for the United States is to stay in the world market for coal, for no sooner is the railroad situation straightened out than we will find ourselves with overproduction of coal again and need the foreign outlet as never before. The lack of output here and in Great Britain is due to different causes—there to lack of mine capacity and man power, here to deficiencies in transportation. We can and will overcome our failing long before England can recuperate her productive capacity, and in the meantime the world needs our coal.

What the Mine Pump Has Done for Industry

INDUSTRY has forgotten what it owes to the mine pump, yet mining with its pumping needs gave industry no less an instrument than the steam engine. Newcomen's engine, invented in 1705, was in 1711 employed for pumping mines. Not until it was applied to this purpose did it have any useful outcome. Humphrey Potter's invention for opening and shutting the valves on the engine was made on a mine pump and Henry Beighton's plug-tree with tappets was invented in 1718 for the same purpose. Then came Smeaton, the great mine-pump builder. James Watt busied himself with a model of a mine pump in 1763.

Not until 1781 did Watt introduce the "sun-and-planet" device that turned the reciprocating motion into one of revolution and converted the mine pump into a steam engine suited for varied industrial purposes. Thus, for fifty-two years the mine pump led the way in the utilization of steam for power purposes. In 1769 came the discovery that steam could be used expansively and in 1782 a patent was issued to Watt covering its use in this manner. In the same year he developed the use of steam by applying it to both ends of the cylinder. From then on the mine pump became an engine for a multitude of industrial uses. Thus is the mine pump father to the factories and the factory systems of the world.

The work of pumping, with reciprocating motion, which is most economically performed at a low rate of speed, just suited the gait of the single-acting atmospheric engine with condensation provided first of all by conducted heat, and then by a spray which lowered the temperature of the cylinder walls and made the action of the piston slow. The work of pumping seemed to be ideally adapted to steam power. It was often proposed, it is true, to use the steam engine to drive mills, but how? By raising water and using the water to turn a wheel. Denis Papin, as far back as 1690, proposed this use of his embryonic invention.

But when we celebrate the mine pump as the father of steam engines, we must not forget how much mining has owed to the mine pump. Without any satisfactory data to back the statement, it may be asserted without fear of contradiction that little of the coal in Europe and 50 per cent of the coal now being mined in America would have to remain underground if there were no mine pumps. There are large areas in mines that are roughly described as self-draining which are dependent on the mine pump for their development and operation. With what difficulty would coal operations be conducted if it were not for this necessary adjunct of coal mining?

Service and Servitude

IN THE three-hour debate between Governor Allen and Samuel Gompers on the rights of the public and of the union members in labor disputes the paramount question was propounded by the Kansas executive thus:

"When a dispute between capital and labor brings on a strike affecting the production or distribution of the necessaries of life, thus threatening the public peace and impairing the public health, has the public any rights in such a controversy, or is it a private war between capital and labor?"

Mr. Gompers did not give a satisfactory answer to this question. In fact he carefully evaded it, directing his efforts to proving that abridgment of the right of men to quit work made slaves of them.

After an interval of ten days Mr. Gompers gave out a carefully-prepared supplementary reply. In this, however, particularly for such an earnest, forthright spokesman, Mr. Gompers was scarcely any more satisfactory than in the debate with Governor Allen, being still insistent that "the public has no rights which are superior to the toiler's right to live and defend himself against oppression."

The fundamental issue is not the right to quit but the right to strike—matters apparently similar but actually different.

The inference that Mr. Gompers draws—that any man would or could be forced to work against his will—is peurile. The right of any man to quit work at any time is unquestioned. Carefully-planned strikes like those of the railroad switchmen and coal miners are another matter. Impending paralysis of industry, threats of starvation and freezing, intimidation of those willing to work, unless the demands of labor leaders are met, are what Governor Allen seeks to prevent.

By such methods the public is made an unwilling accessory to as vicious a conspiracy in restraint of trade as the Sherman anti-trust act was ever invoked to suppress. Through appeal to the primary instinct of self-preservation the consumer is enlisted as an unwilling but potent ally, who to prevent a calamity must bear the burden of the cost.

Commission Takes Drastic Steps to End Coal Shortage East of Mississippi River

New England Given Preference and Priority in Transportation of Coal to Tidewater—J. J. Storrow Named as Consignee—Open-Top Cars Denied to All Commodities Except Coal for Thirty Days

EFFECTIVE June 24, the Interstate Commerce Commission has ordered that coal for New England shall have priority in transportation. The order was issued June 19. With that order came another providing for the preferential use of open-top cars for coal loading. The latter order became effective June 21 and is to continue for thirty consecutive days.

EMBARGO ON COAL EXPORTS WAS FEARED

While considerable relief is felt that the commission did not order an out-and-out embargo on coal exports, it is believed that a modification of the priority order will have to be made in the very near future. With the Shipping Board order assigning 500,000 tons of additional shipping to the New England coal trade and with the priority order insuring the prompt loading of all vessels which are made available, it is expected that great congestion will ensue at New England ports. It is stated that dock capacity and means of inland distribution are entirely inadequate to handle the volume of coal which is certain to move to New England ports under these orders.

The priority order is the direct result of a visit to Washington of James J. Storrow and five New England governors. In fact, Governor Coolidge of Massachusetts was the only New England governor who was not a member of the party. Massachusetts, however, was represented by Mr. Storrow, who was fuel administrator for New England during the war.

UNSETTLING INDUSTRIAL EFFECTS FEARED

It is feared that the priority order in favor of New England will have dire effects in depriving industries of coal. Carrying out of the New England order may shut down a large proportion of byproduct coke ovens. Textile mills are almost certain to have to close, along with many other industries which secure their coal from the regions which will be drawn upon most heavily by New England.

It was a great relief to coal men when the New England order was accompanied by instructions to give coal mines first call on open-top cars. This will insure an adequate car supply at most mines and is expected to bring out the maximum production during the period of the order. It is understood, however, that the thirty-day period will be extended if conditions warrant.

The order, of course, has called forth tremendous protest from other industries using open-ton cars. The constructional industries are particularly vehement in their representations. The housing situation is such as to have resulted, it is asserted, in a nationwide demand for the government to embark in the construction of houses, so as to insure shelter for the population.

During the war, it is pointed out, constructional materials were placed at the bottom of the preferential list. Since then, the Interstate Commerce Commission is informed, cars have been available to handle only ten per cent of the building materials offered for transportation. Second to the pressure being brought against any further curtailment of cars available for building materials, it is the demand that road construction be allowed to continue. Because of congestion on the railroads, highways are being used to an unprecedented extent, and have come to form a transportation channel second only to the railroads themselves. To cut off materials for their maintenance and extension is only to aggravate the situation still further.

Other industries using open-top equipment are working tirelessly to have set aside the preferential assignment of open-top cars for coal. The commission is being told that cars are not used efficiently in the coal trade. Even an aeroplane has been employed from which to make photographs of long lines of coal cars which have been standing for long periods under load. Figures are being gathered at many points to show that coal cars are neither promptly loaded nor unloaded.

COMPLETE TEXT OF THE PRIORITY ORDER

The text of the Interstate Commerce Commission's service order No. 6, which covers priority for New England coal, reads as follows, in its entirety:

It appearing in the opinion of the commission that because of a shortage of equipment and congestion of traffic, aggravated by unfavorable labor conditions which continue to exist upon the lines of each and all common carriers by railroad within official classification territory and Southern classification territory subject to the Interstate Commerce Act, and further because of the inability of said common carriers properly and completely to serve the public, and especially in the matter of transportation of bituminous coal to New England, an emergency exists which requires immediate action, particularly with respect to the transportation of bituminous coal to tidewater coal transshipment piers at and north of Charleston, S. C., for transshipment by water to coastwise points within the United States:

It is ordered that the common carriers by railroad hereinbefore described be, and they are hereby, authorized and directed, effective June 24, 1920, and until the further order of the commission, in the transportation of bituminous coal consigned to any tidewater coal transshipment pier at or north of Charleston, S. C., and in the supply of cars therefor, and in the movement of such traffic, (a) to give preference and priority to carloads of such coal consigned to James J. Storrow, whose address is Boston, Mass., as a part of a pool or pools of bituminous coal at any such port for transshipment by water to any New England coastwise destination, or consigned as a part of a pool or pools of bituminous coal at any such port for transshipment by water to any United States coastwise destination other than New England; and (b) to furnish transportation of bituminous coal and cars therefor, consigned to any of said ports either for bunkerage or for cargo purposes, only upon a permit and direction therefor issued by J. W. Howe, commissioner, Tidewater Coal Exchange, Inc., New York, for piers within New York Harbor, Philadelphia, Pa., and Baltimore, Md.; by E. I. Ford, commissioner, Newport News Coal Exchange, Newport News, Va., for piers at

Newport News, Va.; by E. M. Graham, manager, Lamberts Point Coal Exchange, Norfolk, Va., for piers at Lamberts Point, Norfolk, Va.; by S. T. Snead, commissioner, Sewells Point Coal Exchange, Norfolk, Va., for piers at Sewells Point, Norfolk, Va.; and by Frank McCabe, general agent Southern Railway Co., Charleston, S. C., for piers at Charleston, S. C., each of whom is hereby designated as an agent of the commission therefor; which permit and direction shall be issued only upon a showing that the destination of the water movement of such coal is a United States coastwise point, or if otherwise that the preference and priority hereby directed will not be impeded thereby, and in any event that the shipper or consignee will be able to unload such coal at the port of transshipment without delay to the rail equipment.

It is further ordered that each of said common carriers by railroad shall establish such rules and regulations respecting the placement of cars for unloading and of vessels for loading at such piers as will effect the preference and priority in transportation hereby directed, including the dumping of cars.

Terms of the Preferential Order on Cars

Service order No. 7, in regard to the preferential use of open-top cars for coal, reads, in full, as follows:

It appearing in the opinion of the commission that because of a shortage of equipment and congestion of traffic, aggravated by unfavorable labor conditions which continue to exist upon the lines of each and all the common carriers by railroad subject to the Interstate Commerce Act within the territory east of the Mississippi River, and because of the inability of said common carriers properly and completely to serve the public in the transportation of coal, an emergency exists which requires immediate action:

It is ordered that such common carriers by railroad in the aforesaid territory which serve coal mines, whether located upon the line of said railroad or customarily dependent upon it for car supply (herein termed coal-loading carriers), be and they are hereby, authorized and directed for the period of thirty consecutive days beginning with June 21, 1920, to furnish such coal mines with open-top cars suitable for the loading and transportation of coal (herein termed coal cars) in preference to any other use, supply, movement, distribution, exchange, interchange, or return of such coal cars, provided that such coal cars may be used in service moving in the direction of the mine or mines to be supplied on the return movement, after the discharge of the coal lading thereof, upon a route not materially out of line and to points not beyond such mine or mines.

It is further ordered that all common carriers by railroad within said territory other than coal-loading carriers (herein termed non-coal-loading carriers) be, and they are hereby, authorized and directed during said period to deliver daily to a connecting coal-loading carrier or carriers empty or loaded coal cars up to the maximum ability of each such non-coal-loading carrier to make such deliveries and of each such connecting coal-loading carrier to receive and use the coal cars so delivered for the preferential purposes herein set forth.

It is further ordered that all such common carriers by railroad within said territory be, and they are hereby, authorized and directed forthwith and during said period to discontinue the use of coal cars for transportation of commodities otherwise than as hereinbefore specified (a) as to each coal-loading carrier, so long as any coal mine remains to be served by it with coal cars, and (b) as to each non-coal-loading carrier, so long as deliveries of any coal cars to connecting carriers may be due or remain to be performed under the terms of this order.

It is further ordered that all common carriers by railroad within the territory hereinbefore described be, and they are hereby, authorized and directed, effective June 23, 1920, and until the further order of the commission, to place an embargo against the receipt of coal by any consignee, and against the placement of coal cars for consignment to any consignee, who shall fail or refuse to unload coal placed for unloading within twenty-four hours after such placement, until all coal so placed has been unloaded by such consignee, provided that this authorization and direction shall not interfere with the movement of coal under permit to any coal pool or pools when authorized by any order heretofore or hereafter entered by the commission.

It is further ordered that all rules, regulations and practices of said carriers with respect to car service are hereby suspended in so far only as conflicting with the directions hereby made; and that the authorizations and directions herein contained are to be considered as not conflicting with or superseding any service order heretofore entered by the commission.

Northwest Asks for Lake Car Priority Order

W. H. Groverman, for Northwestern Dock Interests, Says Assigned Cars Are Essential to Supply Coal Required

FEARING that the arguments of the five New England governors might induce the Interstate Commerce Commission to divert coal to New England at the expense of the Lakes, W. H. Groverman, secretary of the Northwest Coal Operators' Association, presented the claims of the Northwest immediately following the representations made by the New England interests. He told representatives of the Interstate Commerce Commission that the matter of securing coal for the Northwest is much more urgent than the problem which confronts New England, since the Lakes are open for traffic an average of only 165 days per year. One-third of the season of navigation has passed and only an insignificant proportion of the coal needs of the Northwest has been transported. Mr. Groverman delivered to Commissioner Clark what he termed the ultimatum of the Northwest, which was a demand for assigned cars for Lake shipments so as to insure 100-per cent car supply for the mines supplying this fuel.

Lake Supplies Far Below Requirements

On June 1 only 1,800,000 tons of coal had been dumped at lower Lake Erie ports. On the corresponding date of last year 5,225,000 tons had been dumped. Moreover last year a surplus of 2,000,000 tons was left on the upper Lake docks at the close of winter. The coming of spring this year found those docks entirely bare of coal and they are still bare. The 250,000 tons which have reached Lake Superior ports passed immediately to consumers. The same is true of the 150,000 tons which were moved to Lake Michigan ports. These figures do not include, of course, shipments made for the account of steel and copper companies.

Mr. Groverman pointed out to Commissioner Clark that it is physically possible to move the requirements of the Northwest after July 1 but that it is inadvisable to delay the movement of this coal a single day. Mr. Groverman estimates the requirements of the Lake Superior commercial docks for the coming winter at 15,000,000 tons and those of Lake Michigan at 8,000,000 tons. This is in addition to the tonnage required for the industrial docks.

There is no demand in the Northwest for an embargo on the exports of coal. It is felt that New England should be willing to take its coal later in the season, if necessities require, since with two or three insignificant exceptions the New England ports do not become icebound. Moreover it was pointed out that New England already is a month in advance of the average year in the matter of fuel stocks.

How the Valier Shaft Mine Was Quickly Developed for Large Daily Output—I

Ultimate Production Will Be Eight to Ten Thousand Tons Per Day—Coal Is Hoisted in 15-ton Skips the Coal Being Dumped Out of the Mine Cars Near the Foot of Shaft by a Two-car Rotary Dump

By Carl Scholz
Charleston, W. Va.

SAFETY, conservation and economy were the three cardinal objectives which the owners of the property sought, when I was placed in charge of this new development, to have embodied in the Valier Mine of Franklin County, Illinois. To be more detailed, the ends sought were safety for the men and property above all else, conservation of the coal supply (meaning a maximum extraction) with an equipment that would permit of the greatest economy and provide a large daily production.

The company owns the coal rights on some 13,000 acres of land which is underlaid with the No. 6 bed. This seam ranges in thickness from 8½ to 12 ft. and lies at a depth of 620 ft. The coal is of quality as high as any found in Illinois, and the fuel requirements of the Chicago, Burlington & Quincy R. R. Co.'s fuel are largely supplied from this field. All the existing conditions called for a mine with a large production—large even for Franklin County, where more mines of big output are now located than in any other equal area in the United States.

The mine site lies on the southward side of a ridge the crest of which is one mile north of the town of Valier, which occupies the opposite hillside. The slope

Plant of Valier Mine

On the right is the tipple of the airshaft; in the center, the track-scale house and transformer station; in the background, the shops, and on the left, the office building.

Temporary Tipple

Rough structure built over main shaft and used for the hoisting of coal till the airshaft was lined. The hoist used for sinking served temporarily for winding, and a temporary skip transported the coal.

affords natural drainage and grade for the railroad yards, while the town site also is favored with exceptional drainage for a flat country. Power for operation is purchased. This solution of the power problem was largely influenced by the absence of a suitable water supply.

Shaft sinking was started in September, 1917, and the coal was reached in May, 1918. The shafts were temporarily curbed with wood, but were later lined from top to bottom with well reinforced concrete lining, varying in thickness from 8 to 26 in., this thickness depending upon the nature of the strata penetrated.

MAIN SHAFT TO PRODUCE 6,500 TONS PER DAY

As soon as the bed was reached in the main shaft, hoisting of coal was started, the sinking engine by means of which the shaft had been sunk and a temporary skip being used for that purpose. Simultaneously the airshaft was receiving its concrete lining and being equipped with a tipple and permanent hoist. This hoist was put into service on Nov. 1, 1918. The main shaft was then concreted and equipped with permanent machinery. This permanent equipment was put in service on Oct. 1, 1919, and prior to the strike which commenced Nov. 1 of that year a production of 3,000 tons per day was attained. Up to the present date the maximum output has been 3,500 tons per day, but by the end of the present calendar year the production will have risen to 5,000 tons. The normal production of the mine is to be about 6,500 tons per day, although by hoisting from both shafts, 8,000 or even 10,000 tons of coal can readily be raised with the equipment and track layout available.

Considering the serious obstacles encountered, such as the severe winter of 1917-18, the shortage of men arising from the army draft and the "flu" epidemic, also the difficulties in obtaining material, it is believed that this mine has reached a larger tonnage in less time than has heretofore been attained in the district.

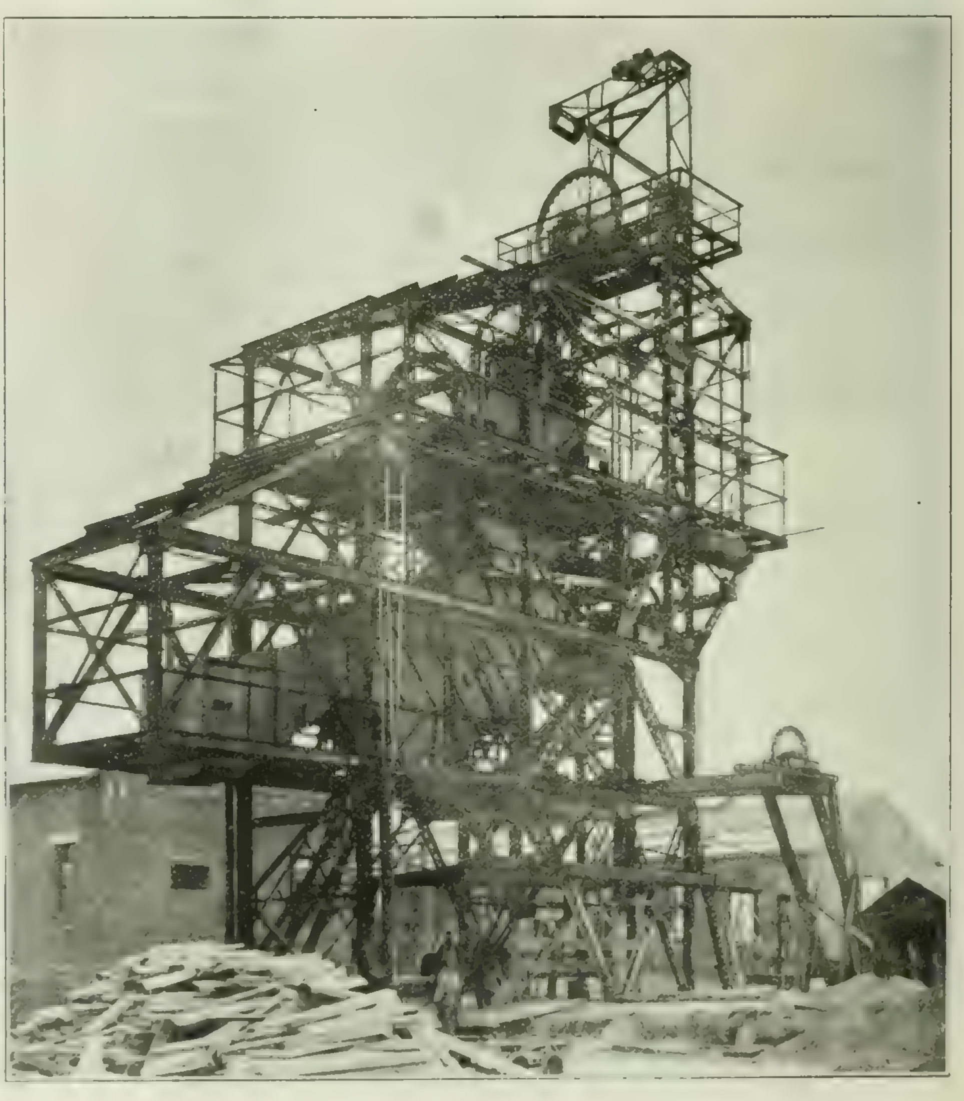
While no radical departures were made in the way of equipment and methods, the plant as constructed represents machinery of the most modern type, and it is believed that it will be economy to extract at least 6,000 acres of coal through the shaft. The accompanying illustrations show the mine in its various stages of development. In the brief description of the plant which now follows special attention is called to the exclusive use of steel, concrete and brick, both in the surface structures and underground.

MAIN SHAFT BIG ENOUGH FOR TWO 15-TON SKIPS

The dimensions of the main shaft are 11 x 19 ft. in the clear. It is built with two compartments each large enough to accommodate a 15-ton overturning skip. The guides are 85-lb. track rails. Those which are at the sides are bolted directly to the end walls, while those in the center are supported by pre-cast concrete bun-

Tipple Airshaft

This sturdy headframe was built of old bridge steel on account of the high cost and scarcity of iron products during the war period. The photograph from which this illustration was made was taken when the tipple was still under construction. The shaft is 13 x 30 ft. in the clear and has four compartments. It had to be built wide enough to accommodate mining machines, electric locomotives and the standard Valier mine cars, which are 10 ft. 9 in. long.



tons. At the bottom of the shaft is located a two-car rotary dump, the coal being spilled directly from this into the skips, its flow being directed by a butterfly valve. The sump extends some 50 ft. below the level of the coal and is equipped with a conveyor for the removal of waste, as well as with a small pumping station.

The airshaft is 30 x 13 ft. in the clear and contains four compartments. The air compartment, 9 ft. wide, is separated from the others by a 12-in. concrete wall so that ventilation of the mine can be effected through the airshaft, allowing the main shaft to remain entirely neutral. A steel stairway occupies the second compartment. A single-platform cage counterbalanced by a two-story hoisting cage, on which men and counterweights can be handled, is installed for the hoisting of men and material and also can be utilized for the hoisting of coal.

First-Aid Station

A corner of the bathhouse has been set apart for a first-aid room which is simply but appropriately equipped for the reception of anyone who may be injured about the plant.

Washhouse Interior

Here is seating room for 500 mine workers and clothes hangers for some 600 men. Note the "bubbler" over against the wall to supply drinking water to the thirsty and three wash troughs for those who desire only partial ablutions.

Shaft Will Accommodate Locomotives

The shaft was made as wide as 13 ft. because it had to accommodate long mine cars and locomotives. The equipment and cages are heavy enough to permit the hoisting of motors, mining machines and other machinery to the surface shop without dismantling. In this shaft are also installed the necessary pipes for water and air as well as electric cables. The signal wires in both shafts are installed in 3-in. pipes imbedded in the concrete lining. They are thereby protected from injury should any material or other objects fall down either of the shafts.

Surface Buildings Substantially Built

The tipple at the main shaft is a 5-track steel structure. It is equipped with a large hopper from which the coal is discharged by means of a feeder to the shaker screen. Two picking tables and loading booms are provided for the handling of lump and egg. The tipple also contains a coal crusher and a box-car loader.

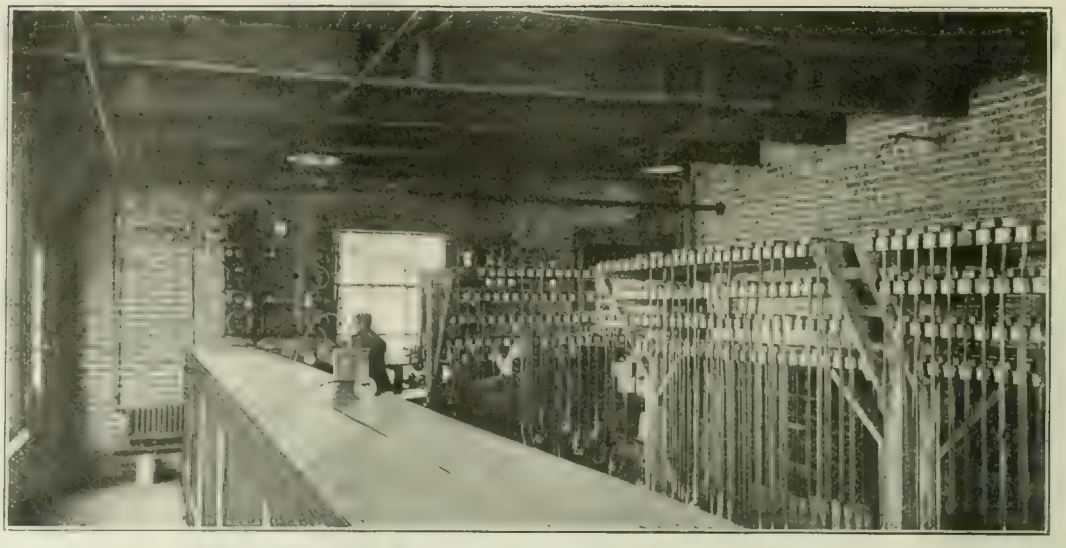
The airshaft tipple is a two-track structure, equipped with a bar screen and 50-ton hopper and contains a single-car rotary dump. It can be utilized for the hoisting of coal for local sales as well as for the raising of rock, but is primarily intended to handle the men and materials to and from the mine.

The other surface buildings are built of brick and roofed with asbestos shingles. They have been located with a view to serving their purpose most conveniently. They are so placed that increases in sizes can be made should the expansion of the mine require it. All buildings are heated by steam supplied from the washhouse boiler.

The washhouse, with a change room accommodating some 600 men, is equipped with overhead clothes hangers and comfortable benches. It is well heated and venti-

Lamphouse

Valier mine lies 630 ft. or more below the rolling prairie and so it makes gas. A lamphouse has been constructed as an adjunct to the bathhouse and here 800 electric safety lamps are housed and tended.



lated and provides a most convenient place wherein employees may wash up and change their clothes. The two shower rooms, separated from the main change room, are equipped with twenty shower baths. The washhouse also contains a foreman's office, with showers and lavatories; a timekeeper's office where employees are checked in and out of the mine; a lamp house containing some 800 storage-battery lamps and a first-aid room.

Completely Equipped Repair Plant Provided

The machine and repair shop, 35 x 100 ft. in ground plan, is equipped with the necessary tools for repairing mining machines and locomotives. A 35 x 100 ft. warehouse has been constructed. This is provided with a track running through the center of the building and leading directly to the shaft. The office building has the necessary accommodations for the general office force and engineers.

The fan house contains a 5 x 14 ft. fan driven by a 250-hp., 2,300-volt motor as primary drive and a steam engine connected by a clutch to keep the ventilation going in case of power trouble.

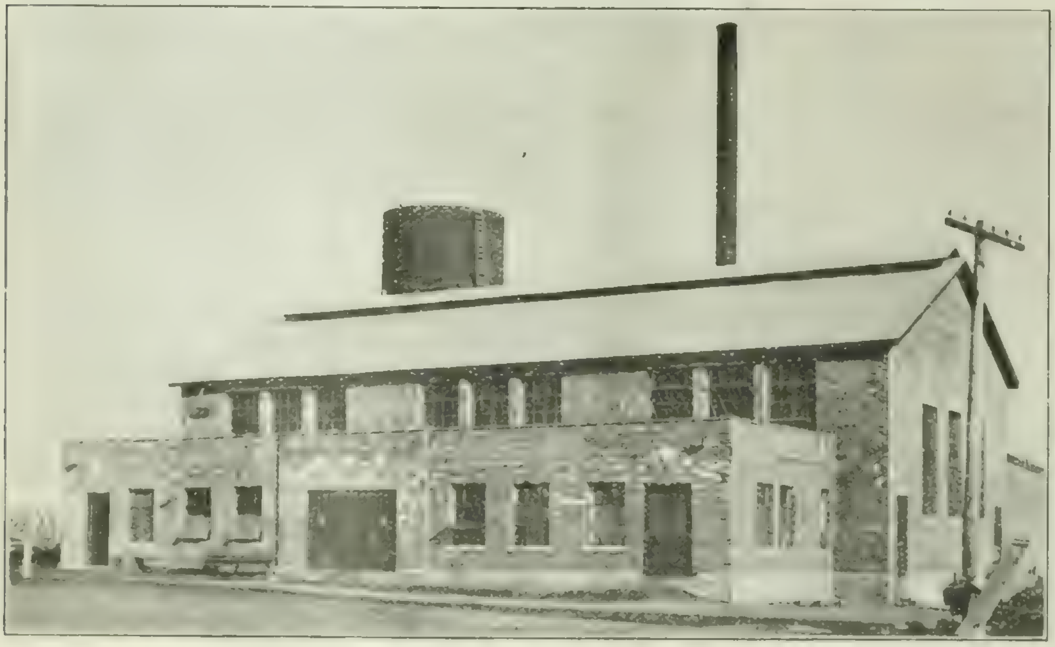
(To Be Continued.)

Governor Does Not Want Troops at Matewan

SENATOR JOSEPH I. FRANCE, of Maryland, having introduced in the Senate on Friday, June 4, a resolution calling upon the President to consider the advisability of sending Federal troops into West Virginia "to suppress domestic violence and prevent civil conflict," Governor John J. Cornwell, of West Virginia, in a telegram told Senator France that his impudence was exceeded only by his ignorance of the Federal Constitution.

At the same time that the Maryland Senator introduced his resolution he asked that it be allowed to lie on the table so that he could call it up for the purpose of making a speech on what he termed were the conditions existing in West Virginia. Data for the speech he was to deliver were furnished, it is charged, by the United Mine Workers.

Following the trouble at Matewan, W. Va., the United Mine Workers called upon the War Department and the Department of Justice to interfere. When the miners were told that no report of a dangerous situation had been received and that troops could not be sent into West Virginia unless the Governor of the State requested it, representatives of the miners became highly incensed at the Department of Justice.

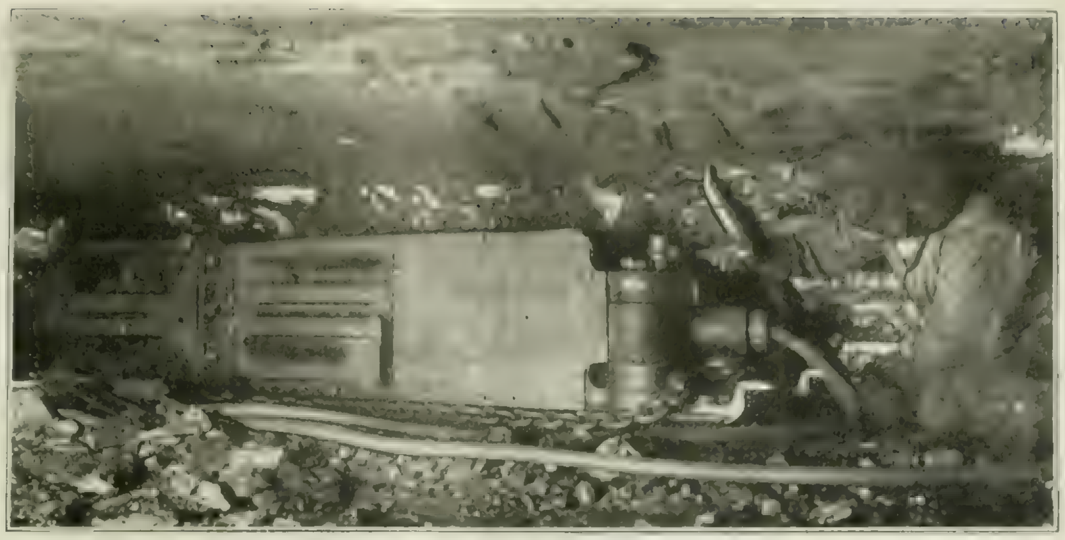


Washhouse

This building contains two shower rooms each with twenty shower baths, hooks for 600 men, a foreman's office, a lamp-charging and first-aid station. Illinois has a number of excellently-appointed bathhouses. In that state the mine workers nearly all bathe and dress before they leave the plant.

A Tight Place

If we could get shoveling machines into the narrow passages and low head room into which we can get our undercutting machines, a larger field would be opened for their operation, especially in the British Isles, where this picture was taken.



Economy and Safety Are Secured by Use of Alternating-Current Coal Cutters

Savings in Equipment Cost, in Power Expense and in Maintenance Charges as Well as Greater Safety Accrue from the Use of Alternating Instead of Direct Current for Driving Undercutters

BY CHARLES B. OFFICER
Chicago, Ill

ALTERNATING-CURRENT motors were first applied to continuous coal cutters in America during the fall of 1912. At that time a Sullivan continuous-cutting chain machine fitted with an induction motor was put into operation by the Star Mining Co. at Rugby, Col. Shortly afterward a second machine identical with the first was started by the Gordon Fuel Co. at Walsenburg, Col. These machines differed from the standard "CE-7" equipment in that an induction motor with suitable starting apparatus replaced the direct-current motor with its starting mechanism. The induction motor and the direct-current machine it replaced were of the same rated horsepower.

CONNECTION TO FEED LINES IS READILY MADE BY DROPPING THREE HOOKS OVER THE THREE CONDUCTORS

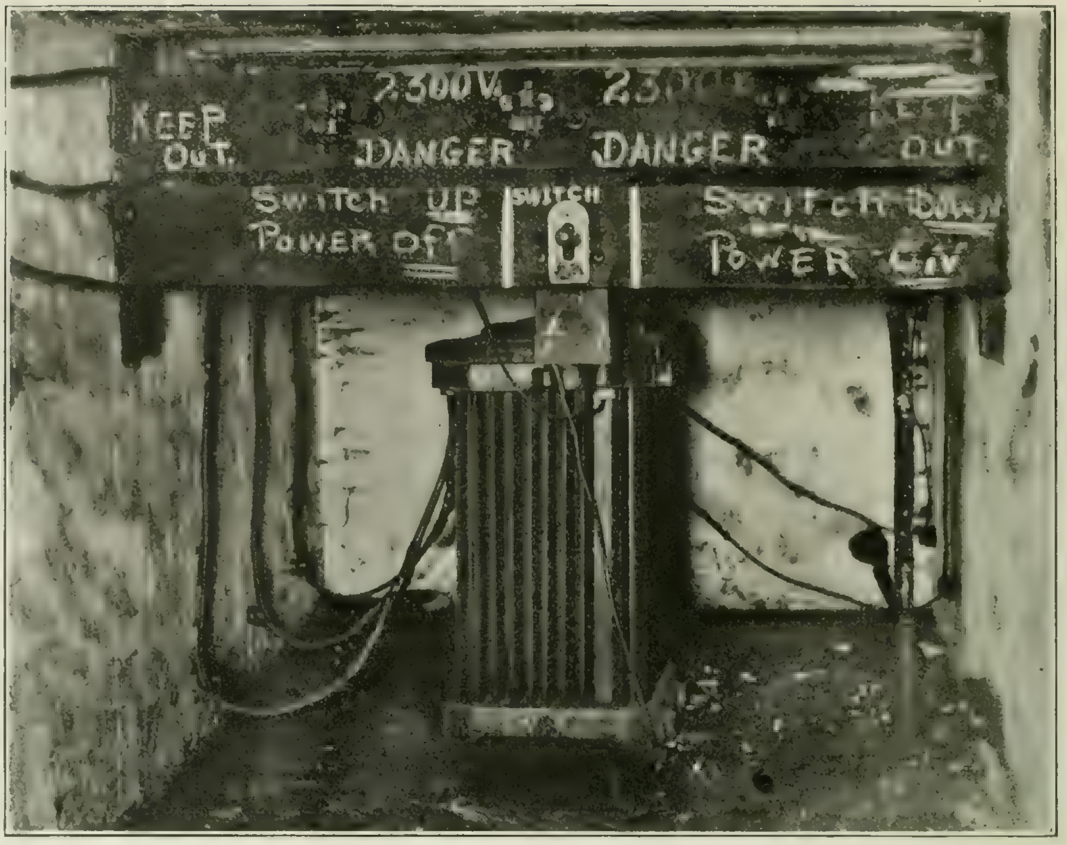
It is just as easy to connect up the cable with alternating current as with direct, except for the fact that there are three contacts to be made instead of two.

From the start the operation of these machines was closely watched. It soon became evident that the application of alternating electric current to coal-cutting equipment was, and would be, successful and economical. Since that time there has been a constant increase in the number of mines which use this form of energy for the operation of cutting machines.

WHY ALTERNATING CURRENT IS FAVORED

The largest single installation employing alternating current underground is at the mines of the Nokomis Coal Co. at Nokomis, Ill. Here thirty-two Sullivan "Ironclad" machines are being operated with 220-volt 3-phase 60-cycle current. The Nokomis Coal Co. was the first in the State of Illinois to use continuous coal cutters equipped with alternating-current motors. It began the operation of these machines in 1913. Since that date the proportion of coal mined in Illinois with alternating-current equipment has increased till now about one-fifth of the coal produced by machines is cut by such equipment.

While there probably are more alternating-current coal cutters in use in the Central and Western States than in the East and South, the satisfaction that the alternating-current machines are giving is leading to their adoption in these older fields in constantly increasing numbers. In foreign lands also alternating-current



An Unpretentious Device

A motor-generator set would make a handsomer illustration, but with alternating-current it is not required. A transformer sunk into the wall of the entry is all that is necessary for stepping down the current. It does its work without an attendant, and does it well. Being so simple, it is inexpensive in first cost, operation and maintenance, readily portable, space saving and in every way desirable.

cutters are increasing in popularity both in longwall and in room-and-pillar mines.

From the above some idea can be gained of the increase in the use of alternating current. The causes that underlie the preference for that form of electric energy are briefly: (1) Saving in initial equipment, (2) saving in operating power charges, (3) greater safety in operation, (4) saving in maintenance expense.

The saving made in the initial equipment cost is the result of the difference between the electrical characteristics of alternating and direct current. It is a known fact that in a 3-phase alternating-current system only 75 per cent of the total weight of copper is required for the circuit that is needed for the installation of a direct-current line of the same voltage and line losses. When the amount of underground wiring necessary for a cutting machine is considered the saving in copper cost alone is an important factor. As it is considered good practice in many localities to run a feed line and use a bonded-rail return where direct current is employed, the statement above should be corrected somewhat, for the figures covering necessary copper refer to a two-wire direct-current circuit.

Excess Copper Used to Offset Rail Return

However, it does not follow that where a bonded-rail return is used a direct-current circuit of this type employs only one-half the copper necessary for a two-wire circuit of the same capacity. The reason for this is that in order to incur only the same power-transmission losses in the circuits it is necessary to install a much larger feed line on the single-wire circuit than is necessary if two wires are used.

This compensates for the larger losses of power in the return side of the circuit, which is composed of bonded rails having a much higher resistance than an all-copper return. It has been found in actual mine practice that a 3-phase alternating-current circuit of the same voltage requires from 5 to 10 per cent less copper than a single-wire direct-current circuit having the same power-transmission losses.

It has been argued in favor of the direct-current installation that in all coal mines some form of haulage system is necessary; up to the present no suitable alternating-current mine locomotive has been designed and it is consequently necessary to use direct current for this purpose. Trolley lines for the haulage system therefore must be installed. Since these lines are necessary, mining machines can be operated from them and it would seem that it would be merely a duplication of expense to install the series of wires necessary for carrying alternating current to the machines.

Lines for Locomotives and for Cutters

This viewpoint is contrary to the best mine practice of today. It has been found by experience that with a mine equipped with direct current only, greater economy has been secured where power lines have been installed for the mining machines independent of those for the haulage motors. The reason for this is that when locomotives and mining machines are on the same power lines the former may draw so much current that the voltage maintained on the mining machine is fluctuating and often low, so that the undercutter slows down and stalls, with resultant loss in coal output. This loss in output more than counterbalances the added cost of a separate power line for the cutting machines.

Not only is the above loss in coal output incurred through having two classes of machines on the same power lines but it has been found also that because of fluctuating voltage the repairs to the cutting machines are increased. This means further loss of production. From the above, the desirability of using independent circuits for haulage and cutting is apparent.

There is, moreover, an additional saving to be made with alternating current. This arises from the fact that by its use it is possible to carry energy at high potential, with a corresponding saving in copper, close up to the point of application and there transform it to a lower voltage suitable for the machines installed.

Can Bring High Tension Near Working Face

This latter economy can be secured in either of two ways—the high-tension current can be carried underground and stepped down to a voltage suitable for the machines at transformer stations, placed within 500 to 1,500 ft. of the face, or the transformer stations may be placed on the surface and low-tension conductors dropped through boreholes to the working face.

In this latter case the transformer stations above ground should be moved forward from time to time as the face advances. In most installations the transformers will be so proportioned as to reduce the voltage to between one-fifth and one-tenth of its original value. Since the weight of copper required for a circuit is inversely proportional to the voltage carried, the saving that can be made in copper expense by the use of these transformers is at once evident.

The second main reason for the growing preference for alternating-current mining machines lies in the cost of producing power. A saving may be made here through the installation of a central power plant for several mines or by the purchase of power from a central generating station. In a large power plant economies of operation can be realized which are impossible with smaller operations. The nature and method of securing these savings have been reviewed so many times at length in the various technical journals that no necessity exists for going into details regarding them.

The ease with which alternating current can be transmitted long distances and transformed with only slight losses renders possible still further savings. A direct-current plant does not lend itself to easy and efficient transformation of voltage and precludes long transmission at high potential. Moreover, the use of direct current necessitates a substation with rotary converters, or motor-generator sets, which always require attendance, whereas with an alternating-current installation the transformer requires no attention.

The third consideration favoring alternating current as against direct is the greater safety attained in operation. In comparing the safety of a direct- with an alternating-current circuit it is necessary to remember that in all parts of the direct-current system there is always a difference in potential between the line and the ground equal to the voltage carried. Should anybody come in contact with the feed line or any part of a live direct-current circuit, he would be subject to a shock from a current of this potential.

Proper Grounding Reduces Shock Liability

On alternating-current installations when the secondary side of the circuit is not grounded it is necessary for a person to come into contact with two out of three wires in any part of the circuit before he would receive a shock. He would then receive the same voltage that he would from a direct-current system. Where alternating-current systems are properly grounded there exits between either of the live wires and the ground a difference in potential equal to approximately one-half the voltage of the full line circuit. This cuts down by 50 per cent the shock which can be received by making

USING A SHORTWALL ALTERNATING-CURRENT COAL CUTTER IN A THICK SEAM

Note the cable in the rear of the machine by which three conductors without any complication bring the electric energy to the induction motor. The connections are quite simple and readily made. The mine in which the photograph for this illustration was taken is located at Nokomis, Ill.

contact with this wire and the ground. Moreover, when alternating current is used it is possible to carry the wire through air courses or passageways seldom frequented by the men.

With an alternating-current circuit also, since the size of each wire is considerably less than that required on a direct-current circuit and it is possible to employ insulated conductors, it is the general practice to install insulated cables. This secures a still greater degree of safety and favors alternating-current.

The fourth item tending to make an alternating-current installation preferable to one employing direct current lies in the saving made in maintenance expense. As far as the mechanical end of the cutting machines is concerned, the cutter bar, feding mechanism and gearing are identical with those employed in the direct-current machines.

The difference in construction consists merely in replacing a direct-current motor with one utilizing alternating current. The alternating-current motor lacks the commutator, brushes, resistance coils, etc., that a direct-current motor requires. The necessary repairs and renewals on such parts are therefore eliminated. In fact, a well-designed induction motor is extremely simple and durable.

OVERLOADED, THE A.-C. CUTTER WILL STALL

The operating characteristics of an induction motor (in comparison with those of a direct-current machine) are such that less severe stresses are thrown by it upon the mechanical parts of the undercutter. With a direct-current motor should the voltage fall any considerable amount, or should the operator of the machine be careless and run the cutter with full bits the motor will continue to drive the cutting mechanism at reduced speed, putting heavy and excessive stresses on all parts of the device.

When similar conditions arise with an alternating-current installation (that is, either a voltage drop or the existence of a great number of dull bits in the cutter chain), thus placing an excessive load on the motor, it will stall, calling to the runner's attention the fact that there is either something wrong with the voltage or that he needs to reset his cutter bits. It naturally follows that at all times the bits are kept in fair condition, thus preventing excessive stresses from being thrown on the mechanism. It has been found also in operating cutting machines of either the direct- or alternating-current variety that when the runners keep their cutter chains always properly filled with sharp bits, they increase their cutting capacity, with a corresponding increase in the daily coal output.

LOW INSTALLATION COST AN ADVANTAGE

The induction motor is a much more nearly constant-speed machine than is a direct-current motor. When conditions are encountered in mining that put a heavy load upon the undercutter the slight reduction in speed caused thereby gives an increased torque to the motor, thus enabling it to carry the overload up to a certain limit. Once this point is passed, however, the motor stalls.

To sum up, alternating current for driving coal cutters is growing in favor. This is due to its lower initial cost for installation, the saving its use makes possible in operating expense, in power and in maintenance, as well as an increased factor of personal safety which its use renders attainable.

Ed. Snyder Found An Accessory to Murder

THE case of the state against Ed Snyder, charged with complicity in the shooting up of a party of miners at Glen White mines in Raleigh County, West Virginia, in November, 1917, was put on trial in the Circuit Court of Pocahontas County on Friday, June 4, the case having been removed to Pocahontas County from Beckley, Raleigh County. The first day was taken up in hearing the motion of the defendant for continuance, which was overruled by Judge Summers H. Sharp; but little time was taken up in getting a jury.

The opening for the state was made by Captain S. B. Avis, of Charleston, and for the defense by W. G. Barnhart, former U. S. Attorney, also of Charleston. The case grew out of the shooting at a cage full of miners, as they came from their work in the mine at Glen White. A party of men ambushed on the mountainside nearby fired hundreds of shots at them, but no one was hurt. A number of the men implicated have been convicted or have confessed.

The charge against Snyder is that, in the fall of 1917, when the government was requiring that every coal mine produce its limit of coal or be taken over by the Fuel Administration, he planned and furnished the arms and ammunition for the ambuscade, though he was not one of those who actually took part in the shooting.

A strike had been called at the Glen White mine and 50 of the 400 miners employed had quit work, but the mine continued to turn out its full quota of coal. The Fuel Administrator refused to interfere and the strikers then resorted to force and violence, and the bushwhacking party of Nov. 16, 1917, was the result. Snyder was an officer of the local miners' union, which called the strike.

More than a year went by before sufficient evidence could be found to back indictments which were filed in the Criminal Court of Raleigh County at the March term of 1919. Four indictments were returned, eight men being indicted jointly. The defendants elected to be tried separately and Tony L. Stafford was put on trial. A hung jury resulted, but the second trial in January ended in a conviction of the defendant. He was charged as an accessory before the fact with an attempt to commit murder and a felony. Witnesses estimate the number of shots fired at the miners fleeing from the cage to shelter at as high as 300, yet no one was hit. The distance fired was 900 ft., and the bullet holes were numerous in the buildings around the mouth of the mine. The weapons used were Winchesters, Mausers, shotguns and pistols.

One of the witnesses for the state, Mrs. Maggie Lethco, of Lester, who has been under guard, was attacked at a hotel in Bluefield and stabbed in the left side, the assailant making a wound four inches long, but missing vital parts. She was able to go from Bluefield to Marlinton in a car, but collapsed on getting there and is now in a hospital at Bluefield.

The witness had retired for the night, the guards being in an adjoining room. Two men went up the elevator and knocked at her door. When she opened it the attack was made. Two men are under arrest who are believed to be the assailants.

After a seven-day trial Ed. Snyder was convicted by the jury on the first ballot and ordered to serve a five-year term in the penitentiary. The armed miners who drifted into Marlintown when the trial commenced quieted down when the state police arrived.

How the "Grand Push" Determined Present Character of Pennsylvania Coals

Most Geologists Lay Stress on the Geologic Horizon—This Monograph Deals, However, with What Is Perhaps More Important: the Relation of Quality to Geographic Location

By George H. Ashley*

IF IT was hard for the average doughboy who first saw northern France torn and trampled by war to picture to himself those same regions as they were before the war, how much harder it is for the average man to picture Pennsylvania before the grand shove changed the surface of that great State from a smiling plain to an impassable sea of ridges and that at the same time changed its vast buried swamp deposits, which had been but recently laid down, into many different types of coal!

When the measures over the coal along the line of the Appalachian Mountains were eight miles deep something gave way and the "Grand Push," or pushes, occurred, moving the earth's crust scores of miles, carbonizing coals and distilling shales. Measures near the mountain line folded most and the coal in that region is more completely carbonized.

Let us go back a few years, say 200 odd million—that is the latest and best estimate of the geologists. If that is too much, cut it down to suit suit yourself, only leave a plenty. For a long time, say 75 million years, more or less, a spirit of unrest had been over the land of William Penn. The land lay near sea level, sometimes above, sometimes below. From time to time peace settled over the region, and vast swamps were formed, some of these being scores or hundreds of feet deep. Then the spirit of unrest would set in and the land would sink and be overrun by the sea; at first by the open, salt sea, and later by fresh waters that probably came from some great inland sea lying to the westward. Deposits of mud and sand were carried widespread over the submerged surface, until the filling again reached water level and another vast swamp formed.

This was repeated time and again with all sorts of variations until the district became a graveyard of old swamp deposits which stretched far to the southwestward. At times the land was raised a bit, and running water carried away part of the mud so recently laid down; in places even parts of the marsh deposits themselves were removed. But the general movement was downward, and after each such rise came a sinking and the half-eroded gulleys were soon washed full of sand and the sinking process went on.

But this marshy period was near the close of long ages of sinking, covering hundreds of millions of years, that had been going on through the Appalachian region until the old rock surface had been bowed down in places as much as 40,000 ft. in a long belt where now stand the Appalachian Mountains. During this time the filling in with new rock material had about kept pace with the sinking until the whole mass had been blanketed with the buried swamp deposits.

Then came the grand push! Just what happened or how it happened I shall not attempt to describe, but after such a great accumulation of rock material something was bound to happen. You cannot stretch a rubber indefinitely, nor can the earth's crust sink indefinitely at one place without upsetting the crustal balance. The conditions might be likened to the collapse of a long, low, arch bridge. Not suddenly, though probably with endless earthquakes, the part of the earth eastward from Pennsylvania began a grand push on the part of the earth's crust to the westward. How long the push lasted I do not know, but probably for millions of years.

When the push was over what a sight was there! In place of the great wide stretching plain or the shallow sea there was now but a sea of ridges. The whole surface of the earth had been shoved northwestward scores of miles and bent into folds that made ridges that may have dwarfed any of the mountain ranges now to be seen in America. It is possible or probable that the push took so long that the ridge tops were eaten down as they rose, and never became nearly as high as they would have been had the uplift been made suddenly.

The rocks and marsh deposits, the latter now changed to coal beds, were more strongly affected at the east and less strongly at the west. The rocks at the east were, so to speak, in the front-line trenches. In fact, along what is now the Allegheny front, just west of Williamsport, Lock Haven and Altoona, the rocks seem to have made a final stand as if, to carry through the simile, their "backs were to the wall." West of that line the rocks were crowded back on themselves and slightly folded, but in general held their places. This line of holding is nearly straight from Alabama to central Pennsylvania, at which point it turns eastward. The northeastern part of Pennsylvania appears to have formed a hinge or buttress that held in place. Whether the rocks there were more resistant or whether the force of the push had lost its energy, which had been expended further south, I do not know.

Then came a long period of quiet, through what has

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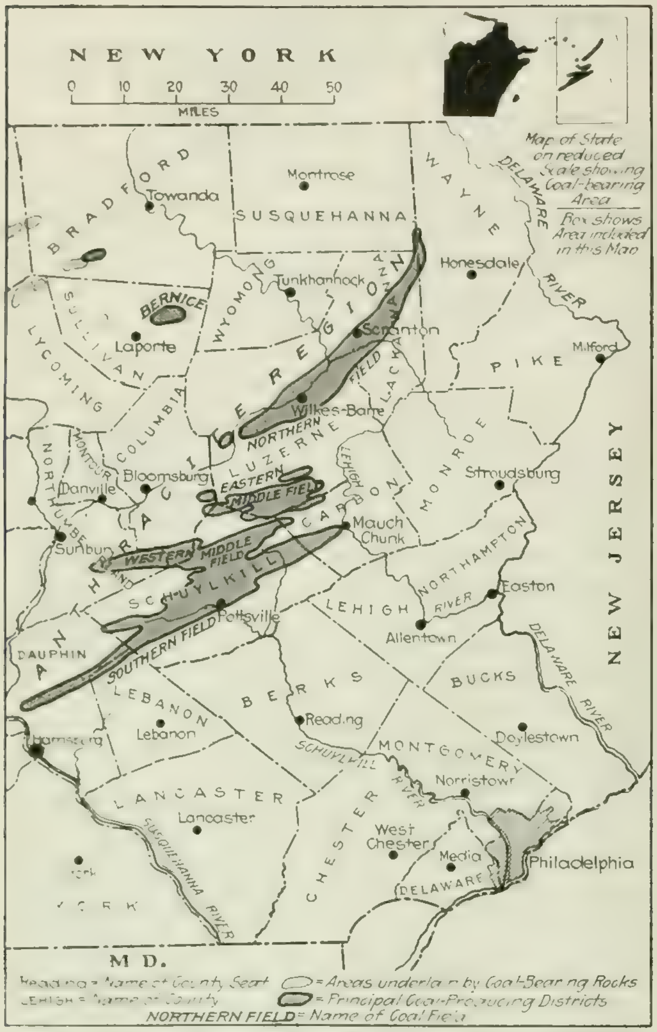
*State geologist of Pennsylvania, formerly geologist in charge of coal investigation in Eastern States, U. S. Geological Survey, and one time chairman Coal Classification Board of the same Survey.

The illustrations in this article are taken from one of a series of state maps of the U. S. Geological Survey. There are nine of them and the price is 10c. a piece. The maps are, of course, larger and more detailed, giving not only the coal areas, towns and counties but the villages and railroads also.



COAL FIELDS OF EASTERN PENNSYLVANIA

All the coals mined in this section of the State have some title to be known as anthracites, though in some of them, notably those in the Bernice basin and on the horns of the Southern and Western Middle Fields, which extend west, the coal is a soft anthracite which Mr. Ashley designates as "Bernicite," after the field of that name. Pennsylvania was at one time covered with coal and she might bring action for trover against the other states which apparently have stored away acres of her coal in places unknown.

been called the Age of Reptiles, during which time such great reptiles as are shown in the Carnegie Museum at Pittsburgh, and in all of the other large museums, roamed the earth. During this time the mountain ranges were being eaten down by rain and running water, until Pennsylvania was again a great rolling plain. But in this eating away of the mountains the rocks were carried away by the cubic mile, including a large part of the coal beds laid down there such a short time before. Here and there a little coal escaped, being carried away because it lay in the bottom of a fold that had been folded below the level of the new erosion plain. It was thus that the coal in the anthracite fields, the Bernice and the Broad Top fields, escaped being carried away and remains to this day.

What has become of the rest of the coal? The fixed carbon and the volatile matter returned to the air, and the ash washed down the rivers. When Washington marched to Fort Pitt, Pittsburgh, the Pittsburgh and other coal beds of that region were being carried away by rain erosion, but probably none of those coals ever reached the Ohio River in such form as to be recoverable. Coal outcroppings which occur along or across the bed of a creek having a steep profile may be recognized as "float" for a few hundred feet below the outcrop, but seldom more than one-fourth of a mile. It may therefore be put down as fairly certain that this coal removed long ago has not been accumulating somewhere waiting for someone to come to dig it up.

After the upfolded ridges had been eroded nearly to a plain, over which rivers flowed southeastward to the sea, there came a broad movement of uplift centering in the Appalachian region. As the land rose the rivers became more active, and continued to eat their way downward, chiseling their old channels across the hard layers which now form the ridges, while side branches of the main rivers cut out the softer layers, until central Pennsylvania became again a sea of flat-topped ridges of hard sandstone, separated by wide valleys where the rocks were shales of limestone, until the surface became as it is today.

BLACK SHALE LOST MUCH BITUMINOUS MATTER

But the grand push did more than fold the rocks. In the process of folding the rocks were compressed and fractured, and possibly or probably were heated to some degree, the final effect of which was to drive out of the black shales their bituminous matter, as if it had been distilled out, and to drive out of the half consolidated marsh deposits more or less of volatile matter or gas, at the same time helping to consolidate it into coal. As with the folding, the effect was most pronounced at the east and decreased westwardly.

In the region where the anthracite is now found nearly all of the volatile matter in the coal was driven off, and the coal was compressed until almost as hard as a rock leaving the "hard anthracite." At the western end of the Southern and Western Middle fields and in the Bernice field the action was less severe and a little of the volatile matter remained in the coal which was not so hardened by compression, giving us our "soft anthracite" or "Berncite" (as I have recently suggested calling this type of coal) in which the fuel ratio, that is, fixed carbon divided by volatile matter, is between 7 and 10. Further west the coal was affected still less. In southern Cambria County, most of Somerset County and in the Broad Top field from 15 to 20 per cent of the volatile matter remained in the coal. Most of the coals of the Johnstown, South Fork, Somerset and Meyersdale fields, as shown on Map No. 2, are of this type. This coal is of the same type as the Pocahontas coal, and has therefore been called Pocahontite, as Pocahontas coal has been shipped and is known the world over.

The coal of the northwestern part of Cambria County, in the Moshannon and Snow Shoe fields, and most of that in Tioga and Bradford counties is of the next type, in which there is left from 20 to 25 per cent of volatile matter. This type has been called "Sewellite," from the type of coal found in the Sewell bed of the New River district of West Virginia. The fuel ratio of this type is from 2.5 to 3.5.

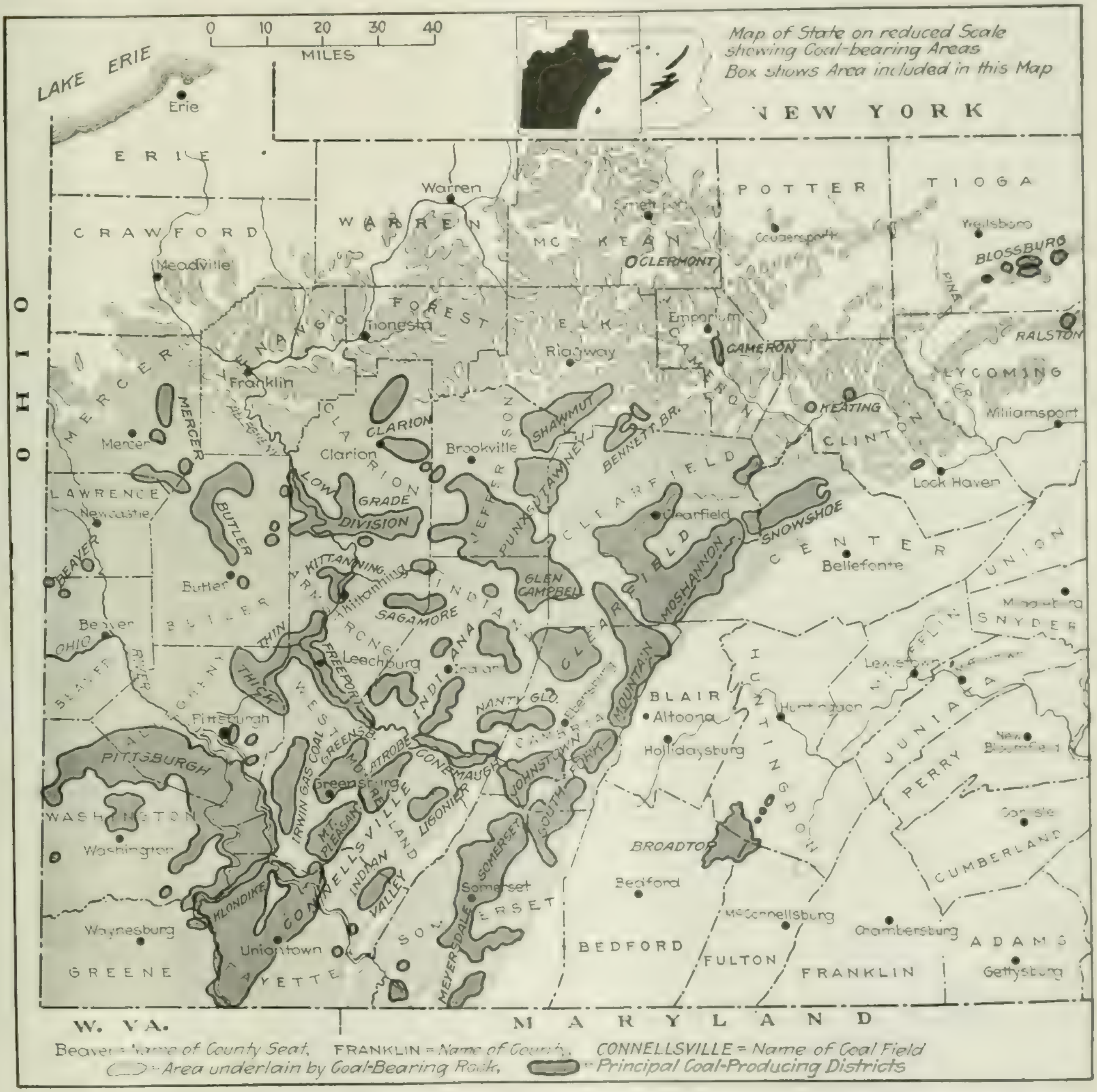
Going still further west the effects of the grand push were less pronounced and there was left about half as much volatile matter (by weight) as of fixed carbon, the fuel ratio being about 2 or from 1.85 to 2.5. This includes the famous Connellsville coking coal, from which the type has been named "Connellsite." It includes also most of the coals in the same belt to the northeastward, including the coal in the Latrobe basin, western Indiana County and the Punxsutawney field

West of the belt just indicated is found the typical

Pittsburgh gas and steam coal, to which the name "Pittsite" has been applied. This coal differs markedly in its physical character from the coals further east. It is a strong coal, mining and shipping in large blocks or cubes, these blocks being the result of vertical joints in the coal combined with bedding plains. Further to the east the vertical joints became more pronounced and nearer one another until in Clearfield, Cambria and Somerset counties the coal is all split up, with such close-set vertical joints that it tends to mine in long blocks or "sticks," the long side of the blocks lying vertically in the bed. These joints are the result of the pressure to which the coal has been subjected. Pittsite has a fuel ratio of from 1.4 to 1.85.

In the coals of the northwestern part of the State, including the Beaver, the Mercer-Butler, and the coal fields in the adjoining counties, a still higher percentage of volatile matter is carried, commonly from 35 to 40 per cent. That part of the state was less affected by the grand push. This type, which has been called "Belmontite" (from Belmont County, Ohio) has a fuel ratio of less than 1.4 and usually has more than 35 per cent of volatile matter.

As just described, there appear to be seven types of



COAL FIELDS OF WESTERN PENNSYLVANIA AS THEY ARE POPULARLY KNOWN AND DESIGNATED

In the right-hand corner are a number of counties without any coal whatsoever, though a remarkable exception is the Broad Top field in Huntingdon, Bedford and Fulton counties. The coal area with this exception appears to fall within a rude quadrant with the lower right-hand corner of the map, near Gettysburg, as approximate center. Along that quadrant the coal has a semi-bituminous character and as the geologist travels further away from Gettysburg, reaching points toward the west and northwest, the coal gets more and more truly bituminous, getting richer in bitumen as each anticline is crossed. The folds, which near the quadrant are quite stiffly marked, become less and less deep as points to the northwest are reached. It is not safe to try to regard location and structure as the final test of the volatile content in the coal. Some other influences, which science may yet satisfactorily explain, appear to exist, forming a problem which demands solution. As we leave the quadrant and go northwest the needlelike coals of the Moshannon Valley give way to the blocky coals of the Pittsburgh, Freeport, Kittanning and Low-Grade Division coal areas, showing that the "Grand Push" affected the quality of coal not only in volatile content but in structure also, and some have contended in pyrite also, though Mr. Ashley does not deal with this feature.

coal in Pennsylvania, with possibly an eighth type barely recognized in recent analyses. These are as follows, the fuel ratio being the basis for the classification:

TYPES OF COAL IN PENNSYLVANIA

					"Standard Analyses"		
Type Letter	Type	Fuel Ratio	B t u	Moisture	Volatile Matter	Fixed Carbon	Ash
A	Anthracite						
	"Hard Anthracite"	10	13,850–13,250	3	5	86	6
B	Bernicite						
	"Soft Anthracite"	10.0–7.0	14,000–13,650	3	9	82	6
*C	Brushymontite	7.0–5.0	14,600–12,000	3	13	78	6
D	Pocahontite	5.0–3.5	14,850–14,250	3	17	74	6
E	Sewellite	3.5–2.5	14,650–14,000	3	22	69	6
F	Connellsite	2.5–1.5	14,350–13,750	3	27	64	6
G	Pittsite	1.85.1.4	14,250–13,700	3	33	58	6
H	Belmontite	over 1.4	13,750–13,000	3	40	51	6

*Not represented in Pennsylvania except by a very few samples, especially from the Broad Top fields.

Space does not permit of a detailed study of the character of the coal of Pennsylvania, nor are the data available at this time sufficient for such a study. Plans have been made by the State Survey in co-operation with the Bureau of Mines for starting a comprehensive sampling of the coals of the state.

PLACE AND STRUCTURE NOT THE ONLY FACTORS

The work already done shows that even in the same districts the coals are not altogether of the same type. For example, in southeastern Washington County the Pittsburgh coal at Marianna shows 34.6 per cent of volatile matter to 57.7 per cent of fixed carbon, giving a fuel ratio of 1.66, while the Waynesburg coal of the same region shows about 33 per cent of volatile matter to 47 per cent of fixed carbon, giving a fuel ratio of 1.42. In the same way it is found that fields which structurally and geographically appear to be similar may be quite dissimilar in the type of coals therein contained. Thus the Johnstown and South Fork fields contain coal of the Pocahontas type, while the Barnesboro-Patton field in the northwestern corner of Cambria County contains coal of the Sewell type. But coal in the Mountain field lying east of the last-named tends to the Connellsite type, which is much lower in percentage of fixed carbon, showing that by some cause not yet recognized the coals in that field were not as deeply affected by the grand push as the coals further to the west.

SHOW COMMERCIAL, NOT SCIENTIFIC, GROUPINGS

It is therefore not possible to designate the coals in each of the fields as of a single rank, though as sampling becomes more complete it will be possible to give the general rank of the coal in each of the fields shown on the map.

It should be added further that the designation of fields on the map is not quite in accord with that which has been adopted by the State Survey in a forthcoming report. In that report the fields are separated primarily on the basis of the rank and character of the coal.

Thus, according to the map, the Clearfield field includes in one basin not only the Moshannon coal but the coal along the west branch of the Susquehanna River where it passes the town of Clearfield. As a matter of fact, the two areas are distinctly separated by the Laurel Hill anticline and the coal of the Moshannon field has a much larger percentage of fixed carbon than that around Clearfield town and further up the river.

In the same way, the South Fork and Johnstown districts are separated by the Viaduct anticline and not as shown in the map. Practically all of the fields shown on the map as having a long northwestern-southeastern diameter contain a different rank of coal at the southeast from that found at the northwest. The grouping of the fields on the map shows rather a grouping of mines with reference to transportation than with reference to the character of the coal.

SELECTED TYPICAL ANALYSES OF PENNSYLVANIA COALS
(Analyses by U. S. Bureau of Mines)

Fields (as per map)	B.t.u. (As rec'd.)	Moisture	Volatile matter	Fixed Carbon	Ash	Type of Coal
Northern Anthracite	13,830	2.2	5.7	86.2	5.9	A
Southern Anthracite	13,300	2.8	1.2	88.2	7.8	A
Bernice	13,380	3.1	8.5	78.0	10.1	B
Blossburg	13,810	1.7	21.5	67.6	9.2	E
Snowshoe	13,862	3.5	22.1	66.6	7.8	E
Moshannon	14,150	3.1	21.0	69.0	6.2	E
Mountain	14,072	1.1	25.6	64.4	8.2	E
Barnesboro-Patton	14,175	3.0	22.5	67.9	6.4	E
Nanty Glo	14,620	1.2	20.5	72.1	6.0	D
Johnstown	14,081	2.0	14.4	75.3	8.1	D
South Fork	14,278	3.5	17.3	73.2	5.8	D
Broad Top	14,414	2.4	18.2	73.4	6.2	D
Somerset	14,170	3.0	15.5	74.5	6.8	D
Meyersdale	14,290	2.7	19.3	71.2	6.6	D
Ligonier	13,370	3.3	23.0	62.5	11.2	E
Conemaugh (eastern part)	13,820	2.5	17.9	70.4	9.2	D
Clearfield (western part)	14,000	4.1	23.0	66.8	6.1	E
Connellsville	13,990	2.8	30.0	60.0	7.2	F
Indiana	14,310	1.3	26.7	64.4	7.6	F
Glen Campbell	14,054	3.4	23.1	67.2	6.3	F
Punxsutawney	14,300	2.5	27.8	64.0	5.7	F
Bennett Br.	14,020	2.7	32.4	58.6	6.3	G
Shawmut	13,280	2.9	34.7	52.8	9.6	G
Klondike	13,270	4.2	32.3	54.0	9.5	G
Greensburg	13,610	2.7	30.3	57.8	9.2	F
Irwin	14,150	2.0	33.6	58.1	6.3	G
Freeport	13,100	2.7	35.7	50.9	10.7	G
Sagamore	13,510	1.0	34.1	54.1	10.8	G
Pittsburgh	14,000	2.6	34.9	56.3	6.2	G
"Thick Vein" Freeport	13,940	1.2	35.9	55.4	7.5	G
Kittanning	13,310	1.4	36.2	52.5	9.9	G
Low-Grade Division	......	3.3	33.8	56.8	6.1	G
Clarion	......	4.8	37.9	50.3	7.0	H
Greene County (western)	......	2.8	36.0	48.4	12.8	H
Washington Co. (central)	......	1.4	37.1	53.8	7.7	G
Washington Co. (northern)	......	2.2	39.2	52.6	6.0	H
Beaver	13,770	2.5	38.0	54.5	5.0	G

The analyses given are actual analyses made by the U. S. Bureau of Mines, but selected as far as possible on the basis of low ash. To that extent the analyses may not be fair averages of the several fields, for in one field the analyses given may contain the typical amount of ash and in another the ash given may be much lower than the average. In the same way the heat values given reflect the ash and moisture contained. The several analyses given are not intended to show the grade of the coal, that is the typical ash and moisture contained, but rather the general relation of the several component parts and the relation of the volatile matter to the fixed carbon. To compare the heat value of the coal from different fields regardless of ash and moisture, the B.t.u. value given should be multiplied by 1 plus (ash plus moisture in percentage).

McLachlan Would Reduce Output One-Half

IF THE advice of District Secretary J. B. McLachlan is taken the miners of Nova Scotia will cut down their output until the Minister of Labor changes his announced decision that he will not name a collective board to consider grievances. In an informal talk to the men he declared that one way to bring coal operators "to their senses" was for the men to decrease their production one-half and thus strike while they are working. The mine workers present took no action on receiving the suggestion.

The mine workers want $1 a day more for all day workers, a 24c. raise in tonnage, and a 25-per cent increase on all deadwork such as timbering, etc. The wage-scale committee will go to Halifax and discuss grievances with the McKinnon conciliation board.

Matters That Must Not Be Overlooked If Mining Machines Are to Do Their Best

Bits Must Be Sharp and Have Clearance at the Back This Will Preserve
the Motor as Well as Save Power Chains Should Be Reasonably Tight
When One Gear Is Renewed Its Fellow Gear May Well Be Renewed Also

By F. E. Van Slyke*

TO INSURE economy and success in the operation of mining machines, provision must be made for a number of details. Unless particular attention is given to them it is difficult to secure entire satisfaction. First and most important of these is the care of the bits, chain and cutter arm. The bits should always be sharp, even if this necessitates frequent changing. The loss of time incurred in putting sharp cutters in place is not nearly so serious as the increased stresses put on the machine when operating with dull bits. Not only do dull bits cause excessive stresses but they sometimes overload the motor as much as 100 per cent, and the wear on all parts is much increased. The only way to insure sharp bits is to keep an adequate supply on hand, taking them from place to place with the machine. It is also highly important that the bits be so shaped that they will have sufficient clearance at the back, for a parallel-sided bit materially increases the consumption of power. The forms sent with the machine show the correct shape, and the bits should occasionally be checked up with these so that the mechanical engineer, or whoever may perform his function, may feel assured that they are being made correctly. The back part of the bit should be at least ⅛ in. less in width than the front.

Sharp bits with proper clearance, the right shape of link in the right place, a chain tight but not too tight, gears that mesh smoothly without excessive wear, rubbing surfaces not unduly worn are necessities if satisfactory results are to be obtained. The bits must cut and not rub their way through the coal.

Set Bits to Clear Cutter Arm and Links

The bits should be so set that they extend the proper distance out from the chain in order to insure clearance for the cutter arm and the links. All set screws should be kept absolutely tight. Dull bits with inadequate clearance at the back and so set as to afford insufficient space for the cutter arm in the kerf are a prolific source of trouble on coal-cutting machines of all kinds. It is therefore highly important that such conditions be avoided.

The chain should be kept moderately tight, but not so tight as to bind. In the first few hours of running, the chain on new machines sometimes gets quite slack, a fault which may be overlooked. The slackness arises from slight irregularities in the holes in the chain which become smooth as soon as the machine is put into operation. The smoothing down of even 0.001 in. on a large number of links will add an appreciable length to the chain. Therefore the chain tension on new machines should be watched carefully.

The chain should be tightened up as far as it will go, and then slacked off about one turn of the adjusting screw. If the operator gives this matter careful attention he can soon arrive at the proper chain tension by observing how it acts under different conditions. It takes a little time to note the operation and experiment a little with various tensions. Such trials are well worth the trouble they entail. The hardened strips and wearing parts of the cutter arm should be renewed as soon as the center line of the chain gets out of true with the center of the cutter bar. When this occurs it causes a reduction in the width of the kerf and makes the cutter arm bind. This condition is easily detected by trying to lift the chain when it is not running. If it can be raised from ¼ to ⅜ in. the parts should be immediately renewed. It will be observed that the proper width of the kerf is entirely dependent upon the chain being held in a central position.

In replacing broken links always be certain that the new part gives the same bit position as that of the one taken out. In many cases machine runners put in a new link without paying any attention to this consideration and in a short time a number of the positions in the chain are entirely eliminated, so that the machine is not cutting uniformly across the full kerf width. This leaves portions of coal which are broken out by the chain links instead of by the bits, causing increased power consumption and wear and tear on all parts.

Another serious matter in connection with the operation of undercutters, which in a good many cases is not looked after properly, is the renewal of gearing. Gears are sometimes replaced without renewing the pinions, or pinions are replaced without renewing the gears. This is bad practice, since a worn gear or a worn pinion never operates satisfactorily with a new part. Unless one of the members is practically new it should never be left in place when renewing the member meshing with it. This is most serious with worn gears, for when one is badly worn it tends to destroy the other rapidly.

When renewing bearings all the bearings for a train of gears should be replaced at one time in order to insure correct gear meshing. It is of little advantage to replace the bearings on a shaft when the shaft carrying the meshing gear is running in a worn journal.

Another detail that cannot be brought out too strongly is the necessity of keeping accumulations of dirt out of the motor and gearing.

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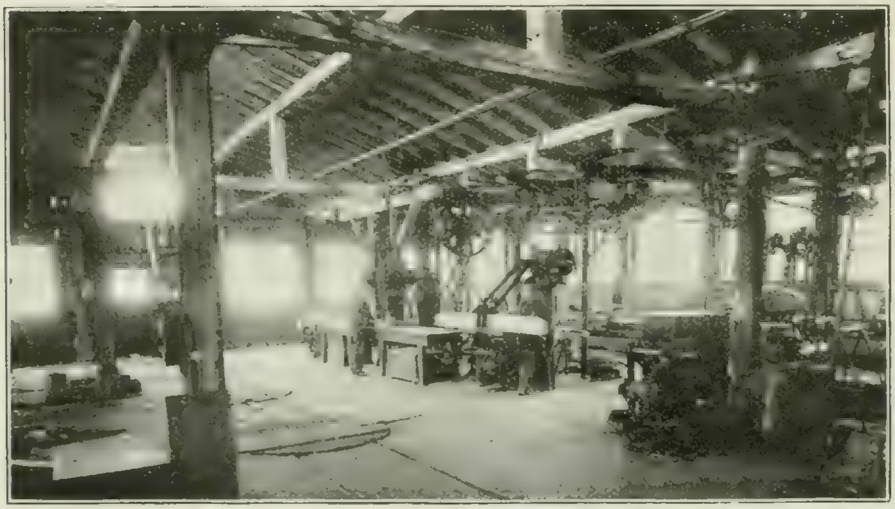
*Jeffrey Manufacturing Co., Columbus, Ohio.

Mine Shops at Kingston Build Storage-Battery Locomotives for Colliery

Small Work Segregated from Large Work to Prevent Misappropriation of Property—Work on Locomotives Maintains Working Force During Slack Summer Period, thus Maintaining Morale of Men

By Dever C. Ashmead
Tarrytown, N. Y.

Because of their arrangement and the completeness of their equipment as well as the volume and quality of work they turn out, the shops of the Kingston Coal Co., at Kingston, Pa., are worthy of more than casual attention. These shops comprise two buildings. Of these the larger houses the machine, carpenter, car-repair and blacksmithing departments, while the smaller serves as the electrical repair shop.



Machine and Carpenter Shop

Part of the Kingston Coal Co.'s shop where cars are repaired by machinists, carpenters and blacksmiths and where in spare time new equipment is constructed.

Electrical Repair Shop

Here armatures are rewound and other repairs made without the delays incident to the shipment of parts to distant machine shops.

Both the buildings are constructed of brick and have concrete floors, but that the electrical building is of later construction than the other can be readily seen by comparing the two illustrations showing the interior of the shops. The roof of the electric shop is supported by steel trusses and I-beams, whereas in the older building the roof trusses are of wood.

Well lighted during the day by numerous windows and at night by large incandescent lamps, these shops are desirable working places. Tracks for handling such mining equipment as is in need of repair extend into the buildings. In the machine shop turntables are so placed and the tracks so arranged that all parts of the shop are easily accessible. In Fig. 1 the carpenter shop is in the immediate foreground. To the rear may be seen the machine shop, the photograph being taken from the blacksmith shop. The foundation of the steam hammer can be seen in the lower right-hand corner of the illustration.

The equipment of the shops is fairly complete and practically any kind of repair work can be done except the making of castings. The machine shop is equipped with a 24 x 84-in. planer, an 18 x 30-in. shaper, a 22-in. swing lathe, an emery grinder, a 24-in. Barnes drill press, a $1\frac{1}{2}$-in. bolt cutter and a 10-in. Cox pipe machine. The carpenter shop has a 24-in. Greenlee cut-off saw, two Greenlee post drills, a mortising machine, a 24-in. surfacer, a Greenlee rip saw, a Colliday 3-ft. band saw and a wood-turning lathe. The blacksmith shop is provided with a 600-lb. steam hammer, a portable crane and four forges.

The blacksmith shop is divided into two parts. One portion is used exclusively for work done for the mine, while the other is employed for repairing and sharpening the miners' tools. The part devoted to this purpose is fenced off completely from the rest of the building and has a separate entrance from the outside. This arrangement is made in order that there may be no necessity for the miners to pass through any other part of the shop, such passage sometimes meaning a reduction in the company's tool supply. People are to be found everywhere who regard tools as common property and who think that for safe keeping they should remove them to their own home.

The electrical shop shown in Fig. 2 is well provided with apparatus necessary for the maintenance and repair of electrical equipment. Because of the weight of motors and armatures a traveling crane has been provided to move these parts about the shop.

In shops of this size it is often necessary to maintain a larger force than is ordinarily required, in order to take care of peak demands. Such demands occur more frequently in winter than in the summer because of the more exacting working conditions then encountered. Such a condition means that during parts of the year there is an excess of men in the shop and a lack of work. No coal company desires to lay men off during periods of slack work, for it realizes that when the demand for men returns it will be unable to secure them, as the other companies in the vicinity probably will be in the field at the same time. A slack-work period must, however, be met. If the company cannot afford to discharge or lay off its men, it must provide some way of using them, for men who are not continuously employed lose their morale and as a result become worthless to their employer.

BATTERY LOCOMOTIVE BUILT BY MINING CONCERN

This 5-ton storage-battery locomotive was constructed during slack time at the blacksmith and electric repair shops of the Kingston Coal Co.

During the past few years there has been a great increase in the use of mechanical haulage, particularly in those fields where the use of the storage-battery locomotive is permissible. A demand for this type of machine has arisen that has been far in excess of the supply. This condition contrasts greatly with a time not over five years ago when some companies would not consider such locomotives at all. One firm actually demanded a contract agreeing that the company would be protected against all damage that the storage-battery locomotive might do to the mine.

Conditions in the mines served by these shops were such that storage-battery locomotives could be used satisfactorily, but the company found it almost impossible to secure such machines. Having a surplus of skilled mechanics during part of the year it decided to assemble its own storage-battery locomotives. The assembling of the frames was done in the machine and carpenter shops, while the electrical installation was performed in the electrical shop. Fig. 3 shows one of the storage-battery locomotives thus constructed. These machines are all of 5-ton size and have forty-eight 23-plate cells.

Compensation Results Achieved in Illinois and Pennsylvania*

Mines Insured Show Consistent Improvement of Physical Condition and Safety, with Lowered Premium Cost—Low Accident Rate Reported

By Herbert M. Wilson

A TYPICAL mine in central Illinois insured from 1915 to 1919 inclusive, with from 190 to 270 employees and premium earnings from $8,800 in 1916 to $14,800 in 1917 and $21,200 in 1918. These premium increases were due in part to increased number of employees and partly to increase in wage rate. During the same period there was an increase in the number of accidents; in 1916 there were 73 non-fatals, costing over $1,200; 3 fatals and 156 non-fatals in 1917, costing $10,300; 1 fatal and 174 non-fatals in 1918, costing $15,000. The margin of profit on the business was negligible.

The schedule-rating history showed a base rate of $4.50 increased by the first schedule rate to $5.21, which reflects the correspondingly bad safety condition. The next schedule rate showed material improvement, $4.36; the last a still further improvement, $3.86. Within the last year there was correspondingly good experience, which earned a credit of 13c., making the adjusted rate $3.70, as compared with the first, which was $5.21.

A mine in northern Illinois, where the fatal-accident record is good and the base rate correspondingly low, viz., $3.60, had a payroll for the two years 1918-19 averaging 390 men, premium earnings the first year $12,000 with 156 non-fatals and compensation costs of $7,800, giving a slight margin of profit. In 1919 the premium was only $9,600 with a material increase in non-fatals to a total of 257 and corresponding increase in compensation costs of $14,400.

At the same time the first schedule rate was above normal, namely, $3.76; the next $3.06 and three were reported during 1919, respectively, $2.79, $2.38 and $2.34. This operator has nothing to complain of, since for everything he has done to safeguard his mine he has had a reduction in his premium rate and corresponding reduction in his total premium costs at a time when his payroll was mounting on account of wage increases and his losses were also mounting, probably because of a poor moral hazard.

A mine in southern Illinois in the gaseous and fiery district, with about 225 employees, had a premium in 1917 of $13,800 with one fatal and 14 non-fatals and loss costs of $7,300. Premium in 1918 was $11,500; one fatal and 17 non-fatals, with lost costs in excess of premium, namely, $12,100. There was a corresponding change in schedule rating results, viz., first schedule rate $4.47, the next $4.38 and the last $4.11.

I hesitate to give you illustrations from Pennsylvania. They are too numerous, and would but be a monotonous repetition of the above. All show practically the same relative trend as illustrated for Kentucky and Illinois but with greater emphasis because the period of insurance has been longer. There has been on the whole a marked improvement in the physical condition of the mines as reflected by the schedule-rating inspections. Many mines are now given nearly or quite perfect safety scores with a few or no charges.

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*At the request of *Coal Age* the general manager of the Associated Companies contributes these typical examples of the workings of the Compensation Act, supplementing his article on "Coal-Mine Compensation in Kentucky," which appeared in a previous number.

Opportunity for Coal Men to Note Mining Methods of a Kindred Industry

A. I. M. E. Will Study Mines of Michigan Copper Country, the Ishpeming, Vulcan, Norway and Iron Mountain Iron Mines and the Strippings of the Mesabi Range — Deep Mines, Difficult Pumping Problems, Immense Strip Pits and Golf Principal Attractions

MINING is still mining, whether in copper, lead, zinc or iron mines, and from any type of mine much may be learned that will serve as suggestions for the operation of mines in the kindred industry of coal mining. Solutions forced on the owners of one type of mining property offer valuable suggestions to operators of another type.

Coal mining engineers will be much interested therefore to learn that the American Institute of Mining and Metallurgical Engineers proposes to make its summer trip to the copper and iron mines of the Great Lakes and to view the works, above and below, of that wonderful mining region.

What the Mesabi region is doing today the anthracite strip-pit mines may be doing tomorrow; the pumping problem of the Athens mine may give a hint to a deep mine in eastern Pennsylvania or northern Ohio; the hoisting problem at a mine 12,500 ft. deep may give a valuable hint to a man whose mine is not a tenth of that depth. All forms of engineering bear on one another but especially does one form of mining engineering contain the kernel of experience and experiment which may better the methods of another.

A limited number of Eastern members will leave Buffalo on Friday morning, Aug. 20, by S. S. Tionesta of the Great Lakes Transit Corporation, picking up other members *en route* and reaching Houghton about noon Monday, Aug. 23.

HOISTING PLANT LIFTING MINERAL 2½ MILES

At Houghton the members probably will take first an automobile trip through the district, seeing in a general way the operations above ground. On Monday evening they probably will have a dance at the yacht club. On Tuesday there will be a visit to the copper mines under ground, a sightseeing and historical trip to Keweenaw, and a trip to see the leaching and milling, the dredging, flotation, smelting and electrolytic refining plant. The members will have an opportunity of seeing mining, descending an inclined shaft that has been sunk with a change in angle under ground. A new hoisting plant to raise mineral from a depth of 12,500 feet will be in operation by the time of the visit. On Tuesday evening there will be further social entertainment and the party will then leave by two special trains, one of which will go to Ishpeming, the other to Vulcan.

At Ishpeming two hours will be spent at the Pioneer Charcoal & Iron Furnace, where not only pig iron and charcoal are made but also many charcoal byproducts, such as wood alcohol, formaldehyde, acetic acid, various acetates, etc. The reinforced-concrete ore-loading dock at Marquette is a model structure of its kind.

After visiting these points lunch will be served at the Wawonowin Golf Club, followed by a visit to the Athens mine, one of the novel features of which is the electrical pumping of water 2,500 feet in one lift. There also will be an opportunity to see at Ishpeming some interesting and architecturally-attractive reinforced-concrete headframes, concrete-lined shaft, etc.

At Vulcan, Norway and Iron Mountain the other party will see some interesting developments in electric hoisting, including safety devices, and other electrical machinery; also some deep pumping with centrifugal pumps, a hydro-electric plant, a concrete-lined shaft, etc., etc. There probably will be a technical session that evening at Iron Mountain, where the trains will be reassembled, and the party will reach Minneapolis early in the morning of Thursday, Aug. 26.

At Minneapolis there will be sightseeing trips for the ladies and technical sessions at the university, followed by a lunch at the Town and Country Club. The afternoon will be devoted to sightseeing, and the evening to a banquet and addresses.

BIG STRIP-PIT PROPOSITION, 300-TON SHOVELS

On Friday, when the Mesabi Range will be visited, the guests will awake at Babbitt, where an inspection will be made of the new mine and of the concentrating and sintering plant of the Mesabi Mining Co. Thence they will go to Virginia to see the 300-ton steam shovels, and from there by automobiles through Mountain Iron, where the Brunt ore-drying plant is located. The party will arrive at Hibbing toward the close of the afternoon. At Hibbing there will be a business and social session, and the party will arrive early in the morning of Saturday at Coleraine, where it will inspect the largest ore-washing plant in the world, thus having seen practically everything in the Mesabi district.

Duluth will be reached about 1 p.m. on Saturday, Aug. 28, and a visit will be made to the Minnesota Steel Co's. plant, with its model village. This company is a subsidiary of the U. S. Steel Corporation. A visit also will on the heights far above the city.

The estimated expenses are in part as follows, meals being extra, except as stated:

Railroad fare on special trains, Houghton to Duluth, about	$45.00
Double lower berth, five days and nights, about	17.00
Upper berth, five days and nights, about	14.00
Compartment for 2 or 3 persons, 5 days and nights, about	50.00
Drawing room for 2 or 3 persons, 5 days and nights, about	60.00
Railroad fare—Chicago to Houghton	13.36
Railroad fare—New York to Chicago	29.42
Railroad fare—Duluth to Chicago	15.21
Railroad fare—New York to Buffalo	14.21
SS "Tionesta" Buffalo to Houghton, including berth and meals	39.96
SS "Juniata" Duluth to Buffalo, including berth and meals	48.60

For further details regarding expenses see the Institute's circular. Reservations should be made immediately.

Blizard Heads Survey at Pittsburgh —Kreisinger Will Co-operate

Former Official of Canadian Mines Department Will Have Assistance of Predecessor Corporation—Lends Financial Aid for Research Work

THROUGH a co-operative agreement entered into between the U. S. Bureau of Mines and the Combustion Engineering Corporation about a year ago, Henry H. Kreisinger, fuel engineer of the Pittsburgh Station, leaves the Government service and is succeeded by John Blizard, formerly chief fuel engineer of the Department of Mines of Canada. Mr. Kreisinger and Mr. Blizard will co-operate with each other in their new duties, however, and it is understood that reports of research work made by Mr. Kreisinger for the Combustion Engineering Corporation will be submitted to the bureau for publication before being used by the former organization.

The U. S. Bureau of Mines allots its fuel department approximately $32,000 yearly. Out of this sum must be paid the salaries of all of the men in the department, which leaves about $5,000 annually for research work. When these figures are contrasted with $20,000, which has been allotted for the first quarter year of Mr. Kreisinger's work with the Combustion Co., the financial handicap on the Bureau of Mines can be realized.

Mr. Kreisinger was born in the town of Radnice, in what is now known as Czechoslovakia, but at the time of his birth the town constituted a part of Bohemia. He came to America in 1891, at the age of fifteen. In 1900 he entered the University of Illinois and four years later received the degree of Bachelor of Science. Continuing his studies, he graduated as Mechanical Engineer in 1906.

After gaining the latter degree he entered the Technological Branch of the U. S. Geological Survey, which had quarters in the St. Louis Exposition grounds. Here he was assigned to the fuel-testing plant. In 1910, when the Bureau of Mines was created and took over the work being done by the fuel-testing department of the Survey, Mr. Kreisinger severed direct connection with the Government and became fuel engineer for the Clinchfield Fuel Co., of Spartanburg, S. C.

While with the Clinchfield Fuel Co., Mr. Kreisinger was frequently consulted on combustion problems by the bureau. The acquaintances formed and opportunities offered by the Bureau of Mines for research work were so attractive to him, however, that in 1913 he returned as head of the fuel department of the Pittsburgh Station. When the bureau home in Pittsburgh was changed from the old Arsenal Buildings on Butler St. to the new million-dollar buildings in the Oakland district, Mr. Kreisinger was given increased opportunities for the research work of which he is so fond. As a designer of fuel-testing apparatus he has perhaps no peer. The result has been that the fuel-testing laboratories of the Pittsburgh station are the most complete of their kind to be found anywhere.

HENRY H. KREISINGER

JOHN BLIZARD

While connected with the Combustion Engineering Corporation as research engineer, Mr. Kreisinger will make his headquarters at the Bureau of Mines station in Pittsburgh. By this arrangement a closer co-operation between the two institutions will be maintained. The first problem upon which Mr. Kreisinger will center his efforts will be a thorough testing of the powdered-coal plant of the Bureau of Mines at Milwaukee, Wis.

While engaged in this work he will have under his direction four men from the Bureau of Mines fuel-testing laboratories and fifteen others who will be carried on the payroll of the corporation. These men will be chosen from newly-graduated engineers and men who will be seniors in college next year. He will be allowed the full and unrestricted use of any equipment or apparatus owned by the bureau.

Mr. Kreisinger is a member of the Sigma Xi engineering fraternity, the Coal Mining Institute of America, the American Society of Mechanical Engineers and the American Society for the Advancement of Science.

John Blizard, who succeeds Mr. Kreisinger as head of the fuel department of the Bureau of Mines, was born at Wotton under Edge, England, in 1882. He is a graduate of the University of Durham and for several years was connected with the firm of Richardsons-Westgarth, marine and electrical engineers, of Hartlepool, England. He came to Canada in 1906 to lecture on mechanical engineering at McGill University, Quebec. While at the university Mr. Blizard became interested in fuel and combustion research work and spent much time with Professor Durley of that institution seeking a solution of combustion-engineering problems.

In 1911 he assumed charge of the fuel-testing department of the Department of Mines of Canada and comes to the U. S. Bureau of Mines directly from this station. While not so well known to mining men as Mr. Kreisinger, he is equally recognized by prominent combustion engineers.

Discussion by Readers

Edited by

James T. Beard

Flotation Fails to Clean Coal

RECENTLY, my attention was attracted to the brief article under the caption "Can Coal be Cleaned by Flotation?" *Coal Age*, Apr. 22, p. 795, and I was much interested in the announcement that investors on the London Stock Exchange were showing confidence in the matter, apparently in the belief that the scheme is practicable.

For many years I was engaged in trying to reduce the sulphur content of coal. To accomplish my purpose I washed the coal, using every method of jigging, concentrating tables, etc, but without success.

Later, about three years ago, the flotation process was drawn to my attention and I sent a sample of the coal we were mining and which contained sulphur, to a plant at Victor, Col. This plant was equipped for making a very thorough test by the flotation process. The report came back, however, that the process failed to work on the coal. It was stated that the oil simply formed a sticky mass with the finely pulverized coal, that could not be managed.

If it is possible to clean coal by flotation there is no doubt that the process will prove an important step in the purifying of certain coals for the market and for the manufacture of coke. I am wondering whether the statement made in the article mentioned is really authentic. Has some one found a way to actually clean coal by the flotation process? If so, we shall be glad to hear from him through the columns of *Coal Age*.

JOHN V. SCHAEFER, Prest.
Chicago, Ill. Cement-Gun Construction Co.

Degenerate Ideas Regarding Mine Safety

AFTER all the measures that have been employed to increase the safety of mining, it is astonishing that anyone would assume to question the wisdom of employing shotfirers where blasting is performed in mines. The suggestion can only be styled as "degenerate" and must come from some one seeking to throw a wet blanket on the efforts of others in the promotion of safety.

Of course, there would be no discussion of a subject if all men had the same opinion; but I claim that no sane argument can be advanced to show that the employment of shotfirers is harmful in any respect, provided the men so employed have a knowledge of the elementary principles of mining and are practiced in the use of explosives and competent to perform their duties as shotfirers.

Assuming it were possible to show that the employment of shotfirers is a menace to safe mining, it would then be necessary to revise our laws regulating and controlling the use of explosives in mines. Mining is progressive, and when a suggestion like this is made, men at once inquire, What safer method or what better system can be adopted for blasting coal?

To say that a mine is safe if properly ventilated shows a lack of experience, since practice teaches that many other matters than ventilation are required to accomplish this purpose. One of the greatest factors contributing to the safe operation of a mine is the exercise of discipline through the authority vested in the shotfirers.

Mining regulations in British Columbia dwell particularly on the requirements in blasting, and attach severe penalties for their violation. Under the law, competent persons must be employed as shotfirers, who are charged with the duty of seeing that the laws are carried out and strictly obeyed. This is not to say that the shotfirer is the only person wise enough to distinguish between what is right and what is wrong; but, in his official capacity, he is empowered to enforce all regulations intended to make blasting safe.

SHOTFIRERS MUST REMAIN

To eliminate the shotfirer in the mine would be to throw all precaution to the winds and return to the many unsafe practices formerly used in shooting coal. As time goes on the dangers incidental to mining are increasing, and these can only be offset by the exercise of greater care and discipline. There is much satisfaction in knowing that, with the enormous quantities of explosives now used in mines, accidents in blasting are less frequent than formerly, owing to the closer supervision of the work by shotfirers.

It may be true that some unsafe systems of shotfiring prevail. This, however, is the fault of such systems and no argument against the employment of competent shotfirers. Speaking from experience and supported by the requirements of our mining laws, I fail to see any justification for regarding shotfirers as harmful, either from a humane or a material standpoint. To displace the shotfirer would be to transfer his responsibilities to each individual miner, with the result that many bad practices would prevail and confusion take the place of order and safety. This alone should show the folly of such an attempt. In that event, we might as well scrap all our technical knowledge and mine regulations and laws relating to safe blasting.

SAFETY A DOLLARS-AND-CENTS PROPOSITION

Good business in the operation of coal mines has come to recognize the importance of a reasonable factor of safety as a dollar-and-cents proposition; and any outlay in this direction is looked upon as a wise investment. True success in mining is not indicated alone by the increased profits and a reduction in the cost-sheet; but the health and good-will of the worker has come to be considered as an important asset in the undertaking.

Formerly, the mistake was often made of attaching more importance to the returns of a venture than to its danger. Today, the order is reversed and the safety of an operation is one, if not the *first*, essential to its success. Experience has shown that where the human side of life's business is overlooked and the dollar is placed foremost, the undertaking proves less successful in the end than where the contentment of the worker and his living and working conditions are considered of the first importance.

It is true there are some mine officials who look on the employment of shotfirers as an increase in the cost of operation; and these are prone to think there would be a saving in permitting the miners to fire their own shots in the manner and where and when they please.

Again, there are some miners who object to the shotfirer's interference in their work and profess to think they could make more money and better progress if they were not compelled to await the shotfirers. Let those who would eliminate the shotfirer say what can be done to insure safety in blasting.

Ladysmith, B. C., Canada. WILLIAM WESNEDGE.

Often Unfair to Blame the Fireboss When Explosion is Mysterious

MUCH interest has been awakened, in respect to the responsibility of the fireboss in case of a mysterious explosion, by the reading of the excellent letter of W. M. Chambers, which appeared in *Coal Age*, May 13, p. 1010. Mr. Chambers referred to the unexplained explosion that took place in the Buffalo mine in Ohio, some time ago.

Evidently, the letter was intended to impress every mine official with the importance of exercising extreme care and caution in the supervision of a mine generating gas, as many seemingly trivial occurrences lead to dangerous results. Careless practices will, sooner or later, prove fatal if allowed to exist.

There Is Always the Possibility That a Fireboss Has Failed in His Duties

The statement is made that the fireboss had examined the Buffalo mine a short time before and reported it "safe." This leads one to conclude that the explosion was a mystery, or that the fireboss failed to report the true condition of the mine, or had not been thorough in his examination. The fact that the testimony given following other explosions has shown that the firebosses were derelict in their performance of duty, it is reasonable to assume that the same could occur again. But, a fairminded person is reluctant to believe such was the case, until it is proven by the evidence.

True it is that a fireboss, having a large section of a mine to examine each morning, would be tempted to assume that conditions were all right in certain places with which he was thoroughly familiar, particularly if his time was growing short because he had found that a fall of roof elsewhere had broken down the brattice and gas had collected in quantity that required to be removed.

Every fireboss knows that to make an incomplete examination is dangerous and if it becomes a habit he will do it once too often, at the cost of an explosion and the possible loss of many lives. The report of the examination in that case, would show no danger or possible cause for the explosion, which would be thought to be mysterious unless the fireboss was honest enough to confess his neglect. But that is doubtful, owing to the embarassment it would cause him.

When an explosion is unexplained it is natural to assume that it was due to a sudden outburst of gas for which the fireboss would not be responsible, rather than to conclude that the man had been negligent in performing his duty. The latter conclusion, of course, would place the blame on the one man charged with the responsibility of making a complete examination of the mine, and one is naturally reluctant to do that, except where the facts point to such a conclusion.

Neglect of a Fireboss Needs to Be Proven

Negligence in a fireboss is surely one of the factors that must be taken into account in the investigation of a mysterious explosion. Considering that, in such a case, he is under a heavy fire of criticism and suspicion, everything should be done to remove this cloud if possible. A competent fireboss who has a good record should not be under suspicion unless the evidence warrants.

There are numerous dangerous conditions and practices in every mine, any one of which may be the cause of the disaster, and the fireboss may be responsible for these if he has done nothing to prevent them. On the other hand, a fall of rock short-circuiting the air or releasing a body of gas; the setting open of a door by a workman or driver; the stopping of the fan by accident, or its speed being reduced without his knowledge would forecast danger. These and similar occurrences would relieve the faithful fireboss of the blame for which disaster might result.

Again, although the time is short between the making of the examination by the fireboss and the entry of the men for work, it is possible for a dangerous condition to arise in a gaseous mine, for which no fireboss could be held responsible.

It must not be thought, however, that an explosion can occur in a mine and no one of the mine officials be to blame, unless they have all, without exception, done everything in their power to make the mine safe for work. Since the responsibility for safe conditions rests mainly on the fireboss, that official should exercise extreme care that his work and demeanor leaves nothing to reflect on his integrity and reliability, both in his official capacity and as a citizen.

The public will be slow to condemn a man who is known by reputation to be safe, painstaking and conscientious, except in the face of facts showing carelessness, incompetence or neglect. They will be more ready to conclude that the cause of the explosion was entirely beyond his control. As a fact, it is seldom we hear of trouble with such a fireboss in charge.

Ample Provision Must Be Made Against Possible Dangerous Conditions

Speaking of sudden outbursts of gas, it is often possible to anticipate such occurrences and make due provision for avoiding their consequences. Let me suggest here that the ventilating system in a mine, as far as practicable, should be so arranged that the old workings will be located on the return of the air. The working places generating gas should be carefully bratticed and a sufficient quantity of air made to reach the face at all times.

The possible circulation in a mine should be such as to handle any ordinary outburst of gas with a fair degree of safety to the men. It is usually the incapacity of the ventilating system that is directly responsible for an explosion occurring because of an increased production of gas in the workings. Where the ventilating system is not sufficient the excuse cannot be offered that a sudden outburst of gas caused the explosion. The fault would then lie at the feet of the mine officials who failed to make ample provision against such an occurrence in the operation of a gaseous mine.

In closing, let me say there are other factors to consider in reference to mine explosions; namely, coal dust, dangerous practices in blasting, use of open lights, etc., all of which naturally come under the supervision and direction of the fireboss, the shotfirer and other mine officials. Neglect to consider these reflects on the competency of the management, in case of disaster.

Thomas, W. Va. W. H. NOONE.

Working Three Overlying Seams

THE question of working three overlying coal seams extending under the Kanawha River is a timely one and will doubtless prove of interest to many mining men who have not, as yet, experienced working under the conditions described.

In the case mentioned in this discussion, the two upper seams are said to have a thickness ranging from three to five feet; let us say an average of four feet. The upper seam lies at a depth of 50 ft. below the surface of the valley, the second seam 50 ft. lower and the third seam 60 ft. below that, making the total depth to the lowest seam 160 ft.

My plan would be to work out the two upper seams together, by sinking a shaft to the second seam, which lies at a depth of 100 ft. I would sink the shaft a little below the seam to allow for a good sump at the bottom. I would prefer to arrange to hoist the coal from each seam by a separate cage. While good sump timbers can be placed for holding the cage on the bottom in the second seam, it will be necessary to arrange a set of keeps for the cage to rest on, at the first or upper seam.

If the conditions are favorable, I would adopt the longwall method of mining each of these seams, driving only narrowwork under the river and starting the longwall face beyond. By this means, should water seep through the roof of the entries under the river, they can be protected by a good cement arch where the trouble occurs.

ADVANTAGE OF SELF-ACTING INCLINES FOR WORKING THE UPPER SEAM

In adopting the longwall method, some will prefer to keep the development in each seam equally advanced; but, my preference would be to work the upper seam by the longwall advancing method and use the retreating system in the second or middle seam for the reason that pitches can then be driven up from the second seam, on a light grade that will enable the cars to be handled by a self-acting incline.

These pitches can be driven in advance and will always be available for lowering the coal mined from the upper seam. In that case, of course, the work of retreating in the lower seam would not be started until the upper seam was practically exhausted. I have seen such a system in operation where the loaded car descending pulled up the empty, and the plan was successful, the movement of the cars being controlled by a band brake on the sheavewheel.

As quickly as the development has progressed far enough that all the coal from the upper seam is taken out through the inclines leading to the second seam, the keeps at the shaft landing in the upper seam can be taken out and both cages used for hoisting all the coal. Assuming a thickness of four feet in these two seams, it should be possible to load and hoist 250 two-ton cars from each seam, making 1,000 tons per day.

I am not in favor of any slope opening even for the upper seam, if the conditions are such that high water may occur from the blocking of the river by debris. The shaft should be kept at the highest possible level and safeguarded against such an occurrence. If the room-and-pillar method of mining is adopted the face in the upper seam should be kept a short distance, say 10 or 12 ft. ahead of that in the second seam.

As the work in the two upper seams nears completion and the coal becomes nearly exhausted, the shaft should be sunk to the lowest of these three seams, or to a depth a little more than 160 ft. to allow for a good bottom sump for drainage. The coal in this seam ranges fom 6 to 9 ft., which will make it possible to maintain the same output as came from the working of the two upper seams now practically exhausted.

The lowest seam can be worked either by the longwall method or the room-and-pillar system of mining, whichever is preferred and seems likely to produce the best results. Speaking of the inclines, I have seen what is known as the "drop staple" method, where the coal was dropped, vertically, from an overlying or upper seam to the seam below, but I prefer the self-acting incline.

Perryopolis, Pa. R. W. LIGHTBURN.

Where Should a Miner Keep His Powder Flask When Drawing Back a Pillar?

KEEPING a powder flask in a safe place in the gob when working under the conditions described by William B. Jackson, *Coal Age*, April 15, p. 771, agrees with my own practice. It is my belief that a flask containing powder or any other explosive should not be placed in a cubbyhole in the rib of a pillar that is being drawn, particularly where the action of the roof is such as to crush the coal.

At the present time I am working where gas is generated, which would increase the danger of placing a powder flask in the cubbyhole where it might be ignited by a possible explosion of gas. I consider it is far safer to hunt a good place in the gob, at a safe distance back from the place where a man is working.

Every miner ought to carefully study the conditions in his place. An experience of several years in the drawing of pillars in soft coal enables me to appreciate what Mr. Jackson has said in regard to the crushing out of the coal and its being thrown down for a considerable distance back from the end of the pillar. When working under top coal and a heavy roof pressure, in a room 20 ft. wide, where the coal was taken out to a height of 12 ft., I have known a fall of coal to cover the pillar 50 ft. back, or more.

Under these conditions, let me ask, what would have happened if I had placed my powder flask in a cubbyhole in the rib. One thing is certain, and that is, it would have been impossible to have recovered the flask until the fallen coal had been loaded out.

My conclusion is, therefore, that the only safe thing for a miner to do with his powder flask is to keep it under cover where it will be protected from a possible explosion of gas, and in a safe place in the gob where it will not be subject to the crushing action of the roof.

Rockwood, Tenn. PILLAR ROBBER.

Inquiries of General Interest

Answered by

James T. Beard

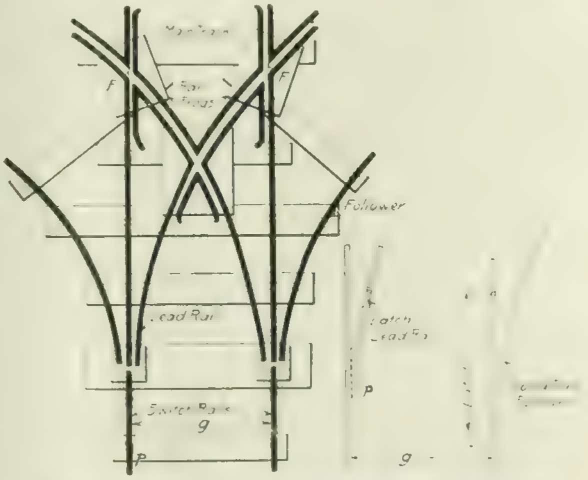
Three-Way Switch in a Mine

WE WANT to lay a three-way switch on the main entry in our mine and would greatly appreciate a diagram or explanation of how this should be done and how to calculate the length of the latches. I have drawn a rough sketch of what we want. The switches leading to the right and left of the main track start from the same point, as shown in my sketch. I remember seeing something similar to this described in *Coal Age*, some time ago, but do not remember how it was done.

——————, Ky. MINE SUPERINTENDENT.

It is impracticable to use latches, in laying a three-way switch, where the switches start from the same point in the main track. In that case, what is termed a "stub-switch" must be used, or one having a single switch-rail that can be thrown into line with any one of the three rails of the main track and the two switches. Such a switch is shown in the accompanying figure.

On the other hand, if it is desired to use latches, one of the side switches must start a little in advance of the other, on the main track. It is evident that both switches cannot start from the same point. A detail of a latch-switch is shown on the right, in the figure. It will be observed that, in this case, the follower rail of a side switch running to the right is one continuous rail, and the latch forms a portion of the right-hand rail in the main track. But, on the other hand, the left-hand rail of the main track is solid, while the latch on that side is made a portion of the lead rail of the switch.



ILLUSTRATING A THREE-WAY MINE SWITCH

The latch-switch is the common form of switch used in coal mines, as there is less danger of derailment of cars when latches are used. In either of the two kinds of switches tierods are used connecting the two latches or switch rails, as the case may be, so that they will each move alike when the switch is thrown. The tie-rods are not shown in the figure.

When laying a mine switch the first question to be decided is the frog number, which can only be determined by the conditions in the mine. Where there is plenty of room for turning the switch, especially in motor haulage, a No. 3 frog, having a spread of one in three, can be used. But where the room for turning the switch is limited, it may be necessary to use a No. 2 frog for a switch leading to a side entry, while a No. 1 frog is frequently used for a room switch.

Knowing the number of the frog (n), and the track gage (g), the length of lead rail (l) is given by the formula,

Length of lead rail, $l = 2gn.$

Thus for a track gage of $g = 36$ in. (3 ft.), and using a No. 2 frog, the length of lead rail required is

$$l = 2gn = 2 \times 3 \times 2 = 12\ ft.$$

This is the distance *PF*, measured on the rail, from the heel of switch or point of the latch, to the point of frog. The length of latch required, allowing a clearance of two inches, between the latch and the main rail, is found by multiplying the square root of twice the gage, in inches, by twice the frog number. Thus, for a track gage of 36 in. and a No. 2 frog, we have

$$\text{Length of latch} = 2n\sqrt{2g} = 2 \times 2\sqrt{2 \times 36}$$
$$= \text{say } 33\tfrac{1}{2}\ in.$$

In the figure, the detail of a latch-switch is outlined on the right or to one side of the stub-switch, which forms the main portion of the figure. With the exception of these details, shown in the lower portion of the figure, the two types of switches are identical. The frogs shown are those known as "rail frogs," and are most commonly used in all mine work. The track rails and guard rails forming the frogs are riveted to heavy plates of sheet iron.

Combustion of Methane

WHAT weight of oxygen will be consumed in the complete combustion of 150 lb. of methane or marsh gas? STUDENT.

La Salle, Ill.

We first write the equation, expressing the reaction that takes place between the gas and the oxygen of the air, in the complete combustion of methane (CH_4); thus,

$$\underset{16}{CH_4} + \underset{64}{2\ O_2} = \underset{44}{CO_2} + \underset{36}{2\ H_2O}$$

The figures written below each symbol indicate the weight of each substance, respectively. It is observed that 16 parts, by weight, of methane require 64 parts, by weight, of oxygen, for its complete combustion. In other words, the weight of oxygen consumed is four times the weight of the methane burned. Therefore, the complete combustion of 150 lb. of methane will require $4 \times 150 = 600$ lb. of oxygen.

Examination Questions

Answered by

James T. Beard

Miscellaneous Questions

(*Answered by Request*)

Ques.—What form of piling would you use to sink through a thick bed of quicksand struck some distance below the surface?

Ans.—The best form of piling for this purpose is an interlocking series of channel bars of wrought iron in lengths convenient for driving each series of piling into the quicksand, all around the shaft. The success of the operation will depend very much on the character of the sand and the pressure or head and quantity of water flowing into the shaft. Sets of timber frames will be required to keep the piling from being forced into the shaft by the pressure from behind. At times there may occur a strong rush of water and sand that will cause the bottom to boil, making the sinking both difficult and dangerous.

Ques.—There are two airways in a mine, one of these is 6 x 12 ft., in section, and the other 4 x 9 ft., in section. If the first airway is 1,000 ft. long, what must be the length of the second airway so that they shall each pass the same quantity of air, under the same pressure?

Ans.—First, write the formula for unit pressure in terms of the airway and the quantity of air in circulation; thus,

$$p = \frac{k l o q^2}{a^3}$$

By the terms of the question, p, k and q are each constant, and it is clear that l varies directly as a^3 and inversely as o. In other words, the length ratio is equal to the cube of the area ratio, multiplied by the inverse perimeter ratio, which is expressed as follows:

$$\frac{l_2}{l_1} = \left(\frac{a_2}{a_1}\right)^3 \times \frac{o_1}{o_2}; \quad \frac{l_2}{1,000} = \left(\frac{36}{72}\right)^3 \times \left(\frac{36}{26}\right) = \left(\frac{1}{2}\right)^3 \times \frac{18}{13}$$

$$l_2 = \frac{1,000 \times 18}{8 \times 13} = \frac{18,000}{104} = 173 \textit{ ft.}$$

Ques.—Two airways of the same length have diameters of 3 ft. and 4 ft., respectively. If a pressure of 5 lb. per square foot will force the air through the 4-ft. airway, what pressure is required to pass the same quantity through the 3-ft. airway?

Ans.—For circular airways of the same length and passing the same quantity of air, the unit pressure will vary inversely as the fifth power of the diameter of the airway. In other words, the pressure ratio is equal to the fifth power of the inverse diameter ratio. Therefore, in this case, calling the required pressure x, we have.

$$\frac{x}{5} = \left(\frac{4}{3}\right)^5 = 4.214;$$

$$x = 5 \times 4.214 = 21.07 \textit{ lb. per sq. ft.}$$

Ques.—Three boreholes, A, B and C, were drilled from No. 10 seam to No. 9 seam overlying, for the purpose of draining the water that had accumulated in the upper seam. The boreholes are each five inches in diameter; their lengths are: A, 110 ft.; B, 80 ft.; C, 90 ft. The elevation of the surface of the water is 1,000 ft., and that of the three points of discharge are: A, 900 ft.; B, 800 ft.; C, 850 ft. The elevations are all above sea level. What quantity of water will flow through each of these boreholes, assuming the elevation of the water remains constant?

Ans.—Substracting the elevation of each point of discharge from the constant elevation of the surface of the water gives the following respective heads: A, 1,000 — 900 = 100 ft.; B, 1,000 — 800 = 200 ft.; C, 1,000 — 850 = 150 ft. Now, assuming the entrance head, due to the resistance caused by the crowding of the stream lines of the water entering the mouth of the pipe, is one-half the velocity head; and, allowing that the dril holes are cased with five-inch pipe, and taking the coefficient of friction in the pipe as 0.01, the formula giving the flow of water (G), in gallons per minute, in a pipe whose diameter is $d = 5$ in., length l and head h, both in feet, is

$$G = 20\, d^2 \sqrt{\frac{2\, dh}{3.12\, d + l}}$$

Then, substituting the given values for the diameter and length of the pipe and the head, in each respective case, we have the following:

$$\text{A,} \quad G = 20 \times 5^2 \sqrt{\frac{2 \times 5 \times 100}{3.12 \times 5 + 110}} = 5,000 \sqrt{\frac{10}{125.6}}$$

$$1,410 \textit{ gal. per min.}$$

$$\text{B,} \quad G = 20 \times 5^2 \sqrt{\frac{2 \times 5 \times 200}{3.12 \times 5 + 80}} = 5,000 \sqrt{\frac{20}{95.6}}$$

$$= 2,287 \textit{ gal. per min.}$$

$$\text{C,} \quad G = 20 \times 5^2 \sqrt{\frac{2 \times 5 \times 150}{3.12 \times 5 + 90}} = 5,000 \sqrt{\frac{15}{105.6}}$$

$$1,884 \textit{ gal. per min.}$$

Ques.—The distance between a pair of cross-entries is 500 ft., and from the main entry out to the boundary line is 1,000 ft. The thickness of the seam is 6.5 ft., and the weight of the wastage in slack is 15 per cent. If the specific gravity of the whole seam is 1.3, how many tons of coal can be gotten from this block, leaving 25 per cent for pillars?

Ans.—Assuming that the main entries are parallel to the boundary line and the cross-entries driven at right angles to each, the cubic contents of the seam bounded by the main entry, the boundary line and the cross-entries is

$$500 \times 1,000 \times 6.5 = 3,250,000 \textit{ cu.ft.}$$

Then, taking the specific gravity of the coal as 1.3 and allowing 15 per cent for waste, which leaves 85 per cent of the seam available, the weight of this coal is

$$0.85(3,250,000 \times 62.5 \times 1.3) \div 2,000 = 112,226 \textit{ tons}$$

Finally, leaving 25 per cent or one fourth of this coal for pillars, gives a total extraction of 84,170 tons.

The Labor Situation

Edited by
R. Dawson Hall

Nottingham Drivers Were Soon Pacified

JUST one day was the duration of a strike of the drivers employed at the Nottingham mine of the Lehigh & Wilkes-Barre Coal Co. near Wilkes-Barre, called June 15. A driver had been discharged for a minor violation of the company's rules.

Maryland Miners Allege Evasion of Award

ALLEGING that the award of the Bituminous Coal Commission has not been lived up to by the operators of the Georges Creek and upper Potomac fields, the United Mine Workers of district No. 16 met in Cumberland, Md., June 15, in a three-day special convention. William J. Trickett, district secretary-treasurer, declared that a majority of the coal operators are not fulfilling their obligations under the ruling of the commission and said that he hoped that the meeting would end in a working agreement being made between mine workers and operators. Meantime, he said the leaders of the union were having much difficulty in preventing strikes.

Kentucky Miners Want Union Recognized

LABOR is again dissatisfied and, according to some prominent operators, there is a chance of another walk-out in southern Kentucky. One operator of the Harlan region stated that many of the mines were paying more than the 27 per cent increase over the old schedule, but that the workers were still not satisfied. He said: "They are getting good wages and getting in much better time than they did, but now that things are getting good they've got to find something to argue about. The new row is over the refusal of the operators to recognize the closed shop and to collect union dues by deductions on the payroll.

"We have one loader who recently pulled down $34 for one day's work, and plenty of men who make $20 to $25 a day. They'll never be satisfied, however, as they are Bolsheviki at heart."

Fairmont Region Settles Its Deadwork and Classification Problems

AFTER parleys lasting for a month or more the joint board of miners and operators of northern West Virginia constituted for the purpose of reaching an agreement as to the pay for deadwork and for agreeing upon the classification of certain kinds of labor in various localities finished its work at Fairmont during the second week of June.

General contract interpretations were agreed upon, such interpretations to form a basis for deciding disputes which may arise in the future. While the miners expressed the belief that basket men should be included in the classification as dumpers, that was not the conclusion of the board and the classification of dumpers remains the same.

The board was composed of the following operators: A. Lisle White, Clarksburg, W. Va., chairman; C. H. Tarleton, Fairmont, and Everett Drennen, Elkins, and of the following miners' representatives: J. F. Forenesch, president of subdistrict 3, Grafton; W. F. Ray, and Ira Marks, district board members, district 17.

Universal (Ind.) Miners Reach Agreement

THE contract between the United States Fuel Co., owners of the mines at Universal, Ind., and the United Mine Workers of Indiana was completed June 9 at Universal without any hitch in the proceedings. Both the miners and the operators went on record as favoring strict enforcement of the present contract. The only difference in the contract signed by the miners with the United States Fuel Co. and the one signed some time ago with the Indiana Bituminous Coal Operators' Association, which has been causing some slight trouble in subdistrict No. 2, is the clause which provides for the settling of disputes. These will be taken up by Ed Stewart, president of the miners, with the secretary of the company.

Insurgents Would Oust Union Officers

A "RUMP" convention of miners was recently held in Sullivan County, Indiana, at which resolutions were passed against the present wage contract and against the officers of district No. 11. Clinton Local No. 2,446 showed itself firmly in support of the district leaders and the contract.

When Salmond, who had been made chairman of the grievance committee of the "rump" convention, and whose duty as such was to go over the district and assist in organizing against the present officers of the regular organization, went before his local union to make his report he was received quietly but dourly. When he had finished his talk the local advised him to withdraw immediately from the committee and have nothing further to do with the movement.

Common Viewpoint Ends Indiana Dispute

COAL operators and miners in Clinton, Ind., believe that the trouble arising from the controversy about the lifting of bottom coal and also that regarding the Saturday holiday movement has come to an end. Miners say that the Saturday holiday does not at this time appear to be feasible, as it keeps the railroad cars idle. Many of the miners expect to go to work when the mines are marked up for a Saturday run. The loaders and operators appear to be standing together in the demand that the machine men cut the coal within 3 in. of the bottom at the front of the cut and down to the bottom at the back.

NEWS FROM THE CAPITOL

BY PAUL WOOTON

Additional Injunctions Against Assigned Cars Sought

ADDITIONAL injunction suits have been filed by the National Coal Association against railroads practicing the use of assigned cars. The new suits are against the Pennsylvania, the Chesapeake & Ohio, and the Southern Railway. The initial suit was filed against the Baltimore & Ohio Railroad. Other suits will be filed soon, as the National Coal Association has determined to press this matter in the most vigorous way possible.

Coal Men Want Claim Settlement Rules Published

THE American Wholesale Coal Association is taking vigorous measures in order to have the Director General of Railroads publish the set of rules for settlement of claims which were agreed to and adopted over a year ago. The original rules were the result of a conference between the claim agents and representatives of the coal operators, jobbers and retailers, and the National Industrial Traffic League. At the time they were agreed to John Barton Payne, then attorney in charge of these matters for the Railroad Administration, advised against promulgation, and they have been held up by the Railroad Administration ever since.

Natural Gas Interests Confer on Conservation Program

DEFINITE progress was made in the Natural Gas Conservation conference at the Department of the Interior on June 11, when tentative resolutions proposed by the National Committee on Natural Gas Conservation were approved. The conference included representatives of the governors and public service commissions of a number of the important natural-gas producing and consuming states.

One of the most important results of the conference, aside from the adoption of the resolutions, was the tentative agreement by state officials in Pennsylvania, West Virginia and Ohio to hold a conference the latter part of this month in Pittsburgh, with a view to formulation of a policy that will be mutually satisfactory to the gas interests in the tri-state fields. The problem of export of natural gas from West Virginia into Ohio and Pennsylvania for a number of years has been a difficult one. It is hoped that the coming conference will be able to proceed on the basis of the proposed resolutions to more effective measures than have previously been possible.

It is also expected that some regulations will be introduced in the Louisiana State Legislature by Mr. M. L. Alexander, a member of the Conservation Committee of that state, in order to give effect to the conservation measures recommended by the resolutions adopted at the conference.

Geological Survey to Study Eastern Power Possibilities

THE U. S. Geological Survey has been authorized, by the Sundry Civil bill, to proceed with the superpower survey for the industrial region, Boston to Washington. The bill also provides an appropriation of $125,000, together with authority to receive additional sums which may be contributed to the work. This survey will include a study of the possibilities of water power compared with coking of coal- and steam-power plants, both at the mine and at seaboard. It is expected that several experts of wide experience will be engaged by the Survey to direct the investigation.

President Signs Water-Power Bill

AFTER thirty years of discussion the nation finally has a water-power policy. Announcement was made June 18 that the President had affixed his signature to the water-power bill previous to June 11, the date of expiration of the ten-day interval allowed for signing bills according to a decision of the Attorney General. This places upon the statute books of the nation a measure dealing comprehensively with water-power developments both on public lands and on navigable waters.

When it is considered that the nation's potential water-power capacity exceeds 60,000,000 horsepower it can be seen that this legislation is likely to have an important bearing on the general fuel situation. At present the country has but 5,000,000 horsepower of developed water powers. While considerable development of water power is expected to begin at once, it is recognized that the conditions laid down by the bill are strict, and it is problematical as to how attractive the development of these power sites may be to capital under its provisions.

Senator Jones of Washington, who is in charge of the legislation in the Senate, is authority for the following statement:

"Every water-horsepower going to waste which could be substituted economically for fuel power would represent approximately five and one-half tons of coal per year, based on an average of twelve hours per day. The labor of one man is released for other uses every time 50 hydro-electric horsepower is developed and every 150 water horsepower developed releases one freight car for other duty.

"This act means a saving of coal and a lower price for that used; a saving of oil and a lower price for that consumed; more efficient transportation and lower cost for service; the development of new industries; the building up of new communities; the creation of new property values, subject to taxation for the support and maintenance of local and state government."

Attorney General Orders Indictment of Coal Profiteers

AS THE result of complaints to the Department of Justice that soft coal operators are profiteering Attorney General Palmer has ordered the prosecution of the offenders. Instructions were issued June 17 to Federal attorneys throughout the country to investigate the cases reported and to prosecute where the evidence warrants.

The complaints allege that coal prices range from $7 to $11 per ton at the mines. According to the Attorney General the cost of production has only increased to $2.79 per ton. Legal action in the cases would be taken under the Lever act, which prohibits unreasonable profits in coal and other necessaries. The Attorney General's instructions to the Government Attorneys follow:

"The department is receiving a number of letters in which complaint is made that bituminous coal prices at the mines now range from $7 to $11 a ton, with a further increase imminent. The writers say that operators are attributing the advanced prices to car shortage and export demand, emphasis being placed upon the export demand.

"Production cost figures gathered by the Federal Trade Commission from 1,589 bituminous operators from the principal producing regions, mining roughly about 60 per cent of the annual output, show that during January, 1920, their costs per ton averaged $2.32 at the mines. Since then there has been an increase of 27 per cent in the cost of labor, enhancing the production cost to $2.79 per ton. The accuracy of these figures is borne out by information in letters coming to the department from purchasers of coal, from which it appears that prices in May did not greatly exceed those furnished to the Federal Trade Commission for January.

"This situation demands the prompt attention of all United States Attorneys. Please give special attention to this matter and seek indictments where investigation discloses that an unreasonable profit has been taken, advising the department of the action that is taken."

Movement of Coal Through the Sault Ste. Marie Canals

SHIPMENTS of coal passing westbound through the Sault Ste. Marie canals during the two months ending with May, according to figures prepared by the U. S. Bureau of Foreign and Domestic Commerce, amounted to 212,000 short tons of anthracite and 582,206 short tons of bituminous.

During the same period of 1919 the totals were: Anthracite, 391,127 short tons, bituminous, 2,655,562 short tons.

Coal Men Endorse Priority Order, but Oppose Assignment of Cars

AFTER having had a few days to study the rather intricate and vague language of the service order of the Interstate Commerce Commission with regard to priority for coal moving to New England, coal men generally are of the opinion that the step is a wise one and probably can be worked out without serious disturbances. Just as service order 5 gave priority to coal moving to pools over coal not moving to pools, order 6 gives priority as between coal moving to New England and coal intended for export.

The order, however, does raise a very serious question, coal men believe, in that it aggravates the practice of assigning cars. No difference can be seen in principle in assigning cars to James J. Storrow as compared with cars assigned to a mine which is producing fuel for railroads.

War Department Awards Contracts for Coal for Western Posts

AWARDS have been made by the War Department covering 800,000 tons of coal to be used at army posts in the West. Because of the conditions of delivery there was a wide range of prices, but most of the coal on which a mine price was quoted varied from $2.70 to $4 per ton. It will be recalled that the army rejected the bids submitted for the coal needed at its Eastern stations. New bids are to be opened July 15.

Trade Report Requirement Suspended Pending Result of Legal Action

AN AGREEMENT was reached Monday by the Federal Trade Commission and the iron and steel companies contesting its right to require monthly reports whereby no steps will be taken against other companies pending the outcome of the cases to be tried in Philadelphia and Trenton.

President's Anthracite Committee to Hold First Meeting in Scranton Today

THE Anthracite Wage Commission decided early this week to hold its first meeting in Scranton today and chose for its chairman William C. Thompson. He is president of Ohio State University and represents the interest of the public in the controversy.

Matewan Tragedy Followed by Marriage

AN AFTERMATH of the Matewan (W. Va.) tragedy of May 19, in which a number of Baldwin-Felts detectives were shot down following an eviction of coal-mine employees, occurred early in this month when Sid Hatfield, chief of police of that town, and Mrs. C. C. Testerman, wife of the mayor, who was killed on the date mentioned, were married. When Testerman and Albert Felts were killed, Testerman, Felts and Hatfield were congregated at the entrance to the village store. Only two weeks later, Hatfield and Mrs. Testerman were married.

Discrimination in Freight Handling Violates Law, Judge Says

IN a decision enjoining certain deep-sea steamship companies from refusing to handle merchandise barred by union labor, Justice Lewis L. Fawcett, New York Supreme Court, says:

"The representatives of the companies who decline to furnish service are violating the law, and the employers where strikes are threatened to compel them to violate the law are engaged in an illegal combination. The carriers have aided and encouraged the unions by seeking to evade their duties to handle plaintiff's goods without discrimination.

"While a man may enter any vocation he chooses, yet if he selects a field indissolubly linked with the rights of the public, such as a common carrier, he must subserve his own rights to that of the public welfare.

"The combination violates the United States Shipping Act and Section 5,440 of the Revised Statutes. Under these statutes a refusal of the carriers to transport the plaintiff's merchandise is a crime, and the unions are engaged in an unlawful conspiracy when they induce, aid or abet the carriers in committing the same, and it is no excuse to the carriers that the employees threaten to strike."

Britain Suspends in Part Government Control of Coal Industry

IN announcing the suspension of the operation of the Household Fuel and Lighting Order, 1919, beginning June 7, the London correspondent of the *Journal of Commerce* states that the Government through the Coal Controller controls both the production and marketing of coal. Technically the Government is in possession of the collieries, and while the management has been left free profits the allocation of coal to export and home requirements and the pithead price have been strictly controlled.

The Government also has controlled wages to the extent that it has acted as the final court of appeal. Marketing of coal, wholesale and retail, also has been strictly controlled. Profits have been limited under the Wholesale Prices Order and the Retail Prices Order. So far as household coal is concerned, the Government has controlled the allocation and purchasing by registering merchants and rationing the consumers. Under the Retail Prices Order local authorities and local fuel overseers have adjusted prices from time to time to meet the increased costs. The system has entailed a heavy administrative burden on the Coal Controller's Department.

The country was very near a coal famine once or twice last winter. Supplies were very limited, and there is an enormous increase in the industrial demand. A very large staff has been employed. The local fuel overseers alone have cost £400,000 a year. In addition there have been divisional offices and officers, traffic superintendents, and their staffs.

The Government's intention is for the present to retain control of production, but to wipe out control of marketing. This will give the coal consumers at home complete freedom of action once more, the consumer will be able to get coal of the quality required, and it is expected that cleaner coal will soon be available.

Fuel overseers and the rest of the large staff employed on the marketing side of control will be released, considerable economies thus becoming possible in the Coal Controller's department, and a very heavy burden of administrative work will be lifted.

Suspension of control becomes effective June 7. This step could only be taken in the summer time, and it is only possible on the present output with a restriction of exports. Exports have been cut down to about 2,000,000 gross tons a month. To provide for the increased demand at home they are now to be cut down to 1,750,000 gross tons per month. The exports committee has agreed to this reduction in view of the necessity for meeting home demands.

In each coal producing area a Board of Trade committee has been sitting under the system of control. With the lifting of control those committees will remain. They will be so arranged as to have on them representatives of the coal owners, the merchants and factors, and consumers. Any complaints as to short supplies in particular districts would by this means be brought to the direct notice of the coal owners. These committees will exercise a supervising interest and will be coordinated by a central committee meeting in London.

There is little prospect of an immediate reduction of price as the result of the lifting of Government control; equally there should be no increase; the removal of control renews competition among merchants and factors, which should tend to lower prices gradually, and the consumer is protected under the Profiteering Act.

The Government through its control experiences is in possession of ample evidence as to cost of production and transport from the pit right down to the consumer, which will be available to the Board of Trade and all profiteering committees. This will exercise sufficient restraint against any attempt to raise the cost of coal to the home consumer.

Smokeless Operators Ask Revision of Navy Coal List

REVISION of the navy's preferential list of coal mines is likely to result from a full discussion of the subject by smokeless operators with navy officials on June 18. It was pointed out that under present conditions the navy's policy works an extreme hardship on the comparatively few mines which are called upon to furnish this coal at a very reduced price. While the hope is entertained that the preferential list can be abolished entirely, it is regarded as practically certain that at least a more general distribution of the navy's requirements will be secured.

The smokeless operators designated O. M. Deyerle, president of the Flat Top Fuel Co., to represent shippers on the Norfolk & Western, and Frank Ellison, general manager of the C. G. Blake Coal Co., to represent shippers on the Chesapeake & Ohio and the Virginian railways. Mr. Deyerle and Mr. Ellison will work out the details of the revision with Commander Hilton of the Navy Department.

Indiana Production Decreases Slightly

PRODUCTION of coal at 192 mines in Indiana in the week of June 12 is reported as 533,174 net tons, a slight decrease compared with the week preceding. These mines operated 62.4 per cent of full time, with car shortage accounting for 29 per cent of full time lost. The other causes contributing to lack of production were labor trouble, mainly in the Evansville and Linton districts, and mine disability.

British Coal Exporters Protest New Government Restriction

AT a meeting held June 11 at Cardiff, according to a cable despatch to the *Journal of Commerce*, the Coal Exporters' Association passed the following resolution:—"The coal exporters, while anxious to support the policy of the Government in providing adequate supplies of coal for inland use, protest strongly against the vexatious and unworkable conditions now enforced on shipments of what coal is available."

Newcastle reports that official information has been received that the Durham allocation of coal for export amounts to 350,000 tons per month, each colliery to supply a certain percentage to individual countries. The percentage is apparently based on output, not on grade of coal mined, and it is assumed therefore that all coals will have to be shipped as wrought. In perspective all screening machinery will be scrapped and foreign buyers must take unscreened coals or do without.

The scheme is considered altogether unworkable and a deputation is proceeding to London to discuss the situation with the Coal Controller. It is expected that many mines will remain idle for a while.

Coal Interests Urge Higher Freight Rates At Commission Hearings

NO SERIOUS objection to an increase in coal rates by the railroads was registered by representatives of the coal industry who appeared before the Interstate Commerce Commission June 16 and 17. In fact, practically every witness expressed a hope that the carriers would be granted an increase which would permit of adequate improvements and replacement of equipment. Practically the entire hearing was consumed in making comparison of rates between the various mining districts. It was asked that the distortions which grew out of general order No. 25 be recognized by the commission in any increase which it may make on coal.

It was argued that it is in the interest of the consumer, the general public, the operators, and the carriers that the well-established differentials be preserved. Many of them, it was pointed out, have been fixed by the Interstate Commerce Commission after litigation and after extensive hearings. To disrupt them would bring about great confusion, it was argued. The relative merits of a flat rate in cents per ton as compared with the percentage increase was presented at length.

One of the contentions made was that short-haul coal is bearing more than its proper proportion of freight rates. It was predicted that any further increase will encourage the production of power at the mines, thus reducing carriers' revenue. It was pointed out that in many cases at present the freight charges to points relatively close to mines already equal the cost of maintaining an overhead line for the transmission of power.

Due to the local nature of the question the National Coal Association took no part in the proceedings other than to introduce as a part of the record the resolution adopted at the Atlantic City convention, which reads as follows:

> Whereas, the present insufficient production of coal is directly due to the lack of adequate transportation facilities, and whereas the quickest way to rehabilitate the railroads and enable them to secure the needed equipment and give the service which will tend to reduce the cost of production of all commodities, including coal, is to re-establish railroad financial credit,
>
> Therefore be it resolved that the coal industry recognizes the need for an immediate increase in the revenues of the railroads, sufficient to insure their solvency and prosperity, by means of an increase in freight and passenger rates. However, the coal industry desires assurance from the Interstate Commerce Commission that this endorsement of an immediate increase in all freight rates will not prejudice the right of any parties interested to obtain redress hereafter, first if the differentials are inequitable, as between different mines or different producing districts, and second, if rates themselves are excessive, unreasonable or discriminatory.
>
> The coal industry desires to call attention to the fact that the coal consumers have already borne more than their share of increased cost of transportation and that the public welfare might be conserved by adopting a higher percentage of increase on freight of greater value and a lower percentage of increase than proposed on coal, which is the basis of industry.

Predicts Sufficient Coal Next Winter

PLENTY of bituminous coal next winter is predicted by George H. Cushing, managing director of the American Wholesale Coal Association, in an address before the City Club of Washington, D. C., on June 15.

Mr. Cushing cited the following figures bearing on the coal production of the nation:

"Since April 1 we have records of the production during nine weeks. The bituminous output of this year compared with last has been: 1920, 80,521,000 tons; 1919, 72,818,000 tons; gain, 7,703,000 tons.

"The average weekly production since April 1 has been: 1920, 8,946,000 tons; 1919, 8,090,900 tons; gain, 855,800 tons.

"The average monthly production has, accordingly, shown a gain of 3,708,450 tons. Last year, with the smaller production, we had accumulated a sufficient storage to help tide us over the worst miners' strike in history. Running ahead, now, of production of last year, I cannot believe the current statements that we are running headlong into a dreadful shortage of coal.

"I know what is being said on the other side of the question. I do not believe it. The fact is that we have a demand which if it were spread in equal monthly proportions over the year would call for a production of 10,300,000 tons per week. The fact that for nine weeks we have been getting a weekly average of only 8,946,700 tons indicates that we are accumulating a shortage at the rate of 1,353,000 tons per week. That would be bad if it were to continue until the end of the year.

"The fact is that we have never, in peace times, had a serious bituminous coal shortage. Yet never, in peace times, have we moved bituminous coal in equal monthly installments. We have always fallen much below our present level of production in summer and then made up the shortage—or seeming shortage—in the fall months. That is what we did last year. We are going to have less of a shortage to make up this fall then we did last, for the reason that we are moving now 3,700,000 tons of coal more to market per month than we did a year ago.

"The plain and simple fact is that we have other and proper uses for open-top cars in the summer. Those uses disappear in the fall. The cars then revert to the coal trade, and production naturally grows in response. That allows coal production to equal demand at the time of use."

Production and the Market

Weekly Review

Interstate Commerce Commission Orders Preference and Priority to New England Coal Shipments to Tidewater—Production Goes Up and Promises to Climb Higher—Order Confining Open-Top Cars to Coal Will Help—Prices Still Going Up.

ARBITRARILY taking several hundred thousand tons a week out of the supply for export will force prices for foreign delivery to even higher levels. At the same time the high prices at tide are due to drop for New England buyers, and with gradual but consistent gains being made in production each week and the benefit to car supply that is certain to follow the order limiting for the next thirty days the use of open-top cars to coal an easier market is looked for over the East generally.

Prices continue to occupy first place in the interest of the public. The Attorney General has issued instructions to his field force to prosecute those dealing in $10 coal, mine price. It is noteworthy that in Illinois mine prices are regularly quoted lower for southern coal than for that from central and northern Illinois, although usually selling for higher prices. The operators in the south field seem to be exercising somewhat greater restraint than the others.

Southern West Virginia coal is now moving west and in the next few weeks the situation will be much easier in the Chicago market. Meanwhile such points as Louisville, St. Louis, Milwaukee and Detroit are struggling to get supplies and are anxiously awaiting the heralded movement of empties ordered in from the West a month ago.

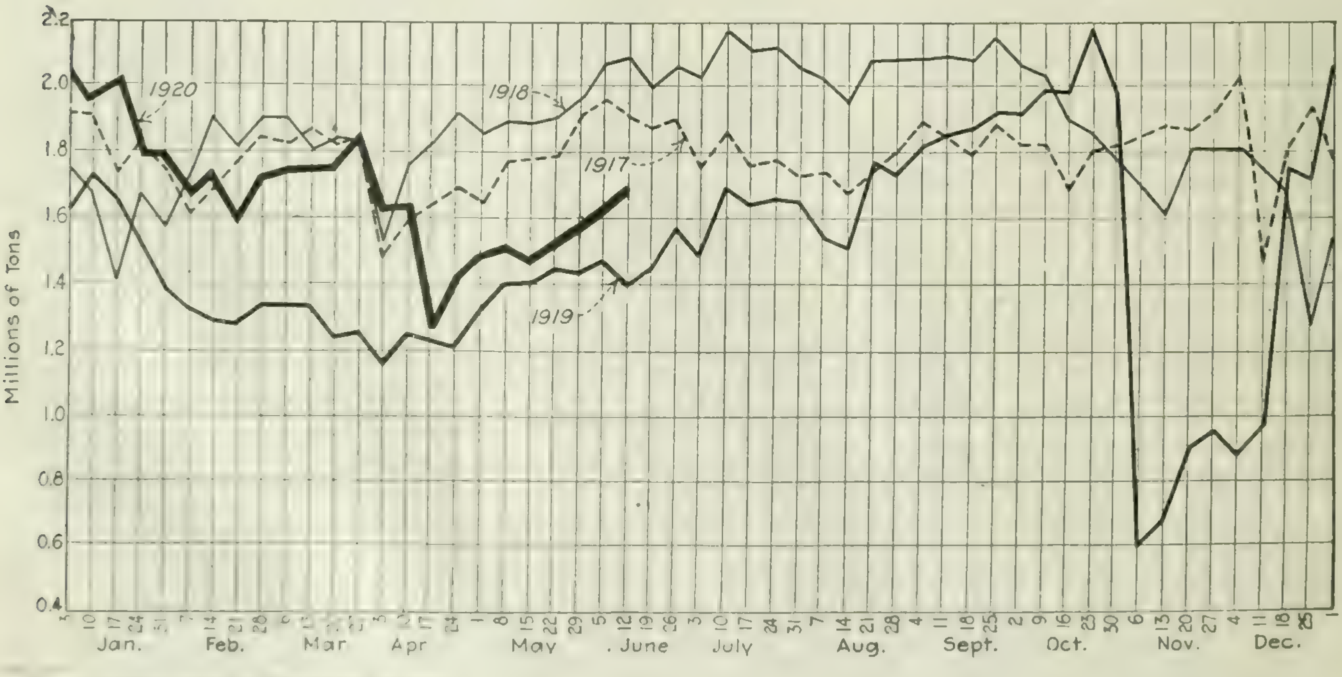
Anthracite is steadily gaining in total output, but whether or not a considerable portion of the increase is washery coal that does not add to the supply of domestic sizes, no information is available. New England has not been concerned until recently about the shipments of hard coal, but the West has been complaining of short movement compared with last year.

Lake Coal Dumped Season to June 19

(NET TONS)

	Cargo	Fuel	Total
1919........	7,160,600	325,970	7,486,570
1920........	2,487,800	245,600	2,733,400

Average Daily Production of Bituminous Coal*



*From weekly report of Geological Survey

Reports From the Market Centers

New England

BOSTON

Spot Prices Seem To Have No Limit — Buyers Strive to Get Coal—Federal Aid Is Invoked—Tidewater Piers Are Congested and Hampton Roads Loading Is Slow—Anthracite Movement Slackens, Causing Much Anxiety.

Bituminous—The spot market on steam grades continues its amazing upward swing. Only 60 days ago there was a strong feeling in the trade that operators would hardly dare mark up prices beyond $6 per net ton at the mines, but at this writing the $11 mark has been passed and $12 is near at hand. There is no sign of price recession and there is still the same clamoring for quick coal that has been characteristic for more than six weeks.

Every wholesale office is besieged with eager buyers. Middle-houses are buying of one another, and conservative consumers who were inclined to wait developments are now thoroughly alarmed and seeking coal at the best price obtainable.

The situation has been taken to Washington. Efforts have focussed on the Interstate Commerce Commission and a hearing was recently held. It was urged that some form of priority in car-supply should be granted this territory, such as has been given the Lake market.

One difficulty is that both Hampton Roads and the Lake territory draw quite largely from the West Virginia fields, while New England is now much more largely supplied from central Pennsylvania, as indeed are New York, New Jersey, and Pennsylvania itself, not to speak of heavy consuming districts in Canada.

The car movement is really improving. Cars have reached New England from beyond Pittsburgh in less than ten days, and the railroads are handling coal traffic in much better fashion.

The tidewater piers, especially at New York, show signs of congestion. Some of the embargoes have been lifted, but the labor situation and the great difficulty of shifting cars and boats are together causing such delays as to make terminal conditions almost impossible. Bottoms have accumulated to greater extent than at any time heretofore this season.

At Hampton Roads there have been further delays the past week. Demurrage charges have accrued on most of the boats listed to load on coastwise business, and re-handlers here have been obliged to mark up prices in consequence. Prices on cars Providence have advanced from $11.50 to $12.50 within a day or two, and at Boston there have been sales up to $16.

The New Haven R.R. has resumed seizing coal in comprehensive amounts. But a system of permits has now been worked out and under the close supervision of division superintendents, industries really in need of fuel are enabled to have their coal protected.

Current prices on bituminous at wholesale range about as follows:

	Clearfields	Cambria and Somersets
F.o.b. mines, net ton	$9 75@$11 25	$10 25@$11 50
F.o.b. Philadelphia, gross tons	12 80@ 14 50	13 40@ 14 80
F.o.b. New York, gross tons	13 15@ 14 85	13 75@ 15 00

Anthracite—Due to renewed urgent inquiry from the Middle West, shipments both all-rail and to tidewater have both appreciably slackened. Domestic sizes are in quite strong demand. The retail dealers are making no secret of their anxiety and by September there is certain to be a mild form of panic to get covered for ordinary requirements.

The weather has interfered with movement by water to a considerable extent during the past fortnight, and as a result receipts here will show quite a falling-off as compared with figures for May. The steam sizes continue in fair request, but there is by no means the buying power to the market for this fuel that might have been anticipated.

Tidewater

NEW YORK

Anthracite Demand Is Strong and Receipts Are Comparatively Low for the Season—Domestic Sizes Needed Here—Movement of Steam Sizes Is Brisk—Bituminous Demand Increases and Coal Moves in Good Volume — Consumers Look for a Break in the Market.

Anthracite—With the demand remaining strong the dealers here are in the market for heavier tonnages than they now receive. Receipts of coal are not as they should be at this season but the trade is not complaining as they realize that New York is being well cared for when the local harbor labor troubles and the demand from the Lake ports are considered. Demand along the line is also strong.

While production is heavy, some shippers fear that with the efforts being made to secure a stronger movement of bituminous, the car supply at the anthracite mines will be cut down.

In this market the companies are barely able to take care of the immediate requirements of the retail dealers and the latter in turn are far behind in their orders to their customers. However, nearly all consumers have some coal in their bins.

The steam coals are finding a steady market. Barley is a little sluggish but buckwheat and rice are active. Considerable of the activity is attributed to the high prices quoted for bituminous.

Quotations for other than company product, at the mines, range about as follows: Buckwheat, $4.25 to $4.75; rice, $3 to $3.75; and barley, $1.75 to $2.25.

Current quotations for company coals, per gross tons, at the mine and f.o.b. New York Tidewater, at the lower ports, are as follows:—

	Mine		Tidewater	
Broken	$7 30	$7 50	$9 15	$9 35
Egg	7 30	7 45	9 15	9 30
Stove	7 55	7 80	9 40	9 65
Chestnut	7 60	7 80	9 45	9 65
Pea	5 85	6 25	7 60	8 00
Buckwheat	4 00	4 10	5 75	5 85
Rice	3 00	3 50	4 75	5 25
Barley	2 25	2 50	4 00	4 25
Boiler	2 50		4 25	

Quotations for domestic coals at the upper ports are generally 5c higher on account of the differences in freight rates.

Bituminous—The increasing demand for fuel continues while the quotations for "anything that looks like coal" seem to be seeking new levels. Prices for coal at the mines are higher than a week ago and there has been a corresponding increase in quotations at this tidewater. Much of the high prices are due to the insistency of buyers who are in the coal fields and are bidding against each other.

Water deliveries in this harbor continue to be delayed because of the marine troubles. Heavy towing charges remain in force driving prices for boats alongside to around $15. Loaded boats are being quoted from $13 to $14, with rumors that slightly higher quotations have been made.

Quotations at the mines vary and while they generally show an advance over those of the previous week it is said that some operators are letting their products go at lower figures. Fair grades of Pennsylvania coals were quoted around $10 with quotations for gas coal at about the same figure. Car supply was slightly better on all roads.

PHILADELPHIA

Dealers Are Unable To Accumulate Anthracite Stocks — Pea and Chestnut Are Short — Stove in Greatest Demand — Steam Coals Are Active, Except Barley — Production at Mines Keeps Up, but Car Supply Diminishes—Heavy Volume of Bituminous Goes to Tide—Record Prices Are Asked.

Anthracite—Moderate tonnages of anthracite continue to reach the city, although dealers so far have been unable to accumulate any reserve stocks. The amount of coal coming in is still sufficient to keep delivery equipment busy, yet the fact that coal is being sent out as fast as it comes in is causing uneasiness among the trade.

Pea coal is actually scarce now;

heretofore it has always piled up at this time of the year. For the past four years the use of this size has extended to an ever-widening territory. At this time the West is taking considerable quantities and among the premium shippers it is stated they are getting as high as $9.75 at the mines for this size.

The size still called for in greatest volume is stove, but no dealer pretends to be able to meet the demand for it. Chestnut coal is also short. The demand for egg keeps up without any sign of diminishing as the season advances.

The steam coals are moving nicely, with the exception of barley. Buckwheat is actually tight and the companies with prices of $4 and $4.10 have all the business they can handle. The independents are getting prices ranging from $4.25 to $4.50 for this size and moving all they can produce. Rice is also quite active, due probably to the scarcity of soft coal. Barley continues stagnant. With the big consumer there seems to be a tendency to permanently change a portion of the boiler equipment so as to be able to take advantage of a situation such as the present, with soft coal sky high and an over-production of barley.

Bituminous—It is claimed that soft coal has shown an increase in production recently. But all week at the mines, prices have hovered closely around $10 and sales even at $11 have not been rare.

However, the big producers have no coal to offer on the spot market, most of them being hard put to try to meet their contract obligations.

As yet the operators will not admit that the car supply has appreciably improved. Those concerns willing to take railway-supply coal, on the basis of $4 to $4.25 at the mines, are the only ones thus far who are able to make anywhere near full working time.

There continues to be a heavy volume of coal going to tide to the various pools. There is a particularly heavy tonnage of gas coals in the pools awaiting vessels for export. Due to the longshoremen's strike, loading has been somewhat delayed and coal has accumulated awaiting the berthing of vessels. The average price for coal at tide is close to $10, although at times during the past two weeks it is reported sales were made around $15.

BALTIMORE

Transportation Conditions and Terminal Congestion Force Export Embargo—Poor Car Supply and Movement of Loads Keep Price Sky High—Anthracite Receipts Are Slow and Prices Advancing.

Bituminous—A continued poor run of cars at the mines, a poor railroad movement, systems jammed with coal on sidings and terminals at tide also crowded with standing cars, faced the trade here the past week. Since midnight of June 15, the Baltimore & Ohio has operated an embargo against all shipments to tide on export, and even the outstanding permits were cancelled.

Coal and ships have to be actually at hand to get results at the pier here. At this writing there are more than 2,000 loaded cars at the B. & O. piers, with 24 ships waiting to take on 144,000 tons on export and coastwise hauls, and with dumpings only averaging a little above 300 cars a day at that point.

The secret of the situation seems to be in poor transportation—poor supply of empties and a poor movement of loaded cars.

Best coals are still selling f.o.b. mines the net ton at between $10 and $10.50, with both export interests and domestic consumers competing for the fuel. Medium-grade coals readily bring $9 and better, while the poorest coals are worth from $8.25 to $8.50. Exports were running quite heavy up to the time the embargo was put into effect, and even now are large. The first half of June saw a loading of more than 250,000 tons of export cargo coal, with the ships taking more than 60,000 tons additional for bunker use.

Anthracite—The receipts of hard coal continue most unsatisfactory. Deliveries to cellars here are far behind this period of last year. And this year those with orders on the books now realize that they will not get the coal at the price at time of order and are urging deliveries, knowing that still higher rates are coming. Meanwhile almost every notice from mine connections shows some advance in wholesale price, and thus overhead costs keep mounting.

Lake

BUFFALO

Slight Improvement in Soft Coal Movement—Demand Is Fair with Most Coal Moving Under Contract — Anthracite Situation and Lake Trade Good—Coke Market Is Unsteady.

Bituminous—The improvement in coal movement is small and complaints from mine owners continue. Allegheny Valley operators especially note poor transportation. If the cars were at all adequate, the present frightful state of prices would last but a short time. As it is the mine prices soar to close to $10.

The demand is fair. Some jobbers are staying out of the market almost entirely beyond looking after their old customers and seeing that they do not run out of coal. A large part of the coal is moving under contract.

Anthracite—The demand continues good and the local supply at least is fair. Never before has so much anthracite been sold here so early in the year. The Canadian supply does not appear to be so good, for a large number of dealers have been here lately, asking for coal.

An odd feature of the trade is the slow sale of the steam sizes of anthracite. It is shown that this coal costs much less than bituminous and yet it is hard to get firemen to use it.

In the Lake trade the movement is good, with one trestle still idle, the amount loaded for the week being 121,400 net tons, of which 30,100 tons cleared for Milwaukee, 28,100 tons for Duluth-Superior, 25,400 tons for Chicago, 12,700 tons for Fort Williams, 7,700 tons for Port Arthur, 7,400 tons for Escanaba, 7,000 tons for Sheboygan and 3,000 tons for Green Bay.

Freight rates are 65c. to Chicago, 60c. to Milwaukee, 55c. to Sheboygan, Green Bay and Escanaba, 50c. to the Lake Superior ports.

Coke—The trade is in quite an unsteady condition, with all sorts of prices asked for single-order shipments. The latest report is of $15.50 at the ovens for both foundry and furnace, with little demand for the domestic sizes. The few sales reported differ about $3 per ton within a week. Only a small part of the consumption is outside of the contracts.

CLEVELAND

Continuous Operation of Mines Is Urged on I. C. C.—Situation Improves Slowly, but Famine Conditions Threaten—Only Anthracite on Hand.

Bituminous—Following a conference with railroad officials and the manager of the Ore and Coal Exchange, operators in the No. 8 district with headquarters in Cleveland, have sent an appeal to the Interstate Commerce Commission for the means of "continuous operation of the mines." This can only be accomplished through adequate supply of cars at the mine mouth.

Complaint continues that cars ordered East from the Western states have not appeared in appreciable quantities in the coal regions supplying this district. Coal men say that the small improvement that has been seen cannot be traced to the heralded car movement from the West.

Most plants continue to operate on a hand-to-mouth basis with respect to coal and efforts to get sufficient coal to prevent shut downs is almost frantic in numerous cases. There has been some improvement in the railroad labor situation, but conditions are still deplorable. As high as $8 is still being offered by consumers in dire need but spot supplies even at that price are almost unobtainable.

Pocahontas and Anthracite—Anthracite coal is about the only grade of coal on hand in dealers' yards, and most retailers are accepting orders for delivery of anthracite but for nothing else. Anthracite prices remain unchanged. Pocahontas supplies have almost reached the vanishing point and retailers are refusing to quote prices or guarantee deliveries. The supply is said to be about five per cent of the demand at present.

Low operations, unusual shipments to tidewater from the mine districts supplying Cleveland and diversion of supplies to supply the Lake trade, are the chief reasons why retailers are short of supplies. Some of them are getting coal from the Indiana fields, a novelty in Cleveland.

Lake Trade—The new pooling arrangement for shipments up the Lakes went into effect a few days ago, and substantial betterment is already indicated. In the first half of June 18,000 tons of coal were loaded at the docks against 15,000 tons during the last 15 days of May.

Retail prices of coal per net ton delivered in Cleveland are as follows: Anthracite—egg $13.20; grate, $13.20 and $13.50; chestnut and stove, $13.50. Pocahontas—shoveled lump, $11.75, and mine-run, $9.25. Domestic Bituminous—West Virginia splint, $11.75; No. 8 Pittsburgh, $8.75; Millfield lump, $11.75; and Cannel lump, $12. Steam coal—No. 6 and No. 8 slack, $8.50 to $8.75; No. 6 and No. 8 mine-run, $8.50 and $8.75; and No. 8 ¾-in. lump, $8.50 to $8.75.

Inland West

COLUMBUS

Car Shortage Curtails Production—High Prices Still Prevail as the Result of Bidding for Tonnage—Factories Are Forced To Suspend Operations and Domestic Demand is Insistent—Lake Trade Continues Slow.

The Ohio coal trade has been rather strenuous during the past week, with the demand for all grades stronger than ever, and curtailed production as the result of the car shortage. Prices are still mounting. In fact new high levels have been reached and it is believed that the end is not in sight.

The steam trade is probably the strongest feature at this time. With factories suspending operations because of lack of fuel, purchasing agents are in a mad chase after tonnage.

Domestic demand is becoming more insistent as the public has come to realize that there may be an acute fuel shortage this winter. The price is not the question, but rather the ability to get the tonnage.

A fair amount of West Virginia splint is arriving and quickly delivered. Practically no Pocahontas is obtainable on the local market. Hocking and Pomeroy grades constitute the bulk of domestic business. Retail stocks are short and in some instances almost exhausted.

Retail prices are higher, as Hocking lump retails at $8.50 and mine-run at practically the same figure. West Virginia splint sells in the neighborhood of $[illegible].50 and Pocahontas around $11.

The lake trade continues slow, according to the reports from the docks of Lake Erie. Loadings to date are less than 20 per cent of last year's records and unless some radical action is taken the Northwest will be quite short of fuel. Vessels are plentiful but the tonnage is not available.

Prices at the mines for the principal grades used in central Ohio are:

Hocking lump	$6.00 to $7.50
Hocking mine-run	5.75 to 7.25
Hocking screenings	5.50 to 6.75
Pomeroy lump	6.25 to 8.00
Pomeroy mine-run	6.00 to 7.50
Pomeroy screenings	5.75 to 7.50
West Virginia splint, lump	6.50 to 8.00
West Virginia splint, mine-run	6.25 to 7.75
West Virginia splint, screenings	6.00 to 7.50

CINCINNATI

Section Is Out of Coal and Dealers Plead for Supply—Industrial Plants Pay Any Price for Fuel—Householders Stock with Available Fuel, as Little Smokeless Is Obtainable.

The entire country from Cincinnati to the Northwest is out of coal. The long continued cold weather, lasting from early last fall until late this spring, completely used up the stocks and the coal dealers in every city, town, village and hamlet are pleading for even a meager supply. But with only two days' car supply per week at the mines during the last two months, the producers are not sending out much coal.

Dealers in Cincinnati have a limited stock and most of this has come down the Ohio River. It is next to impossible to get smokeless coal in the local field. In fact the market here is extremely short of certain grades of fuel. The large industrial plants, as well as the small industries are clamoring for coal and are paying any price for it.

Futile efforts are being made by the industrial users to get a reserve stock; they are disregarding prices, but are failing to lay in a stock simply because it is not to be had.

While prices at the mines advanced during the past three weeks, the retail price (delivered) in Cincinnati has not, remaining at the following figures:

Bituminous lump	$8@ $8.25
Bituminous nut	7.25
Bituminous run-of-mine	6.75
Smokeless lump	9.25
Smokeless run-of-mine	8.50
Smokeless anthracite	14.00

MILWAUKEE

Coal Situation at Milwaukee Is Serious—Prices Will Go Higher Unless I. C. C. Interferes—Eastern Coals Are Not in the Market.

Watching, waiting, worrying—these three words fitly express the attitude and state of mind of the men at Milwaukee who are in a way responsible for the coal supply of a large area of territory. As to the market, there is none. There is no soliciting of trade, and the consumer takes what he can get.

Prices continue to be held at the April and May level. There is no denying that the situation is critical and that the Northwest is confronted with the possibility of a serious coal famine next winter.

There is a fair movement of anthracite, and the liberal deliveries of hard coal tend to allay anxiety on the part of the general public, but heavy users of soft coal are not in as tranquil a state of mind.

There is practically no eastern soft coal in the market, the receipts being absorbed to the limit. Illinois and Indiana coal can be had in limited quantities. Receipts by Lake thus far this year aggregate 207,460 tons of anthracite and 242,592 tons of soft coal, against 194,653 tons of the former and 395,153 tons of the latter during the same period in 1919.

MIDWEST REVIEW

Transportation Is Improving—Coal Prices Are Firm, with Mine-Run on a Par with Prepared Sizes—Embargoes Are Proposed To Relieve New England—Prices Stiffen Toward End of the Week.

The railroads serving the Middle West coal fields appear this week to be in better shape than at any time since they were returned to private ownership. We hear that the car supply in the Springfield district, as well as the coal-producing districts in northern Illinois, is quite good—in fact, over 50 per cent.

In the southern Illinois coal fields the situation is not so good, although cars are moving to the mines more freely than last week, or the week before. When talking to railroad men, one gets the impression that the car-supply question will improve slowly but steadily from now on.

The market continues to hold up quite strongly and in some cases steam sizes, such as mine-run and screenings, are bringing as high prices as the prepared sizes made for domestic use. This is, undoubtedly, because manufacturing interests are buying coal as fast as they can and in as great quantities as possible.

CHICAGO

Coal Comes in Fairly Well, Relieving Situation Somewhat—Best Coals Sell at Reasonable Prices—Inferior Fuels Held at Higher Rates.

Coal continues to come into the Chicago market in fairly satisfactory quantities. Retailers report that they now have a little reserve on hand and that the mines are making shipments to them in a fairly satisfastory manner, considering conditions in the market and the handicaps at the mines. Steam plants also are in better shape, and are in a position to use a little more discrimination in buying than heretofore.

Prices vary greatly in the different fields. Franklin County coal, perhaps the best coal produced in this territory, is still selling at fairly low prices, while other coals, not so good, either from a standpoint of quality or preparation, are bringing higher prices. Current prices, f.o.b. mines, are approximately as follows:

ILLINOIS

		Rate to Chicago
Southern Illinois Franklin, Saline and Williamson counties		
Prepared sizes	$3.50 to $6.00	$1.55
Mine-run	3.50 to 5.50	1.55
Screenings	3.25 to 4.50	1.55
Central Illinois Springfield District		
Prepared sizes	$4.00 to $6.00	$1.32
Mine-run	4.00 to 5.00	1.32
Screenings	4.00 to 4.75	1.32
Northern Illinois		
Prepared sizes	$4.75 to $5.00	$1.24
Mine-run	4.50 to 5.00	1.24
Screenings	4.25 to 4.50	1.24

INDIANA

		Rate to Chicago
Clinton and Linton Fouth Vein		
Prepared sizes	$5.00 to $6.00	$1.27
Mine-run	4.50 to 5.25	1.27
Screenings	4.25 to 4.50	1.27
Knox County Field Fifth Vein		
Prepared sizes	$4.00 to $5.50	$1.37
Mine-run	4.00 to 4.75	1.37
Screenings	4.00 to 4.50	1.37
Brazil Block	4.25 to 4.50	1.27

EASTERN COALS

Pocahontas and New River coals		
Prepared sizes	$8.00 to $10.00	$2.65
Mine-run	7.00 to 10.00	2.65
West Virginia splint and gas coals		
Prepared sizes	$8.00 to $9.50	$2.65
Mine-run	7.25 to 8.25	2.65
Southeastern Kentucky Hazard, Harland and Big Sandy fields		
Prepared sizes	$7.00 to $9.00	$2.45
Mine-run	7.00 to 9.50	2.45

It will be noted in some cases there is quite a wide variation in prices. This is because some operators are sticking close to their April quotations to the trade, while others have disregarded them. The quotations given, it must be remembered, are current prices, and cover only coal produced and sold from day to day.

ST. LOUIS

Steam Coal and High-Grade Domestic Are Short—Southwest Plants Are Closing Down — Operators, Dealers and Steam Users Are Alarmed Over the Future.

Locally St. Louis is short of steam coal and high-grade domestic; in general the domestic demand is not what it should be and this is causing grave anxiety to the retail dealers.

The domestic call from the country is far greater than the available supply can take care of on any kind of coal. In many sections in the southwest, plants are closing down on account of no steam fuel.

In the Standard district the mines continue to get about two days a week on commercial coal and considerably better showing where railroad coal is loaded.

In the Mt. Olive field a little better running time is experienced and the railroad tonnage here is also heavy.

In the Carterville field two days a week is the commercial run on the Missouri Pacific. About three days work a week holds on the other roads, with better time where railroad coal is loaded.

The miners are generally satisfied and there is little or no labor trouble. The movement of cars throughout all fields is slower than normal.

Standard coal is quoted for St. Louis delivery at from $3.25 to $4.50 at the mines for domestic sizes and about the same for screenings and mine-run. Mt. Olive still continues to maintain circular prices of $3.00@$3.25 on all sizes, excepting washed, which is about $3.60.

The Carterville circular of $3.70 is not held. Some operators are getting $4.50@$5. In the Duquoin field nearly all operators have passed up their contracts and orders and are loading mine-run coal at $4.50.

DETROIT

Shortage of All Kinds of Fuel Is Serious Here—Local Soft-Coal Market Is Supplied Chiefly from Ohio — Dealers Are Unable To Fill Anthracite Orders.

Bituminous—In the matter of fuel supply, steam and domestic buyers in Detroit are seriously handicapped. Jobbers say conditions are not improving and that the shortage of bituminious coal is as serious as at any time since the war. There is said to be no free coal on the tracks, practically all of the stock sent here going directly from the mines to consumers.

Though small shipments are coming from Illinois and Indiana, the market is practically dependent on Ohio for its bituminous coal. Slack from that district is reported selling around $6.75 at the mines per short ton. Mine-run is quoted at $7 to $7.25 and lump is offered at $7.50. There has been some complaint among customers concerning shipments of low-grade coal.

Reports received by the jobbers indicate that shortage of cars is still preventing mines in nearly all districts from turning out more than the equivalent of two or three days' production in a week. Coal from West Virginia and Kentucky has nearly disappeared from the market and is received only in shipments applying on long-standing contracts. This coal, which was formerly the chief supply of Detroit manufacturers, is now being sent to tidewater, while prices are said to be at a level that renders it impracticable for local buyers of steam coal to purchase it.

Anthracite—From the viewpoint of the retailer and the consumer, the situation in the anthracite trade is quite unsatisfactory. Retailers are able to get very little coal and in consequence are unable to fill orders which were booked weeks ago. Their customers are becoming anxious over the delay.

Lake Trade—With the system of pooling Lake coal again in effect, as in 1918, shipments are still disappointingly small and many ships are unable to get cargoes for their upbound trips.

South

LOUISVILLE

Failure of Car Supply in Kentucky Fields Again Drives Prices Upward—Demand Is Heavy — Buyers Force the Market and Make the Price.

There has never been a time when the situation in the Kentucky fields was so chaotic as it is at the present time. Many operators are making no effort to get business, merely allowing buyers to bid up the price and accepting the highest offer. No contracts are being accepted; on orders taken, prices are open and subject to wire confirmation of the price at time of shipment.

Operators had a three-day supply of cars in early June, the following week showing but two day's operations, while for the past week many mines have worked less than two days, some only one day.

The prices of lump and screenings are practically the same as mine-run. Buyers are willing to accept any size of gas coal, at prices ranging above $9 a ton, running up even to $10.

Conditions indicate that the gas and byproduct companies, the public utilities, the railroads and the big industries are forcing the market. Domestic business is at a standstill as consumers will not pay the price and are waiting for something to happen.

There are practically no quotations on anything but mine-run as that is practically all that is being produced, and prices are about the same for all sizes.

Quotations for mine-run at mines are as follows:

Gas Coal	$9@$9.50
Non-gas	8@ 8.50
Western Kentucky	5@ 5.50

BIRMINGHAM

Coal Moves Somewhat Easier Due to Less Confiscation — Hot Weather and Strikes Curtail Production—The Little Spot Coal Available Is Taken at High Prices.

Although there has been no noticeable increase in the number of cars furnished the mines in this district over the previous week, reports indicate that coal is moving smoother and with less delay due to less confiscation by the railroads. Contract-fuel mines are getting about all the cars they need, and commercial operations receive a supply ranging from 45 to 50 per cent.

The extremely warm weather of the past week has brought about increased idleness on the part of mine labor generally, which under normal conditions works with quite a satisfactory degree of regularity. This labor delinquency is greatly curtailing coal production, as mines which have a full car supply are thus prevented from operating to capacity.

There has been no change in the mining regions of Bibb, Tuscaloosa and Walker counties, where local strikes have interfered with production at a number of smaller mines, the men still remaining away from work.

Activity in trade channels in confined chiefly to declining coal orders, which continue to come to brokers and selling agencies in great volume. There is no coal available or in sight, with which to care for additional business, and only a nominal amount is being taken on. The little spot coal that finds its way to market is absorbed at prices ranging from $4.50 to $7 per ton mines, regardless of grade.

Receipts of domestic coal are quite unsatisfactory to retailers who are trying to accumulate a supply for winter, as a number of the mines producing domestic sizes have been wholly or partly closed by strikes for several weeks, and transportation facilities are inadequate to move what could otherwise be mined.

News From the Coal Fields

Northern Appalachian

FAIRMONT

Transportation Conditions Go from Bad to Worse in Second Week of June — Railroads Persist in Assigned-Car Practice — Little Commercial Coal Shipped — Suit Is Entered Against Railroads.

The second week of June brought many disappointments to operators of the Fairmont, Monongalia and other northern West Virginia regions. Transportation conditions were even worse than they had been during the first week of the month.

While mines on the Monongahela R.R. had a fairly large run of cars on Monday, every one of the 110 cars furnished on Tuesday was assigned. Summarizing conditions it is not believed that mines in northern West Virginia, on an average were able to produce more than 35 or 40 per cent of potential capacity.

With such a short car supply, it was next to impossible to load any commercial coal, since the railroads secured all the coal they wanted by the simple expedient of assigning cars. One effect of such a slim production was to increase the price of mine-run in northern West Virginia fields to about $9.25 a ton. On some days fully half the coal produced at various points was for railroad consumption.

That accounts for the limited tonnage movement to Tidewater, to Inland East and West markets and to the Lakes. Curtis Bay shipments over the Monongah division of the Baltimore & Ohio did not average more than 150 cars a day.

The climax to the inexcusable assignment of cars in northern West Virginia came on Saturday, June 12, when suit was entered in the Marion Circuit Court, against the Baltimore & Ohio R.R., to put a stop to the further assignment of cars, the suit involving a mandatory injunction as well as a demurrage phase.

PITTSBURGH

Lake Pooling Plan Has Not Increased Car Supply — Spot Prices Still Advance—Exports Disturb Market—Local Bankers Are Alarmed Over Situation.

Even the pooling of Lake coal shipments, together with Lake ore shipments, put into operation June 14, has not materially increased the supplies of cars to Pittsburgh district coal mines, thus far at least. A curious reflection of the pooling, however, is that several steel works in the district found themselves shorter of cars in the first few days than they had been, the extra shortage being attributed to the establishment of the coal pool.

Everywhere the Lake coal situation is recognized as serious and as absolutely demanding relief. This is admitted even by coal consumers in this district who have closed their works because they cannot secure coal, or cannot afford to pay market prices.

The spot market, and there is practically no other, since the buyer almost invariably requires car numbers, is trending upwards rather than downwards, and may be estimated on an average at nearer $10 than $8. The market, however, is narrow, for by far the major part of the production is going against contracts.

The greatest disturbance is caused by dealers seeking coal for export, such buyers being almost reckless in their bids. There is no restraining influence to price advances, since the conservative operators are tied up with contracts and the sellers of spot coal are chiefly small operators, who are not particularly interested in market stability. Some of the banking interests in Pittsburgh are greatly alarmed over the situation.

The spot market in general is quotable at $8@10, per net ton at mine, Pittsburgh district, steam and gas grades usually bringing approximately the same price, while byproduct runs close to $10.

CONNELLSVILLE

More Furnace Coke is Contracted, but Uncertainty Prevails—Market Value of Coal Should Affect Coke Price—Car Supplies Do Not Improve and Market Continues High.

In addition to the contracts for second half furnace coke, reported a week ago, aggregating about 25,000 tons monthly, on a 4-to-1 ratio basis against basic pig iron at valley furnaces, several flat price contracts have been made for the second half, at between $10 and $12 per net ton at ovens. Quite a tense situation exists as to furnace-coke contracts, both sellers and buyers being beset with uncertainties, especially the furnacemen.

Thus, $12 as a flat price for coke for the second half of the year seems like a high one to consumers, but coal is bringing more than $8 in the open market and it requires 1½ tons of coal to make a ton of coke, so that from this viewpoint $12 coke is altogether too low.

There has been no material improvement in car supplies, and the region is running at about 75 per cent of the rate obtaining prior to the rail strike and traffic congestion. The heavy production of pig iron, now nearly if not quite equal to the March rate, indicates that the byproduct coke ovens are doing better than the Connellsville beehive ovens.

The spot market continues high, with limited demand and limited offerings, being quotable at about $15 for furnace and $16 for foundry coke, per net ton at ovens.

The *Courier* reports production in the Connellsville and Lower Connellsville region in the week ended June 12 at 185,230 tons, a decrease of 4,350 tons.

Estimates of Production

FROM THE WEEKLY REPORT OF THE GEOLOGICAL SURVEY

BITUMINOUS COAL.

	1920		1919 (a)	
	Week	Calendar Year to Date	Week	Calendar Year to Date
May 29 (b)	9,568,000	211,925,000	7,938,000	175,077,000
Daily average	1,595,000	1,652,000	1,498,000	1,372,000
June 5 (b)	9,122,000	221,048,000	8,927,000	184,004,000
Daily average	1,650,000	1,650,000	1,488,000	1,377,000
June 12 (c)	10,332,000	231,380,000	8,485,000	192,489,000
Daily average	1,722,000	1,657,000	1,414,000	1,379,000

ANTHRACITE

	1920		1919 (a)	
	Week	Calendar Year to Date	Week	Calendar Year to Date
May 29	1,834,000	34,888,000	1,298,000	31,649,000
June 5 (b)	1,495,000	36,383,000	1,703,000	33,351,000
June 12 (c)	1,895,000	38,278,000	1,695,000	35,047,000

BEEHIVE COKE

United States Total

Week Ended				
June 12 (c) 1920	June 5 (b) 1920	June 14 1919	1920 to Date	1919 to Date (a)
408,000	412,000	286,000	9,762,000	8,939,000

(a) Less one day's production during New Year's week to equalize number of days covered for the two years. (b) Revised from last report. (c) Subject to revision. All figures in net tons.

Middle Appalachian

LOGAN AND THACKER

Logan Mines Speed Up Production with More Empties to Load—Cars Come in from the West—Coal Goes to the Lakes and the West—Thacker Output Stagnates Due to Labor Troubles.

With transportation facilities on the Chesapeake & Ohio superior to those of previous weeks, Logan mines speeded up production during the second week of June.

It is estimated that Logan mines had about 500 more cars at their disposal than they had been able to secure for any weekly period during the two months preceding; it being possible therefore to increase production to about 165,000 tons—a gain of 25,000 tons.

The major part of the increase was due to a large number of empties turned over to the Chesapeake & Ohio by connecting lines, the Logan field, therefore, benefitting by the action taken by the Interstate Commerce Commission.

Even making allowances for the fact that production had climbed upward toward the middle of June not half of the potential capacity of the 115 mines in the field was being produced.

Debarred from shipping to Tidewater during the first half of the week, Logan producers had no recourse other than to increase Western and Lake shipments.

Difficulty was experienced in making contract deliveries because of the fact that so many cars were assigned for railroad fuel loading. It was impossible to produce much coal for spot sale, that being one of the reasons why a price of $9 a ton and higher was being offered for Logan mine-run at Tidewater.

No settlement of the labor troubles in the Thacker field was in sight by the middle of June. Leaders of the mine workers announced they are making progress in organizing the field but that was controverted by the operators.

Production was greatly stagnated as a result of the labor troubles in the Thacker district. The movement of Thacker coal was largely to Tidewater as it had been in previous weeks, no softening of prices.

POCAHONTAS AND TUG RIVER

Tug River Receives Better Supply of Cars—Yet Production is Less Than 50 Per Cent—More Cars Come in from West—Empties Are Scarce in the Pocahontas Field.

While conditions in the period ended June 12 seemed to have undergone improvement from a transportation standpoint in one part of the territory supplied by the Norfolk & Western, on the easterly end of this road in the Pocahontas field, mines were experiencing just as much difficulty as they have been doing all along, in securing barely enough cars to keep from shutting down entirely.

While there seemed to be more cars coming from or through Western gateways, yet the increase was not such as to materially increase production and certainly was not large enough for distribution to all fields reached by the Norfolk & Western.

The increase in the number of Western cars turned over to the Norfolk & Western was met by a corresponding increase in Western tonnage.

Mines in the Tug River region occupied a more advantageous position than mines in the neighboring Pocahontas field, the operators reporting a general though not marked improvement in the supply of cars, especially as compared with the same week in May.

The Tug River region received most of the benefit of the increased Western supply of empties. Despite the improvement shown production was less than 50 per cent.

Virtually the entire output was needed to meet contract obligations. The little spot coal available was bid for at $9 a ton and more; but the major part of the output of the field is under contract at about $5 a ton.

Little headway was made by Pocahontas mines in overcoming past losses, owing to the fact that cars were still scarce—so scarce, in fact, that as against a production of only about 235,000 tons, there was a loss of over 300,000 tons from a shortage of equipment alone.

Cars were being returned quite slowly from tidewater, where the bulk of Pocahontas coal was being billed. As nearly as can be estimated, Pocahontas mines were operated on just about a 40 per cent basis during the week ended June 12, or less than three days out of the six.

NORTHEAST KENTUCKY

Output Changes Little, Being About 45 Per Cent—Commission Should Adopt More Drastic Measures About Coal Cars—More Coal Goes to the West and Lakes—Prices Are Firm.

The second week of June brought no perceptible change in the Northeast Kentucky field insofar as any increase in production was concerned. Mines in the field named had perhaps 100 cars more than during the previous week, at least in that section supplied by the Chesapeake & Ohio and its branches, including the Big Sandy, Sandy Valley & Elkhorn and the Long Fork.

There was not more than an output of about 45 per cent in the Eastern Kentucky field. Little if any benefit had been derived from the effort of the Interstate Commerce Commission to divert a larger number of empties to eastern coal regions.

The general feeling in Northeast Kentucky coal circles, was that the commission would have to adopt more drastic regulations before securing any results, and would have to stop the promiscuous use of cars for the loading of sand, gravel and other commodities.

Despite the shortage of empties in Northeast Kentucky the run of cars was far and away in excess of May, last year, it being stated that Eastern Kentucky mines received about 1,500 cars more during May, 1920, than during May, 1919.

Kentucky producers shipped a larger proportion of their product than usual to Western markets and to the Lakes. The demand for steam and byproduct coal was running strong and spot coal was quite hard to obtain. As a result of the short supply, prices continued firm, Eastern Kentucky mine-run averaging $7.50 a ton or better.

The activities of the Kentucky High Cost Commission and Fair Price body are of no avail for the present at least by action of Federal Judge Walter Evans. He recently ruled that the amendment to the Lever Act was too vague to be enforceable, and dismissed a dozen or so cases held over to the Grand Jury following preliminary examination. Judge Evans did not hold the act unconstitutional, as several federal judges have, but did refuse to prosecute under it. This means that the High Cost Commission is powerless to appeal the cases, or do anything further until the Supreme Court finally rules in the matter of constitutionality.

VIRGINIA

Lacking Many Cars, Operators Coke Coal to Avoid Interruption to Operation—Railroads Assign Cars and Take Large Tonnage—Spot Coal Scarce and High Prices Prevail.

Inability to secure anything approaching an adequate supply of cars precluded mines in southwestern Virginia from making any headway in increasing their output during the weekly period ended June 12, there still being an approximate loss of 50,000 tons due to a shortage of empties.

In addition to the tonnage produced for shipment, however, some mines continued to coke a considerable tonnage of coal in order to avoid as much interruption to operation as possible.

Not only was the scant car supply a potent factor in holding back the production of commercial fuel, but assigned cars also interfered quite materially with shipments, railroads taking a very large proportion of the output of the field for their own use.

There was a comparatively small amount of commercial coal with which to meet contract obligations, and scarcely any tonnage to meet the heavy demand for spot fuel.

Prices were held about on the level heretofore existing, $7.50 and better being offered; higher prices prevailed for spot coal for Tidewater delivery.

Labor conditions in themselves were satisfactory; however, assigned car plants were able to hold their miners better than plants without a preferential car supply.

NEW RIVER AND WINDING GULF

Winding Gulf Works Two-Thirds Time. New River Only Three Days Out of the Six—Car Supply Is Limited in All Fields—Tidewater Tonnage Keeps Up and Western Shipments Increase.

Ground was gained over previous weeks in the tonnage of coal mined in the Winding Gulf and New River fields, during the second week of June, by virtue of a somewhat increased car supply in both fields, the greatest gains being made, however, in the Winding Gulf region. But in neither field was there as large a production as an excellent car supply early in the week led operators to believe would be the case, the run of empties still being sub-normal.

As against a 25 per cent supply of cars during the period ended June 5, plants in the Winding Gulf district had about a 66 per cent car supply during the week following; mines were able to operate about four days out of the six on the Virginian Ry. However, mines reached by the Chesapeake & Ohio had only a 50 per cent supply and were limited to about three days' operation.

The hope of New River producers for three or four full-day operation, inspired by quite a favorable supply of cars on Monday was dissipated by a marked decline in the quota of cars furnished after the first of the week.

Even at mines having individual cars, there was not more than a 50 per cent production in the field, while other mines less fortunate were not able to produce that large a percentage.

Western shipments from the New River region were in somewhat larger volume than during the previous week; at the same time there was no decrease in tidewater tonnage. There was a very insistent demand for New River coal in New England as well as for export.

KANAWHA

Production Changes Little, Being About 45 Per Cent—Kanawha Is Embargoed at Tide Due to Congestion—High Prices Prevail.

While cars in the Kanawha field during the weekly period ended June 12 were somewhat more plentiful than had been the case during the previous week, the increase was almost negligible, carriers being far short of the mark in the distribution of empties. The production for the week was about 45 per cent.

While the percentage of allotment was running a little larger at mines supplied by the Kanawha & Michigan than by the Chesapeake & Ohio, during the first few days of the week, even on that road the supply faded away toward the end of the week.

Signs indicated a slight increase in the run of empties from the West but not a sufficient increase to restore conditions to anything approaching normal.

Between June 7 and June 10 the Chesapeake & Ohio west of Handley was closed to all Kanawha shipments for Tidewater. The road found it necessary to impose an embargo until it could relieve the congestion following slides on June 5. With Tidewater points closed for a few days, more coal was of course shipped to Western points, Lake consumers also participating in the increase.

Inasmuch as there was heavy assignment of cars for railroad fuel loading, there was only a little volume of commercial coal for shipment, especially spot, since producers were having a hard time even in taking care of contract obligations.

As a result of the reduced production, as much as $7.50 a ton was offered for Kanawha mine-run for Western delivery. The price was even higher for Tidewater delivery, running up to $9 a ton or more.

Canada

BRITISH COLUMBIA

Crow's Nest Output Is Increasing; Vancouver Island Decreases — Coal Is Supplanting Fuel Oil—Coke Production Way Below Former Output.

An analysis of the latest figures available relative to the coal production of British Columbia shows that, while the output of the mines of the Crow's Nest Pass Field is increasing, the production of Vancouver Island mines is declining slightly.

It is generally predicted that the shortage of fuel oil will increase the demand for coal. The collieries of Vancouver Island anticipate that the present fuel situation will affect their bunker trade.

Freight and passenger vessels are being re-converted into coal burners, and many of those under construction are designed for the use of the latter fuel. Consequently there should be an increase in the demand for coal shortly. Meanwhile the domestic demand has fallen off somewhat and production, as far as the coast mines are concerned, is about stationary.

Production in the Crow's Nest field, on the other hand, is climbing, a good market being found in supplying the Great Northern Ry. Coal is used in pulverized form in the operation of this railroad. The greater proportion of the Corbin coal is shipped to Spokane, Wash., a comparatively small quantity being taken by the Canadian Pacific Railway.

A recent development, the results of which may be of importance, is a shipment of coal to Winnipeg, Manitoba, by the Crow's Nest Pass Coal Co. This is an emergency shipment to meet a shortage caused by the lack of coal usually obtained from the coal fields of United States.

Eastern British Columbia and the Province of Alberta may be called on to meet the requirements of the Canadian Middle West to a greater extent in the future than in the past.

Coke production in the Crow's Nest field still is far below what it once was, the ovens at Fernie being idle and only some of those of Michel being in use. The product of these ovens is absorbed by the Canadian Consolidated Mining & Smelting Co. for the Trail smelter.

Operating Conditions at Coal Mines in Indiana, May, 1920

PREPARED BY JONAS WAFFLE, SECRETARY INDIANA COAL TRADE BUREAU

Railroads on Which Mines Are Located	District	No. of Mines	Tons Produced	Full Time Capacity (Tons)	— Tons Lost and Causes Therefor —			
					Total All Causes	Car Shortage	Labor Trouble	Mine Disability
Big Four	Terre Haute	6	31,693	104,822	73,129	69,941	1,652	1,536
B. & O. S. W.	Vincennes	2	31,370	47,230	15,860	9,390	6,049	421
C. & E. I. (1)	Clinton	27	213,288	544,624	331,336	118,141	207,422	5,773
	(2) Sullivan	16	130,316	279,796	149,480	130,921	11,250	7,309
	Totals	43	343,604	824,420	480,816	249,062	218,672	13,082
C. I. & W.	Dana	1	9,035	10,309	1,274	453	821	
Cent. Ind	Brazil	1	4,801	4,993	192			192
C. T. H. & S. E. (3)	Clinton	14	146,912	276,376	129,464	94,483	31,752	3,229
	Linton	27	14,937	368,679	226,742	186,227	36,564	3,951
	Totals	41	288,849	645,055	356,206	280,710	68,316	7,180
E. & I.	Clay City-Petersburg	10	57,252	179,649	122,397	118,041	3,217	1,139
E. & E.	Evansville	2	7,812	9,308	1,496	1,413	......	83
E. S. & N.	Evansville	3	18,406	27,326	8,920	7,816	659	445
Ills. Cent.	Linton	6	48,855	104,705	55,850	53,480	1,987	383
Monon (4)	Linton	20	131,473	334,809	203,336	175,776	20,071	7,489
P. C. C. & St. L.	(5) Main Line	20	143,509	350,585	207,076	170,563	25,579	10,934
	(6) Vincennes	21	218,917	712,160	493,243	407,363	48,537	37,343
	Totals	41	362,426	1,062,745	700,319	577,926	74,116	48,277
Southern	Ayrshire	9	30,584	120,534	89,950	85,526	3,825	599
	Boonville	9	38,527	125,239	86,712	85,597	228	887
	Totals	18	69,111	245,773	176,662	171,123	4,053	1,486
Totals		194	1,404,687	3,601,144	2,196,457	1,715,131	399,613	81,713
Total month ending April 30, 1920		189	1,466,197	3,520,426	2,054,229	1,802,101	146,262	105,866

(1) Two mines served by two railroads.
(2) Includes all mines South of Terre Haute.
(3) One mine served by two railroads.
(4) Four mines served by two railroads.
(5) Includes all mines on St. Louis and Michigan Division.
(6) Includes all mines on Vincennes Division and Dugger Branch.

Mine and Company News

ALABAMA

Fort Payne—The Appalachian Coal & Iron Co., is planning for the development of a large tract of coal property in this section, and will acquire machinery and equipment for the purpose. It is proposed to erect a number of homes for miners at the plant. W. L. Smith is superintendent.

ILLINOIS

Duquoin—The Carlinville Mining Co., operating a mine at Carlinville, Macoupin County, north of here, has recently completed the erection of a concrete and steel tipple and hoisting has been resumed after an idleness of several months. The mine has been operating for some years. While the new tipple was being built, a number of other improvements were made around the mine, including repair work in the air shaft. New options have lately been taken out giving the company a larger territory for development. At the present time the plant is served by the Chicago & Alton R. R. but plans have been perfected whereby the Illinois Traction System will begin construction of a switch to the mine, greatly facilitating the problem of transportation. The Standard Oil Co., has also recently finished the sinking and erection of two mines near this plant.

Mount Vernon—The Southern Gem Coal Co., has purchased a block in the business section of this place with the intention of erecting a large modern 5-story building which will serve as headquarters for the northern terminal of the Wabash, Chester & Western R.R., a line which they recently acquired. The building also will be the coal headquarters for the company in southern Illinois. The company holds extensive tracts throughout this section, mostly, however, in Jefferson County. In addition to the new office building, the Southern Gem will erect a modern rescreening plant near the outskirts of Mt. Vernon, which will be served by the W. C. & W. and the Chicago & Eastern Illinois railroads.

KENTUCKY

Louisville—It is reported that the Louisville & Nashville R.R. has closed contracts for the entire output of six mines in the Hazard, Ky., field, the total production amounting to about 25 cars daily, this being about all the coal that will be required from the one district for railroad use. It is reported that the contract was closed at a price slightly under $4 a ton for mine-run. It is also reported that the L. & N., as well as other roads are buying better grades of coal today than formerly, they having discarded the cheap grades, which they formerly sought.

MARYLAND

Baltimore—The Eagle By-Products Collieries Co., Equitable Building, has incorporated with a capital of $750,000 to operate coal properties. George R. Curtis, Henry Ortman and Harry A. Mason are the incorporators.

NEW YORK

New York—The Crystal Coal Corporation recently organized under the Delaware laws with a capital stock of $1,000,000. It is sponsored by the Victor S. Fox interests which recently acquired control of the Consolidated Maritime Lines.

The new corporation is to engage in the sale and production of anthracite and bituminous coal, particularly for export. The close affiliation with the Consolidated Maritime Lines which is said to control over 200,000 tons of shipping, indicates that this new coal company may be a big factor in the export trade. Most of the Fox ships are now actively engaged in carrying coal to Italy, France and Scandinavia.

The new corporation is now acquiring the output of several mines and has purchased two large mines in the Fairmont and New River districts.

A deal is said to have been consummated recently involving the purchase of 25 coal producing properties in Pennsylvania, Ohio, West Virginia and Kentucky, at a cost of between $10,000,000 and $12,000,000, by John H. Jones, head of the Bertha Coal Co. and affiliated fuel companies.

It is said that the plan means that big industries of the United States and Canada are pooling their fuel requirements with an independent producing concern, instead of seeking coal as individuals. Mr. Jones admits that such a plan has been formulated.

The production of the Jones interests will exceed 12,000,000 tons of coal a year when contemplated improvements are completed.

A partial list of the newly acquired properties includes: The Sara mines, formerly operated by the West Virginia & Kentucky Coal Co. at Delna, Ky.; Jessie mines, formerly operated by the Smoot Creek Coal & Coke Co., at Delna, Ky., and Isabella mines, formerly operated by the Woodburn Coal Co., at Blackie, Ky. In addition, Mr. Jones has also leased from the Kentucky River Coal Corporation, 10,000 acres of coal lands and is rushing the development and equipment of the Elsie and Dorothy mines on this property.

In Ohio Mr. Jones acquired 1,600 acres of coal lands, together with a large number of houses in the town of Powhattan, and at Cresaps station, on the Baltimore & Ohio, the coal extending on both sides of the Ohio river at this point. Three shafts are now being sunk on the latter property.

NORTH DAKOTA

Dickinson—The McGillivary coal mine, four miles east of here, has been purchased by E. A. Hughes. Immediate improvements in the mine are planned by the new owner. The mine is said to be the largest on the main line of the Northern Pacific, and is ranked as one of the best lignite mines in North Dakota.

Modern machinery will be installed and the mine will be electrically operated. Electric current will be supplied to the mine from Dickinson.

The mine has been operated for several years, and has employed as high as 100 miners; Mr. Hughes plans to install sufficient machinery to make it possible to employ 200 men next fall and winter and to increase the capacity to 500-tons a day. The shafts now are sunk to a depth of about 125 feet.

The Beulah Coal Co., of which C. B. Little is president and in which Mr. Hughes is heavily interested, plans to open another mine either at Beulah or Hazen in an adjoining county.

OKLAHOMA

Tulsa—"Coal is the fuel Tulsa is going to have to turn to within a short time," John H. Leavall told members of the Chamber of Commerce, in presenting his plan for opening a large strip coal mine between Tulsa and Dawson.

"Fuel oil is now so high that it cannot be used for the generation of steam. It takes four barrels of oil to equal one ton of coal, and that would make $14 coal on a par with oil."

The company, now being organized by Mr. Leavall, will be capitalized at about $250,000 and is being financed by local business men. The operation will be carried on under the open shop plan.

OHIO

Steubenville—The Panhandle Collieries Co., which is putting in a large plant on the Pennsylvania R.R. west of here, has just about completed its 8-mile spur. A bridge across Cross Creek has also been finished and the work of erecting the tipple and power plant will go forward. It is expected to start operations by Oct. 1 if not earlier. The mine will have a capacity of about 1,500 tons daily. J. W. Blower and the Hisylvania Coal Co. interests of Columbus are pushing the development.

PENNSYLVANIA

Pittston—The Pennsylvania Coal Co. is completing plans for the construction of a breaker near here to cost in excess of $200,000. William P. Jennings is superintendent.

Coversdale—The Pittsburgh Terminal Railroad & Coal Co., Wabash Building, Pittsburgh, Pa., has inaugurated work on a housing development for miners at its coal properties in the vicinity of Coversdale. Sixty two-story homes will be built.

Pittsburgh—The Vesta Coal Co. has acquired about 500 acres of coal lands in Washington County, heretofore held by J. C. Work and associates, Uniontown, at a price of about $550 an acre. Plans are under way to develop the property.

The Consolidated Coke Company, in the Oliver Building, of this place, is said to be planning for extensive work in connection with its coal mining properties. Arrangements are under consideration for the construction of a river tipple at Grays Landing, Fayette County, to be equipped with loading and conveying machinery to provide a capacity of about 4,000 tons a day. It is proposed to utilize the Monongahela River for transportation. The company recently completed negotiations for the acquirement of the Sharpneck mines of the Superior Coal Co. in the vicinity of Brownsville, Fayette County, including a tract of about 600 acres, and plans are being arranged for the complete electrification of this plant. It is proposed to increase capacity to about 2,000 tons daily. The consideration was to be in excess of $1,500,000.

It is said the Diamond Coal & Coke Co. has been granted a Federal permit for large extensions and improvements in its properties in the Barking Station mine, located on the Allegheny River, for increased capacity. The proposed work includes the construction of concrete ice-breakers, tipple, tipple pier, as well as other extensions.

Hazleton—The Lehigh Valley Coal Co., has begun preliminary work at the Stockton mines, east of this place, which have not been operated for some years past, and proposes to operate the property at maximum capacity, bringing considerable increased tonnage to the Hazleton Shaft colliery at Hazleton.

SOUTH DAKOTA

Aberdeen—Ralph Blair and his father have bought the John Meiger farm of 480 acres lying near this city and will open up the seam of soft coal which was discovered on the property some 10 or 12 years ago.

The Blairs are planning to install modern equipment and will begin digging coal in the near future.

The seam is said to be within 70 to 90 ft. of the surface and to be eight ft. thick.

Ralph Blair paid $75,000 for the farm. His father, Gustave Blair, has also recently bought a farm in Faulk County, paying $165 an acre for 235 acres.

Mount Hope—V. S. Veazey, of this place, owner and developer of the Hi Top Mine, near Sun, W. Va. (operating a New River Seam), recently acquired a lease on the Boone coal on Packs Branch and has begun development; this comprises about 300 acres of the Long Branch seam. He is also sinking a shaft to open a tract of his at Glen Jean, W. Va., which carries the New River measures, this was at one time a part of the Sun lease (New River Collieries Co.). Shipments are expected to be made from one or both mines by August 1, and will be via the Virginian Ry.

WEST VIRGINIA

Wheeling—Charles F. Bachmann, of this place is understood to have completed negotiations for the purchase of approximately 3,000 acres of coal lands in the vicinity of Cresaps, near Moundsville, W. Va. It is said that plans are now in process of formation covering the installation of machinery and equipment for the development of the tract.

Fireco—The Wilton Smokeless Coal Co., recently organized with a capital of $350,000, is having plans prepared for the development of a total of about 650 acres of coal properties in the Fireco district. It is proposed to have a capacity of about 400 tons a day. J. W. Wilson, Wyco, W. Va., is president; C. H. Meador, vice-president, and J. B. Clifton, both of Beckley, W. Va., is secretary-treasurer.

CANADA

Ottawa—Coal-mining operations will be commenced in the new coal field near Lampman, Saskatchewan, within the next two months. This field is being developed by the Farmers' Coal Mining Co., Ltd., which is incorporated with a capitalization of half a million dollars.

Association Activities

Washington State Fuel Merchants' Association

The second annual convention of the Washington State Fuel Merchants' Association was held at Spokane, Wash., recently. By a unanimous vote of the convention, A. J. Davis, of Tacoma, was elected president; Roy Bungay, Spokane, vice-president; W. B. Monks, Seattle, secretary-treasurer. The offices of secretary and treasurer, which heretofore have been separate, will be combined hereafter.

The report of the resolutions committee indorsed a state-wide publicity campaign to awaken the coal consuming public to the necessity of storing their fuel during the spring and summer so that mine operators may keep their men employed more uniformly throughout the year, and that the public may be better protected against suffering resultant from a fuel shortage next winter.

Telegrams are to be sent to all senators and representatives from this state, asking them to work and vote for the passage of a bill providing for reduced freight rates on coal during the summer months.

Following an address on "Destination Weights," by Roy S. Brown, traffic expert with the Western Retail Lumbermen's Association, the question was generally discussed.

An address on "Cost Accounting" was given by Harvey S. Jordan, commissioner of the Retail Coal Merchants' Credit Association of Seattle. C. E. Arney, assistant supervisor of agriculture of the Northern Pacific Ry., also gave a talk on "Traffic Conditions."

Addresses were also given by W. J. Hindley on "Chasing the Profiteer" and by W. T. Prosser, of Seattle, on "Seasonal Coal Business."

Northern West Virginia Operators' Association

The validity of the assignment of cars will be tested in the courts. That course was decided upon at a meeting of the Northern West Virginia Operators' Association held at Fairmont on June 4.

Another meeting was planned for June 9 when Rush C. Butler, chief counsel for the National Coal Association was invited to be present to discuss the legal phases of the proposed suit.

Believing that the assigned-car practice is repugnant to the rules and regulations governing car distribution, the Northern West Virginia association proposes to seek relief from the Interstate Commerce Commission, from the federal courts and if necessary from Congress. It has been tentatively decided to bring the suits mentioned against the carriers direct.

Northern West Virginia operators made the charge that there was and had been a failure at Curtis Bay to dump coal promptly, with the result that there had been numerous embargoes and a marked increase in demurrage charges at this port. The association directed its vice-president, George T. Bell, to investigate the dumping situation and to see what it was possible to do.

Tidewater Coal Exchanges

Tidewater coal exchanges are now in full operation at Newport News, Sewall's Point and Lambert's Point. At Newport News, to which the Chesapeake & Ohio R.R. ships its coal, the arrangements provide for the railroad paying 75 per cent and the shippers 25 per cent of the expense. At Sewall's Point the expense is divided evenly between the railroad and the shippers.

Industrial News

Chicago, Ill.—The Chicago offices of The Cutler-Hammer Manufacturing Co., of Milwaukee and New York, have been removed from the Peoples Gas Bldg., where they have been located for the last eight years to the company's own building (323 No. Michigan Ave.) on the new Michigan Boulevard link. Because of the rapidly growing business in the Chicago territory, the fifteen offices in the Peoples Gas Building were no longer large enough so that the new building was necessary. Considerable extra storage space is also available which will make it possible to carry a larger amount of stock of standard apparatus and parts for ready delivery. H. L. Dawson is manager of the Chicago office, which handles the business of nineteen states with the sub-offices in Cincinnati and Detroit.

Kenosha, Wis.—The corporate name of the Macomber & Whyte Rope Co., of this place, has been changed to the MacWhyte Co.—effective June 1, 1920. No change in ownership, management, or policy of the company is involved.

The products of the MacWhyte Co. have for several years been known and advertised under the trade name, "MacWhyte." The change, therefore, brings the name of the company into line with the name of the products. Furthermore, the MacWhyte Co. manufactures not only wire rope, but also streamline wire, for airplanes, mine-car hitchings, safety detaching hooks for coal mines. George S. Whyte continues as president and general manager; Jessel S. Whyte as secretary, and E. W. Reitzel as treasurer.

Easton, Pa.—The Pennsylvania Pump & Compressor Co., of this place, announces the opening of its sales offices in the following cities: New York, N. Y., 50 Church St., H. C. Browne, manager; Philadelphia, Pa., 2222 Chestnut St., W. J. Devlin, manager; Pittsburgh, Pa., 631 Fulton Bldg., C. W. Gellinger, manager; Richmond, Va., Mutual Bldg., W. F. Delaney, manager; Birmingham, Ala., 2027 Jefferson Bank Bldg., H. I. Kahn, manager; Salt Lake City, Utah, Newhouse Bldg., C. H. Jones, manager; Milwaukee, Wis., 604 First Nat'l Bank Bldg., Coates & Zarling, representatives.

Orange, N. J.—The Edison Storage Battery Co. announces the recent appointment of Don C. Wilson as assistant sales manager in charge of its Railroad Department. Mr. Wilson has been active in railroad operating and mechanical affairs for many years, having been electrical engineer for the Union Pacific R.R., at Omaha, Neb., and in a similar capacity with the Central of Georgia at Savannah. The Edison Storage Battery Co.'s works are at Orange, N. J., with offices at 23 West 43rd St., New York City.

Personals

Richard H. Williams, of the firm of Williams & Peters of No. 1 Broadway, New York City, has been elected as a Class B Director of the Federal Reserve Bank of New York. He succeeds W. B. Thompson. Mr. Williams is a director of the Pennsylvania Coal Co., a director and member of the executive committee of the Equitable Life Assurance Society and a director and member of the finance committee of the Atlantic Mutual Insurance Co.

A. F. Harper has resigned his position as division engineer of coal mines with the Woodward Iron Co., Dolomite, Ala., to accept the position of mining engineer with Sloss-Sheffield Steel & Iron Co., with headquarters in Birmingham, Ala.

George E. Land, who has been [illegible] ing manager of the Blaw-Knox Co., Pittsburgh, Pa., has gone into business for himself under the name of the Technical Publicity Co., of Pittsburgh, Pa.

T. H. Huddy, a well-known [illegible] in the Kanawha, W. Va., field, [illegible] years has been the [illegible] superintendent of the Boomer Coal & [illegible] at the Paint Creek Coal Min[illegible] has been appointed general manager of the Williamson Coal & Coke Co., of the [illegible] Coal Co. and of the Sudduth Coal Co. operating in the Thacker, W. Va., field with headquarters at Williamson, W. Va. The companies mentioned have been recently [illegible] A. H. Land and others.

J. L. Coombes, formerly mining engineer at the Lynch mines of the U. S. Coal & Coke Co., has recently returned to his old position as field engineer with the Fargo Engineering Co., at Battle Creek, Mich. He has spent six months at Temiskaming, Quebec, Can., as engineer for the Kippawa Co., Ltd.

Howard I. Smith, mining engineer, serving on the American Commission at Belgrade, Serbia, reports some interesting progress made in mining methods in the Balkan States. He expects to return to America in December.

F. A. Dalburg, consulting mining engineer has recently returned from Manila, Philippine Islands, where he was general manager of the National Fuel Co. He will take up consulting work again in this country with headquarters at 40 East 40th St., New York City. Mr. Dalburg's home address is Ralston, Pa.

Horatio C. Ray, who has been connected with the School of Mines of the University of Pittsburgh as Professor of Metallurgy and Ore Dressing, has resigned his position to take effect at the close of the present school year. Mr. Ray will become affiliated with the Keystone Consolidated Publishing Co., of Pittsburgh, and will have direct charge of the editing of the metallurgical section of the Coal Catalogue—one of this concern's publications.

Among the honors conferred at the commencement exercises of Columbia University, held recently at New York, was the awarding of the medal of the Class of '89, of the School of Mines, to **Robert Van Arsdale Norris.** The medal is given triannually to the alumnus who "distinguished himself most in the field of human endeavor." Mr. Norris received the honorary degree of Master of Science from the University in 1914.

The French society of civil engineers is to have a symposium on "Rational Utilization of Fuels," as a part of its June activities. **M. George Charpy** is in charge of the major plans of the program, and will deliver the principal paper.

H. H. Boyd, who has held the position of chief engineer of the Bell & Zoller Mining Co., at Zeigler, in Franklin County, Ill., for a number of years, has resigned to become assistant bridge engineer for the Missouri, Kansas & Texas Lines. He was formerly with the Burlington railroad as engineer.

Bert Lloyd, Colorado representative of the Colorado-American Coal Co., of Milwaukee, Wis., is opening an office in Colorado Springs, Col., in which he will conduct a general coal-mining engineering practice.

John B. T. Jones, superintendent of the Laflin colliery of the Hudson Coal Co., has been appointed superintendent of the Pine Ridge colliery of the same company, succeeding John J. Walsh who has not been reassigned as yet. The headquarters of the Hudson company is at Scranton, Pa.

W. Guy Sroder, of Charleroi, Pa., who recently resigned as general superintendent of the Diamond Coal & Coke Co., of Pittsburgh, Pa., following the passing of the control of that company to the Hillman interests, has accepted a similar position in charge of the coal operations of the Shenango Furnace Co., at Willpen, Westmoreland County, Pa. The plant is on the Ligonier Valley R. R., four miles from Ligonier. Mr. Sroder now lives at Ligonier and has his office at Willpen.

Joseph H. Beek has been appointed Traffic Director of the St. Paul Association, at St. Paul, Minn., as Executive Secretary, in the place of Guy M. Freer, deceased. Mr. Beek assumed the duties of this office on June 1.

R. V. Norris, Jr., who has been chief mining engineer of the Lehigh Coal & Navigation Co., of Lansford, Pa., for the past year, has resigned his position to take effect June 1. Mr. Norris is leaving for California and has not as yet decided as to his future activity. The Navigation company has not announced any successor to Mr. Norris.

Morgan A. Morgan, who has just been appointed superintendent of the coal mine at Black Diamond, was the guest of honor at a district meeting of the Mount Rainier Sportsmen's Association at Burnett, Wash., recently. More than 150 members of the organization attended. During the meeting Mr. Morgan was presented with a gold watch, the gift of the men with whom he has worked while superintendent of the Burnett mine.

Fred W. Price, who has recently been with a large mining company in Colorado and formerly located at Duquoin, Ill., has returned to Illinois to accept a responsible position with the Victory Collieries Co., operating at Tamaroa, Ill.

Coming Meetings

American Mining Congress will hold its annual meeting at Denver, Col., Nov. 15. Secretary, J. F. Callbreath, Munsey Building, Washington, D. C.

American Institute of Mining & Metallurgical Engineers will hold its fall meeting Aug. 20 to Sept. 3. It is proposed to leave Buffalo by steamer and cruise through the Lakes, the first stop being at Houghton, Mich., after which the party will visit Duluth and the Iron Ranges of Minnesota, spending a day or two in Minneapolis on its return. Secretary, Bradley Stoughton, 29 West 39th St., New York City.

National Exposition of Chemical Industries will hold its sixth exposition Sept. 20 to 25, inclusive, at the Grand Central Palace, New York City.

American Institute of Electrical Engineers holds annual convention at White Sulphur Springs, W. Va., June 29 to July 2. Secretary, F. L. Hutchinson, New York, N. Y.

Mine Inspectors' Institute of America will hold its annual meeting July 13, 14 and 15 at Cleveland, Ohio. Secretary, J. W. Paul, Pittsburgh, Pa.

Illinois and Wisconsin Retail Coal Dealers' Association's annual meeting Aug. 4 and 5 at Milwaukee, Wis. Secretary, I. L. Runyan, Chicago, Ill.

Indiana State First Aid Meet at Clinton, Ind., July 5, under the auspices of the Indiana State First Aid Association, with the co-operation of the Clinton First Aid Association, Chamber of Commerce, Indiana Coal Operators' Association, United Mine Workers of America, Bureau of Mines, and State Mine Inspection Department.

The Rocky Mountain Coal Mining Institute, in conjunction with the **Colorado Metal Mining Association**, the local chapters of the American Mining Congress and the American Institute of Mining & Metallurgical Engineers, and the International First-Aid Meet, will hold its annual meeting Sept. 9, 10 and 11 at Denver, Col. Secretary, F. W. Whiteside, Denver, Col.

National Safety Council will hold its 1920 congress on Sept. 27 to Oct. 1 inclusive at Milwaukee, Wis. General manager, C. W. Price, Chicago, Ill.

Oklahoma Coal Operators' Association will hold its annual meeting Sept. 14 at McAlester, Okla. Secretary, F. F. LaGrave, McAlester, Okla.

Obituary

Robert H. Lindsay, aged 40, a mining engineer of Seattle, Wash., was killed recently by falling down the shaft of a mine in Butte, Mont. Mr. Lindsay was making an inspection of an old workings owned by James A. Murray of Seattle and Butte, when he met with the fatal accident. He was married 12 years ago in Virginia City, Mont.

James Dunsmuir, son of the late Robert Dunsmuir, the first large coal-mine operator of Vancouver Island and former Premier and Lieutenant-Governor of British Columbia, died suddenly on June 5. The name of Dunsmuir is identified inseparably with the development of the coal measures of western Canada. James Dunsmuir sold the Wellington, Comox and Alexandria collieries in 1910 to Messrs. MacKenzie and Mann for approximately ten million dollars. He still retained, however, the coal in the remaining area of the Esquimalt & Nanaimo Ry. land belt, title to which subsequently passed to the Canadian Collieries Ltd., in which concern he was heavily interested at the time of his death.

Samuel Flory died of heart failure recently at his home in Bangor, Pa., at the age of 66 years. Mr. Flory was interested in a number of corporations, the principal one being the manufacturing plant founded by him 44 years ago, known as the S. Flory Manufacturing Co., of which he was the head during these many years. The Flory company's suspension cableways and hoists have been in operation in the slate, coal and quarry regions of the United States and Canada for over 40 years. Surviving Mr. Flory are his widow and three children.

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